



## Soil and Groundwater Monitoring and Assessment

### Purpose

To manage *Risks*<sup>1</sup> due to soil and groundwater contamination.

### Requirements

Manager is **Accountable** for requirements 1 to 6.

1. **Comply** with requirements defined in the Soil and Groundwater Standard Overview.
2. **Assess the Risk of soil and groundwater contamination** and review it with the Competent Person to determine what investigation, control or remedial action is required.
  - a. The scope of this assessment shall be dependent on the level of risk that site contamination or other pre-existing environmental conditions may present, and shall consider the previous, current and planned uses for the property. The assessment shall define the environmental condition of the land/facility, also be used in developing a decommissioning/reinstatement plan as per specifications Site Decommissioning and Site Restoration and Reinstatement.
  - b. Have the Competent Person investigate the following for soil and groundwater contamination:
    - on-shore Major Installations;
    - sites where known or suspected releases have RAM red or yellow Risk or can cause non-compliance with legislation;
    - sites subject to acquisition, lease or divestment; and
    - other sites assessed to require investigation.
  - c. Use the findings to decide on acquisition, lease, divestment and future management.
  - d. Review and approve the **Remedial Action Plan** required by requirement 4 with the Competent Person, and implement it to completion.
3. **Implement an operational soil and groundwater monitoring program** to determine whether operational controls and remedial actions are effective in managing risks to ALARP.
  - a. Install wells to detect or monitor offsite migration of contaminated groundwater at the perimeter of onshore Major Installations and *Onshore Pipelines Right of Way* with the potential for groundwater contamination, and at sites where the Competent Person has identified that wells are required as a result of requirement 2.
    - Groundwater monitoring wells should be located considering potential sources, pathways and receptors. Groundwater monitoring wells shall also be located as appropriate to detect potential changes in groundwater level due to facility infrastructure.
    - Pipeline: Groundwater monitoring wells shall be installed at pre-selected locations along the pipeline route where appropriate. The locations of these shall be selected based on environmental sensitivity, such as water-crossings of high environmental value, a number of wetland locations, and groundwater resources used for drinking water. [EIA Addendum on Oil Spill Response]
  - b. Establish and implement an operational groundwater monitoring programme to monitor the groundwater characteristics throughout the operational life of the Project.
    - Sample the monitoring wells in accordance with the HSE Monitoring Overview, but at least annually.
  - c. Establish and implement a soil monitoring programme.
    - Identify soil sampling sites within the territory and zone of influence of Major Installations and at control sites outside of the zone of influence. Soil sampling locations shall as a minimum include those specified in the HSE Monitoring Overview, and may include additional sites as recommended by Competent Person or Manager. Site selection shall take into consideration potential hazards and environmental sensitivity.
    - Implement regular monitoring of soil quality throughout the operational life of the Project. Samples shall be collected in accordance with the HSE Monitoring Overview, but at least annually.

<sup>1</sup> Italicized terms in this document are included in the Sakhalin Energy HSE Glossary.

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## Soil and Groundwater Monitoring and Assessment Specification

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d. **Review** results from soil and groundwater monitoring at least annually.

- If potential contamination is indicated, then implement investigation and remedial action as described in Soil and Groundwater Assessment Specification.
- If impacts to groundwater level are indicated, investigate potential cause, assess mitigation options, and review and approve plans internally and with Authorities as necessary.

**Competent Persons in soil and groundwater assessment and remediation are *Responsible* for requirements 4 to 6.**

4. Perform and document site investigations in accordance with requirement 2, and develop a Remedial Action Plan including a post-remediation soil and groundwater monitoring program, to meet RF and international requirements.
5. Design the operational groundwater monitoring system, considering Risk Based Corrective Action methodology, in accordance with requirement 3.
6. Review soil and groundwater monitoring results and recommend action to manage Risk.

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