Environmental Permit No. FEP-01/571/2019/B

Proposed Golf Course Development at Tai Po Lot No. 246 Shuen Wan

Environmental Team Leader Certification

Reference Document

Document to be Certified:	Works Plan
Date of Report:	October 2025
Date received by ETL:	16 October 2025

Reference EP Condition

Environmental Permit Condition: 2.21

The Permit Holder shall, no later than one month before the commencement of construction of the Project or otherwise approved by the Director, submit 4 hard copies and 1 electronic copy of a Works Plan prepared based on the approved Design Plan under Condition 2.20 of this Permit. The Works Plan shall provide details for implementing the interfacing works including all demolition, relocation, reprovision and modification works of the existing landfill restoration facilities and shall include but not limited to the following information:

(i) Works areas;
(ii) Construction phasing;
(iii) Number of operatives;
(iv) Experience and special skills of operatives;
(v) Supervisors responsibilities;
(vi) Plant and equipment;
(vii) Method statement, procedures and sequencing of the works;
(viii) Measures to address the interfacing issues and to avoid any impacts to the existing operations of the landfill;
(ix) Emergency procedures, including fire fighting;
(x) Storage and use of safety equipment;
(xi) Proposed landfill gas monitoring requirements;
(xii) Safety precaution; and
(xiii) Signs, barriers and guarding.

The Works Plan shall be prepared in consultation with the Shuen Wan Landfill Restoration Contractor. The Works Plan shall be prepared by the Specialist Contractor, certified by the ET Leader, verified by the Independent Landfill Consultant, and then verified by the IEC for approval by the Director. All works and measures described in the approved Works Plan shall be fully implemented during construction phase of the Project.

ETL Certification

I hereby certify that the above reference report complies with the above referenced condition of FEP-01/571/2019/B.

Calvin Leung

Mr. Calvin Leung
Environmental Team Leader

Date: 20th October 2025

Environmental Permit No. FEP-01/571/2019/B

Proposed Golf Course Development at Tai Po Lot No. 246 Shuen Wan

Independent Landfill Consultant Verification

Reference Document

Document to be Verified:	Works Plan
Date of Report:	October 2025
Date received by Independent Landfill Consultant:	17 October 2025

Reference EP Condition

Environmental Permit Condition: 2.21

The Permit Holder shall, no later than one month before the commencement of construction of the Project or otherwise approved by the Director, submit 4 hard copies and 1 electronic copy of a Works Plan prepared based on the approved Design Plan under Condition 2.20 of this Permit. The Works Plan shall provide details for implementing the interfacing works including all demolition, relocation, reprovision and modification works of the existing landfill restoration facilities and shall include but not limited to the following information:

(i) Works areas;
(ii) Construction phasing;
(iii) Number of operatives;
(iv) Experience and special skills of operatives;
(v) Supervisors responsibilities;
(vi) Plant and equipment;
(vii) Method statement, procedures and sequencing of the works;
(viii) Measures to address the interfacing issues and to avoid any impacts to the existing operations of the landfill;
(ix) Emergency procedures, including fire fighting;
(x) Storage and use of safety equipment;
(xi) Proposed landfill gas monitoring requirements;
(xii) Safety precaution; and
(xiii) Signs, barriers and guarding.

The Works Plan shall be prepared in consultation with the Shuen Wan Landfill Restoration Contractor. The Works Plan shall be prepared by the Specialist Contractor, certified by the ET Leader, verified by the Independent Landfill Consultant, and then verified by the IEC for approval by the Director. All works and measures described in the approved Works Plan shall be fully implemented during construction phase of the Project.

Independent Landfill Consultant Verification

I hereby verify that the above reference report complies with the above referenced condition of FEP-01/571/2019/B.

Meinhardt Infrastructure and Environment Limited
Independent Landfill Consultant

Date: 20 October 2025

Environmental Permit No. FEP-01/571/2019/B

Proposed Golf Course Development at Tai Po Lot No. 246 Shuen Wan

Independent Environmental Checker Verification

Reference Document

Document to be Verified:	Works Plan
Date of Report:	October 2025
Date received by IEC:	17 October 2025

Reference EP Condition

Environmental Permit Condition: 2.21

The Permit Holder shall, no later than one month before the commencement of construction of the Project or otherwise approved by the Director, submit 4 hard copies and 1 electronic copy of a Works Plan prepared based on the approved Design Plan under Condition 2.20 of this Permit. The Works Plan shall provide details for implementing the interfacing works including all demolition, relocation, reprovision and modification works of the existing landfill restoration facilities and shall include but not limited to the following information:

(i) Works areas;
(ii) Construction phasing;
(iii) Number of operatives;
(iv) Experience and special skills of operatives;
(v) Supervisors responsibilities;
(vi) Plant and equipment;
(vii) Method statement, procedures and sequencing of the works;
(viii) Measures to address the interfacing issues and to avoid any impacts to the existing operations of the landfill;
(ix) Emergency procedures, including fire fighting;
(x) Storage and use of safety equipment;
(xi) Proposed landfill gas monitoring requirements;
(xii) Safety precaution; and
(xiii) Signs, barriers and guarding.

The Works Plan shall be prepared in consultation with the Shuen Wan Landfill Restoration Contractor. The Works Plan shall be prepared by the Specialist Contractor, certified by the ET Leader, verified by the Independent Landfill Consultant, and then verified by the IEC for approval by the Director. All works and measures described in the approved Works Plan shall be fully implemented during construction phase of the Project.

IEC Verification

I hereby verify that the above reference report complies with the above referenced condition of FEP-01/571/2019/B.

Mr. Adi Lee
Independent Environmental Checker

Date: 20 October 2025

ARUP

Tai Po Golf Club Limited

Proposed Golf Course Development at Tai Po Lot No. 246 Shuen Wan

Works Plan

Reference: 289499-REP-029-07

Job number 289499

Ove Arup & Partners Hong Kong Limited
Level 5 Festival Walk
80 Tat Chee Avenue
Kowloon Tong
Kowloon
Hong Kong
arup.com

Contents

Appendices

1. Project Background

1.1.1.1 In June 2017, the Chief Executive in Council has agreed in principle to the government proposal to grant a piece of land in Tai Po in exchange for its private land in Sha Lo Tung which has high ecological values. Under the non-in-situ land exchange proposal, the piece of land at the Shuen Wan Restored Landfill in Tai Po will be granted and the Sha Lo Tung site would be considered by government for active conservation management to avoid degradation and damage for long-term public enjoyment. This land exchange proposal is a unique, exceptional and isolated case, adding the idea is technically feasible as the private land ownership is largely unified under one entity and both Sha Lo Tung and the land at the landfill site, which has been planned for golf course development, are located in Tai Po, as shown in Figure 1 of FEP-01/571/2019/B (extracted as **Appendix 1.1**). The non-in-situ land exchange proposal has been completed in July 2022, and the Project Site has been handed over to the Project Proponent (PP).

1.1.1.2 The Project is a Designated Project (DP) under Environmental Impact Assessment Ordinance (EIAO), and an Environmental Impact Assessment (EIA) study was conducted in 2017. The *Shuen Wan Golf Course EIA Report* was approved by the Director of Environmental Protection (DEP) on 5 July 2019 (AEIAR-221/2019) ("the approved EIA Report") with the Environmental Permit (EP, EP-571/2019) issued on 20 September 2019. An application of Further Environmental Permit (FEP) has been made by Tai Po Golf Club Limited (the PP) and FEP was issued on 29 November 2022 (FEP-01/571/2019). Besides, surrender of EP-571/2019 has been applied and approved on 9 December 2022. In addition, an application for variation of EP has been made on 16 May 2023 to amend FEP-01/571/2019, and the amended EP was issued on 6 June 2023 (FEP-01/571/2019/A). Furthermore, another application for variation of EP has been made on 4 August 2025 to amend FEP-01/571/2019/A, and the amended EP was issued on 2 September 2025 (FEP-01/571/2019/B).

1.1.1.3 As stipulated in Condition 2.21 of FEP-01/571/2019/B, a Works Plan is prepared based on the approved Design Plan under Condition 2.20 of this EP. The Works Plan shall provide details for implementing the interfacing works including all demolition, relocation, reprovision and modification works of the existing landfill restoration facilities. The Works Plan shall be prepared in consultation with the Shuen Wan Landfill Restoration Contractor. The Works Plan shall be prepared by the Specialist Contractor, certified by the Environmental Team (ET) Leader, verified by the Independent Landfill Consultant, and then verified by the Independent Environmental Checker (IEC) for approval by the DEP. All works and measures described in the approved Works Plan shall be fully implemented during construction phase of the Project.

2. Works Plan

2.1.1.1 The Works Plan is prepared to comply with Conditions 2.21 of FEP-01/571/2019/B. This Works Plan contains works areas, construction phasing, number of operatives, experience and special skills of operatives, supervisors responsibilities, plant and equipment, method statement, procedures and sequencing of the works, measures to address the interfacing issues and to avoid any impacts to the existing operations of the landfill, emergency procedures, including fire fighting, storage and use of safety equipment, proposed landfill gas monitoring requirements, safety precaution, and signs, barriers and guarding. For details of the Works Plan, please refer to **Appendix 2.1**.

Appendix 1.1

Figure 1 of FEP-01/571/2019/B

Legend 圖例

Project Location
工程項目位置

1.2 ha Core Roosting Area
1.2 公頃核心夜間棲息地

Aquilaria sinensis
土沉香

Project Title **工程項目名稱**	**Shuen Wan Golf Course** **船灣高爾夫球場**
Figure 1 **圖一**	**Project Location and Conceptual Layout Plan** **工程項目位置及概念佈局圖** [This figure was prepared based on Figure 2.1 of EIA Report (Register No.: AEIAR-221/2019)] [本圖是根據環境影響評估報告 (登記冊編號: AEIAR-221/2019) 圖 2.1 編制]

Environmental Permit No.:
環境許可證編號：
FEP-01/571/2019/B

Appendix 2.1

Works Plan

WORKS PLAN FOR LANDFILL FEATURES

PLOVER COVE GOLF COURSE
AT RESTORED SHUEN WAN LANDFILL

TAI PO, HONG KONG

Prepared By:

Shanghai SUS Remediation Co., Ltd

In Cooperation with
PLOVER COVE GOLF CLUB

Revision 6.0
10 October 2025

Nature of this Works Plan

The Works Plan is a "living document" and will be subject to ongoing updates and revisions throughout the duration of the construction stage of the project.

As site conditions evolve and new information becomes available, the Works Plan will be amended to reflect the current works status and requirements, ensuring that the document remains consistent with the intended design and responsive to the needs of the project.

All stakeholders are encouraged to refer to the most recent version of the Works Plan document for the latest information and guidance.

Document Preparation, Review and Issuance

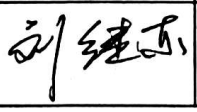
Document Version and Date of Issuance		Prepared by	Checked by	Reviewed and Approved for Submission
Rev 0 - First Issuance 18 July 2024		-	-	-
Rev 1.0 30 August 2024		-	-	-
Rev 2.0 23 October 2024		-	-	-
Rev 3.0 15 November 2024		-	-	-
Rev 4.0 7 May 2025	Plover Cove Golf Club	-	-	-
	Shanghai SUS Remediation Co., Ltd	-	-	-
Rev 5.0 17 June 2025	Plover Cove Golf Club	-	-	-
	Shanghai SUS Remediation Co., Ltd	-	-	-
Rev 6.0 10 October 2025	Plover Cove Golf Club			
	Shanghai SUS Remediation Co., Ltd			

Table of Contents

List of Attachments

Introduction

This Works Plan provides a comprehensive framework for the safe and efficient execution of tasks related to demolition, relocation, reprovisioning and modification of the various existing landfill facilities across the restored Shuen Wan Landfill. It addresses various aspects related to the works, including (but not necessarily limited to): work areas, construction phasing, operatives' roles, supervisors' responsibilities, plant and equipment, method statements, monitoring, and emergency procedures.

Objectives

The primary objectives of this Works Plan are to:

- Ensure the safe and efficient execution of landfill-related works.
- Protect the environment and comply with relevant regulations.
- Minimize disruption to ongoing landfill operations.
- Provide clear guidelines for operatives, supervisors, and other stakeholders.
- Facilitate smooth coordination and communication among all parties involved.

Abbreviation

- SM = Settlement monitoring monument
- GW = Groundwater monitoring well
- W = Leachate monitoring well
- AQ = Air quality monitoring station
- GMP = Gas monitoring probe
- I.C. = Infiltration monitoring cells
- NG = Gas collection well
- NDL = Drip-leg
- T-riser = Gas Venting Trench
- EPD = Environmental Protection Department of the Hong Kong Special Administrative Region Government

Notes

1. Yellow highlights as they may appear in this document are intentional and represent amendments in response to the most recent Comments from EPD or other relevant Government Departments or associated parties. Refer to the Response to Comments as they appear in Attachment 1 hereto this document.

THIS PAGE INTENTIONALLY BLANK

1.0 Works Areas

Overview

This section of the Works Plan outlines the tasks and responsibilities for the various works areas (refer to **Figure 1**) involved in the construction phasing plan. It includes the necessary operatives, their roles, and a detailed breakdown of activities required for the safe and efficient execution of tasks within each designated work area. The primary goal is to ensure minimal environmental impact and adherence to all safety regulations.

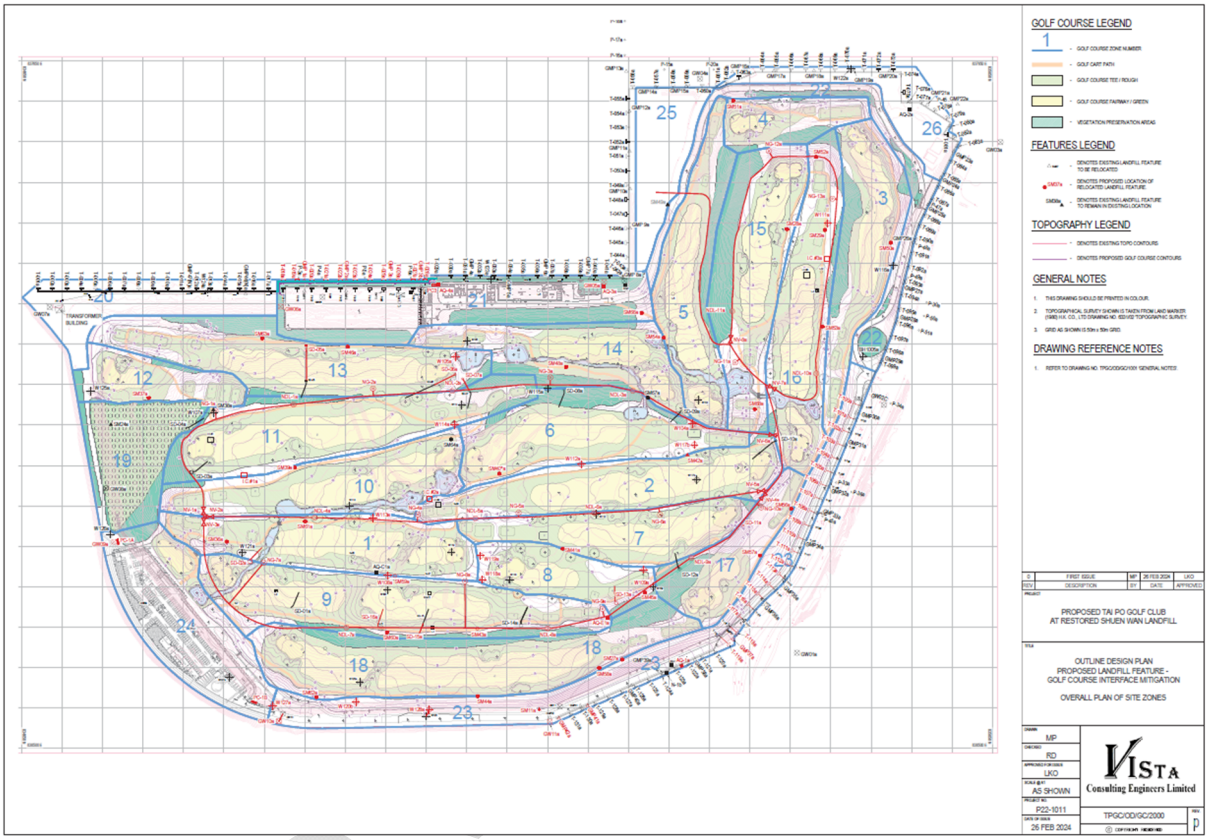


Figure 1: Landfill Facilities Works Areas

1.1 Monitoring System Works Area

Scope:

- Settlement monitoring monument (SM)
- Groundwater monitoring well (GW)
- Leachate monitoring well (W)
- Air quality monitoring station (AQ)
- Gas monitoring probe (GMP)
- Infiltration monitoring cells (I.C.)
- Slope settlement marker at Slope G
- Inclinometer at Slope G
- Piezometer at Slope G

Tasks:

- Site Preparation:
  - Clear the area of debris and vegetation.
  - Set up safety barriers and signage.
  - Identifying the location of the work area.
  - Setting out coordinates of the proposed works area and associated features.
- Installation:
  - Install monitoring equipment according to specifications.
  - Ensure proper calibration and functionality.
- Coordination:
  - Coordinate with environmental scientists to ensure proper placement and data collection.
  - Schedule regular maintenance and data recording sessions.
- Environmental Protection:
  - Minimize disturbance to surrounding habitats.
  - Implement erosion control measures if necessary.

1.2 Gas Management System Works Area

Scope:

- Gas collection well (NG)
- Drip-leg (NDL)
- Gas Collection Network
- Gas Venting Trench (T-riser)

Tasks:

- Site Preparation:
  - Conduct tree falling and site clearance for new gas well areas.
  - Establish temporary access routes.
  - Identifying the location of the work area.
  - Setting out coordinates of the proposed works area and associated features.
  - Detection on underground utilities.
- Drilling and Installation:
  - Use appropriate drilling rigs for gas well installation.
  - Install casing if/as necessary to prevent gas leaks.
- Temporary Connection:
  - Connect gas wells temporarily to existing gas networks for performance testing.
  - The temporary connection may require connection of newly drilled gas wells to the existing gas collection network serves several key purposes:

- **Performance Testing:** The primary purpose of temporarily connecting new gas wells to the existing network is to conduct performance testing. This involves evaluating the efficiency and effectiveness of the newly drilled wells in terms of gas flow rates, pressure stability, and gas composition (e.g., CH_4, CO_2, O_2, N_2). By closely monitoring these parameters, any potential issues such as leaks, blockages, or suboptimal gas collection can be identified and addressed before the wells are integrated into the permanent system. This step confirm that the new gas wells are fully operational and meet the target capacity.

- **Minimize Impact to Ongoing Landfill Operations:** Temporarily connecting the new gas wells to the existing gas collection network helps minimize disruption to ongoing landfill operations. The decommissioned gas wells are taken offline, the temporary connection of new gas wells ensures that there is no significant loss in the overall gas collection capacity. This compensation helps maintain the stability of the landfill's gas management system, preventing any potential gaps in gas collection that could lead to safety hazards or environmental issues.

- **Readiness for Integration into the New Gas Collection Network:** Due to the sequence of work, the new gas collection network will not be ready before the decommissioning of the existing gas wells. The temporary connection ensures the stability of the landfill's gas management system, preventing any potential gaps in gas collection that could lead to safety hazards or environmental issues.

- Gas Collection Network:
  - Excavate trenches for gas collection pipes.
  - Lay and weld HDPE pipes, ensuring leak-proof connections.
  - Conduct pressure tests and system integration.
- Coordination:
  - Coordinate with formation contractors to align activities with overall project timelines.
  - Monitor gas well performance and make necessary adjustments.
- Environmental Protection:
  - Implement measures to minimize soil and air contamination.
  - Regularly inspect and maintain gas collection infrastructure.

1.3 Leachate System Works Area

Scope:

- Leachate pipe
- Extraction well
- Valve chamber
- Weir chamber
- Pumping chamber
- Recirculation surge tank

Tasks:

- Site Preparation:
  - Clear and level the site for leachate system components.
  - Set up safety barriers and signage.
  - Identifying the location of the work area.
  - Setting out coordinates of the proposed works area and associated features.
- Installation:
  - Install leachate pipes and wells according to design specifications.
  - Construct valve, weir, and pumping chambers.
  - Install recirculation surge tanks and integrate with the leachate management system.
- Coordination:
  - Coordinate with the formation contractor to ensure proper sequencing of installation and soil filling.
  - Conduct testing and commissioning of the leachate system.
- Environmental Protection:
  - Ensure proper handling and disposal of leachate.
  - Implement measures to prevent leachate spills and soil contamination.

1.4 Utility Works Area

Scope:

- Electrical cable
- Draw pit
- Access manhole

Tasks:

- Site Preparation:
  - Clear and prepare the site for utility installations.
  - Set up safety barriers and signage.
  - Identifying the location of the work area.
  - Setting out coordinates of the proposed works area and associated features.

- Installation:
  - Install electrical cables, draw pits, and access manholes.
  - Ensure proper alignment and secure installation.
- Coordination:
  - Coordinate with other work areas to avoid conflicts and ensure seamless integration.
  - Conduct testing and commissioning of utility systems.
- Environmental Protection:
  - Minimize soil disturbance and implement erosion control measures.
  - Ensure proper handling of electrical components to prevent hazards.

1.5 Workshop and Office Works Area

Scope:

- Workshop for equipment maintenance and repairs
- Office for administrative tasks and project management

Tasks:

- Site Preparation:
  - Clear and level the area designated for the workshop and office.
  - Set up safety barriers and signage.
  - Identifying the location of the work area.
  - Setting out coordinates of the proposed works area and associated features.
- Construction:
  - Erect temporary or permanent structures for the workshop and office.
  - Install necessary utilities (electricity, water, internet).
- Setup:
  - Equip the workshop with tools and equipment for maintenance and repairs.
  - Furnish the office with desks, chairs, computers, and communication equipment.
- Coordination:
  - Ensure the workshop and office are centrally located to facilitate easy access for all site personnel.
  - Maintain clear communication channels between the workshop, office, and other work areas.
- Environmental Protection:
  - Implement waste management protocols in the workshop to handle and dispose of hazardous materials safely.
  - Ensure the office operates sustainably, with measures to reduce energy consumption and waste.

Coordination and Communication:

- Regular Meetings:
  - Schedule regular coordination meetings with all stakeholders, including formation contractors, environmental scientists, and project managers.
  - Review progress, address issues, and adjust plans as needed.
- Documentation and Reporting:
  - Maintain detailed records of all activities, including site preparation, installation, testing, and maintenance.
  - Provide regular progress reports to stakeholders.

Environmental and Safety Compliance:

- Safety Inspections:
  - Conduct regular safety inspections and audits.
  - Ensure all operatives follow safety protocols and use personal protective equipment (PPE).
- Regulatory Compliance:
  - Monitor compliance with all relevant environmental and safety regulations.
  - Address any compliance issues promptly.

1.6 Traffic Arrangement and Access to Landfill Restoration Facilities

With reference to **Figure 1** herein, all site traffic will enter the existing site entrance. Access to the various landfill facilities will generally be routed along:

- the existing block-paved road from the site entrance toward the seawall;
- the two existing ramps up to the +38mPD Platform and the +30mPD Platform/+40mPD Platform;
- the eastern perimeter of the site, first via the existing access track along the seawall, then the road along the eastern side of the site to be constructed as part of the Works;
- the western perimeter of the site, first via the existing track to the south of the +38mPD Platform and along the western site boundary from the seawall to the existing landfill gas plant, then via the roads around the western side of the site to be constructed as part of the Works; and
- within the site, the Works will generally be performed from the seawall at the south, to the site entrance at the north.

2.0 Construction Phasing

General Principles

The current Construction Phasing Plan (CPP) follows the principles outlined in the approved Environmental Impact Assessment (EIA) Report.

The sequence of work is defined based on the Construction Phasing Plan dated May 2024.

Phasing and Implementation

The CPP consists of three main phases (Phase 1, Phase 2, and Phase 3), with Phase 3 further divided into Phase 3A and Phase 3B. The construction of ancillary facilities spans all three phases.

2.1 Construction Phase 1:

Scope:

- Monitoring System:
  - Groundwater monitoring well (GW)
  - Leachate monitoring well (W)
  - Gas monitoring probe (GMP)
  - Infiltration monitoring cells (I.C.)
  - Slope settlement marker at Slope G
- Gas Management System:
  - Gas Venting Trench (T-riser)
- Leachate System:
  - Leachate pipe
  - Pumping chamber
  - Recirculation surge tank
- Utility:
  - Electrical cable
  - Draw pit
  - Access manhole

Details:

- **Coordination:** Coordinate with the site formation contractor to schedule the period of works and ensure minimal disruption to ongoing operations. Close communication is essential to avoid delays and conflicts.

- **Environmental Considerations:** Tree removal and site clearance should be phased and coordinated with new plantings to maintain habitat continuity. Temporary fencing shall be installed around sensitive areas to protect wildlife.

2.2 Construction Phase 2:

Scope:

- Monitoring System:
  - Settlement monitoring monument (SM)
  - Air quality monitoring station (AQ)
  - Inclinometer at Slope G
  - Piezometer at Slope G
- Gas Management System:
  - Gas collection well (NG)
  - Drip-leg (NDL)
  - Gas Collection Network
- Leachate System:
  - Leachate pipe
  - Extraction well

Details:

- **Coordination:** Coordinate with the formation contractor for the period of works, ensuring that the installation of gas wells and leachate systems aligns with overall project timelines.
- **Site Preparation:** Formation contractors should complete tree falling and site clearance on the new gas well area, including establishing temporary access routes.
- **Gas Well Installation:** Install landfill gas wells before formation works start. Temporarily connect these wells to the existing gas network. The formation contractor should then fill the soil to the final elevation next to the new gas wells.
- **Gas Network Installation:** After the formation contractor completes the final soil profile, install the new gas collection network, ensuring seamless integration with the existing infrastructure.

2.3 Construction Phase 3A/B:

Scope:

- Similar to Phase 2, including the installation of gas management and leachate systems.

Details:

- **Coordination:** Maintain coordination with the formation contractor for the period of works. Ensure all activities are scheduled to minimize impact on landfill operations.
- **Environmental Protection:** Continue to monitor and protect the core roosting area by maintaining fencing and minimizing disturbances.

2.4 Ancillary Facilities:

Scope:

- Leachate System:
  - Leachate pipe
  - Valve chamber
  - Weir chamber
  - Pumping chamber

Details:

- **Coordination:** Coordinate with the formation contractor for the period of works, ensuring the ancillary facilities' construction spans across all three phases seamlessly.

- **Extended Timeline:** The construction of ancillary facilities, including foundation, superstructure, exterior, and interior installations, will take an extended time. Schedule these works to overlap phases as needed.

- **Environmental Impact:** Implement measures to minimize environmental impact, including dust control, noise reduction, and careful management of construction debris.

3.0 Number of Operatives

Introduction

This section outlines the number of operatives to be involved in specific works related to the various landfill facilities, including; but not necessarily limited to; demolition, relocation, reprovision and modification. Proper documentation and planning of operatives will ensure efficient execution and compliance with safety and operational standards.

Number of Operatives

- Project Manager
  - Number Required: 1
  - Qualifications: Landfill and/or Landfill Aftercare/Afteruse Construction and Operation Experience
- Construction Manager
  - Number Required: 1
  - Qualifications: Landfill and/or Landfill Aftercare/Afteruse Construction Work Experience
- Supervisors:
  - Number Required: 1
  - Qualifications: Landfill and/or Landfill Aftercare/Afteruse Construction Work Experience
- Skilled Workers:
  - Number Required: ≥ 4
  - Skills Needed: HDPE Pipe Welding and Installation, Well Drilling (Landfill Gas, Leachate Extraction, Monitoring Wells, etc.), Concrete Works.
- Heavy Equipment Operators:
  - Number Required: 2
  - Skills Needed: Excavator, Compactor Operations Experience.
- General Laborers:
  - Number Required: ≥ 5
  - Responsibilities: General Construction Work Experience

4.0 Experience and Special Skills of Operatives

This section of the Works Plan outlines the tasks and responsibilities for the demolition, relocation, reprovisioning and relocation of existing landfill facilities. It includes the necessary operatives, their roles, and a detailed breakdown of activities required for safe and efficient demolition work.

4.1 Demolition Works to Existing Landfill Facilities

Existing Facilities to be Demolished:

- Monitoring system
  - Settlement monitoring monument (SM)
  - Groundwater monitoring well (GW)
  - Leachate monitoring well (W)
  - Air quality monitoring station (AQ)
  - Gas monitoring probe (GMP)
  - Infiltration monitoring cells (I.C.)
  - Slope settlement marker at Slope G
  - Inclinometer at Slope G
  - Piezometer at Slope G

- Gas Management System
  - Gas Venting Trench (T-riser)
  - Gas collection well (NG)
  - Drip-leg (NDL)
  - Valve

- Leachate System
  - Leachate pipe
  - Extraction well
  - Valve chamber
  - Weir chamber
  - Pumping chamber
  - Recirculation surge tank

- Utilities
  - Electrical cable
  - Draw pit
  - Access manhole
  - Subsoil drainage

Objective:

To safely and efficiently demolish existing landfill structures, ensuring minimal environmental impact and adherence to all safety regulations.

Operatives:

- Project Manager
  - Experience:
    - Extensive experience in project management, particularly in landfill or waste management projects.
    - Proven track record of managing large-scale demolition projects.
  - Special Skills:
    - Strong leadership and communication skills.
    - Proficiency in project management software (e.g., MS Project, Primavera).
    - In-depth knowledge of environmental and safety regulations.
- Site Supervisor
  - Experience:
    - Supervising demolition or construction projects.
    - Managing site safety and logistics.
  - Special Skills:
    - Excellent organizational and problem-solving skills.
    - Ability to oversee multiple teams and coordinate activities.
    - Strong understanding of safety protocols and regulations.
- Engineer
  - Experience:
    - Designing and overseeing demolition projects.
    - Structural analysis and demolition techniques.
  - Special Skills:
    - Expertise in structural engineering and demolition methods.
    - Proficiency in CAD software and structural analysis tools.
    - Strong analytical and problem-solving abilities.
- Heavy Equipment Operators
  - Experience:
    - Operating heavy machinery (e.g., excavators, hydraulic-breakers, bulldozers).

        - Working on demolition or construction sites.
    - Special Skills:
        - Certification in operating heavy equipment.
        - Excellent hand-eye coordination and spatial awareness.
        - Knowledge of equipment maintenance and safety procedures.

- Demolition Laborers
    - Experience:
        - Demolition or construction labour roles.
        - Using manual demolition tools and techniques.
    - Special Skills:
        - Strong physical stamina and ability to perform manual labour.
        - Knowledge of demolition safety practices and procedures.
        - Ability to work as part of a team and follow instructions.

- Waste Management Coordinator
    - Experience:
        - Waste management or environmental services.
        - Handling and disposal of hazardous materials.
    - Special Skills:
        - Expertise in waste segregation, recycling, and disposal methods.
        - Knowledge of environmental regulations and compliance standards.
        - Ability to manage waste disposal logistics and documentation.

- Safety Officer
    - Experience:
        - Construction or demolition safety roles.
        - Implementing and monitoring safety programs.
    - Special Skills:
        - Certification in occupational health and safety.
        - Strong knowledge of safety regulations and best practices.
        - Excellent observational and communication skills.

Tasks:

- Pre-Demolition Planning
    - Site Survey and Assessment:
        - Conduct a detailed survey of the site and existing structures.
        - Identify potential hazards and environmental concerns.
    - Demolition Plan Development:

- Develop a comprehensive demolition plan, including safety measures and waste management strategies.
- Obtain necessary permits and regulatory approvals.

- Site Preparation
  - Hazardous Material Removal:
    - Identify and safely remove hazardous materials (e.g., asbestos, chemicals).
    - Ensure proper disposal of hazardous waste.
  - Utility Disconnection:
    - Disconnect and secure utilities (e.g., water, gas, electricity) to prevent accidents.
- Demolition Execution
  - Structural Demolition:
    - Use heavy machinery and manual labour to demolish structures.
    - Ensure controlled and safe demolition of buildings and infrastructure.
  - Debris Removal:
    - Segregate, remove, and transport debris to designated disposal or recycling facilities.
    - Maintain clean and organized work areas.
- Waste Management
  - Waste Segregation:
    - Ensure proper handling and disposal of all waste materials.
  - Disposal:
    - Transport waste to appropriate disposal facilities.
    - Ensure compliance with disposal regulations.
  - Documentation and Reporting:
    - Maintain records of waste disposal and recycling activities.
    - Provide regular reports on waste management progress.
- Site Rehabilitation
  - Site Cleanup:
    - Conduct thorough cleanup of the site.
    - Remove any remaining debris and ensure the site is safe.
- Safety and Compliance
  - Safety Inspections:

- Conduct regular safety inspections and audits.
- Ensure all operatives follow safety protocols and use personal protective equipment (PPE).

➢ Regulatory Compliance:
- Monitor compliance with all relevant environmental and safety regulations.
- Address any compliance issues promptly.

4.2 Relocation Works of Existing Landfill Facilities

The objective is to safely and efficiently relocate existing landfill structures and components, ensuring minimal environmental impact and adherence to all safety regulations.

Existing Facilities to be Relocated:

- Monitoring system
  - ➢ Settlement monitoring monument (SM)
  - ➢ Air quality monitoring stations (AQ)
  - ➢ Gas monitoring probes (GMP)
  - ➢ Infiltration monitoring cells (I.C.)
  - ➢ Slope settlement markers at Slope G
  - ➢ Inclinometers at Slope G
  - ➢ Piezometers at Slope G

- Gas Management System
  - ➢ Gas Venting Trenches
  - ➢ Subsoil drainage systems

Operatives:

- Project Manager
  - ➢ Experience:
    - Extensive experience in project management, particularly in landfill or waste management projects.
    - Proven track record of managing large-scale relocation projects.

  - ➢ Special Skills:
    - Strong leadership and communication skills.
    - Proficiency in project management software (e.g., MS Project, Primavera).
    - In-depth knowledge of environmental and safety regulations.
- Site Supervisor
  - ➢ Experience:
    - Supervising relocation or construction projects.

- Managing site safety and logistics.

➢ Special Skills:
- Excellent organizational and problem-solving skills.
- Ability to oversee multiple teams and coordinate activities.
- Strong understanding of safety protocols and regulations.

- Engineer
  - ➢ Experience:
    - Designing and overseeing relocation projects.
    - Structural analysis and relocation techniques.
  - ➢ Special Skills:
    - Expertise in structural engineering and relocation methods.
    - Proficiency in CAD software and structural analysis tools.
    - Strong analytical and problem-solving abilities.
- Heavy Equipment Operators
  - ➢ Experience:
    - Operating heavy machinery (e.g., excavators, bulldozers, cranes).
    - Working on relocation or construction sites.
  - ➢ Special Skills:
    - Certification in operating heavy equipment.
    - Excellent hand-eye coordination and spatial awareness.
    - Knowledge of equipment maintenance and safety procedures.
- Laborers
  - ➢ Experience:
    - Relocation or construction labour roles.
    - Using manual relocation tools and techniques.
  - ➢ Special Skills:
    - Strong physical stamina and ability to perform manual labour.
    - Knowledge of relocation safety practices and procedures.
    - Ability to work as part of a team and follow instructions.
- Waste Management Coordinator
  - ➢ Experience:
    - Waste management or environmental services.
    - Handling and disposal of hazardous materials.
  - ➢ Special Skills:
    - Expertise in waste segregation, recycling, and disposal methods.

- Knowledge of environmental regulations and compliance standards.
- Ability to manage waste disposal logistics and documentation.

- Safety Officer
  - Experience:
    - Construction or relocation safety roles.
    - Implementing and monitoring safety programs.
  - Special Skills:
    - Certification in occupational health and safety.
    - Strong knowledge of safety regulations and best practices.
    - Excellent observational and communication skills.

Tasks:

- Pre-Relocation Planning
  - Site Survey and Assessment:
    - Conduct a detailed survey of the site and existing structures.
    - Identify potential hazards and environmental concerns.
  - Relocation Plan Development:
    - Develop a comprehensive relocation plan, including safety measures and waste management strategies.
    - Obtain necessary permits and regulatory approvals.
- Site Preparation
  - Hazardous Material Removal:
    - Identify and safely remove hazardous materials (e.g., asbestos, chemicals).
    - Ensure proper disposal of hazardous waste.
  - Utility Disconnection:
    - Disconnect and secure utilities (e.g., water, gas, electricity) to prevent accidents.
- Relocation Execution
  - Component Relocation:
    - Carefully disassemble and relocate components and equipment will be reused.
    - Ensure all components are transported and reassembled safely (Store in the safe area if the final location is not ready, coordinate with the Formation contractor to arrange installation).
- Waste Management

- Waste Segregation:
  - Ensure proper handling and disposal of all waste materials.

- Disposal:
  - Transport waste to appropriate disposal facilities.
  - Ensure compliance with disposal regulations.

- Documentation and Reporting:
  - Maintain records of waste disposal and recycling activities.
  - Provide regular reports on waste management progress.

- Site Rehabilitation
  - Site Cleanup:
    - Conduct thorough cleanup of the original and new sites.
    - Remove any remaining debris and ensure the sites are safe.

- Safety and Compliance
  - Safety Inspections:
    - Conduct regular safety inspections and audits.
    - Ensure all operatives follow safety protocols and use personal protective equipment (PPE).

  - Regulatory Compliance:
    - Monitor compliance with all relevant environmental and safety regulations.
    - Address any compliance issues promptly.

4.3 Reprovision of Existing Landfill Facilities

This section of the Works Plan outlines the tasks and responsibilities for the reprovisioning of existing landfill facilities. It includes the necessary operatives, their roles, and a detailed breakdown of activities required for the safe and efficient reprovisioning of landfill components.

Existing Facilities to be Reprovisioned:

- Gas Management System:
  - Gas collection well (NG)
  - Drip-leg (NDL)
  - Gas Collection Network

- Leachate System:
  - Leachate pipe

- Extraction well
- Valve chamber
- Weir chamber
- Pumping chamber
- Recirculation surge tank

Objective:

To safely and efficiently reprovision existing landfill structures and components, ensuring minimal environmental impact and adherence to all safety regulations, while minimizing the impact on ongoing landfill operations.

Operatives:

- Project Manager
  - Experience:
    - Extensive experience in project management, particularly in environmental or civil engineering projects.
    - Proven track record of managing large-scale reprovisioning projects.
    - Specific experience in landfill operations, including gas and leachate management.
  - Special Skills:
    - Strong leadership and communication skills.
    - Proficiency in project management software (e.g., MS Project, Primavera).
    - In-depth knowledge of environmental and safety regulations.
    - Ability to minimize the impact of reprovisioning activities on ongoing landfill operations.
- Site Supervisor
  - Experience:
    - Supervising reprovisioning or construction projects.
    - Managing site safety and logistics.
  - Special Skills:
    - Excellent organizational and problem-solving skills.
    - Ability to oversee multiple teams and coordinate activities.
    - Strong understanding of safety protocols and regulations.
- Reprovisioning Engineer
  - Experience:
    - Designing and overseeing reprovisioning projects.
    - Structural analysis and reprovisioning techniques.
    - Experience in landfill construction planning and coordination.

- Special Skills:
  - Expertise in structural engineering and reprovisioning methods.
  - Proficiency in CAD software and structural analysis tools.
  - Strong analytical and problem-solving abilities.

- Heavy Equipment Operators
  - Experience:
    - Operating heavy machinery (e.g., excavators, bulldozers, cranes).
    - Working on reprovisioning or construction sites.
  - Special Skills:
    - Certification in operating heavy equipment.
    - Excellent hand-eye coordination and spatial awareness.
    - Knowledge of equipment maintenance and safety procedures.

- Laborers
  - Experience:
    - Reprovisioning or construction labour roles.
    - Using manual reprovisioning tools and techniques.
  - Special Skills:
    - Strong physical stamina and ability to perform manual labour.
    - Knowledge of reprovisioning safety practices and procedures.
    - Ability to work as part of a team and follow instructions.

- Waste Management Specialists
  - Experience:
    - Waste management or environmental services.
    - Handling and disposal of hazardous materials.
  - Special Skills:
    - Expertise in waste segregation, recycling, and disposal methods.
    - Knowledge of environmental regulations and compliance standards.
    - Ability to manage waste disposal logistics and documentation.

- Safety Officer
  - Experience:
    - Construction or reprovisioning safety roles.
    - Implementing and monitoring safety programs.
  - Special Skills:
    - Certification in occupational health and safety.
    - Strong knowledge of safety regulations and best practices.

- Excellent observational and communication skills.

- Environmental Scientist
  - Experience:
    - Environmental science or engineering roles.
    - Environmental impact assessments and mitigation.
  - Special Skills:
    - Expertise in environmental monitoring and analysis.
    - Knowledge of environmental regulations and compliance.
    - Ability to conduct environmental assessments and provide recommendations.

Tasks:

- Pre-Reprovision Planning
  - Site Survey and Assessment:
    - Conduct a detailed survey of the site and existing structures.
    - Identify potential hazards and environmental concerns.
  - Reprovision Plan Development:
    - Develop a comprehensive reprovisioning plan, including safety measures and waste management strategies.
    - Obtain necessary permits and regulatory approvals.

- Site Preparation
  - Hazardous Material Removal:
    - Identify and safely remove hazardous materials (e.g., asbestos, chemicals).
    - Ensure proper disposal of hazardous waste.
  - Utility Disconnection:
    - Disconnect and secure utilities (e.g., water, gas, electricity) to prevent accidents.

- Reprovisioning Execution
  - Component Reprovisioning:
    - Carefully disassemble and reprovision smaller components and equipment.
    - Ensure all components are transported and reassembled safely.
  - Gas Well Drilling: Drilling sequence should be integrated with landfill operation and formation works. Gas wells may require temporary connections for performance testing. The demolition work sequence should be integrated with new gas well performance and readiness to avoid or minimize impact to

landfill operations. Refer to the demolition work plan and sequencing of work for more details.

Supervision:

- Ensure proper drilling procedures are followed and safety protocols are in place.
- Coordinate with landfill operations to minimize disruption.
- Monitor drilling activities to ensure compliance with environmental regulations.

Drilling Rigs:

- Use appropriate drilling rigs for gas well installation.
- Ensure rigs are operated by certified and experienced personnel.
- Maintain and inspect rigs regularly to ensure they are in good working condition.

Casing Installation:

- Properly install casing if/as necessary to prevent gas leaks.
- Use high-quality materials to ensure durability and integrity of the casings.
- Monitor the installation process to ensure casings are correctly positioned and secured.

Integrity Testing:

- Conduct pressure tests to ensure integrity and safety.
- Test wells both before and after connecting to the gas collection network.
- Monitor pressure levels to detect any potential leaks or weaknesses in the well structure.

Integration with Landfill Operations:

- Performance Testing:
  - Temporarily connect gas wells to the gas collection network for performance testing. For more detailed, refer to **Section 1.2 Task\Temporary Connection**. This involves linking the newly drilled gas wells to the existing network to evaluate their performance, ensuring they are functioning effectively before full integration into the system.
  - Monitor gas flow rates and composition to assess well performance.
  - Adjust and optimize well configurations based on test results.

Coordination with Demolition Works:

- Integrate demolition work sequence with the performance and readiness of new gas wells.
- Ensure new gas wells are fully operational before commencing demolition of old structures.
- Minimize disruption to landfill operations by carefully planning the timing and sequence of demolition and reprovision activities.

Key Considerations:

- Safety: Adhere to all safety protocols and ensure all personnel are trained and equipped with necessary PPE.
- Environmental Impact: Minimize environmental impact by following best practices and complying with all regulatory requirements.
- Efficiency: Optimize drilling and installation processes to ensure timely completion of works without compromising quality.
- Coordination: Maintain clear communication with all stakeholders, including landfill operators, to ensure smooth integration of drilling and demolition activities.

Gas Collection Network Installation:

- Trenching and Excavation:
  - Use excavators to create trenches for the gas collection pipes.
- Pipe Laying:
  - Lay HDPE pipes for the gas collection network, ensuring proper alignment and slope.
- Welding and Joining:
  - Use HDPE pipe welding machines to ensure secure and leak-proof joints.
- Pressure Testing:
  - Conduct pressure tests on the gas collection network to ensure no leaks.
- System Integration:
  - Integrate the new gas collection network with existing facilities, ensuring seamless operation.

Leachate System Reprovisioning:

- Pipe Installation:
  - Install new leachate pipes and ensure proper connections to existing systems.
- Chamber Construction:
  - Construct valve chambers, weir chambers, and pumping chambers as per design specifications.

- Surge Tank Installation:
  - Install recirculation surge tanks and integrate them with the leachate management system.
- Testing and Commissioning:
  - Test the entire leachate system for leaks and operational efficiency before commissioning.

Waste Management

- Waste Segregation:
  - Separate recyclable materials from waste.
  - Ensure proper handling and disposal of all waste materials.
- Disposal:
  - Transport waste to appropriate disposal facilities.
  - Ensure compliance with disposal regulations.
- Documentation and Reporting:
  - Maintain records of waste disposal and recycling activities.
  - Provide regular reports on waste management progress.

Site Rehabilitation

- Site Cleanup:
  - Conduct thorough cleanup of the original and new sites.
  - Remove any remaining debris and ensure the sites are safe.
- Environmental Restoration:
  - Implement measures to restore the sites, such as soil stabilization and vegetation planting.
  - Monitor the sites for any post-reprovisioning environmental impacts.

Safety and Compliance

- Safety Inspections:
  - Conduct regular safety inspections and audits.
  - Ensure all operatives follow safety protocols and use personal protective equipment (PPE).
- Regulatory Compliance:
  - Monitor compliance with all relevant environmental and safety regulations.
  - Address any compliance issues promptly.

4.4 Modification Works to Existing Landfill Facilities

This section of the Works Plan outlines the tasks and responsibilities for the modification of existing landfill facilities. It includes the necessary operatives, their roles, and a detailed breakdown of activities required for the safe and efficient modification of landfill components.

Existing Facilities to be Modified:

- Gas Management System:
  - Gas collection well (NG)
  - Drip-leg (NDL)
  - Gas Collection Network
- Leachate System:
  - Leachate pipe
  - Extraction well
  - Valve chamber
  - Weir chamber
  - Pumping chamber
  - Recirculation surge tank

Operatives:

- Project Manager
  - Experience:
    - Extensive experience in project management, particularly in environmental or civil engineering projects.
    - Proven track record of managing large-scale modification projects.
  - Special Skills:
    - Strong leadership and communication skills.
    - Proficiency in project management software (e.g., MS Project, Primavera).
    - In-depth knowledge of environmental and safety regulations.

- Site Supervisor
  - Experience:
    - Supervising modification or construction projects.
    - Managing site safety and logistics.
  - Special Skills:
    - Excellent organizational and problem-solving skills.
    - Ability to oversee multiple teams and coordinate activities.
    - Strong understanding of safety protocols and regulations.

- Modification Engineer
  - Experience:
    - Designing and overseeing modification projects.
    - Structural analysis and modification techniques.

- Special Skills:
  - Expertise in structural engineering and modification methods.
  - Proficiency in CAD software and structural analysis tools.
  - Strong analytical and problem-solving abilities.

- Heavy Equipment Operators
  - Experience:
    - Operating heavy machinery (e.g., excavators, bulldozers, cranes).
    - Working on modification or construction sites.
  - Special Skills:
    - Certification in operating heavy equipment.
    - Excellent hand-eye coordination and spatial awareness.
    - Knowledge of equipment maintenance and safety procedures.

- Laborers
  - Experience:
    - Modification or construction labour roles.
    - Using manual modification tools and techniques.
  - Special Skills:
    - Strong physical stamina and ability to perform manual labour.
    - Knowledge of modification safety practices and procedures.
    - Ability to work as part of a team and follow instructions.

- Waste Management Specialists
  - Experience:
    - Waste management or environmental services.
    - Handling and disposal of hazardous materials.
  - Special Skills:
    - Expertise in waste segregation, recycling, and disposal methods.
    - Knowledge of environmental regulations and compliance standards.
    - Ability to manage waste disposal logistics and documentation.

- Safety Officer
  - Experience:
    - Construction or modification safety roles.
    - Implementing and monitoring safety programs.
  - Special Skills:
    - Certification in occupational health and safety.
    - Strong knowledge of safety regulations and best practices.

- Excellent observational and communication skills.

- Environmental Scientist
  - Experience:
    - Environmental science or engineering roles.
    - Environmental impact assessments and mitigation.
  - Special Skills:
    - Expertise in environmental monitoring and analysis.
    - Knowledge of environmental regulations and compliance.
    - Ability to conduct environmental assessments and provide recommendations.

Tasks:

- Pre-Modification Planning
  - Site Survey and Assessment:
    - Conduct a detailed survey of the site and existing structures.
    - Identify potential hazards and environmental concerns.
  - Modification Plan Development:
    - Develop a comprehensive modification plan, including safety measures and waste management strategies.
    - Obtain necessary permits and regulatory approvals.

- Site Preparation
  - Hazardous Material Removal:
    - Identify and safely remove hazardous materials (e.g., asbestos, chemicals).
    - Ensure proper disposal of hazardous waste.
  - Utility Disconnection:
    - Disconnect and secure utilities (e.g., water, gas, electricity) to prevent accidents.

- Modification Execution
  - Structural Modification:
    - Use heavy machinery and manual labour to modify structures.
    - Ensure controlled and safe modification of buildings and infrastructure.
  - Component Modification:
    - Carefully disassemble and modify smaller components and equipment.
    - Ensure all components are transported and reassembled safely.

- Waste Management
  - Waste Segregation:
    - Separate recyclable materials from waste.
    - Ensure proper handling and disposal of all waste materials.
  - Disposal:
    - Transport waste to appropriate disposal facilities.
    - Ensure compliance with disposal regulations.
  - Documentation and Reporting:
    - Maintain records of waste disposal and recycling activities.
    - Provide regular reports on waste management progress.

- Site Rehabilitation
  - Site Cleanup:
    - Conduct thorough cleanup of the original and new sites.
    - Remove any remaining debris and ensure the sites are safe.
  - Environmental Restoration:
    - Implement measures to restore the sites, such as soil stabilization and vegetation planting.
    - Monitor the sites for any post-modification environmental impacts.

- Safety and Compliance
  - Safety Inspections:
    - Conduct regular safety inspections and audits.
    - Ensure all operatives follow safety protocols and use personal protective equipment (PPE).
  - Regulatory Compliance:
    - Monitor compliance with all relevant environmental and safety regulations.
    - Address any compliance issues promptly.

5.0 Supervisors' Responsibilities

This section of the Works Plan outlines the tasks and responsibilities of the Site Supervisor(s) for the demolition, relocation, reprovisioning and modification of existing landfill facilities. It includes the role, and a detailed breakdown of activities required for safe and efficient demolition work; focusing specifically on the responsibilities of site supervisors. The successful demolition, relocation, reprovisioning and modification of existing landfill facilities requires a team of skilled operatives with specialized experience and skills. Site supervisors play a critical role in overseeing the project, ensuring that all activities are carried out safely and efficiently, and maintaining compliance with all regulatory requirements. By focusing on thorough planning, meticulous site preparation, and precise execution, the project can be completed with minimal impact on the landfill operation.

5.1 Demolition Works

Existing Landfill Facilities to be Demolished

The existing landfill facilities to be demolished include the following:

- Monitoring System:
  - Settlement monitoring monument (SM)
  - Groundwater monitoring well (GW)
  - Leachate monitoring well (W)
  - Air quality monitoring station (AQ)
  - Gas monitoring probe (GMP)
  - Infiltration monitoring cells (I.C.)
  - Slope settlement marker at Slope G
  - Inclinometer at Slope G
  - Piezometer at Slope G

- Gas Management System:
  - Gas Venting Trench (T-riser)
  - Gas collection well (NG)
  - Drip-leg (NDL)
  - Valve

- Leachate System:
  - Leachate pipe
  - Extraction well
  - Valve chamber
  - Weir chamber
  - Pumping chamber
  - Recirculation surge tank

- Utilities:
  - Electrical cable
  - Draw pit
  - Access manhole
  - Subsoil drainage

Supervisors' Responsibilities

- Pre-Demolition Planning
  - Site Survey and Assessment:
    - Conduct a detailed survey of the site and existing structures.
    - Identify potential hazards such as asbestos, lead, or other hazardous materials.
    - Assess structural stability and determine the best methods for demolition.
    - Evaluate environmental concerns including potential contamination and necessary remediation measures.
    - Document all existing facilities to create a comprehensive inventory.

  - Demolition Plan Development:
    - Develop a detailed demolition plan in collaboration with the project manager and engineer.
    - Include methods for controlled demolition to minimize dust, noise, and vibration impacts.
    - Outline specific safety measures to protect workers and the surrounding environment.
    - Create a detailed schedule outlining each phase of the demolition process.
    - Plan for the management and disposal of demolition waste, including recycling and hazardous material disposal.
    - Ensure that all necessary permits and regulatory approvals are obtained from relevant authorities.

  - Stakeholder Communication:
    - Inform local communities and stakeholders about the demolition plans, potential impacts, and safety measures.
    - Establish communication channels for ongoing updates and feedback during the demolition process.

- Site Preparation
  - Hazardous Material Removal:
    - Supervise the identification and safe removal of hazardous materials such as asbestos, lead, and chemicals.

- Coordinate with specialized hazardous material removal teams to ensure proper handling and disposal.
- Ensure compliance with all regulations for hazardous waste management and disposal.

➢ Utility Disconnection:
- Oversee the disconnection of all utilities (water, gas, electricity, telecommunications) to prevent accidents.
- Ensure proper capping and securing of utility lines.
- Verify that utility providers have safely disconnected services and that the site is safe for demolition activities.

➢ Site Setup:
- Establish access routes for heavy machinery and emergency vehicles.
- Set up safety barriers, fencing, and signage to secure the demolition site.
- Install temporary facilities such as site offices, first aid stations, and rest areas for workers.
- Ensure that emergency procedures are in place and communicated to all team members.

➢ Environmental Protection:
- Implement erosion control measures to prevent soil runoff.
- Set up air quality monitoring systems to track dust and emissions.
- Establish noise barriers to minimize impact on surrounding communities.

● Demolition Execution

➢ Structural Demolition:
- Supervise the use of heavy machinery (e.g., excavators, hydraulic-breakers, bulldozers) and manual labour for demolition.
- Implement controlled demolition techniques to ensure safety and precision.
- Monitor structural stability continuously to prevent unplanned collapses.
- Ensure that all demolition activities adhere to the safety plan and regulatory requirements.

➢ Debris Removal:
- Oversee the segregation of recyclable materials from general waste.
- Ensure the safe removal and transportation of debris to designated disposal or recycling facilities.
- Maintain clean and organized work areas to prevent hazards.

- Monitor the loading and transport process to ensure compliance with waste management regulations.

➢ On-Site Waste Management:
- Coordinate on-site waste management activities, including temporary storage and segregation.
- Ensure proper labelling and handling of hazardous waste.
- Maintain detailed records of waste types, volumes, and disposal methods.

➢ Site Inspections and Adjustments:
- Conduct regular site inspections to ensure adherence to the demolition plan.
- Make real-time adjustments to demolition methods and schedules as needed.
- Address any issues or unforeseen challenges promptly and effectively.

5.2 Relocation Works

Existing Landfill Facilities to be Relocated

The existing landfill facilities to be relocated include the following:

- Monitoring System:
  - ➢ Settlement monitoring monument (SM)
  - ➢ Air quality monitoring (AQ)
  - ➢ Gas monitoring probe (GMP)
  - ➢ Infiltration monitoring cells (I.C.)
  - ➢ Slope settlement marker at Slope G
  - ➢ Inclinometer at Slope G
  - ➢ Piezometer at Slope G

- Gas Management System:
  - ➢ Gas Venting Trench
  - ➢ Subsoil drainage

Supervisors' Responsibilities

- Pre-Relocation Planning
  - ➢ Site Survey and Assessment:
    - Conduct a detailed survey of the site and existing structures.
    - Identify potential hazards and environmental concerns.
    - Assess structural stability and determine the best methods for relocation.

- Evaluate environmental concerns including potential contamination and necessary remediation measures.
- Document all existing facilities to create a comprehensive inventory.

➢ Relocation Plan Development:
- Develop a detailed relocation plan in collaboration with the project manager and engineer.
- Include methods for controlled relocation to minimize disruptions and environmental impacts.
- Outline specific safety measures to protect workers and the surrounding environment.
- Create a detailed schedule outlining each phase of the relocation process.
- Plan for the management and disposal of any waste generated during the relocation, including recycling and hazardous material disposal.
- Ensure that all necessary permits and regulatory approvals are obtained from relevant authorities.

➢ Stakeholder Communication:
- Inform local communities and stakeholders about the relocation plans, potential impacts, and safety measures.
- Establish communication channels for ongoing updates and feedback during the relocation process.

● Site Preparation

➢ Hazardous Material Removal:
- Supervise the identification and safe removal of hazardous materials such as asbestos, lead, and chemicals.
- Coordinate with specialized hazardous material removal teams to ensure proper handling and disposal.
- Ensure compliance with all regulations for hazardous waste management and disposal.

➢ Utility Disconnection:
- Oversee the disconnection of all utilities (Leachate, Landfill gas, electricity, compressed air) to prevent accidents.
- Ensure proper capping and securing of utility lines.
- Verify that utility providers have safely disconnected services and that the site is safe for relocation activities.

➢ Site Setup:
- Establish access routes for heavy machinery and emergency vehicles.
- Set up safety barriers, fencing, and signage to secure the relocation site.

- Install temporary facilities such as site offices, first aid stations, and rest areas for workers.
- Ensure that emergency procedures are in place and communicated to all team members.

➢ Environmental Protection:
- Implement erosion control measures to prevent soil runoff.
- Set up air quality monitoring systems to track dust and emissions.
- Establish noise barriers to minimize impact on surrounding communities.

- Relocation Execution
  ➢ Component Relocation:
  - Oversee the disassembly, transportation, and reassembly of smaller components and equipment.
  - Ensure proper labelling and documentation of all components to ensure they are correctly relocated and reinstalled.
  - Monitor the loading and transport process to ensure compliance with waste management regulations.

  ➢ On-Site Waste Management:
  - Coordinate on-site waste management activities, including temporary storage and segregation.
  - Ensure proper labelling and handling of hazardous waste.
  - Maintain detailed records of waste types, volumes, and disposal methods.

  ➢ Site Inspections and Adjustments:
  - Conduct regular site inspections to ensure adherence to the relocation plan.
  - Make real-time adjustments to relocation methods and schedules as needed.
  - Address any issues or unforeseen challenges promptly and effectively.

5.3 Reprovisioning Works

Existing Facilities to be Reprovisioned

The existing landfill facilities to be reprovisioned include the following:

- Gas Management System:
  - Gas collection well (NG)
  - Drip-leg (NDL)
  - Gas Collection Network

- Leachate System:
  - Leachate pipe
  - Extraction well
  - Valve chamber
  - Weir chamber
  - Pumping chamber
  - Recirculation surge tank

Supervisors' Responsibilities

- Pre-Reprovision Planning
  - Site Survey and Assessment:
    - Conduct a detailed survey of the site and existing structures.
    - Identify potential hazards and environmental concerns.
    - Assess structural stability and determine the best methods for reprovisioning.
    - Evaluate environmental concerns including potential contamination and necessary remediation measures.
    - Document all existing facilities to create a comprehensive inventory.

  - Reprovision Plan Development:
    - Develop a detailed reprovision plan in collaboration with the project manager and engineer.
    - Include methods for controlled reprovisioning to minimize disruptions and environmental impacts.
    - Outline specific safety measures to protect workers and the surrounding environment.
    - Create a detailed schedule outlining each phase of the reprovisioning process.
    - Plan for the management and disposal of any waste generated during the reprovisioning, including recycling and hazardous material disposal.
    - Ensure that all necessary permits and regulatory approvals are obtained from relevant authorities.

  - Stakeholder Communication:
    - Inform local communities and stakeholders about the reprovision plans, potential impacts, and safety measures.
    - Establish communication channels for ongoing updates and feedback during the reprovision process.

- Site Preparation
  - Hazardous Material Removal:
    - Supervise the identification and safe removal of hazardous materials such as asbestos, lead, and chemicals.

- Coordinate with specialized hazardous material removal teams to ensure proper handling and disposal.
- Ensure compliance with all regulations for hazardous waste management and disposal.

➢ Utility Disconnection:
- Oversee the disconnection of all utilities (water, gas, electricity, telecommunications) to prevent accidents.
- Ensure proper capping and securing of utility lines.
- Verify that utility providers have safely disconnected services and that the site is safe for reprovisioning activities.

➢ Site Setup:
- Establish access routes for heavy machinery and emergency vehicles.
- Set up safety barriers, fencing, and signage to secure the reprovision site.
- Install temporary facilities such as site offices, first aid stations, and rest areas for workers.
- Ensure that emergency procedures are in place and communicated to all team members.

➢ Environmental Protection:
- Implement erosion control measures to prevent soil runoff.
- Set up air quality monitoring systems to track dust and emissions.
- Establish noise barriers to minimize impact on surrounding communities.

● Reprovisioning Execution

➢ Component Reprovisioning:
- Oversee the disassembly, transportation, and reassembly of smaller components and equipment.
- Ensure proper labelling and documentation of all components to ensure they are correctly reprovisioned and reinstalled.
- Monitor the loading and transport process to ensure compliance with waste management regulations.

➢ On-Site Waste Management:
- Coordinate on-site waste management activities, including temporary storage and segregation.
- Ensure proper labelling and handling of hazardous waste.
- Maintain detailed records of waste types, volumes, and disposal methods.

➢ Site Inspections and Adjustments:

- Conduct regular site inspections to ensure adherence to the reprovisioning plan.
- Make real-time adjustments to reprovisioning methods and schedules as needed.
- Address any issues or unforeseen challenges promptly and effectively.

5.4 Modification Works

Existing Facilities to be Modified

The existing landfill facilities to be modified include the following:

- Gas Management System:
  - Gas collection well (NG)
  - Drip-leg (NDL)
  - Gas Collection Network

- Leachate System:
  - Leachate pipe
  - Extraction well
  - Valve chamber
  - Weir chamber
  - Pumping chamber
  - Recirculation surge tank

Supervisors' Responsibilities

- Pre-modification Planning
  - Site Survey and Assessment:
    - Conduct a detailed survey of the site and existing structures.
    - Identify potential hazards and environmental concerns.
    - Assess structural stability and determine the best methods for modification.
    - Evaluate environmental concerns including potential contamination and necessary remediation measures.
    - Document all existing facilities to create a comprehensive inventory.

  - Modification Plan Development:
    - Develop a detailed modification plan in collaboration with the project manager and engineer.
    - Include methods for controlled modifications to minimize disruptions and environmental impacts.
    - Outline specific safety measures to protect workers and the surrounding environment.

- Create a detailed schedule outlining each phase of the modification process.
- Plan for the management and disposal of any waste generated during the modification, including recycling and hazardous material disposal.
- Ensure that all necessary permits and regulatory approvals are obtained from relevant authorities.

➢ Stakeholder Communication:
- Inform local communities and stakeholders about the modification plans, potential impacts, and safety measures.
- Establish communication channels for ongoing updates and feedback during the modification process.

● Site Preparation
➢ Hazardous Material Removal:
- Supervise the identification and safe removal of hazardous materials such as asbestos, lead, and chemicals.
- Coordinate with specialized hazardous material removal teams to ensure proper handling and disposal.
- Ensure compliance with all regulations for hazardous waste management and disposal.

➢ Utility Disconnection:
- Oversee the disconnection of all utilities (water, gas, electricity, telecommunications) to prevent accidents.
- Ensure proper capping and securing of utility lines.
- Verify that utility providers have safely disconnected services and that the site is safe for modification activities.

➢ Site Setup:
- Establish access routes for heavy machinery and emergency vehicles.
- Set up safety barriers, fencing, and signage to secure the modification site.
- Install temporary facilities such as site offices, first aid stations, and rest areas for workers.
- Ensure that emergency procedures are in place and communicated to all team members.

➢ Environmental Protection:
- Implement erosion control measures to prevent soil runoff.
- Set up air quality monitoring systems to track dust and emissions.
- Establish noise barriers to minimize impact on surrounding communities.

- Modification Execution
  - Structural Modification:
    - Supervise the use of heavy machinery (e.g., cranes, transport vehicles) and manual labour for modification.
    - Implement controlled modification techniques to ensure safety and precision.
    - Monitor structural stability continuously to prevent unplanned collapses.
    - Ensure that all modification activities adhere to the safety plan and regulatory requirements.

  - Component Modification:
    - Oversee the disassembly, transportation, and reassembly of smaller components and equipment.
    - Ensure proper labelling and documentation of all components to ensure they are correctly modified and reinstalled.
    - Monitor the loading and transport process to ensure compliance with waste management regulations.

  - Well Drilling:
    - Supervise the drilling of new wells for gas collection and leachate extraction.
    - Ensure proper casing and installation of wells to meet safety and operational standards.
    - Conduct tests to confirm the integrity and functionality of the newly drilled wells.

  - HDPE Pipe Works:
    - Oversee the installation of HDPE pipes for the gas and leachate systems.
    - Ensure all connections and welds are secure and meet industry standards.
    - Conduct pressure tests and inspections to verify the integrity of the pipe network.

  - Gas Collection Network Tie-In:
    - Supervise the connection of the new gas collection network to the existing facilities.
    - Ensure all connections are secure and meet safety and operational standards.
    - Conduct pressure tests and inspections to verify the integrity of the connections.

- Leachate Piping Tie-In:
  - Oversee the connection of the new leachate piping to the existing facilities.
  - Ensure all connections are secure and meet safety and operational standards.
  - Conduct flow tests and inspections to verify the integrity of the connections.

- On-Site Waste Management:
  - Coordinate on-site waste management activities, including temporary storage and segregation.
  - Ensure proper labelling and handling of hazardous waste.
  - Maintain detailed records of waste types, volumes, and disposal methods.

- Site Inspections and Adjustments:
  - Conduct regular site inspections to ensure adherence to the modification plan.
  - Make real-time adjustments to modification methods and schedules as needed.
  - Address any issues or unforeseen challenges promptly and effectively.

Special Skills of Operatives

- Project Manager
  - Special Skills:
    - Strong leadership and communication skills.
    - Proficiency in project management software (e.g., MS Project, Primavera).
    - In-depth knowledge of environmental and safety regulations.

- Site Supervisor
  - Special Skills:
    - Excellent organizational and problem-solving skills.
    - Ability to oversee multiple teams and coordinate activities.
    - Strong understanding of safety protocols and regulations.

- Engineer
  - Special Skills:
    - Expertise in structural engineering and modification methods.
    - Proficiency in CAD software and structural analysis tools.
    - Strong analytical and problem-solving abilities.

- Heavy Equipment Operators
  - Special Skills:
    - Certification in operating heavy equipment.
    - Excellent hand-eye coordination and spatial awareness.
    - Knowledge of equipment maintenance and safety procedures.

- Drilling Operators
  - Special Skills:
    - Expertise in well drilling techniques and equipment.
    - Knowledge of casing and well installation procedures.
    - Ability to conduct well integrity and functionality tests.

- HDPE Pipe Technicians
  - Special Skills:
    - Proficiency in HDPE pipe installation and welding techniques.
    - Knowledge of industry standards for pipe connections and welds.
    - Ability to conduct pressure tests and inspections.

- Demolition Laborers
  - Special Skills:
    - Strong physical stamina and ability to perform manual labour.
    - Knowledge of modification safety practices and procedures.
    - Ability to work as part of a team and follow instructions.

- Waste Management Coordinator
  - Special Skills:
    - Expertise in waste segregation, recycling, and disposal methods.
    - Knowledge of environmental regulations and compliance standards.
    - Ability to manage waste disposal logistics and documentation.

- Safety Officer
  - Special Skills:
    - Certification in occupational health and safety.
    - Strong knowledge of safety regulations and best practices.
    - Excellent observational and communication skills.

- Environmental Scientist
  - Special Skills:
    - Expertise in environmental monitoring and analysis.
    - Knowledge of environmental regulations and compliance.
    - Ability to conduct environmental assessments and provide recommendations.

6.0 Plant and Equipment

6.1 Overview

This section outlines the necessary plant and equipment required for the various types of works to be performed on the existing landfill facilities, including: demolition, relocation, reprovision, and modification. Each type of work requires specific equipment and tools to ensure efficiency, safety, and compliance with environmental regulations.

6.2 Demolition Plant and Equipment:

The plant and equipment anticipated to be necessary to safely and efficiently demolish existing landfill structures, ensuring minimal environmental impact are as follows.

- Excavators:
  - Hydraulic excavators with various attachments (e.g., grapples, breakers, shears) for breaking down structures.
- Bulldozers:
  - For clearing debris and levelling the site post-demolition.
- Loaders and Skid Steers:
  - For loading debris into trucks and moving materials on-site.
- Dump Trucks:
  - For transporting demolition debris to disposal or recycling facilities.
- Crane:
  - For lifting and removing heavy components.
- Concrete Crushers:
  - For breaking down concrete structures and foundations.
- Dust Suppression Systems:
  - To control dust and particulate emissions during demolition activities.
- Personal Protective Equipment (PPE):
  - Helmets, gloves, safety glasses, high-visibility vests, and respiratory protection for all workers.

6.3 Relocation Plant and Equipment

The plant and equipment anticipated to be necessary to safely and efficiently relocate existing landfill structures and components are as follows:

- Cranes:
  - For lifting and relocating large structures and heavy components.
- Transport Trucks:
  - Flatbed and lowboy trucks for transporting equipment and pre-fabricated structures.
- Excavators:
  - For digging and preparing new sites, as well as moving earth and materials.
- Forklifts:
  - For loading and unloading materials and equipment.
- Hydraulic Jacks:
  - For lifting and moving heavy structures.
- Temporary Supports and Bracing:
  - For securing structures during relocation.
- Surveying Equipment:
  - Total stations, GPS, and laser levels for precise measurement and alignment.
- PPE:
  - Helmets, gloves, safety glasses, high-visibility vests, and respiratory protection for all workers.

6.4 Reprovisioning Plant and Equipment

The plant and equipment anticipated to be necessary to safely and efficiently reprovision existing landfill structures and components are as follows:

- Drilling Rigs:
  - For well drilling operations.
- HDPE Pipe Welding Machines:
  - For welding HDPE pipes used in gas and leachate systems.
- Excavators:
  - For trenching and installing new piping and wells.

- Pipe Laying Equipment:
  - For installing gas and leachate pipes.

- Concrete Mixers:
  - For constructing valve, weir, and pumping chambers.

- Pumps and Hoses:
  - For installing and testing pumping systems.

- Pressure Testing Equipment:
  - For testing the integrity of installed pipes and connections.

- Surveying Equipment:
  - Total stations, GPS, and laser levels for precise alignment and installation.

- PPE:
  - Helmets, gloves, safety glasses, high-visibility vests, and respiratory protection for all workers.

6.5 Modification Plant and Equipment

The plant and equipment anticipated to be necessary to safely and efficiently modify existing landfill structures and components are as follows:

- Excavators:
  - For earthmoving and trenching required for modifications.

- Cutting and Welding Equipment:
  - For modifying existing gas and leachate systems.

- HDPE Pipe Welding Machines:
  - For connecting new sections to existing HDPE pipes.

- Concrete Saws and Breakers:
  - For cutting and removing sections of existing concrete structures.

- Cranes:
  - For lifting and positioning new components during modifications.

- Loaders and Skid Steers:
  - For moving materials and equipment on-site.

- Temporary Supports and Bracing:
  - For securing structures during modification.

- Surveying Equipment:
  - Total stations, GPS, and laser levels for precise measurement and alignment.

- PPE:
  - Helmets, gloves, safety glasses, high-visibility vests, and respiratory protection for all workers.

7.0 Method Statement, Procedures and Sequencing of the Works

These method statements collectively ensure that the landfill's gas and liquid management systems are installed, modified, and maintained to the highest standards. By following these detailed procedures, the landfill operations can be conducted safely, efficiently, and in compliance with environmental regulations. Each method statement addresses a specific aspect of the landfill's infrastructure, from the installation of gas wells and HDPE pipes to the diversion of leachate and gas pipes, ensuring that the entire system operates cohesively and reliably.

7.1 Gas Well Method Statement (General Gas Extraction Well and Collection System Installation)

Construction Sequence / Methodology

- Site Preparation
  - Tree Removal:
    - Ensure that all trees are removed by the designated contractor to allow access to the site.
    - Coordinate with the tree removal team to confirm completion before proceeding.
  - Access Road and Working Platforms:
    - Construct an access road suitable for heavy machinery, ensuring stability and accessibility.
    - Build stable working platforms for the drilling rig, using compacted soil or other suitable materials to support heavy equipment.
  - Underground Utilities Check
    - Identifying the existing underground utilities and pipelines from the available as-built drawings, prevent accidental damage during excavation and installation.
  - Expose Existing HDPE Liner:
    - For platforms with HDPE liner:
      - Excavate soil to expose existing HDPE liners with a minimum 800 x 800mm opening.
      - Use a supervised mini excavator for initial excavation and hand digging for precise work.
      - Take care to avoid damaging the liner during excavation.
      - Further excavate to a minimum depth of 200mm to confirm there is no existing header pipe at the proposed location.

- Safety Measures:
  - Conduct a comprehensive site safety briefing for all personnel involved in the project.
  - Ensure all personnel are equipped with appropriate Personal Protective Equipment (PPE) such as helmets, gloves, safety glasses, and high-visibility clothing.
  - Identify and mark the locations of existing utilities and pipelines to avoid accidental damage during excavation.
  - Confined space work:
    - Eliminate Confined Space Work: Use engineering methods to design, construct, and maintain systems that avoid the need for confined space entry.
    - If Confined Space Work is Necessary: Ensure all relevant safety measures are in place, including statutory controls, compliance with safety regulations, adequate ventilation, use of personal protective equipment (PPE), and emergency preparedness to meet all statutory requirements and protect worker safety.

- HDPE Liner Handling
  - Cutting and Protecting the Liner:
    - Carefully cut the HDPE liner with an 800 x 800mm opening using appropriate cutting tools.
    - Place temporary protection liner material over the exposed area to prevent contamination and damage.
  - Survey and Backfill:
    - Take a precise survey record of the opening position for future reference.
    - Backfill the hole with soil to temporarily cover the opening.
    - Mark the location clearly with survey stakes for easy identification.

- Drilling
  - Platform Preparation:
    - Prepare and define the platform for the drilling rig with appropriate signage and barriers to ensure safety.
    - Ensure the platform is level and stable to support the drilling rig.
  - Drilling Rig Setup:
    - Mobilize the drilling rig to the site and set it up according to manufacturer guidelines and safety procedures.

- Ensure all necessary equipment and materials are on-site and ready for use.

➢ Drilling the Gas Well:
- Drill the gas well to the design depth, ensuring it is at least 10 meters above the known base liner or base formation level.
- Monitor drilling parameters continuously to maintain control and prevent deviations.
- Use appropriate drilling techniques to minimize the risk of collapse and ensure the integrity of the borehole.
- Manage drilling spoil by transferring it to a standby tipper truck for disposal at a designated location.
- **Gas Detection:** Prior to any drilling works, conduct landfill gas detection in accordance with the requirements in the Construction Phase Landfill Gas Hazard Assessment. The focus of this monitoring is particularly the Lower Explosive Limit (LEL) of methane, recognizing that the waste mass will continuously be generating gas.
- **Safety Precautions:** Since it is not feasible to fully isolate the gas generation from the waste mass, maintain a water truck on standby at all times. Ensure that the casing and drilling equipment in contact with waste are kept wet to prevent the risk of ignition and to control dust.

➢ Installation of Extraction Pipe:
- Install the extraction pipe into the drilled well, ensuring it reaches the required depth.
- Place a gravel surround and a bentonite seal according to the detailed drawing.
- If a well casing was used, withdraw it carefully to avoid disturbing the gravel and bentonite seal.

● HDPE Liner Repair (Only for Platforms with HDPE Liner)

➢ Expose and Repair the Liner:
- Re-expose the HDPE liner around the gas well.
- Repair the liner using the extrusion welding method, ensuring a secure and durable seal.
- Install a liner boot to the well extraction pipe to maintain the integrity of the liner.

➢ Testing and Backfill:
- Conduct a vacuum on the repair weld to ensure it is airtight.
- Record the results of the repair and testing.
- Backfill the area with soil to protect the liner and maintain site stability.

- Protection of the Gas Well
  - Final Installation:
    - Extend the extraction pipe to the final level and fit it with a temporary cap.
    - Fill soil around the gas well in a cone shape with a 1:1 slope until it reaches the final level, using an excavator.
    - Ensure the soil is provided and placed by the Formation Contractor.
  - Concrete Ring Installation:
    - Install a concrete ring around the gas well to provide physical protection and stability.
    - Ensure the concrete ring is securely positioned and set properly.
  - Handover:
    - Handover the area to the Formation Contractor for soil fill completion.
    - Coordinate with the Formation Contractor to ensure the area is ready for the next phase of work.

- Wellhead Connection
  - Final Assembly:
    - Once the Formation Contractor has completed the formation works and the area is ready for the header line installation, proceed with the final assembly.
    - Install the wellhead connection, sample port, and valve as per the design specifications.
    - Ensure all connections are secure and tested for leaks.

Plant and Equipment

- Mini Excavator: For precise excavation and handling around the HDPE liner.
- HDPE Pipe Welder (Fusion or Electrofusion): For secure welding of HDPE liners and pipes.
- Drilling Rig: For drilling gas wells to the required depth.
- Tipper Truck: For transporting drilling spoil to the disposal location.
- Water Truck or Bowser: For dust control and fire mitigation during drilling operations.

Testing and Inspection/Commissioning

(i) Drill Depth Inspection:

Objective: Ensure that the borehole is drilled to the correct depth according to the project specifications to effectively capture landfill gas from the targeted waste layer.

Procedure: Review geological surveys and site-specific data to determine the required drilling depth for each well. Use depth gauges and measurement tools to verify that the borehole

reaches the specified depth. Document the final depth of each borehole and compare it against project requirements to ensure compliance.

(ii) Pipe Depth Inspection:

Objective: Install the well casing and screen to the correct depth within the borehole to optimize gas extraction and ensure the structural integrity of the well.

Procedure: Select the appropriate casing pipe length and material based on the specified installation depth. Lower the casing pipe into the borehole, ensuring that it reaches the designated depth without obstructions. Confirm the installation depth using measuring tapes or downhole measurement devices to ensure accuracy.

(iii) Pipe Joint Visual Inspection

Objective: Ensure the integrity of pipe joints through visual inspection, as pressure testing may not be feasible in this context.

Procedure: Ensure clean the ends of the pipe sections to be joined, removing any debris, dirt, or moisture that could affect the joint. Apply appropriate jointing compound or sealant if required by the project specifications. Carefully inspect each pipe joint after assembly to ensure there are no visible gaps, misalignments, or defects. Check for uniformity in the joint and confirm that the jointing process was completed according to standard procedures.

Inspection and Documentation: Conduct a visual inspection of each backfill layer to confirm correct placement and compaction. Document the type, quantity, and placement of backfill materials for each well, including any deviations from the planned specifications.

(iv) Backfill Material Inspection

Objective: Verify the quality and placement of backfill materials, including gravel, bentonite layers, and other specified materials, to ensure the stability and effectiveness of the gas extraction well.

Material Verification: Inspect the backfill materials delivered to the site to confirm they meet the project specifications for size, composition, and quality. Ensure that gravel, bentonite, and other backfill materials are free from contaminants and of the appropriate grade.

Layer Placement: Place gravel around the well screen to create a permeable layer that supports gas flow. Install a bentonite seal above the gravel layer to prevent vertical migration of gas or water. Backfill the remaining annular space with suitable material, compacting it in layers to prevent settlement.

Inspection and Documentation: Conduct a visual inspection of each backfill layer to confirm correct placement and compaction. Document the type, quantity, and placement of backfill materials for each well, including any deviations from the planned specifications.

(v) Final Inspection

- Conduct a final inspection to ensure all work meets the required standards and specifications.
- Complete all necessary documentation and handover reports, providing them to the relevant parties.
- The final inspection will be arranged for the completion of the works refer to the EP condition 2.10, the Independent Landfill Consultant (ILC) shall "audit the modification works of the existing landfill restoration facilities".

Post-Work Activities

Documentation and Handover: Compile all testing and commissioning data, including pressure test results, gas flow measurements, and calibration records. Prepare a comprehensive handover report, including as-built drawings, test certificates, and maintenance recommendations. Handover the well to the client or relevant authority, ensuring that all documentation is complete and accessible.

Gas Flow and Quality Testing (For Recording Purpose Only):

Objective: Record gas flow and quality data for documentation purposes, recognizing that these factors are heavily dependent on the waste composition in the landfill.

Initial Gas Flow Measurement: After well installation, open the wellhead valves to allow gas to flow from the well. Measure the initial gas flow rate using a flow meter installed at the wellhead. Record the flow rate for documentation purposes, understanding that the actual performance may vary based on waste composition.

Gas Quality Analysis: Collect gas samples for analysis to determine the composition, including methane (CH4), carbon dioxide (CO2), and other gases. Document the gas quality results, recognizing that these measurements reflect the specific conditions at the time of testing.

Data Recording: Maintain detailed records of all gas flow and quality measurements, including the date, time, and conditions of the tests. Use this data for future reference, system adjustments, or to inform stakeholders of the system's baseline performance.

Special Note:

Temporary Connection: Temporary connections to the existing LFG systems may be required for selected wells during soil fill placement operations by the Site Formation Contractor. This is necessary to perform pumping tests and evaluate the performance of the wells. This involves linking the newly drilled gas wells to the existing network to evaluate their performance, ensuring they are functioning effectively before full integration into the system.

The primary purpose of temporarily connecting new gas wells to the existing network is to conduct performance testing. This involves evaluating the efficiency and effectiveness of the

newly drilled wells in terms of gas flow rates, pressure stability, and gas composition (e.g., CH_4, CO_2, O_2, N_2). By closely monitoring these parameters, any potential issues such as leaks, blockages, or suboptimal gas collection can be identified and addressed before the wells are integrated into the permanent system. This step confirm that the new gas wells are fully operational and meet the target capacity.

7.2 Pumping Chamber Method Statement (Construction of Pumping Chambers)

This method statement outlines the procedures for the construction of pumping chambers, including: site preparation; sheet piling for excavation; base slab construction; installation of the lower pre-cast concrete structure; upper cast-in-place concrete structure construction; installation of pumping equipment; backfilling; restoration; testing; and commissioning.

Work Procedures

- Preparation
  - Site Setup:
    - Ensure the site is cleared of all obstacles and access roads are prepared for equipment and personnel movement.
    - Set up the working area with necessary safety barriers and signage to prevent unauthorized access and ensure safety.
  - Material Check:
    - Inspect all materials and equipment for damage or defects prior to commencing work.
    - Ensure all necessary tools and equipment are available, functional, and meet project specifications.
  - Safety Measures:
    - Conduct a comprehensive site safety briefing for all personnel involved in the project.
    - Ensure all personnel are equipped with appropriate Personal Protective Equipment (PPE) such as helmets, gloves, safety glasses, and high-visibility clothing.
    - Identify and mark the locations of existing utilities and pipelines to avoid accidental damage during excavation.
    - Confined space work:
      - Eliminate Confined Space Work: Use engineering methods to design, construct, and maintain systems that avoid the need for confined space entry.
      - If Confined Space Work is Necessary: Ensure all relevant safety measures are in place, including statutory controls, compliance with safety regulations, adequate ventilation, use of personal

protective equipment (PPE), and emergency preparedness to meet all statutory requirements and protect worker safety.

- Sheet Piling
  - Sheet Pile Installation:
    - Mark the perimeter of the excavation area accurately based on project drawings.
    - Drive sheet piles into the ground around the marked perimeter to support the excavation, ensuring they reach the required depth and are properly interlocked.
  - Bracing and Support:
    - Install bracing or struts as necessary to support the sheet piles and prevent collapse during excavation.
    - Regularly inspect the sheet piles and bracing system for stability and integrity throughout the excavation process.
- Excavation
  - Excavation:
    - Excavate within the sheet-piled area to the required depth for the pumping chamber, using excavators and other appropriate equipment.
    - Ensure continuous monitoring of the excavation process to maintain safety and stability of the sheet piles.
  - Dewatering:
    - Set up dewatering pumps to manage groundwater and keep the excavation area dry, ensuring continuous operation of dewatering pumps as needed.
- Base Slab Construction
  - Foundation Preparation:
    - Level and compact the base of the excavation to create a stable foundation for the concrete slab.
    - Place and compact a layer of gravel or sand to provide a uniform base for the concrete slab.
  - Reinforcement Installation:
    - Install reinforcement steel according to the design specifications, ensuring correct placement and secure fastening.
  - Concrete Pouring:
    - Pour concrete for the base slab, ensuring it is evenly spread and properly compacted to avoid voids and weak spots.

- Cure the concrete according to standard practices to achieve the desired strength and durability.

- Lower Pre-Cast Concrete Structure Installation
  - Pre-Cast Structure Delivery:
    - Transport pre-cast concrete sections to the site, ensuring they are handled with care to avoid damage.
  - Placement:
    - Carefully lower and position the pre-cast sections onto the base slab using cranes, ensuring proper alignment and secure connection between sections.

- Upper Cast-In-Place Concrete Structure Construction
  - Formwork Installation:
    - Install formwork for the upper part of the pumping chamber, ensuring it is stable and properly aligned.
  - Reinforcement Installation:
    - Place reinforcement steel as specified in the design drawings, securing it within the formwork.
  - Concrete Pouring:
    - Pour concrete for the upper structure, ensuring it is properly compacted and cured to achieve the required strength.
    - Remove formwork after the concrete has sufficiently cured, ensuring no damage to the structure.

- Installation of Pumping Equipment
  - Equipment Placement:
    - Install the pumping equipment, including pumps, valves, and associated piping, ensuring proper alignment and secure connections.
  - Electrical and Control Systems:
    - Install electrical wiring, control panels, and any necessary instrumentation, ensuring all components are properly connected and tested.
  - Testing of Equipment:
    - Conduct initial testing of the installed equipment to ensure functionality, making any necessary adjustments to achieve optimal performance.

- Backfilling and Restoration
  - Backfilling:
    - Backfill around the completed pumping chamber with suitable material, ensuring layers are compacted to prevent settlement.
  - Surface Restoration:
    - Restore the surface to its original condition, including replanting vegetation or resurfacing as necessary to match the surrounding area.

- Testing and Inspection/Commissioning
  - System Testing:
    - Conduct thorough testing of the entire pumping system to ensure it operates correctly, checking for leaks, proper flow rates, and correct operation of all components.
  - Commissioning:
    - Complete all commissioning procedures and ensure the system is ready for operation, documenting all steps and results.
  - Final Inspection:
    - Conduct a final inspection to ensure all work meets the required standards and specifications.
    - Complete all necessary documentation and handover reports, providing them to the relevant parties.
    - The final inspection will be arranged for the completion of the works refer to the EP condition 2.10, the Independent Landfill Consultant (ILC) shall "audit the modification works of the existing landfill restoration facilities".

- Plant and Equipment
  - Sheet Piling Equipment: Used for driving sheet piles into the ground.
  - Excavators: For excavation work.
  - Dewatering Pumps: To manage groundwater during excavation.
  - Concrete Mixers: For mixing concrete for the base slab and upper structure.
  - Formwork and Reinforcement Tools: For constructing the upper cast-in-place concrete structure.
  - Cranes: For placing pre-cast concrete sections.
  - Compaction Equipment: For compacting backfill material.
  - Pumping Equipment: Including pumps, valves, and associated piping.
  - Electrical Tools and Control Systems: For installing electrical and control systems.

- Materials
  - Sheet Piles: For supporting the excavation.
  - Reinforcement Steel: For reinforcing concrete structures.
  - Concrete: For base slab and upper structure construction.
  - Pre-Cast Concrete Sections: For the lower structure.
  - Gravel or Sand: For base preparation.
  - Backfill Material: For backfilling around the pumping chamber.
  - Electrical and Control Components: For the installation of pumping equipment.

7.3 Leachate Recirculation Reinforced Concrete Surge Tank Method Statement (Construction of Surge Tank)

This Method Statement outlines the procedures for the construction of the leachate recirculation surge tank, including: site preparation; excavation; base slab construction; re-connection of existing pipes; concrete structure construction; backfilling; restoration; testing; and commissioning.

Work Procedures

- Preparation
  - Site Setup:
    - Remove debris, vegetation, or obstacles from the worksite to ensure a clean and safe working environment.
    - Ensure access roads are prepared and stabilized to support the movement of heavy machinery and personnel.
    - Set up the working area with necessary safety barriers and signage to prevent unauthorized access and ensure safety.
  - Material Check:
    - Inspect all materials and equipment for damage or defects prior to commencing work.
    - Ensure all necessary tools and equipment are available, functional, and meet project specifications.
  - Safety Measures:
    - Conduct a comprehensive site safety briefing for all personnel involved in the project.
    - Ensure all personnel are equipped with appropriate Personal Protective Equipment (PPE) such as helmets, gloves, safety glasses, and high-visibility clothing.
    - Identify and mark the locations of existing utilities and pipelines to avoid accidental damage during excavation.
    - Confined space work:

- ❖ Eliminate Confined Space Work: Use engineering methods to design, construct, and maintain systems that avoid the need for confined space entry.
- ❖ If Confined Space Work is Necessary: Ensure all relevant safety measures are in place, including statutory controls, compliance with safety regulations, adequate ventilation, use of personal protective equipment (PPE), and emergency preparedness to meet all statutory requirements and protect worker safety.
- ❖ Monitor for the presence of landfill gas throughout the performance of the works.

- Excavation
  - ➢ Excavation:
    - Excavate within the construction area to the required depth for the surge tank, using excavators and other appropriate equipment.
    - Ensure continuous monitoring of the excavation process to maintain safety and stability of the slopes.
  - ➢ Dewatering:
    - Set up dewatering pumps to manage and keep the excavation area dry, ensuring continuous operation of dewatering pumps as needed.

- Base Slab Construction
  - ➢ Foundation Preparation:
    - Level and compact the base of the excavation to create a stable foundation for the concrete slab.
    - Place and compact a layer of gravel or sand and concrete blinding layer to provide a uniform base for the concrete slab.
  - ➢ Reinforcement Installation:
    - Install reinforcement steel according to the design, ensuring correct placement and secure fastening.
  - ➢ Concrete Pouring:
    - Pour concrete for the base slab, ensuring it is evenly spread and properly compacted to avoid voids and weak spots.
    - Cure the concrete according to standard practices to achieve the desired strength and durability.

- Concrete Structure Construction
  - ➢ Formwork Installation:
    - Install formwork for the surge tank, ensuring it is stable and properly aligned.

- Reinforcement Installation:
  - Place reinforcement steel as specified in the design drawings, securing it within the formwork.

- Concrete Pouring:
  - Pour concrete for the structure, ensuring it is properly compacted and cured to achieve the required strength.
  - Remove formwork after the concrete has sufficiently cured, ensuring no damage to the structure.

- Re-connection of Existing Pipes
  - Re-connect existing pipes to the surge tank with suitable fixings, ensuring all connections are water tight.

- Backfilling and Restoration
  - Backfilling:
    - Backfill around the completed surge tank with suitable material, ensuring layers are compacted to prevent settlement.

  - Surface Restoration:
    - Restore the surface to its original or intended condition, including planting of vegetation or resurfacing as necessary to match the surrounding area.

- Testing and Inspection/Commissioning
  - System Testing:
    - Conduct thorough testing of the entire leachate piped system to ensure it operates correctly, checking for leaks, ensuring the surge tank can receive leachate and correct operation of all components.

  - Commissioning:
    - Complete all commissioning procedures and ensure the system is ready for operation, documenting all steps and results.

  - Final Inspection:
    - Conduct a final inspection to ensure all work meets the required standards and specifications.
    - Complete all necessary documentation and handover reports, providing them to the relevant parties.
    - The final inspection will be arranged for the completion of the works; the Independent Landfill Consultant (ILC) shall “audit the modification works of the existing landfill restoration facilities”. refer to the EP condition 2.10).

7.4 Subsoil Drainage System (Construction of Pipeline for Subsoil Drainage System)

Subsoil Drainage System Pipeline

This Method Statement outlines the procedures for the construction and installing of a new subsoil drainage discharge pipe to extend the existing subsoil drainage outlets to new outlet locations.

Preparation

- Site Setup:
  - Site Clearance:
    - Remove debris, vegetation, or obstacles from the worksite to ensure a clean and safe working environment.
    - Ensure existing subsoil drainage outlet is exposed and is clear of all blockages, obstructions or anything which may prevent the existing subsoil drainage from flowing through the existing outlet.
    - Ensure access roads are prepared and stabilized to support the movement of heavy machinery and personnel (as may be necessary).
  - Safety Barriers and Signage:
    - Install safety barriers around the working area to prevent unauthorized access.
    - Place clear and visible signage indicating the presence of welding activities and restricted zones.
  - Designated Areas:
    - Designate specific areas for material storage, equipment setup, and worker rest areas to maintain organization and safety on site.
- Material Check:
  - Inspection of Pipes and Fittings:
    - Inspect all pipes and fittings for any signs of damage, such as cracks, dents, or deformities.
    - Ensure that the pipes and fittings comply with the project specifications and standards.
  - Equipment Calibration:
    - Check that all welding equipment, including butt fusion and electrofusion machines, is calibrated and in good working order.
    - Verify the availability of all necessary tools and equipment, including pipe clamps, aligners, and heating plates.

- Safety Measures:
  - Safety Briefing:
    - Conduct a comprehensive safety briefing for all personnel, covering the project scope, potential hazards, and emergency procedures.
    - Emphasize the importance of adhering to safety protocols and wearing appropriate PPE at all times.

  - PPE Requirements:
    - Ensure all personnel are equipped with the required PPE, including helmets, gloves, safety glasses, high-visibility clothing, and safety boots.

  - Utility Marking:
    - Identify and mark the locations of existing underground utilities and pipelines to prevent accidental damage during excavation and installation.

  - Confined space work:
    - Eliminate Confined Space Work: Use engineering methods to design, construct, and maintain systems that avoid the need for confined space entry.
    - If Confined Space Work is Necessary: Ensure all relevant safety measures are in place, including statutory controls, compliance with safety regulations, adequate ventilation, use of personal protective equipment (PPE), and emergency preparedness to meet all statutory requirements and protect worker safety.
    - Monitor for the presence of landfill gas throughout the performance of the works.

Welding (if applicable)

- Butt Fusion Welding:
  - Pipe Preparation:
    - Clean the pipe ends thoroughly using suitable cleaning agents to remove any dirt, grease, or contaminants.
    - Use a pipe scraper to ensure the ends are smooth and free of oxidation.

  - Alignment:
    - Align the pipe ends in the butt fusion machine, ensuring they are centred and properly supported.
    - Use pipe clamps and aligners to maintain correct alignment during the welding process.

- Heating:
  - Ensure the heating plate is clean and free of debris before use.
  - Heat the pipe ends using a heating plate until a uniform bead forms on each end, following the specified temperature and heating time.

- Joining:
  - Join the heated pipe ends under controlled pressure, maintaining the specified pressure and cooling time to form a secure weld.
  - Allow the welded joint to cool under pressure to ensure a strong bond.

- Quality Check:
  - Inspect the weld bead for uniformity, alignment, and proper fusion.
  - Record the welding parameters and results for quality control purposes.

- Electrofusion Welding:
  - Pipe Preparation:
    - Clean and scrape the pipe ends to ensure a clean surface for welding.
    - Use a pipe scraper or rotary tool to remove the outer layer of the pipe, exposing fresh material.

  - Coupler Installation:
    - Fit the electrofusion coupler onto the pipe ends and secure it with clamps to prevent movement during welding.

  - Welding:
    - Connect the electrofusion control unit to the coupler and follow the manufacturer's specified welding cycle, including heating and cooling times.

  - Cooling:
    - Allow the joint to cool naturally before removing the clamps to prevent joint distortion and ensure a strong bond.

  - Inspection:
    - Inspect the electrofusion joint for proper bead formation and alignment.
    - Record the welding parameters and results for quality control purposes.

Installation

- Trench Preparation:
  - Excavation:
    - Excavate trenches to the specified depth and width, ensuring they are free of water and debris.

- Use excavation equipment that is suitable for the soil conditions and site constraints.

➢ Trench Bottom Preparation:
- Ensure the trench bottom is level and free of sharp objects that could damage the pipes.
- Place a bedding layer of sand or gravel to provide a stable base for the pipes.

- Pipe Placement:
  - ➢ Laying Pipes:
    - Carefully lay the welded pipes in the trench, ensuring they are properly aligned and supported to prevent sagging.
    - Use spacers or supports to maintain the correct pipe gradient and alignment.
  - ➢ Pipe Bedding and Backfill:
    - Surround the pipes with a layer of bedding material to provide support and protection.
    - Ensure the bedding material is free of sharp objects and compacted to prevent pipe movement.
- Jointing:
  - ➢ Mechanical Couplings or Flanges:
    - Use mechanical couplings or flanges for joining pipes where butt fusion or electro fusion is not feasible.
    - Ensure all joints are properly aligned, secured, and leak-proof.

Testing and Inspection/Commissioning

- Visual Inspection:
  - ➢ Weld Joint Inspection:
    - Inspect all welded joints for uniformity, proper bead formation, and alignment.
    - Check the entire pipeline for any visible defects or damage.
  - ➢ Documentation:
    - Record all inspection findings and ensure they are documented for quality control purposes.

7.5 HDPE Pipe Installation Method Statement

HDPE Pipe Welding and Installation

This method statement outlines the procedures for the welding and installing of High-Density Polyethylene (HDPE) pipes, ensuring a secure and efficient pipeline system.

Preparation

- Site Setup:
  - Site Clearance:
    - Remove any debris, vegetation, or obstacles from the worksite to ensure a clean and safe working environment.
    - Ensure access roads are prepared and stabilized to support the movement of heavy machinery and personnel.
  - Safety Barriers and Signage:
    - Install safety barriers around the welding area to prevent unauthorized access.
    - Place clear and visible signage indicating the presence of welding activities and restricted zones.
  - Designated Areas:
    - Designate specific areas for material storage, equipment setup, and worker rest areas to maintain organization and safety on site.
- Material Check:
  - Inspection of HDPE Pipes and Fittings:
    - Inspect all HDPE pipes and fittings for any signs of damage, such as cracks, dents, or deformities.
    - Ensure that the pipes and fittings comply with the project specifications and standards.
  - Equipment Calibration:
    - Check that all welding equipment, including butt fusion and electrofusion machines, is calibrated and in good working order.
    - Verify the availability of all necessary tools and equipment, including pipe clamps, aligners, and heating plates.
- Safety Measures:
  - Safety Briefing:
    - Conduct a comprehensive safety briefing for all personnel, covering the project scope, potential hazards, and emergency procedures.
    - Emphasize the importance of adhering to safety protocols and wearing appropriate PPE at all times.

- PPE Requirements:
  - Ensure all personnel are equipped with the required PPE, including helmets, gloves, safety glasses, high-visibility clothing, and safety boots.

- Utility Marking:
  - Identify and mark the locations of existing underground utilities and pipelines to prevent accidental damage during excavation and installation.

- Confined space work:
  - Eliminate Confined Space Work: Use engineering methods to design, construct, and maintain systems that avoid the need for confined space entry.
  - If Confined Space Work is Necessary: Ensure all relevant safety measures are in place, including statutory controls, compliance with safety regulations, adequate ventilation, use of personal protective equipment (PPE), and emergency preparedness to meet all statutory requirements and protect worker safety.

Welding

- Butt Fusion Welding:
  - Pipe Preparation:
    - Clean the pipe ends thoroughly using suitable cleaning agents to remove any dirt, grease, or contaminants.
    - Use a pipe scraper to ensure the ends are smooth and free of oxidation.

  - Alignment:
    - Align the pipe ends in the butt fusion machine, ensuring they are centred and properly supported.
    - Use pipe clamps and aligners to maintain correct alignment during the welding process.

  - Heating:
    - Heat the pipe ends using a heating plate until a uniform bead forms on each end, following the specified temperature and heating time.
    - Ensure the heating plate is clean and free of debris before use.

  - Joining:
    - Join the heated pipe ends under controlled pressure, maintaining the specified pressure and cooling time to form a secure weld.
    - Allow the welded joint to cool under pressure to ensure a strong bond.

- Quality Check:
  - Inspect the weld bead for uniformity, alignment, and proper fusion.
  - Record the welding parameters and results for quality control purposes.

- Electrofusion Welding:
  - Pipe Preparation:
    - Clean and scrape the pipe ends to ensure a clean surface for welding.
    - Use a pipe scraper or rotary tool to remove the outer layer of the pipe, exposing fresh material.
  - Coupler Installation:
    - Fit the electrofusion coupler onto the pipe ends and secure it with clamps to prevent movement during welding.
  - Welding:
    - Connect the electrofusion control unit to the coupler and follow the manufacturer's specified welding cycle, including heating and cooling times.
  - Cooling:
    - Allow the joint to cool naturally before removing the clamps to prevent joint distortion and ensure a strong bond.
  - Inspection:
    - Inspect the electrofusion joint for proper bead formation and alignment.
    - Record the welding parameters and results for quality control purposes.

Installation

- Trench Preparation:
  - Excavation:
    - Excavate trenches to the specified depth and width, ensuring they are free of water and debris.
    - Use excavation equipment that is suitable for the soil conditions and site constraints.
  - Trench Bottom Preparation:
    - Ensure the trench bottom is level and free of sharp objects that could damage the pipes.
    - Place a bedding layer of sand or fine gravel to provide a stable base for the pipes.

- Pipe Placement:
  - Laying Pipes:

- Carefully lay the welded HDPE pipes in the trench, ensuring they are properly aligned and supported to prevent sagging.
- Use spacers or supports to maintain the correct pipe gradient and alignment.

➢ Bedding and Padding:
- Surround the pipes with a layer of bedding material to provide support and protection.
- Ensure the bedding material is free of sharp objects and compacted to prevent pipe movement.

- Jointing:
  - ➢ Mechanical Couplings or Flanges:
    - Use mechanical couplings or flanges for joining pipes where butt fusion is not feasible.
    - Ensure all joints are properly aligned, secured, and leak-proof.
  - ➢ Leak Testing:
    - Conduct a visual inspection and leak test of all joints before backfilling to ensure integrity.

Testing and Inspection/Commissioning

- Visual Inspection:
  - ➢ Weld Joint Inspection:
    - Inspect all welded joints for uniformity, proper bead formation, and alignment.
    - Check the entire pipeline for any visible defects or damage.
  - ➢ Documentation:
    - Record all inspection findings and ensure they are documented for quality control purposes.
- Pressure Testing:
  - ➢ Hydrostatic Pressure Test:
    - Perform a hydrostatic pressure test to check for leaks and ensure the integrity of the pipeline.
    - Maintain the test pressure for the required duration and record the results meticulously.
  - ➢ Leak Detection:
    - Identify and document any leaks or issues, perform necessary repairs, and retest to confirm integrity.

- Final Inspection:
  - Pre-Backfilling Inspection:
    - Conduct a comprehensive final inspection of the entire pipeline before backfilling.
    - Ensure all work meets project specifications and quality standards.
  - Completion Documentation:
    - Complete all test records and inspection reports, and submit them for review and approval.
    - The final inspection will be arranged for the completion of the works refer to the EP condition 2.10, the Independent Landfill Consultant (ILC) shall "audit the modification works of the existing landfill restoration facilities".

Plant and Equipment

- Butt Fusion Welding Machine: For welding HDPE pipes using the butt fusion method.
- Electrofusion Control Unit: For welding HDPE pipes using electrofusion couplers.
- Generators: To provide power for welding and other equipment.
- Excavators: For trench excavation and site preparation.
- Pressure Testing Equipment: For conducting hydrostatic pressure tests.
- Materials
- HDPE Pipes and Fittings: The primary materials for the pipeline system.
- Electrofusion Couplers: For joining pipes using the electrofusion method.
- Butt Fusion Welding Accessories: Including heating plates and pipe scrapers.
- Cleaning: For cleaning pipe ends before welding.
- Scraping Tools: For preparing pipe surfaces for electrofusion welding.

7.6 Leachate Pipe Diversion Method Statement

Diversion of Leachate Pipe Works

This method statement outlines the procedures for the diversion of the various leachate pipes, including, but not necessarily limited to: site preparation, excavation, diversion installation, connection to the existing system, backfilling, restoration, and testing

Preparation

- Site Setup:
  - Clearing and Access:
    - Ensure the site is cleared of any obstacles, debris, and vegetation to create a safe working environment.
    - Prepare access roads to facilitate the movement of heavy machinery and personnel.

- Safety Barriers and Signage:
  - Set up safety barriers around the work area to prevent unauthorized access.
  - Place clear and visible signage to inform about the ongoing works and safety precautions.

- Site Layout:
  - Establish a designated area for material storage and equipment setup to maintain an organized site.

- Material Check:
  - Inspection:
    - Inspect all HDPE pipes, fittings, and other materials for any damage or defects.
    - Verify that all materials comply with the project specifications and standards.

  - Equipment Check:
    - Ensure all necessary tools and equipment, including pipe cutting and jointing tools, are available and in good working condition.

- Safety Measures:
  - Safety Briefing:
    - Conduct a comprehensive site safety briefing for all personnel, covering the scope of work, potential hazards, and emergency procedures.

  - PPE Requirements:
    - Ensure all personnel wear appropriate Personal Protective Equipment (PPE) such as helmets, gloves, safety glasses, high-visibility clothing, and safety boots.

  - Utility Marking:
    - Identify and mark the locations of existing underground utilities and pipelines to prevent accidental damage during excavation.
  - Confined space work:
    - Eliminate Confined Space Work: Use engineering methods to design, construct, and maintain systems that avoid the need for confined space entry.
    - If Confined Space Work is Necessary: Ensure all relevant safety measures are in place, including statutory controls, compliance with safety regulations, adequate ventilation, use of personal protective equipment (PPE), and emergency preparedness to meet all statutory requirements and protect worker safety.

Excavation

- Site Survey:
  - Marking the Route:
    - Conduct a detailed site survey to accurately mark the location of the existing and new pipe routes.
    - Use survey stakes and markers to outline the excavation path.

- Excavation:
  - Paving Removal:
    - Cut and break existing paving or surface material, if applicable, to access the pipeline route.

  - Trench Excavation:
    - Excavate the trench along the marked route to the specified depth and width, ensuring the trench bottom is level and free of debris.
    - Use open cut or shoring to excavate. Support the trench walls and prevent collapse, especially in deeper excavations.

  - Monitoring:
    - Continuously monitor the excavation for stability and adjust shoring or trench boxes as necessary to ensure worker safety.

Diversion Installation

- Pipe Laying:
  - Alignment and Support:
    - Lay the new leachate pipes along the excavated trench according to the design specifications, ensuring proper alignment and support to prevent sagging or misalignment.

  - Temporary Supports:
    - Use temporary supports or spacers to maintain the correct gradient and alignment during installation.

- Joining:
  - Butt Fusion:
    - For butt fusion welding, clean and align the pipe ends, heat them with a heating plate, and join them under controlled pressure to form a secure weld.

- Electrofusion:
  - For electrofusion welding, clean and scrape the pipe ends, fit the electrofusion coupler, and secure it with clamps before following the manufacturer's welding cycle.

- Quality Check:
  - Inspect all joints for proper alignment and uniform bead formation to ensure leak-proof connections.

- Bedding and Surround:
  - Bedding Material:
    - Place a layer of bedding material, such as sand or fine gravel, around the pipe to provide support and prevent movement.

  - Compaction:
    - Ensure the bedding material is compacted uniformly to support the pipe along its entire length.

Connection to Existing System

- Shutdown and Drainage:
  - Coordination:
    - Coordinate with the relevant authorities to schedule a shutdown of the existing leachate system to allow for safe connection work.

  - Draining:
    - Drain the existing pipes as necessary to prevent spillage during the connection process.
    - Use appropriate containment methods to manage any residual leachate.

  - Cutting and Connecting:
    - Pipe Cutting:
    - Cut the existing pipe at the specified location using appropriate tools, ensuring a clean and precise cut.

  - Connecting:
    - Connect the new diversion pipe to the existing system using suitable couplings or fittings, ensuring a secure and leak-proof connection.

  - Leak Testing:
    - Conduct an initial leak test on the connection before reinstating flow.

- Reinstating Flow:
  - Gradual Reintroduction:
    - Gradually reintroduce flow into the system, monitoring for leaks or issues during the process.
  - Observation:
    - Observe the system for any signs of leakage or pressure drops and address any issues promptly.

Backfilling and Restoration

- Initial Backfilling:
  - Layered Backfilling:
    - Backfill the trench with suitable material up to the level of the bedding material, ensuring proper compaction in layers to prevent settlement.
  - Compaction:
    - Use mechanical compactors to ensure each layer of backfill material is properly compacted.
  - Final Backfilling:
    - Completion of Backfill:
    - Continue backfilling with excavated material or imported fill up to the surface level, ensuring proper compaction throughout.
  - Surface Levelling:
    - Level the surface to match the original ground level or as specified in the project plan.
- Surface Restoration:
  - Vegetation and Paving:
    - Restore the surface to its original state, including replanting vegetation or resurfacing roads and pavements if necessary.
  - Site Cleanup:
    - Clean up the site, removing any debris or leftover materials to leave the area in a tidy condition.

Testing and Inspection/Commissioning

- Visual Inspection:
  - Joint Inspection:
    - Inspect all joints and connections for proper alignment, sealing, and overall integrity.

- Pipeline Inspection:
  - Ensure the entire pipeline is correctly supported, free from damage, and meets the design specifications.

- Pressure Testing:
  - Hydrostatic Pressure Test:
    - Conduct a hydrostatic pressure test on the new diversion pipe to check for leaks and ensure the system's integrity.
    - Maintain the test pressure for the required duration, documenting the results meticulously.
  - Leak Detection:
    - Identify any leaks or issues, perform necessary repairs, and retest to confirm integrity.

- Final Inspection:
  - Comprehensive Review:
    - Conduct a comprehensive final inspection to ensure all work is completed to the required standards and specifications.
  - Documentation:
    - Complete all test records, inspection reports, and handover documentation, submitting them for review and approval.
    - The final inspection will be arranged for the completion of the works refer to the EP condition 2.10, the Independent Landfill Consultant (ILC) shall "audit the modification works of the existing landfill restoration facilities".

Plant and Equipment

- Excavators: For trench excavation and site preparation.
- Pipe Cutting Tools: For cutting existing pipes and new pipes to the required length.
- Pipe Jointing Equipment: Including butt fusion machines and electrofusion control units.
- Compaction Equipment: For compacting backfill material in layers.
- Pumps: For draining the existing leachate system and managing groundwater.
- Materials
- HDPE Leachate Pipes: The primary material for the diversion pipeline.
- Pipe Couplings and Fittings: For connecting new pipes to existing systems and joints.
- Bedding and Backfill Material: Including sand, gravel, and suitable fill material.
- Joint Sealing Materials: For ensuring leak-proof connections.
- Rubber Gasket Sealing Materials: For ensuring leak-proof connections.

7.7 Gas Pipe Diversion Method Statement

Diversion of Gas Pipe Works

This method statement outlines the procedures for the diversion of gas pipes, including site preparation, excavation, diversion installation, connection to the existing system, backfilling, restoration, and testing.

Preparation

- Site Setup:
  - Clearing and Access:
    - Ensure the site is cleared of any obstacles, debris, and vegetation to create a safe working environment.
    - Prepare access roads to facilitate the movement of heavy machinery and personnel.
  - Safety Barriers and Signage:
    - Set up safety barriers around the work area to prevent unauthorized access.
    - Place clear and visible signage to inform about the ongoing works and safety precautions.
  - Site Layout:
    - Establish a designated area for material storage and equipment setup to maintain an organized site.
- Material Check:
  - Inspection:
    - Inspect all gas pipes, fittings, and other materials for any damage or defects.
    - Verify that all materials comply with the project specifications and standards.
  - Equipment Check:
    - Ensure all necessary tools and equipment, including pipe cutting and jointing tools, are available and in good working condition.
- Safety Measures:
  - Safety Briefing:
    - Conduct a comprehensive site safety briefing for all personnel, covering the scope of work, potential hazards, and emergency procedures.
  - PPE Requirements:

- Ensure all personnel wear appropriate Personal Protective Equipment (PPE) such as helmets, gloves, safety glasses, high-visibility clothing, and safety boots.

➢ Utility Marking:
- Identify and mark the locations of existing underground utilities and pipelines to prevent accidental damage during excavation.

➢ Confined space work:
- Eliminate Confined Space Work: Use engineering methods to design, construct, and maintain systems that avoid the need for confined space entry.
- If Confined Space Work is Necessary: Ensure all relevant safety measures are in place, including statutory controls, compliance with safety regulations, adequate ventilation, use of personal protective equipment (PPE), and emergency preparedness to meet all statutory requirements and protect worker safety.

Excavation

- Site Survey:
  - ➢ Marking the Route:
    - Conduct a detailed site survey to accurately mark the location of the existing and new pipe routes.
    - Use survey stakes and markers to outline the excavation path.
  - ➢ Excavation:
    - Paving Removal:
    - Cut and break existing paving or surface material, if applicable, to access the pipeline route.
  - ➢ Trench Excavation:
    - Excavate the trench along the marked route to the specified depth and width, ensuring the trench bottom is level and free of debris.
    - Use open cut or shoring for trench excavation. Support the trench walls and prevent collapse, especially in deeper excavations.
  - ➢ Monitoring:
    - Continuously monitor the excavation for stability and adjust shoring as necessary to ensure worker safety.

Diversion Installation

- Pipe Laying:
  - ➢ Alignment and Support:

- Lay the new gas pipes along the excavated trench according to the design specifications, ensuring proper alignment and support to prevent sagging or misalignment.

➢ Temporary Supports:
- Use temporary supports or spacers to maintain the correct gradient and alignment during installation.

- Jointing:
  - ➢ Butt Fusion:
    - For butt fusion welding, clean and align the pipe ends, heat them with a heating plate, and join them under controlled pressure to form a secure weld.

  - ➢ Electrofusion:
    - For electrofusion welding, clean and scrape the pipe ends, fit the electrofusion coupler, and secure it with clamps before following the manufacturer's welding cycle.

  - ➢ Quality Check:
    - Inspect all joints for proper alignment and uniform bead formation to ensure leak-proof connections.

- Bedding and Surround:
  - ➢ Bedding Material:
    - Place a layer of bedding material, such as sand or fine gravel, around the pipe to provide support and prevent movement.

  - ➢ Compaction:
    - Ensure the bedding material is compacted uniformly to support the pipe along its entire length.

Connection to Existing System

- Isolation and Purging:
  - ➢ Coordination:
    - Coordinate with the relevant authorities to schedule an isolation of the existing gas system to allow for safe connection work.

  - ➢ Purging:
    - Use the appropriate purging method to manage any residual gas to prevent leakage during the connection process.

- Cutting and Connecting:
  - Pipe Cutting:
    - Cut the existing pipe at the specified location using appropriate tools, ensuring a clean and precise cut.
  - Connecting:
    - Connect the new diversion pipe to the existing system using suitable couplings or fittings, ensuring a secure and leak-proof connection.
  - Initial Leak Testing:
    - Conduct an initial leak test on the connection using the suction air leak survey method.
- Reinstating Flow:
  - Gradual Reintroduction:
    - Gradually reintroduce flow into the system, monitoring for leaks or issues during the process.
  - Observation:
    - Observe the system for any signs of leakage or pressure drops and address any issues promptly.

Backfilling and Restoration

- Initial Backfilling:
  - Layered Backfilling:
    - Backfill the trench with suitable material up to the level of the bedding material, ensuring proper compaction in layers to prevent settlement.
  - Compaction:
    - Use mechanical compactors to ensure each layer of backfill material is properly compacted.
- Final Backfilling:
  - Completion of Backfill:
    - Continue backfilling with excavated material or imported fill up to the surface level, ensuring proper compaction throughout.
  - Surface Levelling:
    - Level the surface to match the original ground level or as specified in the project plan.
- Surface Restoration:

- Vegetation and Paving:
  - Restore the surface to its original state, including replanting vegetation or resurfacing roads and pavements if necessary.

- Site Cleanup:
  - Clean up the site, removing any debris or leftover materials to leave the area in a tidy condition.

Testing and Inspection/Commissioning

- Visual Inspection:
  - Joint Inspection:
    - Inspect all joints and connections for proper alignment, sealing, and overall integrity.

  - Pipeline Inspection:
    - Ensure the entire pipeline is correctly supported, free from damage, and meets the design specifications.

- Leak Detection:
  - Suction Air Leak Survey:
    - Use the suction air leak survey method to detect any leaks in joints and connections that cannot be pressure tested.
    - Apply a vacuum to the joints and monitor for air ingress, indicating potential leaks.

  - Leak Repair:
    - Identify any leaks, perform necessary repairs, and retest to confirm integrity.

- Final Inspection:
  - Comprehensive Review:
    - Conduct a comprehensive final inspection to ensure all work is completed to the required standards and specifications.

  - Documentation:
    - Complete all test records, inspection reports, and handover documentation, submitting them for review and approval.
    - The final inspection will be arranged for the completion of the works refer to the EP condition 2.10, the Independent Landfill Consultant (ILC) shall “audit the modification works of the existing landfill restoration facilities”.

Plant and Equipment

- Excavators: For trench excavation and site preparation.
- Pipe Cutting Tools: For cutting existing pipes and new pipes to the required length.
- Pipe Jointing Equipment: Including butt fusion machines and electrofusion control units.
- Compaction Equipment: For compacting backfill material in layers.
- Pumps: For purging the existing gas system and managing groundwater.
- Materials
- HDPE Gas Pipes: The primary material for the diversion pipeline.
- Pipe Couplings and Fittings: For connecting new pipes to existing systems and joints.
- Bedding and Backfill Material: Including sand, gravel, and suitable fill material.
- Rubber Gasket Sealing Materials: For ensuring leak-proof connections.

7.8 Decommissioning/Demolition Works

Introduction

This method statement outlines the procedures for the safe and controlled decommissioning/ demolition of the existing landfill gas and leachate extraction systems. The scope of work includes the decommissioning/demolition of gas and leachate extraction wells, and the associated pipelines, leachate collection/transmission pipes, and other monitoring equipment. The objective is to ensure that the decommissioning/demolition is carried out efficiently, with minimal environmental impact, and in compliance with all safety and regulatory requirements.

Scope of Work

The scope of the decommissioning/demolition work includes, but is not limited to:

- Landfill gas extraction wells
- Landfill gas pipelines and associated infrastructure
- Leachate extraction wells
- Leachate collection and transmission pipes
- Gas and leachate monitoring equipment

Pre-works planning

Conduct a detailed survey of the site to identify all components to be decommissioned/ demolished, including their locations, conditions, and connections to other components/ systems.

Identify any potential hazards such as gas build-up, contaminated soils, or hazardous materials that may require special handling.

Review as-built drawings and records to understand the configuration and extent of the systems.

Prior to decommission/demolition of systems/components, ensure that the necessary reprovision, relocation and/or modification of the affected systems/components are completed through and including successful Testing and Commissioning.

Safety Planning:

- Conduct a risk assessment to identify potential hazards associated with the decommissioning/demolition works.
- Develop a safety plan that includes procedures for handling hazardous materials, emergency response, and the use of appropriate personal protective equipment (PPE).
- Confined space work:
    - Eliminate Confined Space Work: Use engineering methods to design, construct, and maintain systems that avoid the need for confined space entry.
    - If Confined Space Work is Necessary: Ensure all relevant safety measures are in place, including statutory controls, compliance with safety regulations, adequate ventilation, use of personal protective equipment (PPE), and emergency preparedness to meet all statutory requirements and protect worker safety.

Utility Disconnection:

- Safely disconnect all utilities connected to the landfill gas and leachate systems, including gas supply lines, electrical power, and control systems.
- Ensure that all energy sources are isolated, locked out, and tagged out according to safety protocols.

Decommissioning/Demolition Work Procedures

Decommissioning/Demolition of Landfill Gas Extraction Wells and Pipelines:

Gas Well Decommissioning:

- Safely vent and depressurize the gas extraction wells to eliminate any residual gas within the system.
- Cap the wellheads and remove any above-ground structures associated with the gas wells.

Pipeline Decommissioning

- Excavate the area around the gas pipelines, exposing the ends to be exposed.
- Cut the pipelines connected to the gas well.
- Backfill and compact the excavated areas.

Pipeline Removal (if required based on conflict with other facilities):

- Excavate the area around the gas pipelines, exposing them for removal.
- Cut the pipelines into manageable sections using appropriate cutting tools.

- Remove the pipeline sections from the trench and transport them to designated disposal or recycling areas.
- Backfill and compact the excavated areas once the pipelines have been removed.

Pipeline Decommission in-place

- Excavate the area around the gas pipelines, exposing them for removal.
- Safely vent and depressurize the gas pipe to eliminate any residual gas within the pipe.
- Cap the pipe and backfill with soil.

Decommission/Demolition of Leachate Extraction Wells and Pipes:

Leachate Well Decommissioning:

- Pump out any remaining leachate from the extraction wells to a safe holding area.
- Remove wellheads, pumps, and associated equipment.
- Seal the wells according to environmental guidelines to prevent contamination of surrounding areas.

Pipe Removal (if necessary):

- Excavate around the leachate pipes, exposing them fully for removal.
- Cut the pipes into sections, ensuring that no residual leachate is spilled during the process.
- Transport the pipe sections to a designated disposal area.
- Backfill and restore the excavation site to its original condition or as specified in the project plan.

Removal of Monitoring Equipment:

Disconnection and Removal:

- Disconnect and safely remove all gas and leachate monitoring equipment, including sensors, probes, and data loggers.
- Ensure that any hazardous materials within the monitoring equipment are handled and disposed of according to environmental regulations.
- Transport the equipment to a designated disposal or recycling area.

Management of Waste and Hazardous Materials:

Waste Segregation:

- Segregate all demolition waste into recyclable, reusable, and hazardous categories.
- Hazardous Materials Handling:
- Identify, label, and safely store any hazardous materials encountered during demolition.
- Ensure that hazardous materials are disposed of by licensed waste disposal contractors according to environmental regulations.

Post-Decommissioning/Demolition Activities

Site Cleanup and Restoration:

- Conduct a thorough cleanup of the demolition site, removing all debris, waste materials, and equipment.
- Restore the site to its original condition or as specified in the project plan, including grading, replanting vegetation, or resurfacing.

Final Inspection and Documentation:

- Conduct a final inspection of the site to ensure that all demolition work has been completed according to the method statement and safety plan.
- Prepare and submit a comprehensive report documenting the demolition process, including photographs, inspection records, and waste disposal documentation.

Handover:

- Handover the site to the client or relevant authority, ensuring that all necessary documentation and approvals are in place.
- The final inspection will be arranged for the completion of the works refer to the EP condition 2.10, the Independent Landfill Consultant (ILC) shall "audit the modification works of the existing landfill restoration facilities".

Health, Safety, and Environmental Considerations

Health and Safety:

- Ensure that all personnel involved in the demolition work are trained and equipped with the necessary PPE.
- Monitor the work site continuously for potential hazards, including gas leaks, structural instability, and exposure to hazardous materials.
- Establish emergency response procedures and ensure that all workers are familiar with them.

Environmental Protection:

- Implement erosion control measures to prevent soil and water contamination during and after demolition.
- Minimize dust and noise emissions by using appropriate demolition techniques and equipment.
- Ensure that all waste materials are disposed of in compliance with environmental regulations.

7.9 Reprovision/Relocation/Modification Works Method Statement

Introduction

This method statement outlines the procedures for the reprovision, relocation, and modification of critical landfill infrastructure, including but not limited to leachate monitoring wells, leachate extraction wells, groundwater monitoring wells, infiltration cells, gas monitoring probes, landfill gas passive trench and vent, and the rising main for leachate installed along the seawall connecting the proposed chambers 1A and 1B. The objective is to ensure that these works are carried out safely, efficiently, and in compliance with all environmental and safety regulations.

Scope of Work

The scope of this method statement includes:

- Reprovisioning and relocating leachate monitoring wells, extraction wells, and groundwater monitoring wells.
- Modifying infiltration cells and gas monitoring probes.
- Relocating and installing landfill gas passive trenches and vents.
- Installing a rising main for leachate along the seawall connecting chambers 1A and 1B.

Pre-Work Planning

Site Survey and Assessment:

- Conduct a detailed survey of the existing infrastructure to identify the locations and conditions of all wells, probes, trenches, vents, and pipelines to be reprovisioned, relocated, or modified.
- Identify any potential hazards or challenges, such as groundwater contamination, gas leaks, or structural instability, that could impact the work.

Safety Planning:

- Conduct a risk assessment to identify potential hazards associated with the reprovision, relocation, and modification works.
- Develop a safety plan that includes procedures for handling hazardous materials, emergency response, and the use of appropriate personal protective equipment (PPE).
- Confined space work:
    - Eliminate Confined Space Work: Use engineering methods to design, construct, and maintain systems that avoid the need for confined space entry.
    - If Confined Space Work is Necessary: Ensure all relevant safety measures are in place, including statutory controls, compliance with safety regulations, adequate ventilation, use of personal protective equipment (PPE), and emergency preparedness to meet all statutory requirements and protect worker safety.

Utility Disconnection and Isolation:

- Safely disconnect and isolate all utilities connected to the infrastructure being reprovisioned, relocated, or modified, including electrical systems, pipelines, and control systems.
- Ensure that all energy sources are isolated, locked out, and tagged out according to safety protocols.

Work Procedures

(i) Reprovision/Relocation of Monitoring Wells (Leachate and Groundwater):

Decommissioning of Existing Wells:

- Safely decommission the existing wells by capping and sealing them according to environmental regulations.
- Remove wellheads and any associated equipment.

Reprovision/Relocation:

- Drill new boreholes at the designated locations as per the site plan.
- Install new well casings and screens to the required depth, ensuring proper alignment and stability.
- Backfill the annular space with suitable material to ensure the well's integrity.
- Install wellheads, caps, and any necessary monitoring equipment.
- Connect the new wells to the existing or modified monitoring network.

(ii) Modification of Infiltration Cells and Gas Monitoring Probes:

Infiltration Cells:

- Excavate around the existing infiltration cells to modify or replace them as required by the project plan.
- Install any necessary components, such as geotextile liners or drainage materials, to enhance the infiltration capacity.
- Backfill and compact the area around the modified cells.

Gas Monitoring Probes:

- Remove existing gas monitoring probes that require modification.
- Install new probes or modify existing ones to meet the updated project specifications.
- Ensure that the probes are connected to the monitoring system and are functioning correctly.

(iii) Relocation and Installation of Landfill Gas Passive Trench and Vent:

Trench Excavation:

- Excavate the designated area for the new passive trench, ensuring the excavation is to the required depth and width.

- Install geotextile fabric, drainage materials, and other components as specified in the design.

Vent Installation:

- Install passive vents at specified intervals along the trench, ensuring proper connection to the gas collection network.
- Backfill the trench, compacting the material to prevent settlement and ensure stability.

(iv) Installation of Rising Main for Leachate along the Seawall:

Pipeline Installation:

- Lay out the route for the rising main along the seawall, ensuring minimal disruption to the surrounding environment.
- Excavate a trench along the route, providing adequate depth and support for the pipeline.
- Install the rising main, connecting it to the existing leachate network and proposed chambers 1A and 1B.
- Backfill and compact the trench, ensuring the pipeline is secure and protected from external damage.

Connection to Chambers:

- Connect the rising main to chambers 1A and 1B, ensuring all connections are leak-proof and meet design specifications.
- Conduct pressure testing to verify the integrity of the pipeline and connections.

Testing and Commissioning

System Testing:

- Conduct thorough testing of all newly installed or modified infrastructure, including pressure testing of pipelines, flow testing of leachate systems, and functionality testing of monitoring equipment.
- Monitor the performance of the gas collection and leachate systems to ensure they are operating correctly and efficiently.

Commissioning:

- Complete all commissioning procedures, ensuring that all systems are ready for full operation.
- Document all steps and results, providing a comprehensive commissioning report.

Final Inspection:

- Conduct a final inspection of all work areas to ensure that the work meets the required standards and specifications.

- Complete all necessary documentation and handover reports, providing them to the relevant parties.
- The final inspection will be arranged for the completion of the works refer to the EP condition 2.10, the Independent Landfill Consultant (ILC) shall "audit the modification works of the existing landfill restoration facilities".

Post-Work Activities

Site Cleanup and Restoration:

- Conduct a thorough cleanup of the work areas, removing all debris, waste materials, and equipment.
- Restore the site to its original condition or as specified in the project plan, including grading, replanting vegetation, or resurfacing.

Handover:

- Handover the completed work to the client or relevant authority, ensuring that all necessary documentation and approvals are in place.

Health, Safety, and Environmental Considerations

Health and Safety:

- Ensure that all personnel involved in the works are trained and equipped with the necessary PPE.
- Monitor the work site continuously for potential hazards, including gas leaks, structural instability, and exposure to hazardous materials.
- Establish emergency response procedures and ensure that all workers are familiar with them.

Environmental Protection:

- Implement erosion control measures to prevent soil and water contamination during and after the works.
- Minimize dust and noise emissions by using appropriate construction techniques and equipment.
- Ensure that all waste materials are disposed of in compliance with environmental regulations.

8.0 Interfacing Issues and Avoid Impacts on Existing Operations

Effective management of interfacing issues is crucial to ensure that the ongoing operations of the landfill are not adversely affected by the new project activities. This section outlines a series of measures designed to address potential interfacing issues and to avoid negative impacts on the existing operations of the landfill.

Detailed Project Planning

- Develop a comprehensive project plan that includes timelines, milestones, and detailed descriptions of the tasks to be performed.
- Incorporate buffer periods in the schedule to account for unexpected delays or issues.

Stakeholder Involvement

- Engage with all stakeholders, including landfill operators, project managers, regulatory authorities, and local communities, to understand their concerns and requirements.
- Conduct regular stakeholder meetings to update progress and gather feedback.
- Key stakeholders:
  - Landfill operator
  - Designer
  - Formation contractor
  - Golf course contractor
  - Landscape contractor
  - Facility contractor
  - Other key sub-contractors

Communication Strategy

- Clear Communication Channels
  - Establish clear communication channels among all teams involved in the project.
  - Designate points of contact for each team to facilitate efficient communication.

- Regular Updates
  - Provide regular updates on project progress and any potential interfacing issues.
  - Use various communication tools, including emails, meetings, and bulletin boards, to disseminate information.

Operational Coordination

- Coordination Meetings
  - Schedule regular coordination meetings between the project team and landfill operations team to discuss upcoming activities and their potential impact on landfill operations.
  - Review and adjust project schedules as necessary to minimize disruptions.

- Integrated Works Plan
  - Develop an integrated work plan that aligns project activities with landfill operations.

- Identify and plan for high-impact activities to be conducted during off-peak hours or when landfill operations are least affected or least affected between formation and facility contractor.

Environmental and Safety Measures

- Environmental Protection
  - Implement measures to protect the environment, such as dust control, erosion control, and proper waste management.
  - Monitor environmental parameters regularly to detect and mitigate any negative impacts promptly.

- Safety Protocols
  - Develop and enforce strict safety protocols to ensure the safety of workers and the public.
  - Conduct regular safety training sessions for all personnel involved in the project.

Technical Solutions

- Use of Advanced Technology
  - Utilize advanced technologies and equipment to enhance the efficiency and precision of project activities.
  - Implement monitoring systems to track project progress and identify any potential interfacing issues in real time.

- Temporary Infrastructure
  - Establish temporary infrastructure, such as access roads and utility connections, to support project activities without disrupting landfill operations.
  - Ensure that temporary infrastructure is removed or integrated into the landfill's infrastructure after project completion.

Risk Management

- Risk Assessment
  - Conduct a thorough risk assessment to identify potential interfacing issues and their impacts on landfill operations.
  - Develop mitigation plans for each identified risk.

- Contingency Planning
  - Prepare contingency plans to address unexpected issues promptly.
  - Allocate resources and personnel to manage and mitigate any interfacing issues that arise.

9.0 Emergency Procedures

Overview

This section of the Works Plan outlines the emergency responsibilities and procedures associated with the various tasks for the works for the existing and proposed landfill facilities; including demolition, relocation, reprovision, and modification. It includes a description of the role of the operatives, and a breakdown of activities required for safe and efficient work, and specific emergency procedures with a focus on preventive measures and firefighting.

The successful reprovisioning of the existing landfill facilities requires a team of skilled operatives with specialized experience. Site supervisors play a critical role in overseeing the project, ensuring that all activities are carried out safely and efficiently, and maintaining compliance with all regulatory requirements. By thorough planning, proper site preparation, and safe execution, the project can be completed with minimal impact to all personnel, the pubic and the surrounding environment.

General Emergency Procedures

Objective: To provide a clear and effective response plan for emergencies, ensuring the safety of all personnel, the public and the surrounding environment.

- Key Components:
  - Emergency Communication:
    - Establish clear communication channels for reporting emergencies.
    - Ensure all personnel have access to emergency contact numbers.
  - Emergency Exits and Assembly Points:
    - Clearly mark emergency exits and routes.
    - Designate assembly points (muster points) for personnel to gather in case evacuation is required.
  - Emergency Drills:
    - Conduct regular emergency drills to ensure all personnel are familiar with proper safety procedures.
    - Review and update emergency plans based on the outcome of the drills.

Specific Emergency Scenarios

Fire Fighting Procedures

Objective: To effectively manage and extinguish fires, ensuring minimal injury to personnel and/or damage to property; and the public remains unaffected.

Steps:

- Immediate Actions:
  - Sound the fire alarm and notify the emergency response team.

- Evacuate personnel from the immediate area of the fire.
- Shut down equipment and plant that may exacerbate the fire.

- Using Fire Extinguishers:
  - Types of fire extinguishers:
    - Water Extinguishers: For wood, paper, and textile fires.
    - Foam Extinguishers: For liquid fires (e.g., oil, gasoline).
    - CO2 Extinguishers: For electrical and flammable liquid fires.
    - Dry Powder Extinguishers: For most types of fires, including electrical.

- Fire Fighting Equipment:
  - Ensure fire extinguishers are easily accessible and regularly maintained.
  - Provide soil in areas with high landfill fire (sub-surface oxidation) risk.

- Evacuation:
  - Use designated emergency exits to evacuate the Site.
  - Ensure all personnel gather at the assembly points (muster points) for headcounts.
  - Do not re-enter the Site until it is declared safe by the Emergency Response Team.

- Calling Emergency Services:
  - Contact local fire services immediately if the fire cannot be controlled with available equipment.
  - Provide details about the fire location, type, and any hazardous materials involved.

Landfill Subsurface Fire:

- Description
  - Subsurface fires can occur due to the spontaneous combustion of landfill materials or external sources of ignition.
- Mitigation
  - Regularly monitor landfill temperatures and gas concentrations; establish fire detection and suppression systems.

Chemical Spill Response

Objective: To contain and clean up chemical spills, preventing environmental contamination and health hazards to personnel and the public.

Steps:

- Immediate Actions:
  - Evacuate personnel from the spill area.

- Notify the Emergency Response Team and Site Supervisor.
- Identify the chemical and assess the spill size and potential hazards.

- Containment:
  - Use spill kits to contain the spill.
  - Block drains and waterways to prevent chemical entry.

- Personal Protective Equipment (PPE):
  - Ensure all personnel involved in the cleanup wear appropriate PPE, including gloves, goggles, and respirators.

- Cleanup:
  - Use absorbent materials to clean up the spill.
  - Dispose of contaminated materials according to hazardous waste regulations.

- Reporting:
  - Document the spill and cleanup process.
  - Report the incident to the relevant environmental authorities.

Medical Emergencies

Objective: To provide immediate medical assistance to injured personnel and ensure their safe transfer to medical facilities.

Steps:

- Immediate Actions:
  - Assess the emergency situation and provide first aid (if trained).
  - Call emergency medical services for serious injuries.
- First Aid Kits:
  - Ensure first aid kits are readily available and stocked with necessary supplies.
  - Train personnel in basic first aid and CPR.
- Incident Reporting:
  - Document the incident and actions taken.
  - Report the incident to the Project Manager and Site Health and Safety Officer.

Preventive Measures

Objective: To minimize the risk of emergencies and ensure a safe working environment.

- General Prevention
  - Risk Assessments:
    - Conduct regular risk assessments to identify potential hazards.
    - Implement control measures to mitigate identified risks.

- Safety Training:
  - Provide regular safety training for all personnel.
  - Include training on the use of PPE, emergency procedures, and specific hazards related to landfill work.

- Equipment Maintenance:
  - Ensure all machinery and equipment are regularly inspected and maintained.
  - Keep maintenance records and address any issues promptly.

- Housekeeping:
  - Maintain clean and organized work areas.
  - Ensure waste is properly disposed of and walkways are free of obstructions.

Fire Prevention

- Fire Safety Training:
  - Train personnel on fire prevention, fire extinguisher use, and emergency evacuation procedures.

- Regular Inspections:
  - Conduct regular inspections of fire extinguishers, hoses, and other firefighting equipment.
  - Ensure all fire safety equipment is in good working order.

- Flammable Materials:
  - Store flammable materials in designated, well-ventilated areas.
  - Keep flammable materials away from ignition sources.

Chemical Safety

- Material Safety Data Sheets (MSDS):
  - Ensure MSDS are available for all chemicals on site.
  - Train personnel on the proper handling and storage of chemicals.

- Spill Kits:
  - Ensure spill kits are readily available and personnel are trained in their use.
  - Conduct regular drills to practice spill response procedures.

Site-Specific Emergency Plans

Objective: To address unique risks and scenarios associated with specific works at landfill facilities.

- Demolition Works:
  - Dust and Debris Control:
    - Use water sprays and dust suppression systems.
    - Ensure debris is safely contained and removed.
  - Structural Collapse:
    - Evacuate the area immediately.
    - Use barriers to restrict access until the site is safe.
- Relocation Works:
  - Heavy Machinery Accidents:
    - Ensure machinery is regularly inspected and maintained.
    - Provide training for safe operation.
  - Load Shifts:
    - Secure all loads during transportation.
    - Use appropriate lifting and securing equipment.
- Reprovision Works:
  - Gas Leaks:
    - Evacuate the area and shut down gas systems.
    - Use gas detection equipment to identify leaks.
  - Pipe Bursts:
    - Insulate the landfill gas or leachate systems.
    - Repair or replace damaged pipes immediately.
- Modification Works:
  - Electrical Hazards:
    - Ensure power is disconnected before working on electrical systems.
    - Use lockout/tagout procedures.
  - Confined Space Entry:
    - Follow confined space entry protocols.
    - Use gas detectors and ventilation equipment.

10.0 Storage and Use of Safety Equipment

Overview

This section outlines the storage and use of the essential safety equipment required for various works associated with the demolition, relocation, reprovision, and modification of the existing landfill facilities. Proper safety equipment is crucial for protecting personnel, ensuring compliance with safety regulations, and minimizing the risk of accidents and injuries.

Safety Equipment for Landfill Facility Works

Personal Protective Equipment (PPE)

Objective: To protect individual workers from health and safety hazards.

- Hard Hats:
  - Protects against head injuries from falling objects and bumps.
- Safety Glasses/Goggles:
  - Protects eyes from dust, debris, chemicals, and impact hazards.
- Ear Protection:
  - Earplugs or earmuffs to protect against noise-induced hearing loss.
- Respirators:
  - Protects against inhaling hazardous substances, such as dust, fumes, and chemicals.
  - Types include N95 masks, half-face respirators, and full-face respirators.
- High-Visibility Clothing:
  - Ensures workers are easily seen, reducing the risk of being struck by moving vehicles or machinery.
- Protective Gloves:
  - Protects hands from cuts, abrasions, chemicals, and heat.
  - Types include leather gloves, rubber gloves, and cut-resistant gloves.
- Safety Boots:
  - Protects feet from crush injuries, punctures, and slips.
  - Should have steel toes, puncture-resistant soles, and slip-resistant treads.

Fire Fighting Equipment

Objective: To control and extinguish fires, ensuring the safety of personnel and property.

- Fire Extinguishers:
  - Different types for various classes of fires (water, foam, CO_2, dry powder).

- Regularly inspected and maintained.

Emergency Response Equipment

Objective: To provide immediate assistance in the event of an emergency.

- First Aid Kits:
  - Fully stocked with supplies to treat minor injuries and stabilize major injuries until medical help arrives.
  - Located in easily accessible areas.

- Emergency Showers and Eyewash Stations:
  - Installed in areas where workers may be exposed to hazardous substances.

- Automated External Defibrillators (AEDs):
  - For immediate response to cardiac emergencies.

- Spill Kits:
  - Contains absorbents, neutralizers, and personal protection for handling chemical spills.

Environmental Protection Equipment

Objective: To protect the environment from contamination and manage hazardous materials safely.

- Secondary Containment:
  - Trays, berms, and barriers to contain spills and leaks of hazardous materials.

- Gas Detection Systems:
  - Monitors for the presence of hazardous gases, triggering alarms if dangerous levels are detected.

- Dust Suppression Systems:
  - Water sprays and fogging systems to control dust emissions during demolition and excavation.

Site-Specific Safety Equipment

Objective: To address unique hazards associated with specific works at landfill facilities.

- Demolition Works:
  - Debris Nets and Fencing:
    - Prevents debris from falling outside the designated demolition area.

- Vibration Monitors:
  - Measures vibration levels to protect structures and workers from excessive vibration.

- Relocation Works:
  - Load Securing Equipment:
    - Straps, chains, and ratchets to secure loads during transportation.
  - Machinery Guards:
    - Protects workers from moving parts of machinery.

- Reprovision Works:
  - Pressure Testing Equipment:
    - Ensures pipes and tanks can handle operational pressures without leaks.
  - Gas Monitoring Detector:
    - Continuously monitors for gas leaks in new installations.

- Modification Works:
  - Lockout/Tagout Kits:
    - Prevents accidental startup of machinery during maintenance.
  - Confined Space Entry Kits:
    - Includes gas detectors, harnesses, and communication systems for safe entry into confined spaces.

Storage of Safety Equipment

Objective: To ensure safety equipment is stored properly to maintain its functionality and readiness for use.

General Storage Guidelines:

- Clean and Dry Areas:
  - Store safety equipment in clean, dry, and well-ventilated areas to prevent damage from moisture and contaminants.

- Organized and Accessible:
  - Keep safety equipment organized and easily accessible to ensure quick retrieval in emergencies.
  - Use labelled storage units and racks to facilitate organization.

- Regular Inspections:
  - Conduct regular inspections of storage areas to ensure equipment is in good condition and properly maintained.
  - Replace or repair damaged or expired equipment promptly.

Specific Storage Requirements:

- PPE Storage:
  - Store PPE such as hard hats, gloves, and safety glasses in designated lockers or bins.
  - Ensure respirators are stored in sealed containers to prevent contamination.

- Fire Fighting Equipment:
  - Store fire extinguishers in easily accessible and visible locations.
  - Fire hoses should be stored in cabinets or reels to protect from damage.

- First Aid Kits:
  - Place first aid kits in visible and easily accessible locations.
  - Ensure kits are sealed and contents are regularly checked and replenished.

- Spill Kits:
  - Store spill kits near areas where hazardous materials are used or stored.
  - Ensure kits are clearly labelled and accessible.

Use of Safety Equipment

Objective: To ensure proper and effective use of safety equipment to protect personnel and manage emergencies.

General Use Guidelines:

- Training:
  - Provide regular training to all personnel on the proper use of safety equipment.
  - Conduct drills and simulations to practice emergency response and equipment use.

- Instructions and Signage:
  - Place clear instructions and signage near safety equipment to guide proper use.
  - Use visual aids and diagrams where applicable.

- Regular Maintenance:
  - Perform regular maintenance and testing of safety equipment to ensure it is in good working condition.
  - Keep maintenance records and schedules.

- Specific Use Instructions:
  - PPE:
    - Ensure all personnel wear appropriate PPE for their tasks.
    - Inspect PPE before each use for any signs of damage or wear.

  - Fire Fighting Equipment:
    - Only trained personnel should use fire extinguishers and other firefighting equipment.
    - Follow the PASS method for using fire extinguishers: Pull the pin, aim at the base of the fire, Squeeze the handle, and Sweep side to side.

  - First Aid Kits:
    - Use first aid kits to treat minor injuries and stabilize major injuries until professional medical help arrives.
    - Document any use of first aid supplies and replenish as needed.

  - Spill Kits:
    - Use spill kits to contain and clean up chemical spills immediately.
    - Wear appropriate PPE when handling spills and follow the instructions provided in the spill kit.

11.0 Landfill Gas Monitoring Requirements

Overview

This section of the Works Plan outlines the tasks and responsibilities for the monitoring of landfill gas wells and the overall gas collection system. The objective is to ensure accurate measurement of landfill gas emissions, protect the environment, and comply with relevant regulations. Key parameters to be monitored include methane (CH4), carbon dioxide (CO2), oxygen (O2), balance gases, well pressure, system pressure, differential pressure (dP), and well temperature.

Work Areas

Planning and Coordination

- Scope:
  - Develop a monitoring schedule.
  - Coordinate with relevant stakeholders.

- Tasks:
  - Monitoring Plan Development:
    - Develop a comprehensive landfill gas monitoring plan outlining the locations, frequency, and methods of monitoring.
    - Coordinate with environmental scientists, engineers, and regulatory bodies to ensure the plan meets all requirements.

Gas Well and Overall Collection System Monitoring

- Scope:
  - Gas wells
  - Gas collection network
  - Key parameters: CH4, CO2, O2, balance gases, well pressure, system pressure, dP, well temperature

- Tasks:
  - Routine Monitoring:
    - Conduct regular monitoring as per the established schedule (e.g., daily, weekly, monthly).
    - Use portable gas analyzers for spot checks and verification.

  - Gas Well Monitoring:
    - Measure CH4, CO2, O2, and balance gases at each gas well.
    - Record well pressure and well temperature.
    - Conduct differential pressure (dP) measurements to assess well performance.

- Gas Collection Network Monitoring:
  - Measure system pressure and gas composition (CH4, CO2, O2, balance gases) at various points in the gas collection network.
  - Monitor differential pressure (dP) across key components of the gas collection system.

Data Collection and Analysis

- Scope:
  - Regular data collection
  - Data recording and analysis

- Tasks:
  - Data Collection:
    - Collect data from gas wells and the gas collection network using portable gas analyzers with data recording function.
    - Ensure data is accurately recorded and stored in a centralized database.
  - Data Analysis:
    - Analyze the collected data to identify trends, peaks, and any anomalies.
    - Compare the data against regulatory limits and baseline measurements.
    - Use the data to assess the performance of the gas collection system and identify areas with potential issues.

Calibration

- Scope:
  - Regular calibration of monitoring equipment

- Tasks:
  - Calibration Schedule:
    - Develop a schedule for the regular calibration of all gas monitoring equipment.
  - Calibration Procedures:
    - Perform calibration of gas analyzers according to manufacturer specifications.
    - Use certified calibration gases and equipment.
  - Documentation:
    - Maintain detailed records of all calibration activities, including dates, equipment used, and calibration results.

- Quality Control:
  - Implement quality control procedures to ensure the accuracy and reliability of monitoring data.

Reporting and Compliance

- Scope:
  - Documentation
  - Regulatory reporting

- Tasks:
  - Documentation:
    - Maintain detailed records of all monitoring activities, including dates, locations, readings, and maintenance performed.
    - Document any incidents, anomalies, or exceedances of regulatory limits.
  - Reporting:
    - Prepare regular reports for regulatory bodies, landfill operators, and other stakeholders.
    - Include analysis of data trends, compliance status, and any recommended corrective actions.
  - Compliance:
    - Ensure all monitoring activities comply with relevant environmental regulations and standards.
    - Address any compliance issues promptly to avoid fines or enforcement actions.

Coordination and Communication

- Regular Meetings:
  - Schedule coordination meetings with site supervisors and project managers to review the status of gas monitoring activities.
  - Address any issues or changes needed promptly.

- Documentation and Reporting:
  - Maintain detailed records of all monitoring and data collection activities.
  - Provide regular updates to stakeholders on the status and findings of the gas monitoring program.

Environmental and Safety Compliance

- Safety Inspections:
  - Conduct regular safety inspections to ensure all monitoring activities are conducted safely and in compliance with regulations.

- Ensure all personnel are aware of and adhere to safety protocols.

- Regulatory Compliance:
  - Monitor compliance with all relevant environmental and safety regulations.
  - Address any compliance issues immediately to avoid fines or work stoppages.

Training and Awareness

- Personnel Training:
  - Train all personnel on the importance of gas monitoring, proper use of equipment, and safety protocols.
  - Provide specific training on data collection, analysis, and reporting procedures.

12.0 Safety Precautions

Ensuring worker and public safety during the demolition, relocation, reprovision, and modification of the landfill facilities is of paramount importances. This section of the Works Plan outlines the necessary safety precautions to be observed during these activities to protect workers, the public, and the environment.

Demolition Safety Precautions

- Planning and Risk Assessment
  - **Site Assessment:** Conduct a thorough assessment of the site to identify potential hazards.
  - **Risk Management:** Develop a risk management plan addressing identified hazards.

- Protective Gear
  - **Personal Protective Equipment (PPE):** Ensure all operatives wear appropriate PPE, including helmets, gloves, safety glasses, and steel-toed boots.
  - **Respiratory Protection:** Provide respirators if dust or hazardous materials are present.

- Safety Protocols
  - **Training:** Conduct comprehensive training on demolition techniques and safety protocols.
  - **Signage:** Place clear signage to warn of demolition activities and restricted areas.
  - **Emergency Procedures:** Establish and communicate emergency procedures, including evacuation routes and first aid stations.

- Environmental Protection
  - **Dust Control:** Implement dust control measures such as water spraying.
  - **Waste Management:** Ensure proper disposal of demolition debris, especially hazardous materials.

Relocation Safety Precautions

- Planning and Coordination
  - **Site Survey:** Conduct a detailed survey of both the current and new locations.
  - **Coordination:** Coordinate with all stakeholders to ensure smooth relocation.

- Handling and Transport
  - **Safe Handling:** Train operatives on safe handling techniques for heavy and fragile items.
  - **Securing Loads:** Ensure all loads are securely fastened during transport.

- Personal Safety
  - **PPE:** Provide appropriate PPE for all workers involved in the relocation.
  - **First Aid:** Ensure first aid kits are readily available at both the origin and destination sites.

- Traffic Management
  - **Traffic Control:** Implement traffic control measures to ensure safe movement of vehicles and equipment.
  - **Public Safety:** Inform the public about relocation activities and provide detours if necessary.

Reprovision Safety Precautions

- Site Preparation
  - **Clearing and Grading:** Ensure site preparation activities do not pose safety risks.
  - **Utility Checks:** Verify the location of underground utilities before digging.

- Installation Safety
  - **Equipment Safety:** Regularly inspect and maintain all equipment used in reprovision activities.
  - **Operator Training:** Ensure operators are trained and certified to use the equipment.

- Structural Safety
  - **Integrity Checks:** Conduct regular checks to ensure structural integrity during construction.
  - **Load Management:** Adhere to load management protocols to prevent overloading.

Modification Safety Precautions

- Planning and Design
  - **Design Review:** Ensure all modifications are designed with safety in mind.
  - **Permits and Approvals:** Obtain necessary permits and approvals before commencing work.

- Worksite Safety
  - **Restricted Access:** Restrict access to the worksite to authorized personnel only.
  - **Safety Barriers:** Erect safety barriers around hazardous areas.

- Operational Safety
  - **Tool Safety:** Ensure all tools are in good condition and used correctly.

- **Work at Heights:** Implement safety measures for working at heights, including harnesses and guardrails.

General Safety Measures

- Health and Safety Training
  - **Induction Programs:** Conduct safety induction programs for all new workers.
  - **Regular Training:** Provide ongoing safety training and refreshers.

- Communication
  - **Daily Briefings:** Hold daily safety briefings to discuss potential hazards and safety measures.
  - **Reporting System:** Establish a system for reporting safety concerns and incidents.

- Monitoring and Review
  - **Safety Inspections:** Conduct regular safety inspections and audits.
  - **Incident Review:** Review all incidents to identify root causes and prevent recurrence.

Potential Issues

During the demolition, relocation, reprovision, and modification of the landfill facilities, various potential issues can arise that may pose significant safety and environmental risks. It is essential to identify these potential issues in advance and develop mitigation strategies to address them effectively as described below.

- Landfill Subsurface Fire
  - **Description:** Subsurface fires can occur due to the spontaneous combustion of landfill materials or external sources of ignition.
  - **Mitigation:** Regularly monitor landfill temperatures and gas concentrations; establish fire detection and suppression systems.

- Landfill Gas Collection Network Damage and Leak
  - **Description:** Damage to the gas collection network can lead to leaks, posing risks of explosion and exposure to harmful gases.
  - **Mitigation:** Conduct regular inspections and maintenance; implement robust containment and repair procedures.

- Gas Leak in Confined Space
  - **Description:** Gas leaks in confined spaces can result in hazardous atmospheres, increasing the risk of asphyxiation or explosion.
  - **Mitigation:** Ensure proper ventilation; use gas detection equipment; follow confined space entry protocols.

- Fire
  - **Description:** Fires can occur during any phase of landfill operations due to flammable materials or equipment malfunctions.
  - **Mitigation:** Implement strict fire safety protocols; provide fire extinguishers and training; establish emergency response plans.

- Leachate Breakout
  - **Description:** Leachate breakout can lead to contamination of soil and groundwater, posing environmental and health risks.
  - **Mitigation:** Monitor leachate levels; maintain and inspect containment systems; respond quickly to any breaches.

- Leachate Collection Network Damage
  - **Description:** Damage to the leachate collection network can result in leaks and improper leachate management.
  - **Mitigation:** Regularly inspect and maintain the collection network; implement prompt repair procedures.

- Surface Water Runoff Overflow
  - **Description:** Excessive surface water runoff can overwhelm containment systems, leading to erosion and contamination.
  - **Mitigation:** Design effective drainage systems; monitor weather conditions; maintain and clear drainage paths regularly.

- Equipment Failure
  - **Description:** Equipment failure can cause delays, safety hazards, and operational disruptions.
  - **Mitigation:** Conduct regular maintenance and inspections; train operators on proper use and emergency procedures.

- Worker Fatigue
  - **Description:** Worker fatigue can lead to decreased performance and increased risk of accidents.
  - **Mitigation:** Implement shift rotations; ensure adequate rest periods; monitor workers' health and well-being.

- Unauthorized Access
  - **Description:** Unauthorized access to the worksite can result in theft, vandalism, or accidents.
  - **Mitigation:** Secure the perimeter with fencing and security personnel; install surveillance cameras; enforce access control measures.

- Hazardous Material Exposure
  - **Description:** Exposure to hazardous materials during landfill operations can pose health risks to workers and the public.
  - **Mitigation:** Use appropriate PPE; conduct risk assessments; implement safe handling and disposal procedures.

13.0 Signs, Barriers and Guarding

Overview

This section of the Works Plan outlines the tasks and responsibilities for the installation, maintenance, and management of signs, barriers, and guarding systems across the construction site. The objective is to ensure the safety of all personnel, protect the environment, and comply with relevant regulations.

Work Areas

- Site Preparation
  - Scope:
    - Identification of locations for signs, barriers, and guarding systems.
    - Assessment of specific site requirements for safety and regulatory compliance.

- Tasks:
  - Survey and Assessment:
    - Conduct a detailed survey of the construction site to identify high-risk areas and points requiring signage and barriers.
    - Assess the site for specific requirements such as height of barriers, types of signs, and guarding needs.

  - Planning:
    - Develop a comprehensive plan for the placement of signs, barriers, and guarding systems.
    - Coordinate with the project manager and safety officer to ensure all areas are covered.

Installation of Signs

- Scope:
  - Safety signs
  - Directional signs
  - Informational signs
  - Warning signs

- Tasks:
  - Procurement:
    - Source signs that meet industry standards and regulatory requirements.
    - Ensure signs are durable, weather-resistant, and clearly visible.

  - Placement:

- Install safety signs at strategic locations such as entry and exit points, hazardous areas, and near heavy machinery.
- Place directional signs to guide personnel and visitors around the site safely.
- Install informational signs to provide details about site operations, emergency contacts, and safety protocols.
- Position warning signs near potential hazards, such as open trenches, high voltage areas, and restricted zones.

➢ Maintenance:
- Regularly inspect signs for visibility and condition.
- Replace damaged or faded signs promptly.

Installation of Barriers

- Scope:
  - ➢ Temporary barriers
  - ➢ Permanent barriers
  - ➢ Fencing
  - ➢ Safety rails

- Tasks:
  - ➢ Placement:
    - Install temporary barriers around active construction zones to prevent unauthorized access.
    - Erect permanent barriers in areas requiring long-term protection, such as around hazardous materials storage.
    - Use fencing to secure the perimeter of the construction site and sensitive areas.
    - Install safety rails along walkways, platforms, and other elevated areas.
  - ➢ Maintenance:
    - Inspect barriers regularly to ensure they are secure and undamaged.
    - Repair or replace any barriers that are compromised.

Guarding System

- Scope:
  - ➢ Machine guarding
  - ➢ Edge protection
  - ➢ Fall protection systems

- Tasks:
  - ➢ Procurement:

- Acquire guarding systems that meet regulatory requirements and are suitable for specific tasks.

➢ Installation:
- Install machine guarding to protect operators from moving parts, sparks, and other hazards.
- Implement edge protection around excavations, pits, and elevated work areas to prevent falls.
- Set up fall protection systems, including guardrails, safety nets, and personal fall arrest systems where necessary.

➢ Maintenance:
- Conduct regular inspections of guarding systems to ensure effectiveness.
- Maintain records of inspections and repairs.
- Train personnel on the proper use and importance of guarding systems.

Coordination and Communication

- Regular Meetings:
  - ➢ Schedule coordination meetings with site supervisors, safety officers, and project managers to review the status of signs, barriers, and guarding systems.
  - ➢ Address any issues or changes needed promptly.

- Documentation and Reporting:
  - ➢ Maintain detailed records of all installations, inspections, and maintenance activities.
  - ➢ Provide regular updates to stakeholders on the status and condition of signs, barriers, and guarding systems.

Environmental and Safety Compliance

- Safety Inspections:
  - ➢ Conduct regular safety inspections to ensure all signs, barriers, and guarding systems are compliant with safety regulations and industry standards.
  - ➢ Ensure all personnel are aware of and adhere to safety protocols.

- Regulatory Compliance:
  - ➢ Monitor compliance with all relevant environmental and safety regulations.
  - ➢ Address any compliance issues immediately to avoid fines or work stoppages.

Training and Awareness

- Personnel Training:
  - ➢ Train all personnel on the importance of signs, barriers, and guarding systems.

- Provide specific training on recognizing and adhering to safety signs, understanding the purpose of barriers, and using guarding systems.

- Emergency Drills:
  - Conduct emergency drills to ensure all personnel know how to respond in case of a breach or failure of safety systems.