



SAKHALIN-2 OIL & GAS RIGHT-OF-WAY RESTORATION PROJECT

 CASE STUDY



Restoring the right-of-way along the 800 km Transsakhlin pipeline, one of the world's largest oil and gas projects

Begun in 1994, Sakhalin-2 is considered one of the world's largest integrated oil and gas projects. It was conceived to develop and produce oil and gas from two fields off the shores of Sakhalin Island for delivery to the rapidly growing Asia-Pacific market.

Sakhalin-2: one of the world's largest oil & gas projects

The project includes three offshore drilling platforms, offshore pipelines onshore processing facilities, an oil export terminal, Russia's first liquefied natural gas (LNG) plant and the 800 km onshore TransSakhlin pipeline system.

Completed in 2008, Sakhalin Energy is required to monitor site restoration and right-of-way reinstatement along the pipeline system. Program requirements were outlined in accordance with the Environmental Impact Assessment and Technical Analysis on disturbed lands and habitat reinstatement, defined before the project had commenced.

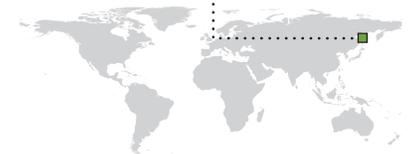
Challenging terrain

The TransSakhlin pipeline was constructed in the area known for its severe natural and climatic conditions: rugged topography, complex geology and hydrography, increased seismic activity and a fragile ecosystem. The task of recovery and restoration is challenging, but a high priority for the company.

“Access to a significant part the pipelines right-of-way is constrained by steep terrain, making ground based observations very difficult,” says Egor Levkovsky, company Leading Environmental Specialist. “Therefore remote sensing data is very important for identification, development and assessment of reinstatement efforts. Moving forward, we also required a methodology to measure the effectiveness of these efforts to help design yearly scope of work and ongoing mitigation actions.”

COMPANY INFORMATION

Sakhalin Energy Investment Company Ltd. (Sakhalin Energy) is the operator of the Sakhalin-2 project under a Production Sharing Agreement with the Russian Federation. Its shareholders are OAO Gazprom (50%+1 share), Royal Dutch Shell plc. (27.5%-1 share), Mitsui and Co. Ltd. (12.5%) and Mitsubishi Corporation (10%).



MAXAR

WorldView-2 provides ideal solution

In 2010 after considering the options of ground base observation and remote sensing technologies, Sakhalin Energy chose Maxar's WorldView-2 satellite to capture the required imagery.

"The width of the area of interest is only about 30 to 50 meters, which meant that we could not use low resolution hyper spectral imagery for such narrow regions" Levkovsky says. "Consequently, spatial accuracy is very important to achieve an accurate estimation to precisely measure reinstatement work requirements and results."

The area for image capture runs north-south along the middle of Sakhalin Island, convenient for data acquisition. The time frame for initial data capture was the three summer months of 2010, the time of year when vegetation shows maximum activity.

Once captured, Sakhalin Energy used ENVI tools for image processing and analysis. A polygon dataset in corporate database was created from assessed NDVI raster to designated areas where additional reinstatement work was required.

"The overall plan accuracy is estimated at four meters, well within our specifications," Levkovsky says.

Summing up the success of the project, Levkovsky says, "Remote sensing data provides clear, evidence of the condition of the environment and will successfully help measure the effects of our efforts to reinstate and restore the pipeline's right-of-way. Satellite imagery also reduces the number of field visits, minimizing exposure to safety hazards and the time needed to develop and execute the program. The business value of this information is very high as it provides all the capabilities we require to complete and monitor the project."

Challenge	Implement right-of-way restoration along the 800 km TransSakhalin onshore oil and gas pipeline then subsequently validate, assess and monitor the resulting environmental impact.
Solution	WorldView-2 8-band satellite imagery provided clear, visual evidence of the environmental conditions surrounding the pipeline giving Sakhalin Energy and the data they required.
Results	Maxar imagery provided Sakhalin Energy with the ability to quickly and cost-effectively measure and assess right-of-way reinstatement requirements, and provide a procedure for continuous monitoring and assessment along the entire length of the pipeline.

INDUSTRY

- Oil and gas

USES

- Monitoring
- Planning

PRODUCT USES

- WorldView-2 8-band multispectral imagery

Egor Levkovsky

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