AEA

IEC Lenders' Independent Environmental Consultant:

Monitoring Report April 2010

Sakhalin-2 Phase 2 Project

Report to Sakhalin-2 (Phase 2) Project Finance Parties

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List of Abbreviations

AEA	AEA Technology plc, Independent Environmental Consultant
AGT	Above Ground Tanks
AOC	Accidentally Oil Contaminated
BETS	BETS B.V. (Bechtel/Enka/Technostroyexport) – OPF construction contractors
BOD	Biochemical Oxygen Demand
BVS	Block Valve Station
COC	Constantly Oil Contaminated
ENL	Exxon-Neftegas Limited, Sakhalin I operator
EOF	Entirely Oil Free
ETP	Effluent Treatment Plant
HSESAP	Health, Safety, Environmental and Social Action Plan
IBC	Intermediate Bulk Container
IEC	Independent Environmental Consultant
IEMP	Interim Environmental Monitoring Plan
ISOS	International SOS – medical provider to the Company
KPA	Korsakov Permanent Accommodations
LUN-A	Lunskoye-A platform
MEG	Mono-Ethylene Glycol
MoC	Management of Change
MOU	Memorandum of Understanding
MPE	Maximum Permissible Emissions
MSDS	Material Safety Data Sheet
OPF	Onshore Processing Facility
OSR	Oil Spill Response
OSRP	Oil Spill Response Plan
OWRP	Oiled Wildlife Response Plan
PA	Piltun-Astokhskoye
PAC	Poly-Aluminium Chloride
PAO	Permanent Accommodation and Offices
PERT	Professional Emergency Response Team
PIG	Pipeline Inspection Gauge
PMD	Pipeline Maintenance Depot
ppm	Parts per million
RF	Russian Federation
RoW	Right of Way
SPZ	Sanitary Protection Zone
STP	Sewage Treatment Plant
WRS	Wildlife Rehabilitation Site
WRSIM	Wildlife Rehabilitation Site Implementation Manual

Executive Summary

AEA Technology (AEA) is the Independent Environmental Consultant (IEC) acting on behalf of the Lenders to the Sakhalin-2 Phase 2 project. Under the Terms of Reference of our engagement, AEA and Lender representatives undertake periodic monitoring visits to the Project. This report presents the findings of the monitoring visit undertaken from 13th to 23rd April 2010. The focus of the visit was to undertake monitoring visits to:

- Onshore Facilities
  - Onshore Processing Facility (OPF)
  - Booster Station 2 (BS2)
  - Liquefied Natural Gas (LNG) Plant

- Pipeline Maintenance Depots (PMD)
  - Nogliki
  - OPF
  - Gastello
  - Prigorodnoye

- Landfills
  - Nogliki
  - Smirnykh
  - Makarov
  - Korsakov

In summary, AEA found no issues of major environmental significance during this monitoring visit. The Company was found to be actively identifying and addressing the key environmental issues in relation to its Assets and Landfills. During the time between our visit and the issue of this report, Sakhalin Energy has already responded to many of the issues identified. New and open Findings remain in relation to secondary containment of hazardous materials, legacy/problem wastes, emissions and discharge limit compliance, construction camp decommissioning and oil spill response. Progress towards the resolution of these Findings will now be included in the IEC's monitoring reports going forward.

AEA's main comments are summarised below.

OPF
Waste management and temporary waste storage at the OPF is still being handled at the temporary waste transit station. The overall standard of housekeeping at the existing waste transit facility was not as good as previously observed in November 2008, however the station is due to be decommissioned as soon as winter is over and waste operations will be transferred to the newly constructed permanent waste storage and handling facility. This new facility will also handle chemical storage which currently is outdoors.

The OPF has inherited approximately 540 containers of unknown content, which were left at the facility by the construction contractor. Sakhalin Energy is currently classifying the contents of each container and preparing a plan for reuse, recycle or disposal of the contents as appropriate.

The facility's sewage treatment plants are now coping well due to reduced staff numbers on site, however, as continuing problems of meeting discharge requirements on both PA-B and LUN-A platforms show, care will be needed during maintenance shutdown periods to ensure that the system is not overloaded by a large influx of maintenance personnel.

The OPF currently has some exceedences of phenol in its process wastewater discharge stream. If the phenol source cannot be eliminated Sakhalin Energy needs to consider putting an activated carbon filter in-line to deal with this problem. AEA also has some concerns over future metals fouling

potential of the injection wells due to precipitation out from mixed water types. While this particular issue is not an immediate lender issue, AEA notes the concern shown by the local administration regarding the injection well's potential connection with higher level aquifers, and requests to be kept updated as information becomes available.

Sakhalin Energy is experiencing increased flaring due to overhead compressor failure, currently resulting in 80% (approximately 2.8 Bscf) of the flaring allowance for the year being used during the first quarter. Sakhalin Energy advises that the total flared volume by the end of the year is expected to be 3.0 Bscf versus the RTN limit of 3.5 Bscf, provided that both overhead compressors continue to run without failure. The cause of the failure is still subject to an ongoing investigation although design enhancements have been agreed upon and are planned for installation during 2011. Fewer shut-downs due to pigging operations and new wells being brought on-line at LUN-A will also help minimise flaring. If the resolution of the flaring issue is delayed, Sakhalin Energy may need to consider the inclusion of a system to mitigate the particulate matter from the flare, such as steam injection at the flare tip.

It is also noted that the MEG reclamation unit is not currently on-line; Sakhalin Energy needs to ensure that installation of the item is carried out well in advance of it being needed as it is understood that this will take one month to install and commission.

Booster Station 2 is now fully commissioned and few environmental issues were noted. Waste handling and storage at BS2 is all indoors and is well managed. Chemical storage is also indoors in a bunded area, although without drip trays and often MSDS documentation – this should be rectified. Environmental monitoring has only just commenced at BS2; AEA has just received the first quarterly monitoring report from BS2, with two parameters initially exceeding the permitted values (suspended solids and synthetic surfactants, i.e. detergent).

Russian Federation law does not permit any living accommodation within an area designated as a SPZ. The Gastello temporary construction camp, still currently occupied by BS2 site personnel, has been confirmed as within the 700 m Sanitary Protection Zone (SPZ), and as such is not in compliance with RF law. Demolition of the camp will reportedly commence during early August 2010, with BS2 site personnel being moved to the Temp Sakhalin Camp (outside the SPZ). Reinstatement is expected to be complete by the end of October 2010.

LNG

The SPZ project has resulted in retaining the 1 km sanitary protection zone around the site. It is noted that the construction camp is currently being disassembled apart from blocks F and L being retained for housing maintenance staff during shutdowns. Sakhalin Energy needs to ensure that the retained blocks are located beyond the SPZ boundary in order to comply with Russian Federation regulations.

With some exceptions, the waste/chemical handling storage at the LNG is well in hand. Housekeeping improvements are required following the observation of several instances of poor storage of materials (lack of secondary containment, wastes stored with new materials, general clutter etc) although it is understood that a new warehouse is due to be commissioned soon and this may resolve some of the storage issues. At the temporary storage facility a bund needs to be repaired, and housekeeping practices of temporary storage and handling of new and used chemicals at the use-point can be improved. The laboratory at the LNG plant also needs more storage area in order to allow the gas bottles to be stored separately and safely, wastes to be stored separately and the offices to be moved outside of the immediate laboratory working area. Also, some waste passports are still pending but are expected to be finalised within few months.

PMDs

Many of the PMD buildings are of a standard design comprising offices, warehouse/storage areas for equipment and vehicles, workshops and oil storage areas, and as such, many of AEA's findings were common to all PMDs. Overall, housekeeping at the PMDs was of a high standard. Vehicle storage areas were clean and tidy. Vehicle maintenance areas were kept free from clutter, and with the exception of the LNG warehouse, workshop areas were kept tidy and tools and other equipment had been put away after use.

Oil spill response equipment and PPE in particular was neatly stored, and vehicles and equipment appeared well-maintained. While OSR team structure (Ecoshelf, CREO, Sakhalin Energy PERT etc) differed at each PMD, the arrangements appear to work well on a local level.

Sakhalin Energy has invested in a significant amount of wildlife response equipment, both hazing, catching and holding/transportation kits stored at many PMDs and equipment to set up a large-scale wildlife rehabilitation site (WRS) at Prigorodnoye. AEA is impressed with the ambitious plans and enthusiasm shown by the Company's wildlife response manager; however it is not known to what extent the 'workforce' earmarked to turn the garage into the WRS knows what to do, as there has not yet been a test-run. AEA recommends that at least one full-scale practice run (under mock-emergency conditions) in establishing the whole facility is undertaken at Sakhalin Energy's first opportunity.

Fuel, oily waste and chemical storage at PMDs requires some attention. The PMDs are faced with two key limitations: storage space and the design of these areas. Very few drums/containers had secondary containment, which is not good practice. This was of particular concern at Nogliki as the fuel storage room itself had no drain/interceptor or bunding, so spills would not be contained and could potentially run directly to unmade ground. AEA recommends that secondary containment for fuel and chemical drums is provided by way of drip trays at all PMDs as a matter of urgency, particularly where no further groundwater protection is provided, as at Nogliki. A Management of Change was raised following AEA's monitoring visit to install self-contained areas at each PMD to store oils (targeting completion in October 2010). In the meantime, the Company's Environmental Manager will visit the Nogliki facility to advise on interim groundwater protection measures.

Landfills

The three upgraded landfills are a vast improvement on the landfill capabilities on the rest of the island and seem to have adopted good working practices. Smirnykh and Nogliki landfills should be encouraged to adopt the working area catch-net system in use at Korsakov – this would help reduce the wind-blown litter problems around the site significantly.

Due to the land allocation problems at Smirnykh, Sakhalin Energy is technically sending its waste to an illegal site. However, given the technical upgrades at the site, this is felt to be greatly preferable to sending waste to one of the unlined sites. It is likely to take the authorities at least a year to resolve the allocation, but we note that this outside of Sakhalin Energy's control or influence.

Korsakov only has approximately two and a half years of further capacity and will require technical / financial assistance in order to be able to develop a further lined cell. Sakhalin Energy is aware of this and is looking at possible ways of working with the operator to secure further safe waste disposal in the future.

Legacy landfill issues have been resolved with the regulator following a detailed survey of the island's landfill sites, and where applicable, Sakhalin Energy has fulfilled its obligation to carry out remedial actions. The two outstanding sites are Val, where seeding is still to be carried out, and Makarov, where Sakhalin Energy will assist in the creation of a new landfill for the district and the closing of the current one once the authority has identified a suitable new area. Discussions are also ongoing for a new landfill at Kholmsk once land allocations problems are resolved by the local administration.

AEA is awaiting the final endpoints for 'problem wastes' such as pigging waxes, sulphinol contaminated sands and legacy wastes from the OPF.

Construction Camps

Sakhalin Energy is actively trying to sell off or remove all existing construction camps along the pipeline and in current facilities. Eight pipeline construction camps are to be sold or removed. To date, one camp has been sold and several others have sales contracts awarded. Two camps have not yet attracted any buyers and will likely be demolished. In addition there are three prefabricated pioneer camps and the OPF construction accommodations which were brought into Russia under the PSA tax exemption. Action on these three camps and the OPF is now on hold pending resolution of tax issues with the RF Customs Office. Finally, the remaining construction camp at BS2 and a significant portion of the LNG construction accommodation are scheduled to be disassembled and removed this calendar year.

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Appendices

1 Introduction

AEA Technology (AEA) is the Independent Environmental Consultant (IEC) acting on behalf of the Lenders to the Sakhalin-2 Phase 2 project (the 'Project'). Under the Terms of Reference of our engagement, AEA and Lender representatives undertake periodic monitoring visits to the Project. AEA has undertaken extensive field monitoring in Sakhalin since 2003 with the two most recent monitoring visits focussing on Sakhalin Energy facilities being undertaken in November 2008 and September 2009. Monitoring reports from 2007 onwards are available from the Sakhalin Energy website[1].

This report presents the findings of the monitoring visit undertaken from 13th to 23rd April 2010. The focus of the visit was to undertake monitoring visits to:

- Onshore Facilities
  - Onshore Processing Facility (OPF)
  - Booster Station 2 (BS2)
  - Liquefied Natural Gas (LNG) Plant
- Pipeline Maintenance Depots (PMD)
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- Landfills
  - Nogliki
  - Smirnykh
  - Makarov
  - Korsakov

Detailed office discussions helped to close out many outstanding issues arising from previous monitoring visits. This report presents the resolution of closed items, progress made, if any, against outstanding items, and new issues identified as a result of this monitoring visit. This reporting template will be used to track issues to completion as the Project moves into the Operations phase.

[1] http://www.sakhalinenergy.com/en/library.asp?p=lib_3rdparty_shelf&l=lib_3rdparty_lendersreport

2 Onshore Processing Facility

The OPF is located 7 km inland from the Lunskoye-A platform (LUN-A) pipeline landfall. The facility is designed primarily to treat the Lunskoye gas and condensate prior to transportation to the oil export terminal and LNG plant at Prigorodnoye. Mono-ethylene glycol (MEG) is added to the hydrocarbon products at LUN-A to prevent hydrate formation before being transported to the OPF via multiphase subsea pipelines. The MEG is then removed and recycled at the OPF and returned to LUN-A for use again in a closed loop system.

The OPF also receives oil and gas streams from the Piltun-Astokhskoye (PA) platforms. Condensate from LUN-A is integrated with oil production from the PA field and piped through the main onshore oil line to the oil export terminal (OET) using booster pumps at the OPF. Gas from LUN-A is combined with that from PA platforms, processed and transported to the LNG facility at Prigorodnoye.

The OPF facility includes a 100 MW power plant and generates power for both the OPF and LUN-A platform. Up to 270 people are accommodated at the OPF at any one time.

2.1 Waste Handling

The table in Appendix 2 summarises waste streams, quantities and final disposal destination of waste from the OPF, based on the Sakhalin Energy Waste Register. Some entries in the table are a combination of various similar wastes of the same class and disposal destination (e.g. used oil waste).

2.1.1 Existing Waste Transit Station

Waste (excluding food waste) from the entire OPF is collected at the Waste Transit Station. The station is currently receiving much less material in comparison to the construction period. Reportedly the station will be dismantled and the land reclaimed in the near future, and all operations will be transferred to the new Waste Transit Station which is already constructed and ready for operation (see section 2.1.4). Winter weather is said to be the cause of delay in switching operations from the existing station to the new one, and the existing site will be abandoned and the new site put into operation as soon as May.

Both hazardous and non hazardous wastes are collected at the station and segregated as required. For non-hazardous waste there are two collections bays for wood and metals (Photo 1). These are both recycled – wood is given to the local community for general use and metal is taken for recycling. Plastic is also collected and sent to a recycler.

Hazardous waste storage comprises three roofed concrete bays (Photo 2), shipping containers and IBCs. The three concrete bays store empty drums in one bay, drums with waste oil and legacy waste oil in the second, centre bay and used PIGs, oily rags and oily soil in the third bay. Legacy waste oil is uncharacterised and currently without applicable waste passport. As a result, Korsakov “Grot Oil” will not accept the material for recycling. Reportedly, Sakhalin Energy is currently testing the material and developing applicable passports so that future disposal will be possible.

Storage containers include used oil, mercury lamps, and batteries and used filters.

Previously, oily water was temporarily stored in three above ground tanks (AGT). According to facility personnel, the three AGTs are no longer in use and oily water is now stored in the observed IBC totes on site. During the site visit, the containers were situated on the surface without secondary containment – this is not good practice.

All waste transfers are conducted by Ecoshelf and waste transfer manifests are signed by the HSE department and kept at the main office.

2.1.2 Domestic Waste

Domestic waste is segregated on-site at multiple locations into plastic, wood, metal and other domestic waste which includes paper, cardboard and food waste. As was described above, the plastic, wood and metals are taken to recyclers. Food waste, paper and cardboard have been collected every second day since April 1st 2010 by newly contracted PolygonEco. PolygonEco has dedicated fit-for-purpose waste collection trucks. Approximately 10 tonnes of food waste per month are disposed of at Nogliki landfill. Possible methods for reducing/eliminating the disposal of food waste to landfill are suggested in Section 9.1 of this report.

2.1.3 MEG Filter Clean Up

The facility engages in MEG filter cleaning, and re-use of the cleaned filters. The cleaning process produces MEG contaminated waste water, which is collected in labelled IBC totes. Waste water quality is analysed prior to disposal; if the resulting parameters are acceptable the waste water is introduced into the industrial waste water stream. If detected MEG concentrations are too high, the waste water is collected by Ecoshelf for disposal.

The MEG filter cleaning room is equipped with waste water collection drains, and filters are placed in drip trays while not being cleaned (Photo 3). However the floor appeared stained, suggesting that the containment trays are not always effective.

2.1.4 New Waste Transit Station

A newly constructed waste transit station is ready and available for operation. Reportedly, operation of the station will commence as soon as May, once the snow has melted and it is possible to transfer waste from the existing transit station to the new one.

The new station is situated in an entirely bunded and roofed area and includes sealed storage units with climate control, ventilation, lighting, and safety equipment. In addition the station is equipped with above ground storage tanks for used oil. Three separate roofed and locked buildings house gas cylinders (Photo 4, Photo 5 and Photo 6).

A schematic diagram provided by OPF site personnel, dated 02/02/2007 and entitled “Waste/Chemical Storage and Bundle Cleaning Area”, shows plans to additionally construct a waste handling building, bundle/column storage, oily waste handling area and bundle cleaning facility – all adjacent to the newly constructed waste transit station.

2.1.5 OPF Legacy Waste

Approximately 540 shipping containers, most of which are 40 feet in length, are located in various open fields at the OPF site (Photo 7). Reportedly, the containers were left by Project contractor BETS and are now the responsibility of Operations. Initially, the contents of the containers were unknown. However within the last year the OPF maintenance department has been systematically opening and surveying the containers, and classifying the contents and structural condition of the containers themselves. The task was slowed down during the winter due to heavy snow accumulation around the containers in the open fields. The purpose of the task was to ascertain what content can be reused at the facility and what needs to be classified as waste and disposed of.

Each container was first examined for lifting integrity since they will need to be moved (and therefore lifted) either for disposal or for housekeeping purposes at the facility. Damaged containers will be emptied and cut up for scrap metal. Containers which are empty but sound will be given away at no charge when there is a request. To date, 540 containers have been examined for lifting integrity and 488 examined for content. Table 1 summarises the initial findings of the survey.

Table 1 Status of Legacy Containers at the OPF

Status of Legacy Containers at the OPF		
Content	Number	Future Use
Cable scrap	30	Disposal (recycle)
Metal scrap	6	Disposal (recycle)
Plastic scrap	2	Disposal (recycle)
Other *	6	Disposal
Spare OPF	68	Electrical and Mechanical Maintenance at OPF
Spare other assets	106	Not indicated
Unknown	212	Unknown
Empty	58	To be given away when requested if container is sound (this is based on verbal information from site personnel and from the update table)
Containers surveyed for content	488 of 540 identified	
Containers inspected for lifting integrity	540	
Containers failing lifting inspection	12	
**No information was provided to define "Other" content*		

2.2 Chemical Handling and Storage

The chemical storage area is currently outdoors and was not accessible due to heavy snow drifts around the area (Photo 8 and Photo 9). During the visit it was observed (from a distance) that the area contained various drums, shipping containers, and various liquid storage containers.

Diesel storage in the process area includes:

- AGT - T4901 134 m^3 – Main diesel system back up tank
- AGT – G4002 10 m^3 – day tank for standby power generator
- AGT – G4007 10 m^3 – day tank for standby power generator

All three areas are bunded. Heavy snow cover prevented a thorough investigation of the storage area. Reportedly a BETS fuel storage facility which was observed during the previous visit was dismantled.

2.3 Waste Water Treatment

2.3.1 Process Water

The process water is filtered through a single filter system rather than the three filter system originally in the plant design. A cyclone system was also trialled but was found not to be sufficient. The current system filters the suspended solids but still requires the addition of freshwater to avoid exceeding the hydrocarbon ppm discharge limits. The MEG reclamation unit is not yet commissioned; to date salt is not a problem, but the unit is in place and would take one month to bring on-line. Currently phenol limits are exceeded in the discharge (80 – 120 ppm) and there is no system in place for treating this; this problem is further discussed in section 9.2.

2.3.2 Sewage Treatment

During the construction phase, the sewage treatment plant (STP) struggled to meet the discharge limits due to constant overloading of the system. Now that numbers are significantly reduced on the site the STP set-up is performing adequately and meeting all criteria. There are current two plants working, each with a capacity of 2 m^3 / hour and therefore capable of dealing with the loading from 270 people. These are treating the effluent from the permanent accommodation and offices (PAO) and the pipeline maintenance depot (PMD). There is a further STP of the same capacity kept as spare for shut-down maintenance events that will result in short-term increases in personnel on site. This is kept in a state of readiness by running some of the plant water through the bio-reactor to keep the biomass active.

The STP treatment consists of de-nitrification (Photo 10), filtration, the addition of Poly-Aluminium Chloride (PAC) to settle out solids (Photo 11) and UV exposure to remove pathogens.

Sampling is undertaken at the input and discharge points of the STP and at the surface discharge point. Monthly sampling is done for internal controls, while three monthly samples are taken for the regulatory reporting with nine parameters tested for and reported.

The control of wastewaters at the OPF is now considered to be generally good but some work is still required to bring the process water parameters within the regulatory limits, this is discussed further in Section 9.2. Careful monitoring of the STP performance will also be necessary during periods at the plant when there is a large influx of personnel for maintenance or any further expansions. The problems of STP performance at the site during the construction phase and on-going overloading of the off-shore platform systems have been well documented in the past, and continue to be noted for LUN-A and PA-B. These have all been related to the numbers of people overloading the capacity of the STPs available, so Sakhalin Energy needs to ensure that there is always sufficient capacity for peak numbers of personnel scheduled on the site during these periods.

2.4 Environmental Monitoring

2.4.1 Overhead Compressor Failure Incident – Flaring Issues

During the initial running of the OPF there was a catastrophic failure of the overhead compressor that compresses the off-gas from the mixed product stream prior to cooling and stabilisation. The original incident took the compressor out of commission for two and half months while it was rebuilt, a second incident following the rebuild resulted in a further five weeks down-time – a catastrophic failure being prevented by the installation of vibration trips into the system.

The result of these failures did not lead to a major health and safety incident or major environmental release - there was a gas release from the lube oil tanks and some spillage of oil, but this was contained within minutes. However, while the cause of the problem is being investigated by the suppliers of the compressor (Hitachi) and a specialist consultancy (ODS), there has had to be a change in the start up procedure for the compressor to ensure the system is fully stable in order to protect the rotors. This leads to more flaring of the gases which, given the liquid content at this point, can be smoky. The situation is currently exacerbated by on-going shutdowns due to LUN-A tying in new wells to the platform, regular pigging of the pipelines and occasional shutdowns at the LNG plant, the most recent being due to bad weather conditions preventing a scheduled tanker loading. In each shutdown incident the following restart results in two hours of flaring while the compressor system is stabilised. This is having a serious effect on the annual flaring limit – currently 80% of the annual flaring limit for 2010 has been used up during the first quarter of the year.

The situation may be improved following the intelligent pigging operation that was underway during the visit as Sakhalin Energy is hoping to be able to adopt a much less frequent pigging programme if it can be shown that corrosion of the lines is not an issue. This will result in fewer shutdowns of the mixed feed system. Other improvements should be noticed once the LNG facility is able to settle into a routine of scheduled tanker loading.

Design enhancements are currently under manufacture and it is anticipated that these components will be installed during 2011. Sakhalin Energy has advised that, based on the cumulative flared volume to date and an expectation that both overhead compressors will continue to run without failure, the total flared volume by the end of the year is expected to be 3.0 Bscf (versus RTN limit of 3.5 Bscf). However, AEA noted continued increased flaring during its June 2010 visit and requests monthly updates of the facility's cumulative flaring totals in 2010.

The results of the environmental monitoring show that there is an issue with particulate matter (soot on the monitoring sheets) at times. This is almost certainly linked to the excessive flaring and the material being sent to the flare with a portion of unseparated condensate included. Should the problem of the overhead compressor continue beyond 2010, Sakhalin Energy may need to consider the options to reduce the particulates in the flare residue such as steam injection at the flare tip.

2.5 Housekeeping

In general, housekeeping at the OPF was found to be very good. Containers for waste and waste oils were well labelled (Photo 12 and Photo 13) and used correctly, and spills and small oil leaks were absorbed using the correct materials (Photo 14). However, as can be seen in Photo 13, some of the oil containers were observed to lack any secondary containment; the OPF HSE manager also noted this and made sure the situation was rectified immediately (Photo 15). Further discussion on site regarding the availability of drip trays showed that there had been a problem in obtaining these items in the past, but now the workshop on the site makes them to order, so every oil, grease or glycol container should be able to have secondary containment to prevent the minor spills.

AEA was pleased to hear that a full site survey was undertaken at the OPF following AEA's monitoring visit. Three drums were identified as being stored outside a bunded area – this situation was reportedly rectified immediately.

The overall standard of housekeeping at the existing waste transit facility was not as good as previously observed in November 2008, however the station is mostly exposed to the elements and this visit was conducted shortly after a heavy snow storm (Photo 16). Moving waste handling to the newly built station in the near future will go a long way towards solving the housekeeping issues.

The major issue with housekeeping at the site are the 500+ containers of legacy waste which have been inherited from the construction phase of the project. These are discussed further in Section 2.1.5 above.

3 Booster Station 2

Booster Station 2 (BS2) is an intermediate pumping and compressor station, intended for the purpose of pressure build-up in the oil and gas pipelines to compensate for head loss. The main process facilities include an export oil pumping station, gas compressor station, electric power generation unit (two gas turbine generators plus one back-up) and utilities. An auxiliary zone comprises a pig launcher/receiver station, emergency evacuation helipad and water intake well. The facility has a pressure release vent rather than flaring system to vent gas from compressor station safety devices and blow down and bleed gas from vessels and piping.

BS2 is located in Poronaysk district, 1.2 km north of Gastello village, adjacent to Gastello PMD and approximately midway between OPF and the OET/LNG facilities. It was commissioned in November 2009, shortly after AEA's previous monitoring visit to the island in September 2009.

3.1 Waste Handling

Waste is temporary stored indoors in the process area. At the time of the monitoring visit, the storage area contained oily rags, used oil filters and used oil. The room was bunded and with a collection sump but there were no drip trays for the drums. Overall the storage area was well organised and clean.

The table in Appendix 3 summarises the waste streams, quantities and final disposal destination of waste from BS2, identified based on the Sakhalin Energy Waste Register. Some entries in the table are a combination of various similar wastes of the same class and disposal destination (e.g. used oil).

3.2 Chemical Handling and Storage

The chemical storage areas observed during the visit included a chemical storage room and three diesel AGTs.

The chemical storage room was clean and with bunded floor and a sump. However, there were no drip trays and no MSDS. The three AGTs are 25 to 30 m^3 volume each and are bunded. Fill points were also bunded and protected with drip trays, safety switches and ground cable. In addition the area was provided with fire fighting equipment and three OSR kits.

3.3 Waste Water Treatment

BS2 has a new sewage treatment plant on the site that currently takes the effluent from the offices of site and the PMD (Gastello) adjacent to the facility. The STP installed by Sakhalin Energy at this facility has a capacity of 30 m^3 / day and consists of an aeration tank for de-nitrification. The equipment for the addition of PAC for flocculation is in place but not currently in use; filtration and UV exposure remove pathogens. The treated water is discharged via spray nozzles to a soakaway site near the fence-line adjacent to the gas vent pipe. Sludge from the STP is collected by Ecoshelf and transported for disposal at the Smirnykh Landfill.

Environmental monitoring at BS2 only commenced in April 2010 so compliance with the discharge consent limits can not be verified at this time. However, given that the unit has plenty of spare capacity for the personnel numbers now at the facility, compliance should not be a problem assuming the STP is kept in good working order and staff numbers remain reduced.

It is understood that the sampling of the intake and discharge will be carried out by Sakhydromet under contract to Sakhalin Energy at a frequency of two samples per month.

The oily water treatment plant for the site is yet to be commissioned. If there is a short-term need for collection and treatment of contaminated water it will be taken off-site by tanker to a local facility. Storm water run-off on the site is put through a separator only prior to discharge, combined with the treated sewage water.

3.4 Environmental Monitoring

Environmental monitoring at BS2 commenced in April 2010 – the first test result for sewage water was received during AEA's visit. Going forward, the facility will arrange a monitoring schedule, undertaken by Sakhydromet, for discharge water (twice monthly), air emissions (monthly), waste volumes (monthly), soil (once per annum) and potable water monitoring (although only bottled water is drunk and used in cooking on site).

BS2 is required to compile quarterly reports for the authorities. AEA has just received the first monitoring report from BS2, with two parameters initially exceeding the permitted values (suspended solids and synthetic surfactants, i.e. detergent).

3.5 Sanitary Protection Zones

The sanitary protection zone (SPZ) for BS2 is set at 700 metres from the boundary of the main BS2 fenced area. Russian Federation law does not permit any living accommodation within an area designated as a SPZ. The Gastello temporary construction camp, still currently occupied by BS2 site personnel, has been confirmed as within the SPZ, and as such is not in compliance with RF law.

Demolition of the construction camp will reportedly commence during early August 2010 with reinstatement being completed by the end of October 2010. Works will be carried out by the Temp Sakhalin Contractor. AEA has subsequently been advised that accommodation for permanent BS2 site personnel will later be provided at the Temp Sakhalin Camp, located approximately 2.5 km from the BS2 facilities, i.e. well outside the SPZ and therefore in line with RF regulations.

3.6 Housekeeping

Housekeeping within the BS2 is good. The facility has plenty of appropriate space for storage of oil and equipment and everything is currently in the correct storage areas (although this is to be expected in a new facility). However, some of the 'finishing', such as safe steps up to the control room, is still to be completed.

4 Liquefied Natural Gas Facility

An oil export terminal (OET) and liquefied natural gas (LNG) processing plant are situated a 490 hectare site at Prigorodnoye, Aniva Bay. The LNG plant comprises two process trains which purify, process and liquefy up to 9.6 million tonnes natural gas per year, and two storage tanks of 200,000 m^3 net combined capacity. LNG is exported via an 805 metre jetty into Aniva Bay, with the first cargo leaving the facility in March 2009.

The oil export terminal (OET) is located 500 metres east of the LNG plant on the same site at Aniva Bay. The facility provides oil storage in two tanks with conventional double deck floating roof and a total storage capacity of 190,000 m^3, equivalent to about six days of throughput from the onshore oil pipeline. Crude oil is exported via a sub-sea pipeline to a tanker loading unit (TLU) located 4.5 km offshore in Aniva Bay. The first oil was offloaded to tanker in December 2009.

4.1 Waste Handling

Hazardous waste is temporarily stored in a bunded enclosed building designated as Building 10. The space contains waste oil, sulphinol-contaminated water, sulphinol-contaminated rags, mercury lamps and spent batteries. In addition, the facility stores sulphinol filters in various conditions. When a used filter comes in, it is initially put into a drum for final draining. Later, the drained filter is packed into large storage bins. Reportedly, no filters have been taken for disposal to date due to a lack of passport. Sakhydromet, a waste contractor to the LNG facility, is said to be currently developing a passport for the used filters. It is understood that once a sufficient number of filters are obtained to make a batch, filters will be sent to the contractor nominated for recycling or treatment of this type of waste.

A bunded concrete outdoor extension to Building 10 is designated as the storage area for empty drums. However during the visit, in addition to approximately 30 empty drums, the area also included approximately 20 drums containing sand contaminated with sulphinol. These drums are open topped and are partially covered with plastic sheets. During the visit, a breach was observed in the bund. As for the sulphinol filters, no applicable waste passport exists for the sulphinol-contaminated sand. At the time of the visit, no applicable waste passport existed for the sulphinol-contaminated sand, however we understand that this has now been obtained and was sent to RTN for approval.

Waste oil was observed also in Shelter 7 (emergency generator) in a drum on the cement floor without a drip tray. It was explained that when the drum is full it will be transferred to Building 10 prior to eventual disposal. The Shelter 7 location was said to be a typical location with a typical waste handling practice. Although any leak in this room would be intercepted by the AOC (Accidentally Oil Contaminated) waste water collection system and eventually be treated via a separation process, it may present an unnecessary load on the treatment system. The concrete floor was clean and the room also had waste bins for oily rags and a spill kit.

In addition to the LNG plant there is an accommodation facility in Korsakov named KPA (Korsakov Permanent Accommodations) which houses approximately 100 personnel. As with the LNG, all class 4 and 5 wastes – domestic waste, street cleaning waste and STP sludge – are delivered to the Korsakov Landfill and kitchen waste and wood waste is given to local farmers and the community respectively. Class 4 and 5 wastes are removed from the site by a contractor named “Novygorod” which removes waste from the LNG and KPA facilities three times a week. Hazardous wastes from both the LNG and KPA facilities are turned over to Green Coast[2] for disposal. Waste generation in all classes, source, quantities, storage and disposal is tracked by Sakhalin Energy HSE personnel who also update the database in the waste tracking system and keep hard copies of waste manifests.

Full details of the LNG waste streams are listed in Appendix 3.

[2] Waste disposal information provided by Sakhalin Energy lists Grotoil as the contractor of record. However in discussions with LNG personnel it was disclosed that Grotoil has recently merged with another contractor and the new company is called Green Coast. Reportedly, Green Coast is the sole contractor removing hazardous waste from the facility and on to appropriate disposal.

4.2 Chemical Handling and Storage

Chemical storage at the LNG plant is all indoors. It is bunded and includes drums of turbine oil, lube oil, ethylene glycol, DIPA (Diisopropanolamine), sulfolane and heat transfer fluid. During the visit the following was observed:

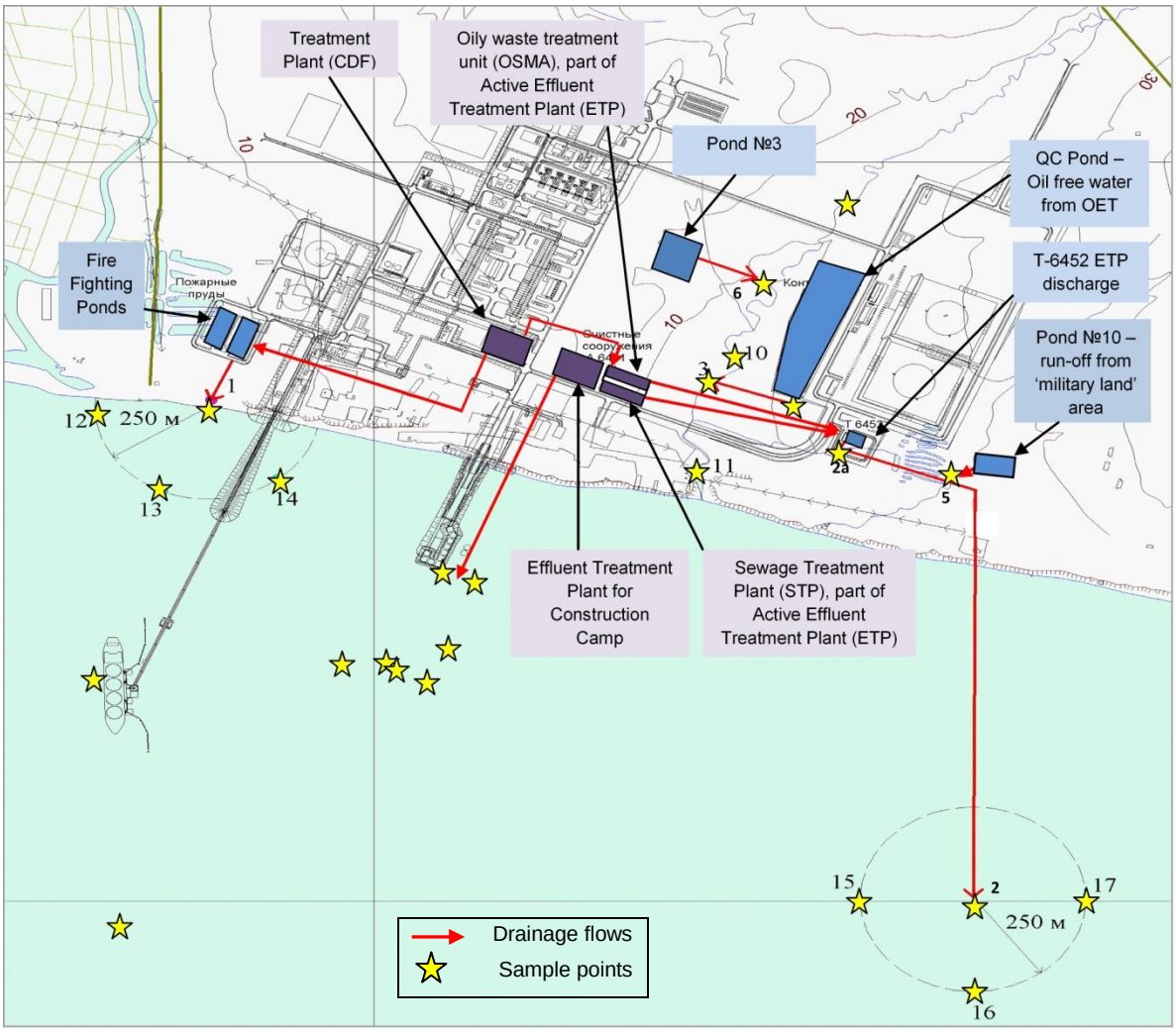
- MSDS present in both Russian and English, stapled together for each chemical
- Spill response kits
- Fire fighting equipment
- Emergency shower and eye wash
- Drains connected to the accidentally oil contaminated (AOC) waste water system (as explained by plant personnel)

Other storage
Part of Shelter 7 is a shelter for two diesel tanks with capacity of 22.7 m^3 each with secondary containment. In addition to the diesel tanks there was one drum each of waste oil (discussed in section 4.1) and clean oil. Both drums were without drip tray (discussion in section 4.1). Fill points for the tanks were bunded and with dedicated spill kit.

4.3 Waste Water Treatment

Figure 1 below shows the water treatment systems and sampling points.

Figure 1 LNG and OET wastewater treatment, drainage flows and sampling points



Wastewater collection at the LNG consists of the following three independent streams: Entirely oil free (EOF), accidentally oil contaminated (AOC) and constantly oil contaminated (COC). These are discussed in the following sections.

4.3.1 Entirely Oil Free

Effluent in this category is considered clean and consists of precipitation and melt water. It is collected throughout the site from open fields and other non-paved areas within the plant that are isolated from the process areas and from any potential contamination sources. The effluent is collected via a network of open channels lined with riprap and discharged into the bay.

4.3.2 Accidentally Oil Contaminated

This effluent is considered and treated as waste. It is collected from all paved areas that don't have direct exposure to contamination sources but that could accidentally be contaminated (e.g. diesel leak from a vehicle on a road which finds its way into the storm drain). In addition there is a network of open drains in the process area which are isolated from areas/processes in which there is a high risk of contaminant discharge (e.g. the drain network is reportedly not connected to the bunded area that houses a diesel tank).

AOC effluent is collected and directed to the treatment facility (CDF in Figure 1 above) where the effluent undergoes mechanical skimming. If the hydrocarbon content is less than 0.1 mg/l, as per CDF specification, the waste water is discharged into the fire-fighting ponds, and from there into Aniva Bay. If the hydrocarbon content exceeds 0.1 mg/l, the waste water goes to the effluent treatment plant (ETP) for further treatment, where sand and activated carbon filters are used for final treatment. After final treatment, the water goes to a buffer tank and is then discharged via a 920 m underwater pipe to Aniva Bay.

4.3.3 Constantly Oil Contaminated

This effluent is considered as waste. It is collected from high risk areas such as fuel and oil storage area and hazardous waste storage area. It is collected as hazardous waste by the hazardous waste collection contractor and recycled/treated/disposed of as applicable.

4.3.4 Sewage Treatment Plant

The site has two 50 m^3 per day capacity STPs in operation with a further two 200 m^3 capacity 'spare' STPs left in place, seven having been removed following the closure of the construction camp. These spare STPs can be brought on-line within one month when an influx of personnel is expected such as during major plant maintenance shut-down. The operational STPs are the Sakhalin Energy standard treatment systems: air injection for nitrification, de-nitrification, PAC dosage to remove solids, filtration and UV for pathogen removal. The treated effluent is then discharged into a tank and on out into Aniva Bay. All sampling and testing to date has been within the regulatory discharge limits.

4.4 Environmental Monitoring

Now that the LNG is entering the operational phase the environmental monitoring is becoming more regular to meet the regulatory requirements for the site. Table 2 gives the sampling and monitoring programme as set up by the on-site environmental team.

Discussions with the Environment team on site demonstrated that they are fully conversant with the requirements of the sampling and testing regime, have set up good systems to track and record the programme and results, and generally are in control of this element of the project. To date the operational phase has not had any major problems with the environmental monitoring.

Table 2 Environmental monitoring schedule at LNG facility

Programme	Location	Frequency
Potable water management		
LNG/OET + Korsakov camp	Wells Nos. 1,2,3,4,150,186	quarterly
	After WTU - P4500 and after UV treatment	weekly
	Distribution net - MAB, workshop, ABM,	twice per month
	accommodation, canteen, guardhouse*, BR-50*	
	* - cold water only	
Waste water management		
FF pond, discharges	Outlet point to Aniva bay (chemical parameters)	monthly
	Outlet point to Aniva bay (microbiological parameters)	monthly
FF pond, control ranges	Aniva bay, 250 m from outlet point (chemical parameters)	quarterly, except Q1
	Aniva bay, 250 m from outlet point (microbiological parameters)	quarterly, except Q2
Pond 3, discharges	Outlet point to Goluboy brook relief	monthly
Pond 3, control ranges and discharge point	Upstream and downstream of Goluboy brook	monthly
QC pond, discharges	Outlet point to Goluboy brook relief	monthly
QC pond, discharge point (control ranges combined with pond3)	Upstream and downstream of Goluboy brook	monthly
QC pond, efficiency	Before and after treatment	monthly
Pond 5, discharges	Outlet point to Tikhiy brook relief	monthly
Pond 5, control ranges	Upstream and downstream of Tikhiy brook	monthly
Marine building roof, discharges	Outlet point to Aniva bay (manhole)	monthly
Marine building roof, control ranges	Points: LNG750, ERF2 and ERF3	quarterly, except Q1
Marine building roof, control ranges	5 points (bottom sediments)	once per year
ETF efficiency	Before and after treatment chemical parameters	quarterly
	Before and after treatment microbiological parameters	quarterly
OSMA (temporary) efficiency	Before and after treatment	quarterly
ETP efficiency	Before and after treatment chemical parameters	quarterly
	Before and after treatment microbiological parameters	quarterly
OSMA (permanent) efficiency	Before and after treatment	quarterly
BR-50. Kors. Accommodation, efficiency	Before and after treatment	monthly then quarterly
Control Discharge Facility	Before FF pond	before discharge
ETF, discharges	Day - average sampling	monthly
OSMA (temporary)	Day - average sampling	monthly
ETF, control ranges	Aniva bay, 250 m from outlet point	quarterly, except Q1
ETP, discharges	T-6452	monthly
ETP, control ranges	Aniva bay, 250 m from outlet point (chemical parameters)	quarterly, except Q1
ETP, control ranges	Aniva bay, 250 m from outlet point (microbiological parameters)	quarterly, except Q1
Korsakov accommodation, discharges	Outlet to Korsakovka river, chemical parameters	monthly
Korsakov accommodation, discharges	Outlet to Korsakovka river, microbiological parameters	monthly
Korsakov accommodation, control ranges	Upstream (100m), downstream (500m) and discharge point of Korsakovka	quarterly
Korsakov accommodation, control ranges	Downstream (500m) point of Korsakovka river microbiological	quarterly
Pond 10, discharges	Outlet point to Bezymyanny brook	monthly
Pond 10, control range and discharge point	300m downstream of Bezymyanny brook	monthly
Ground water monitoring		
Ground water level	As per monitoring programme	monthly
Ground water quality	As per monitoring programme	quarterly

Programme	Location	Frequency
Soil cover monitoring		
Soil quality monitoring (SPS 9-12). Sanitary programme	Soil quality monitoring on the SPZ borders as per map	once per 1 - 3 years
Soil quality monitoring. Sanitary programme	Soil quality monitoring around LNG/OET	once per 1 - 2 years
Soil quality monitoring. Sanitary programme	Soil quality monitoring at 1,2,3 ZSP of potable water wells	once per 1 - 3 years
Soil quality monitoring (SPS 8). Sanitary programme	Soil quality monitoring outside of LNG/OET SPZ. Dacha area	once per 1 - 2 years
Soil quality monitoring. EMP	Soil quality monitoring around LNG/OET	once per year
Air emissions monitoring		
Stack gases monitoring	Acid gas incinerator,	once per year
	Gas turbine generators KT-1420, KT-1440	once per year
	Gas turbine compressors GT-4001/2/3/4/5	once per year
	Workshop	quarterly
Sanitary Protection Zone (SPZ) monitoring	Within SPZ borders as per updated coordinates	monthly
Flaring, under plume site	Location of point depends on wind direction	monthly
Dacha air emission	Nechaevka, Teplovik, Strotel'	monthly
Dacha noise monitoring	Nechaevka, Teplovik, Strotel'	monthly
Surface water local monitoring		
Goluboy and Mereya	Goluboy mouth and 2km upstream, Mereya mouth and 2km upstream:	
	Chemical parameters in water and bottom sediments and flow rate	3 times per year
	Benthos monitoring (except Mereya 2km upstream)	2 times per year
Soil and topsoil monitoring	Samples to be located in 3 directions at the distance of 0.5, 1.0, 2.0 and 4.0 km from the plant boundary	once per year
Vegetation monitoring	Monitoring to be conducted during maximum vegetation	once per year
Monitoring of birds & terrestrial animals		1-2 times per year
TLU/MOF/LNG jetty impact on Aniva bay	Sea water + bottom sediments. In September	once per year
Ballast water monitoring	As per monitoring programme	2 / month and 1 / year
Birds observations	Keeping records	Continuously
Water protection zones and sea observations	Aniva bay, Goluboy brook, Bezymyanny brook	Continuously

4.5 Sanitary Protection Zones

A recent project by the regulator has resulted in the SPZ boundary remaining the same around the plant at a distance of 1 km from the facility. To date, air emissions have been significantly reduced with flaring being approximately 40% below the target allowance.

The construction camp to the north of the site is in the process of being decommissioned and disassembled, with a limited number of blocks being left in place, ('mothballed') for future use during maintenance shut-down when an influx of staff is to be expected. It should be noted that, under Russian Federation law, it is not permitted to have any living accommodation within an area designated as a SPZ. Sakhalin Energy has confirmed that accommodation blocks F and L are indeed outside of the SPZ. These blocks will need to remain outside the SPZ boundary in order to be fully compliant with RF law.

4.6 Housekeeping

4.6.1 General

LNG is still waiting for the commissioning of a new warehouse for further storage; the building is complete but not yet ready to receive equipment. The impact that this is having is to leave elements of the storage, such as spares, some workshop items and oil drums, not being kept appropriately.

Some items noted during the visit were:

- Open boxes of spares in the middle of the workshop floor unattended
- Part used, open oil contain on top of a cupboard
- Tools left out unattended in workshop area
- Oil drums with no secondary containment in garage area
- Anti-freeze drums with no secondary containment in garage area
- Random, untidy stack of wooden blocks used for axle supports left in garage area

4.6.2 Laboratory

There is a laboratory on the LNG site used primarily for quality control of the gas and oil products prior to shipping, although there is also the capability for water quality testing. The facility is relatively compact with store rooms, offices and shower facilities all crowded into the laboratory area, some concern was expressed by the site HSE team as to potential fire risk and they are looking to move the office area away from the immediate working laboratory area.

Some items noted during the visit were:

- Gas bottles were stored in various areas around the lab – a dedicated store would be more suitable, with whichever bottles that can be stored safely outdoors being moved out to create more space.
- Waste materials (tested oils, gas calibration bottles etc.) in the same store as unused items.
- Insufficient storage room for many new items – stacks of boxes in between the cupboards. Sakhalin Energy reported that this situation was rectified following the visit (items that had been recently received for the Gas Chromatograph were subsequently unpacked and boxes removed).
- Several items of lab equipment were marked ‘not in use’ and were awaiting maintenance. Sakhalin Energy reported that five (of a total 66) items were out of service (and labelled appropriately as required by the maintenance quality system), and two of these items will be repaired shortly. If a decision is made not to repair the other three items, they must be removed from the laboratory.
- Two unidentifiable samples of glycol from the turbine coolers had been delivered to the lab for testing in plastic water bottles rather than the appropriate sample bottles. No paperwork had been submitted with the sample. Sakhalin Energy must ensure enforcement of sample handling procedures, both in the use of correct sample containers and the scheduling requests.
- Currently no system for the disposal of the correlation gas samples sent through as part of the Shell world-wide laboratory assessment. A disposal route must be identified for these samples.

5 Pipeline Maintenance Depots

Six PMDs are strategically located along the pipeline RoW at Nogliki, Yasnoye, OPF, Gastello (BS2), Sovetskoye and Prigorodnoye (LNG/OET). The PMDs are primarily responsible for:

- Pipeline maintenance activities along well-defined stretches of pipeline, including routine helicopter surveillance of the RoW (undertaken by contractors at some PMDs);
- Maintenance of access to Block Valve Stations (BVS). These were permanently de-manned from 1 April 2010 and now have security cameras, sensors and alarms (monitored by PMD staff);
- Operation of pig trap stations (PTS) – receiving/launching pigs and management of pigging wastes;
- Oil spill and emergency response;
- Maintenance of a range of vehicles:
    - Emergency (e.g. fire fighting vehicles, ambulances)
    - Oil spill response (e.g. Kamaz and Ural trucks, river/sea vessels)
    - Maintenance and snow-moving vehicles (e.g. dozers, shovels)
    - General site vehicles (e.g. Land Cruisers).

AEA visited four PMDs during this visit – the 'stand-alone' PMD at Nogliki, Gastello (associated with BS2) and PMDs embedded within the OPF and LNG facilities. Accommodation and wastewater treatment are provided at some PMDs. Many of the PMD buildings are of a standard design comprising offices, warehouse/storage areas for equipment and vehicles, workshops and oil storage areas. As such, many of AEA's findings were common to all PMDs. These are discussed in general, highlighting any exceptions, in this section.

5.1 Oil Spill Response

PMDs are responsible for responding to oil spills at their associated facilities and their particular allocation of RoW. These stretches of RoW are well-defined and PMD personnel appeared aware of where their responsibilities lay.

5.1.1 Equipment Storage and Maintenance

Oil spill response (OSR) equipment is stored in a similar manner at all PMDs. Reels of boom, pre-stocked containers, pumps, motors etc and sea/river vessels are stored in large, dedicated warehouses containing neatly stacked shelving, clear gangways and well-labelled boxes (Photo 17). OSR personal protective equipment (PPE) was tidily stored and readily accessible to responders (Photo 18).

OSR equipment appeared well-maintained. At Nogliki, boat maintenance is undertaken during spring, summer and autumn. In winter, skimmers are utilised and therefore checked, along with ice saws. Booms are inspected (including inflation) on a rotation basis 2-3 times a month and during exercises. It was estimated that all stretches of boom will be taken out and checked at least once each year. Similarly, Gastello equipment is reportedly tested once a quarter; booms for rivers were laid out having recently been tested.

OSR vehicles are stored pre-loaded with key first-response equipment, ready to be quickly deployed (Photos 19). Inventories on container doors showed that the contents were regularly checked. Gastello personnel explained that different equipment is used for summer and winter conditions (for example winter pumps provide steam) therefore these pre-stocked containers are swapped seasonally – Gastello PMD was just changing from 'winter' to 'summer' equipment containers.

Seven small incinerators (originally earmarked for burning oily waste) were stored at the Gastello PMD, although AEA was advised that there are no plans to actually use these.

5.1.2 Oil Spill Responders

Each PMD visited had a different OSR team structure incorporating Sakhalin Energy, Ecoshelf and CREO personnel. While team structure is differs at each PMD, the arrangements appear to work well on a local level. Regular desk-based and practical training exercises are being undertaken.

Nogliki:

Seven Ecoshelf people are fully trained to deploy the OSR equipment from the Nogliki PMD. These people also have other roles and responsibilities within the PMD. In addition, Nogliki PMD enjoys a strong network of local volunteers who are trained and willing to support the professional team if required. They meet regularly for refresher training. The Ecoshelf person showing us around claimed that the entire professional Ecoshelf team could be assembled at the PMD within 30 minutes of an alarm being raised.

OPF:

Four professionally trained and qualified CREO personnel work with other PERT-trained (Professional Emergency Response Team) Sakhalin Energy staff at the OPF PMD. As previously understood, Senior Sakhalin Energy personnel are responsible for the overall co-ordination of incidents, although the CREO and Sakhalin Energy responders work as an integrated team. CREO manages the day-to-day equipment maintenance activities with Sakhalin Energy personnel working under their supervision.

LNG:

AEA was advised that two dedicated CREO responders are on duty at the facility at any one time, reporting to a Sakhalin Energy OSR co-ordinator. AEA was advised that a further 30 CREO people in Yuzhno would be able to respond to an incident, along with approximately 40 student volunteers. In addition, 30 LNG operators are PERT-trained to assist with any response effort (15 per shift).
An OSR drill undertaken on 16 April 2010 involved a 10-strong CREO 'South Mobile Team' working with the two LNG-CREO responders. It was pleasing to hear that some of the student volunteers were also involved in this exercise.

All offshore OSR activities (personnel, equipment maintenance etc) are undertaken by Ecoshelf personnel. Offshore OSR was not covered by this visit due to additional security clearance required by the port. Combined CREO/Ecoshelf exercises are undertaken once per year – any opportunity to increase the frequency of these is encouraged as it is very likely that the two teams will need to work together in an incident at Prigorodnoye.

5.1.3 Oiled Wildlife Facility – Prigorodnoye

Sakhalin Energy's Oiled Wildlife Response Plan[3] (OWRP) is supplemental to the Company's OSRPs and serves as a general guidance for wildlife hazing, capture and rehabilitation by Sakhalin Energy staff during an oil spill response involving wildlife. It details the way in which an oiled wildlife response should be initiated, implemented, managed and evaluated within Sakhalin Energy, and contains strategies, actions and data to enable the Company to initiate and manage a wildlife response within the Sakhalin Energy Emergency Coordination Team.

Sakhalin Energy's oiled wildlife response plans include setting up a Wildlife Rehabilitation Site (WRS) at the LNG site in Prigorodnoye. During AEA's previous monitoring visit in September 2009, Sakhalin Energy's wildlife response manager presented the Company's Wildlife Rehabilitation Site Implementation Manual[4] (WRSIM). The WRSIM focuses on actually establishing the WRS, and describes the ambitious and detailed plans to transform the main LNG vehicle garage into an environment suitable for treating and rehabilitating oiled wildlife.

[3] Sakhalin Energy Investment Company: Oiled Wildlife Response Plan. Doc No: 0000-S-90-04-P-7032-00-E Revision 01, 31/07/2009. Available on Sakhalin Energy's external website at http://www.sakhalinenergy.com/en/documents/OWRP_01_last_Web-site_En.pdf
[4] Sakhalin Energy Investment Company: Wildlife Rehabilitation Implementation Manual Number 17. Doc No.: 0000-S-90-04-P-7033-00-E, Revision 01, 31/05/09.

During this April 2010 monitoring visit, AEA was able to see the area earmarked for the WRS. It was explained that the vehicles currently housed would be moved out into the yard, allowing temporary constructions such as tents, net-bottomed pens, cages, aviaries and pools etc, to be constructed inside. Sakhalin Energy estimates that the WRS can be set up in 48 hours by approximately 22 people, although this has not yet been tested.

Because the vehicle garage was not originally designed to accommodate a WRS, water-safe electrical connectors and cabling have been installed, and additional heating and ventilation systems need to be brought in to maintain the temperature at 25-30 ºC (as recommended by IFAW and IBRRC). Birds will be washed in the former vehicle washing room, making good use of the drainage systems already in place. It is understood that the oil in water concentration will be acceptable for discharge through plant's oil-contaminated wastewater system.

The WRS equipment is currently stored in various places in the LNG plant's main warehouse, which is used by many other PMD departments for storing a variety of large items. The new WRS equipment will be moved into the new warehouse once it is commissioned. While current storage arrangements are only temporary and the equipment appeared in good condition, it is not an ideal situation.

It is clear that the wildlife response manager knows exactly what needs to be done to turn the vehicle garage and other PMD areas into a wildlife rehabilitation centre. These plans are also well documented in the WRSIM. However it is not known to what extent the 'workforce' earmarked to turn the garage into the WRS knows what to do, as there has not yet been a test run. For such an ambitious and time-critical operation, AEA strongly recommends (as we did in our September 2009 monitoring report) that at least one full-scale practice run in establishing the whole facility under mock-emergency conditions is undertaken at Sakhalin Energy's first opportunity, ideally within six months of commissioning the new warehouse.

AEA was informed that local vets had received wildlife rehabilitation training in Japan, two of them with renowned Japanese expert Dr Saito. AEA also reiterates its September 2009 recommendation that Sakhalin Energy invites Dr Saito and his colleagues to view their rehabilitation facilities in order to build relationships and share knowledge, thus enabling more collaborative response efforts in the future.

5.1.4 Oiled Wildlife Response Equipment

Sakhalin Energy has invested in supplying some PMDs with the equipment to respond, capture, treat and rehabilitate oiled wildlife and also 'hazing' devices to prevent oiling by deterring wildlife the spill site. A practical demonstration of this equipment was provided by Sakhalin Energy's wildlife response manager in September 2009. Copies of delivery notes were seen prior to the monitoring visit, and wildlife response equipment was seen at all PMDs visited in April (Photo 20).

It was AEA's original understanding that all oil spill responders would be trained in capture techniques and equipment deployment, and indeed some PMDs claim that staff have been trained. However Sakhalin Energy's wildlife rehabilitation manager advised that this would not be the case. Wildlife response equipment will continue to be stored and maintained at each PMD, however should deployment be necessary, specially trained wildlife responders would travel to the affected area and manage that part of the response effort themselves. It is recommended that this message be communicated internally again to prevent any confusion at the PMDs regarding responsibilities.

5.1.5 Emergency Response Manager

During the visit, AEA learned that Sakhalin Energy's Emergency Response Manager was leaving the Company imminently. At the time of the visit, Sakhalin Energy had not yet identified anyone suitable to replace him, and his responsibilities were being undertaken by the HSE General Manager and by the Lead Emergency Response Specialist while a successor was found.

Sakhalin Energy was clear that the Emergency Response Manager must be highly experienced both in methods and in the field. AEA supported these criteria and encouraged the Company to work fast to fill the role as the team has many OSR-related commitments to achieve in the near future, including further work on scenarios (Finding OSR.05, as addenda to the main OSRPs), expanding the OSR

Summaries (Finding OSR.13) and development of the Emergency Response Standard of Organisation (superseding the Corporate OSRP). Work relating to the re-approval of Company's asset-specific OSRPs is also due to commence this year.

Following the visit, Sakhalin Energy appointed a new Emergency Response Manager who commenced in the role on 1 July 2010.

5.2 Emergency Response

PMDs have responsibility for responding to emergencies at facilities and pipelines, including fires, explosions and other incidents involving injuries to personnel. Emergency response equipment are stored and maintained at the PMDs, and dedicated, trained responders must be on duty.

Fire trucks are available at all sites. LNG has five fire trucks, although two were under maintenance at the time of the visit. As with OSR, the facility has two dedicated fire fighters per shift, plus 30 facility operators (15 per shift) trained to assist with emergency response efforts. Around 30 containers of foam-producing chemicals were stored in drums near the fire trucks.

OPF has three fire trucks with a dedicated fire chief and assistant at the facility; volunteer staff at the facility make up the crews. All staff involved with the fire fighting have been trained externally in Malaysia and further on-going training is provided through weekly exercises at the plant.

Gastello fire trucks are not generally used to take water to a fire (although they can be), but are more often connected to hydrants around the BS2 site and just used as a pump. Six fire responders are on duty per shift. In addition, the PMD also has access to local volunteer teams if required. The PMD's fire crews undertake joint fire training with the local Poronaysk fire crews every six months, and also undertake some training with Smirnykh crews. Both Poronaysk and Smirnykh crews have telephone numbers for the Gastello PMD in case a fire/leak is detected at Project assets. The Gastello PMD emergency telephone number is also shown on signage along the pipeline RoW. A fire response training exercise was being undertaken at Gastello during AEA's visit, practicing the deployment of equipment and breathing apparatus. A meeting was held in the PMD conference room in the morning, and a small group of responders were seen outside in the afternoon observing a demonstration by the fire truck.

Gastello PMD has two ambulances (one each for the PMD and BS2) and one on-site doctor. As far as was known, the PMD did not coordinate any training with local ambulance stations/hospitals in Poronaysk, although maintaining good lines of communication would be recommended in case further support was required from local medical teams.

5.3 Vehicle Storage and Maintenance

The vehicle storage and maintenance areas were of a standard design across all PMDs. Overall, they were found to be clean, free from clutter and appeared well-managed.

Wherever possible, vehicles were parked indoors to avoid exposure to the elements. Floors around the large vehicles were clean and free from spills and debris, and in particular OSR vehicles were facing roller doors in readiness (Photos 19). Areas housing smaller vehicles (e.g. A300 Bobcats), generators and ice saws were also seen; these were stored in a tidy manner with only small spots of staining were noticed on the ground (Photo 21).

The vehicle maintenance areas at Nogliki, Gastello and OPF, and to a lesser extent LNG, were neat and clean. Wheeled waste oil drums were seen at all PMDs, but as noted in section 2.5, these should be placed inside drip trays. In addition clearly labelled containers for other oil-contaminated wastes (filters, rags) were noted. Mechanics working on vehicles were observed to be wearing gloves.

PMDs managers advised that they have trained first aiders. First aid supplies were available (only one cupboard checked was locked) and eye-wash stations were well stocked (Photo 22).

HSE information was available, with a good dual-language example seen in Nogliki (Photo 23).

Up to 20 waste batteries were held in storage at Nogliki and OPF, awaiting disposal by Ecoshelf. Some were sat on a table under an extraction hood but most additional ones were on the floor. The OPF PMD employed the good practice of placing these in secondary containment (Photo 24). An acid storage cupboard containing a further two to three batteries plus bottles of battery acid was constructed of metal, off the floor and with extraction (Photo 25). The cupboard was not locked, although it did have a lock and closed properly.

Tyre change areas looked tidy, with protective cages for inflating tyres and well-maintained equipment. Tool storages areas were tidy at Nogliki and OPF – unfortunately we were unable to see the Gastello tool storage area as the authorised person was not available to accompany us.

5.4 Fuel Storage

Fuel and oily waste storage at PMDs requires some attention. The PMDs are faced with two key limitations: storage space and the design of these areas. Similar issues were noted at all PMDs visited due to the buildings' common design.

The storage space available for fuel drums and other chemicals used one-site is limited. While large fuel drums were not stacked, and reportedly never would be, smaller containers were stacked four-high (Photo 26). Stacked containers (particularly dented containers as shown) may fall, presenting a greater potential for damage, spillage and also personal injury.

Very few drums/containers had secondary containment, which is not good practice. This was of particular concern at Nogliki as the room itself had no drain/interceptor or bunding, so spills would not be contained and could potentially run directly to unmade ground. AEA recommends that secondary containment for fuel drums is provided by way of drip trays at all PMDs as a matter of urgency, particularly where no further groundwater protection is provided, as at Nogliki.

Also at Nogliki, of concern was a drum marked as poisonous and a marine pollutant (marked UN2810: glutaraldehyde or glutaric dialdehyde), an organic compound used *inter alia* as a biocide for industrial water treatment and as a chemical preservative. This drum was without secondary containment and stored in an unbunded area – breach of the drum would potentially lead to uncontrolled groundwater contamination (Photo 27).

AEA has been advised that Sakhalin Energy has raised a Management of Change (MoC) following the visit to install self-contained areas at each PMD to store oils. This MoC is still at the approval stage, although completion of the works is targeted for October 2010. Nogliki, the PMD of most concern, will be visited by the Company's Environmental Manager on 22 June to advise on interim groundwater protection measures.

On a positive note, drums were labelled and MSDS for diesel were displayed at most PMDs.

5.5 Wastewater Treatment

Nogliki is a stand-alone PMD with its own wastewater treatment facility. The Nogliki PMD STP is designed for 42 people (maximum flow 50 m^3/day) although currently only handling 30 people. Cleaned water is sent to land via a soakaway. No problems have been identified with resulting effluent quality and the STP appears to be working well.

Wastewater from PMDs associated with main Project assets (OPF, BS2 and LNG) is treated by their main STPs and described in earlier sections.

5.6 Housekeeping

Housekeeping at PMDs was generally of a high standard. Vehicle storage areas were clean and tidy. Vehicle maintenance areas were kept free from clutter, and with the exception of the LNG warehouse, workshop areas were kept tidy and tools and other equipment had been put away after use.

Storage of oil spill response equipment at all PMDs was well-organised, with neatly stacked shelving, clear gangways, well-labelled boxes and overall a very good standard of housekeeping.

However as discussed in section 4.6, the LNG PMD is still waiting for a large warehouse to be commissioned. All newly procured wildlife rescue and rehabilitation equipment is currently stored different places in a general warehouse, alongside other workshop supplies, spares and equipment, ready to move into the new warehouse. As a result, the existing warehouse has become overstocked and untidy, with housekeeping standards slipping as more items are temporarily moved in. It is expected that this problem will be resolved once the new warehouse come on line (expected around June) and more storage space becomes available. This should be checked on future monitoring visits.

As noted in section 2.5 and Photo 13, wheeled waste oil drums were noted in every PMD vehicle maintenance hall without secondary containment. It is considered good practice to place hazardous liquid containers (including waste oil and vehicle batteries) inside drip trays as shown in Photo 15 and Photo 24, as a precautionary measure to contain any spills.

6 Clinics

Medical services at the OPF and LNG plant are provided by International SOS (ISOS), a leading provider of medical assistance and international healthcare. ISOS medical professionals were met at both OPF and LNG clinics during the visit, and a tour of the OPF clinic was conducted.

6.1 Clinical Waste

Clinical waste is a controlled waste, defined by the EC Controlled Waste Regulations (1992) as any waste that consists wholly or partly of:

- Blood or other bodily fluids
- Drugs or other pharmaceutical products
- Excretions
- Human or animal tissue
- Swabs or dressings
- Syringes, needles or other sharp instruments which, unless made safe, may be hazardous to anybody who comes in contact with it.

When dealt with incorrectly, clinical waste represents a risk both to people and to the environment.

Clinical waste generated by the Project facilities' ISOS clinics consists primarily of contaminated swabs and surgical dressings, syringes and needles. The clinics use the internationally recognised hazard classification of Class A and B wastes.

Class A wastes such as contaminated swabs, surgical dressings and other blood/tissue contaminated wastes are immediately soaked in Alaminol disinfectant solution (Photo 28) reducing them to Class B. Wastes are then moved into yellow-lined pedal bins displaying the biocide symbol. Used examination gloves and other non-blood wastes are classified as Class B and placed directly into black-lined pedal bins also displaying biocide symbol without prior treatment (Photos 29). Alaminol solutions are changed every 10 days.

Used syringes are first autoclaved to burn and destroy the needle, then put into a specific sharps container (also containing Alaminol disinfectant solution) with other such items. The doctor estimated that the container was filled in approximately 7-10 days.

Sharps containers and both black and yellow waste bags are collected by Ecoshelf as Class B wastes and taken to Yuzhno. The doctor was not aware of the wastes' fate after leaving the clinic.

AEA could not speak in depth with the LNG doctor as she was with a patient at the time of the visit, and only part of the LNG clinic was seen as an external trainer was delivering a first aid course in one of the treatment rooms. AEA could however confirm that the LNG clinical waste management procedures were identical to those noted at the OPF.

6.2 Other Facilities

Both ISOS clinics appeared clean and clutter-free. Instruments appeared well maintained and stored tidily. The doctor on duty at the OPF had only been in position for a short time, but commented upon how impressed he was with the facilities he was now working with.

One doctor and one paramedic are reportedly on duty at all times, working back to back. Both OPF and LNG clinics had dedicated emergency access at the rear of the building for ambulances – this route was clear and unobstructed. The OPF clinic had an isolation chamber that would accommodate a doctor and infected patient in complete isolation – drugs, supplies and facilities were stored in the room that would sustain two people in the case of a serious infectious outbreak.

7 Landfills and Other Waste Endpoints

Waste generation from construction activities was considered in the TEOC as one of the main environmental aspects of the project and as such it set commitments for Sakhalin Energy to upgrade three existing landfill sites (Nogliki, Smirnykh and Korsakov) selected based on strategic location and size. Sakhalin Energy has been using the three upgraded landfill sites from between Q4 2005 and Q2 2006 and has been continuing to do so through construction completion, commissioning and now operation.

Initially, due to the lack of adequate infrastructure in Sakhalin and the sanitary regulations that oblige waste disposal immediately after generation, the Project's contractors and subcontractors disposed of non-hazardous waste into some unlicensed landfill areas that were used at that time by local communities. These landfill areas form the legacy landfill commitments that Sakhalin Energy has taken on to offset the potential environmental impacts that have occurred due to the contractors' waste placement at these sites.

7.1 Nogliki Landfill

The landfill site is located in the north of Sakhalin Island in the Nogliki District of Sakhalin Oblast at a distance of some 4 km from the Nogliki to Katangli road. The original design of the up-grade was to allow for 39,000 m^3 of waste per annum for three years to construction phase completion followed by 30,000 m^3 per annum for a further twenty seven years. The landfill is designed to receive class 4 and 5 wastes (domestic / non-hazardous).

The landfill site was visited on 14th April 2010, unfortunately during blizzard conditions that limited the observations that were able to be made. The following items were noted:

- Visitors to the site had to undergo a Health and Safety induction and sign the visitors' book prior to being allowed onto the site;
- Visitors were accompanied at all times by staff from the site;
- The site has a small covered facility for the temporary storage of wastes that fall into waste classes 1, 2 and 3 and have been delivered to the site in other loads. These include oils, oil contaminated rags and soil and batteries. Each load delivered to the site is checked at the gate and again during unloading on the tip, where materials are noted that are unsuitable for the site these are set to one side in the temporary storage. Where possible the items are returned to the waste generator for them to sort out the correct disposal, otherwise there is a contract in place with a specialist company to remove the wastes and ensure disposal at appropriate endpoints (Photo 30 and Photo 31).
- Daily cover materials. During the spring and summer soils are brought to site either from local construction sites or from a nearby sand and gravel pit that supplies clays and sands to the landfill, these are placed over the waste to prevent vermin and bird infestation when the waste layer reaches a thickness of 2 metres. During the winter snow is used as a cover material.
- Leachate. Leachate, generated by the percolation of precipitation and snow melt through the waste mass, is re-circulated back on to the waste mass from the collection system. Originally this was carried out using a mobile tanker but now pumps have been bought that pump and spray the leachate back onto the waste. Following excessive precipitation or large snow-melt events the leachate is taken by tanker out to the Nogliki sewage treatment plant.
- Environmental Monitoring. The monitoring work around the site is now entirely the responsibility of the landfill owner, with Sakhalin Energy no longer paying for this service. Monitoring of the groundwater wells is undertaken every three months with two laboratories being used, one local and one in Yuzhno. To date there have been no pollution incidents recorded in the well samples, although concern was expressed on site by the landfill management about how good the laboratory capabilities were to carry out this work.

- There are three main waste generators that use the site – Sakhalin Energy, ENL and the local municipality, currently ENL waste is kept separately from the other two and, once the current cell is full, Sakhalin Energy waste will be stored separately from the municipality waste.
- On completion of a cell the land will be formed to have 1:4 slopes with a plateau-shaped crown, an impermeable membrane and soil will be placed for restoration purposes.

7.1.1 General Comment – Nogliki

In comparison to the original landfill, the site is well run and controlled. The investment put into the improvements to the infrastructure and training of the local staff has resulted in a site that is now fully compliant with Russian Federation regulations and meets many of the European standards. There are some minor improvements that could be made such as better compaction of the waste on initial placement and the use of catch nets around the working area to better control wind-blown litter, but overall the landfill development is a success.

7.2 Smirnykh Landfill

Smirnykh landfill is located in the centre of Sakhalin Island in the Smirnykh District of Sakhalin Oblast at an approximate distance of 3.5 km northwest of Smirnykh town. The original design for the site allowed for the receipt of 14,200 m^3 per annum of waste for the first four years during completion of the construction and commissioning of the Sakhalin Energy project, followed by 10,000 m^3 per annum for a further 19 years. The landfill is designed to receive class 4 and 5 wastes. Currently 16 people work at the site.

The landfill was visited briefly on 17th April with discussions being held with the on-site management. The following items were noted:

- Visitors to the site had to undergo a Health and Safety induction and sign the visitors' book prior to being allowed onto the site;
- Visitors were accompanied at all times by staff from the site;
- The site has a separate storage area for the vehicles and waste generated from the maintenance of the vehicles. This is generally class 3 oily waste that has to be disposed of at other facilities. The area also includes restrooms and facilities for site staff (Photo 32 and Photo 33).
- Phase 1 of the site was originally designed to accept 56,000 m^3 of waste, the site has managed to place a further 39,000 m^3 in the same area, giving a total of 95,000 m^3. This is due to the increased quantities that are now being put into the site. Phase 1 is now complete and the owner is planning on capping the cell using soil from a nearby river cleaning project and a local clay pit to give a similar landform to that proposed at Nogliki (Photo 34).
- Daily cover for the site is supplied from a local clay pit and occasional construction work in the local area. As at Nogliki, snow is used in the winter months.
- Phase 2 of the site ready to receive waste and has void space enough for 19 years of operation according to the site manager.
- All trucks bringing waste to the site have the load inspected and the volume checked against the waste manifest. The site has a policy of a maximum waste size of 20 x 20 cm, anything larger than this has to be broken down prior to deposition in the site.
- Waste volumes deposited into the site in the last two years have been 33,000 m^3 (2008) and 28,000 m^3 (2009) with the three main contributors being Ecoshelf, Sakhalin Energy and the local communities.
- The site operates an environmental monitoring programme with water samples taken from two wells every three months, surface water samples taken from two stream locations every six months, air samples taken from four points (two on the landfill, one at the fence-line and one at the SPZ boundary) every six months and four soil samples taken every six months. Testing is carried out by the Central Epidemiological laboratory in Yuzhno.

- Leachate from the site is collected in the leachate pit and pumped into a tanker for disposal to the local sewage treatment plant. During times of low rainfall the leachate is pumped for spraying back onto the waste mass.

7.2.1 General Comment – Smirnykh

In comparison to the original landfill, the site is well run and controlled. The investment put into the improvements to the infrastructure and training of the local staff have resulted in a site that is now fully compliant with Russian Federation regulations and meets many of the European standards. There are some minor improvements that could be made such as better compaction of the waste on initial placement and the use of catch nets around the working area to better control wind-blown litter, but overall the landfill development is a success.

It has been noted that there is an issue with the land allocation for the site. The local authority allowed the construction of the lined cells and the oil contaminated storage area adjacent to the tip without ensuring that the land allocation had been changed from forestry use to industrial use. The result of this is that, technically, the landfill is an illegal site even while complying with Russian Federation laws in other ways. The responsibility for getting the land allocation issue resolved is down to the site owner and the local authority, this is proving to be a slow process and could taken another year to eighteen months. As a result of this Sakhalin Energy is also dumping waste into an illegal site. However, given the lack of alternatives and the engineered nature of this site as opposed to the unlined tips available elsewhere on the island, this is by far the best environmental option.

Smirnykh Landfill is also the location of the Oily Waste Holding area, an enclosed, engineered space for receiving and storing oil contaminated soils in the event of a major oil spill incident with a capacity of some 15,500 m^3. The land allocation issue also affects this part of the facility and requires resolution in order to make the site legal. The details of this facility and the systems in place to control oily run-off have been discussed previously in other site reviews. The issue of treatment of the oil contaminated wastes is discussed further in section 9.3 later in this report.

7.3 Korsakov Landfill

Korsakov Landfill is located on the plain some 1.5 km inland from Aniva Bay, approximately 3 km south east of Korsakov town on the main road to the LNG asset at Prigorodnoye. The original design for the site allowed for 64,700 m^3 per annum of waste for four years followed a further 50,000 m^3 per annum for a further seventeen years. The landfill is designed to receive class 4 and 5 wastes.
The landfill was visited on 24th April 2010 and discussions held with the site management staff. The following items were noted:

- Visitors to the site had to undergo a Health and Safety induction and sign the visitors' book prior to being allowed onto the site;
- Visitors were accompanied at all times by staff from the site;
- The site has an extensive environmental monitoring programme consisting of three air samples every three months, four groundwater samples every three months, three surface water samples every four months and two soil samples taken at four points around the 1.5 km SPZ at the main compass points. Leachate sampling will be undertaken this year. A specialist contractor is used for the sampling and testing. The only elevated results from the site are for iron which is high in the natural ground due to the presence of peaty soils.
- The management estimate that there is approximately 100,000 m^3 of void space left in the site, following a recent topographic survey, without further expansion. This equates to approximately two and a half years of continuous infill at current rates. It should be noted that the original design had been for twenty years, but the site has been filled at a rate four times faster.
- The site appears to be very well run technically with the compactor carrying out four compaction passes on the waste upon placement, gas vents being constructed through the waste mass and catch fences being placed around the working area to minimise the wind blown rubbish from the site. Cover material was available on site for daily cover, all truck loads were inspected on arrival

from a purpose built laddered gantry and a disinfected wheel wash facility was run through by the trucks as they left the site (Photo 35, Photo 36 and Photo 37).

- In the past security and scavenging on the site had been a big problem. The site management now allows the scavenging groups, which used to operate on the old landfill site, access to the tip for half an hour on completion of the days' waste deliveries and prior to the placement of the daily cover. The site is then cleared and the gates locked to prevent further access. These groups are also employed on a temporary basis each spring following the snow-melt to help clear rubbish from the site surrounds.
- The main clients for the site are Korsakov Municipality and the Sakhalin Energy LNG plant, ENL stopped bring their waste to the site in 2008.

7.3.1 General Comments – Korsakov

In comparison to the original landfill, the site is well run and controlled. The investment put into the improvements to the infrastructure and training of the local staff has resulted in a site that is now fully compliant with Russian Federation regulations and meets many of the European standards. There is a potential issue with the site running out of capacity that will need resolution in the next six months to a year. To date Sakhalin Energy has been the main source of funding and technical input for the site while still having to pay to place waste within the facility, Sakhalin Energy management is currently exploring options to assist with the expansion of the site while looking to remove the overall reliance of the operator on Sakhalin Energy to maintain the operation.

To date the assistance Sakhalin Energy has given to the site development to improve the facility and the abilities of the staff has shown a remarkable improvement to the landfill capabilities in the Korsakov area and resulted in the local management of the site coming up with their own innovations to improve the environmental performance of the operation through such items as catch fences and wheel washes.

7.4 Legacy Landfills

With the problems of getting the three engineered landfill sites designed, permitted and constructed, there was a period up until 2006 where Sakhalin Energy contractors were having to use local landfill sites for disposal of the construction waste. On award of the central contract for waste disposal, this practice ceased and Sakhalin Energy has sought to identify where environmental impacts may have occurred due to the project waste disposal activities and arrange for suitable offset or mitigation measures to be put in place. An initial survey of 41 landfills was carried out to identify possible sites that had been used by Sakhalin Energy contractors and, after discussion with the oblasts this resulted in a list of 14 alleged legacy sites. A further process of visiting all these potential sites was undertaken with regulatory technical staff present to try and identify proof that the site had been used. The following list summarises the official letters sent out to Sakhalin Energy from the regulator after the visits:

- Argi Pagi Landfill – letter dated 9/2/09, no proof of Sakhalin Energy dumping in landfill.
- Argi Pagi 2 Landfill – letter dated 12/2/09, no proof of Sakhalin Energy dumping in landfill.
- Yasnoye Landfill, Tymosvky – letter dated 12/2/09, in 2007 Sakhalin Energy used the area to store soil but this was re-cultivated and officially accepted by letter on 12/8/07.
- Porechye Landfill – letter dated February 2009, no general waste dumped by Sakhalin Energy but Starstroi placed soil at the site (Res. 114 dated 04/07, soil planned for use to restore Makarov Landfill).
- Pogachevo Landfill/Gastello – letter dated February 09, waste from residents only, no proof of Sakhalin Energy dumping in Landfill.
- Tymovskoe Landfill – letter dated 12/4/09, no proof of Sakhalin Energy dumping in landfill. Sakhalin Energy donated Kamaz truck to site plus there is the intention of other equipment to be handed over – bulldozer handed over for use in July 2009.

- Novoye Landfill – letter dated 20/7/07, official inspection of the site showed much illegal dumping but no proof of Sakhalin Energy or Starstroi waste was noted.
- Gastello – letter dated 25-26/7/07, same report as for Novoye Landfill – an official inspection, soil testing within limits, concluded that no Sakhalin Energy waste had been dumped at the site.
- Dolinsk – letter dated 31/10/07, 19,200 m^2 reinstated by mechanical levelling, delivery of 15,813 m^3 of crushed rock and compacting soil to a depth of 1 metre over the site. Six vent pipes installed. Landfill translated back to the owner.
- Vizmorye Landfill – letter dated 31/10/07, 12,500 m^2 reinstated by mechanical levelling, 8,821 m^2 crushed rock and compacting soil to a depth of 1 metre, a further 9,500 m^2 of road and turning circle has been repaired. Area is now transferred back to the owner.
- Yuzhno – Sokol – letter dated January 2009, Sakhalin Energy moved all construction and domestic waste generated by them from here in August / September 2907 to Dolinsk Landfill. Testing showed no presence of Sakhalin Energy waste. Earlier inspection note from 2007 noted only a concrete block valve section on the site that could be tied back to Starstroi.
- Smirnykh (old) letter dated12/9/07, 10 hectares of land reinstated by 200 mm loamy soil cover.

Sakhalin Energy has set aside a budget of US$ 145,000 for environmental improvements to Val, Molodeznoye, Tymovsk, Onor, Yasnoye, Makarov, Novoye, Vizmore and Dolinsk as part of their corporate responsibility package. However, it has been agreed with the local regulator that there is a risk in paying out cash for improvements so Sakhalin Energy has implemented surveys, design work and remedial actions with the Sakhalin Oblast Administration acting in an assurance role. A further US$ 350,000 has been budgeted to assist with a new Yuzhno landfill.

The only outstanding matters with regard to legacy landfills are Val landfill awaiting seeding following cover and Makarov Landfill, discussed below.

7.4.1 Makarov Landfill

The Makarov Landfill site was visited briefly on 19th April. This is an uncontrolled, unfenced landfill where domestic and other waste has been pushed over a hillside towards the Pikovka River. The wastes are un-compacted, have no daily cover and are known to be occasionally set fire to in order to create further void space (Photo 38 and Photo 39).

Sakhalin Energy has agreed to assist in the closure of the current Makarov landfill site and the development of a new site for the local administration under a Memorandum of Understanding (MOU) signed between the two parties. This is currently being delayed through the local administration having problems in identifying a suitable alternative site that is acceptable to the local population. Sakhalin Energy has carried out the design work for the remedial works at the current landfill and also has soil stored at Porechye that will be used in the capping of the current site. To date, there is no timescale set for the commencement of the new landfill work and the Makarov Administration is pushing to start the engineering work to close parts of the current site. However, full closure of the old site can only be accomplished following construction of the new site.

7.5 New Landfill Proposals

With the on-going problems of suitable landfill options on the island, Sakhalin Energy has undertaken to look at the possibility to assist in the construction of new sites. To date there are MOU's signed for Makarov Landfill as discussed in section 7.4.1 and a new site at Kholmsk, there is also on-going discussion with the Administration in Korsakov for the next phase of landfill development at the Korsakov Landfill.

7.5.1 Kholmsk Landfill

Sakhalin Energy has been using Kholmsk port for the landing of drill cuttings from the off-shore activities, where the cuttings have been too coarse for down-hole injection. The domestic waste from

the platforms is also landed here prior to onward transportation to landfill. If a suitable landfill could be developed at or near to Kholmsk, it would be a benefit both to the local administration and to Sakhalin Energy. In May 2008 an MOU was signed and design work for the site undertaken to provide a site with a total capacity of 980,000 m^3, of which 90,000 m^3 would be available to Sakhalin Energy. The design has been approved but the local administration is having similar problems to Makarov and Smirnykh in getting the necessary land allocation. Preparation work has stopped at one possible site and potential new sites are now being considered. There are likely to be long delays in the implementation of this project and Sakhalin Energy is having to make other arrangements to deal with off-shore wastes in the meantime.

7.5.2 Phase 4 – Korsakov

As discussed in section 7.3, Korsakov landfill is going to run out of void space in approximately two and half years. Discussions with the on-site management indicate that they have an area within their land allocation that would be suitable for further development into the next lined cell. However, it is unlikely that they would have the necessary in-house capabilities to be able to design and develop the new area and therefore will need some form of outside assistance. Sakhalin Energy is aware of the situation and is starting the early stages of negotiation with one possibility being looked at of payment for the new cell in return for free disposal of wastes for the life of the extension. Negotiations are on-going at this time.

7.6 Other Waste Disposal Endpoints

Sakhalin Energy has a well developed waste register for the company with defined endpoints for the majority of their waste items. Table 3 summarises the wastes, hazard class, annual tonnage and proposed endpoint for non-landfill wastes.

Table 3 Summary of Sakhalin Energy Non-Landfill Wastes

Non-Landfill Wastes – End Points, Hazard Class, Tonnage and Endpoints		
Waste type within the Hazard Class	Total (te)	Final Destinations
Hazard Class 1		
Mercury lamps. Luminescent mercury-containing tubes, used and rejected	26.910	"Regional Ecological center of Demercurization"
Used mercury thermometer	0.005	Landfil "Zeleniy Gorod" / "Poligon Tomsk"
Used absorbent carbon contaminated by sulphinol	190.200	Landfil "Zeleniy Gorod" / "Poligon Tomsk"
Hazard Class 2		
Lead accumulators. Used non-damaged. With not poured off electrolyte	73.961	"Komsomolsk Expermental Mettalurgic Enterprise"
Dry charged elements of chemical supply	28.920	Landfil "Zeleniy Gorod" / "Poligon Tomsk"
Chemical waste	38.000	Landfil "Zeleniy Gorod" / "Poligon Tomsk"
Used filters contaminated by sulphinol	17.756	Landfil "Zeleniy Gorod" / "Poligon Tomsk" / MGUP Promotkhody (Ecocentr) / "Ecoinvest"
Used absorbent carbon contaminated by hazardous material	30.550	Landfil "Zeleniy Gorod" / "Poligon Tomsk" / MGUP Promotkhody (Ecocentr) / "Ecoinvest"
Sorbent contaminated by chemicals	18.840	Landfil "Zeleniy Gorod" / "Poligon Tomsk" / MGUP Promotkhody (Ecocentr) / "Ecoinvest"
Sorbent / Waste water contaminated by chemicals (sulphinol)	812.000	Landfil "Zeleniy Gorod" / "Poligon Tomsk" / MGUP Promotkhody (Ecocentr) / "Ecoinvest"
Sorbent / Sand contaminated by chemicals (sulphinol)	145.000	Landfil "Zeleniy Gorod" / "Poligon Tomsk" / MGUP Promotkhody (Ecocentr) / "Ecoinvest"
Used filters from thermal liquid	9.050	"Grotoil" / "Ecoshelf"
Other chemical waste / Used thermal liquid Dowtherm Q	60.000	"Grotoil"
Other chemical waste / Used sulphinol	809.000	Landfil "Zeleniy Gorod" / "Poligon Tomsk" / MGUP Promotkhody (Ecocentr) / "Ecoinvest"

Non-Landfill Wastes – End Points, Hazard Class, Tonnage and Endpoints		
Waste type within the Hazard Class	Total (te)	Final Destinations
Hazard Class 3		
Used polypropylene sorbent contaminated by oil	72.250	Landfil "Zeleniy Gorod" / "Poligon Tomsk" / MGUP Promotkhody (Ecocentr) / "Ecoinvest"
Used sorbent, contaminated by hydrocarbon	1.349	"Grotoil" / "Ecoshelf"
Used sorbent, peat contaminated by hydrocarbon		
Used absorbent carbon contaminated by hazardous material	61.650	"Grotoil" / "Ecoshelf"
Other solid wastes, spoil and snow contaminated by oil products	0.794	"Grotoil" / "Ecoshelf"
Ceramics contaminated by hazardous material	6102.000	Landfil "Zeleniy Gorod" / "Poligon Tomsk" / MGUP Promotkhody (Ecocentr) / "Ecoinvest"
Filters contaminated by hazardous material	11.289	Landfil "Zeleniy Gorod" / "Poligon Tomsk" / MGUP Promotkhody (Ecocentr) / "Ecoinvest"
Unsorted nonferrous scrap and waste	61.087	"Umitex"
Used motor oil	151.829	"Grotoil"
Used automobile oil	197.759	"Grotoil"
Used diesel oil	20.582	"Grotoil"
Used industrial oil	57.846	"Grotoil"
Used transmission oil	4.421	"Grotoil"
Used transformer oils free of halogens. poly chloride vinyls diphenyls and tetphenyl	0.122	"Grotoil"
Used compressor oil	72.690	"Grotoil"
Used turbine oil	167.873	"Grotoil"
Used hydraulic oil not containing halogens	209.535	"Grotoil"
Leftover of diesel fuel that lost consumer properties	106.569	"Grotoil"
Floating film from oil traps (gas traps. sewage units and washing cars)	339.563	"Grotoil"
Residue from oil separated units (MEG residue)	103.920	"Grotoil" / "Ecoshelf"
Residue from pipeline and tank cleaning (barrels, containers, tank cars, road oilers) from oil	3717.169	"Grotoil" / "Ecoshelf"
Oily cotton wastes (oil content 15 % and above)	72.169	"Grotoil" / "Ecoshelf"
Used oil and air filters	59.677	"Grotoil" / "Ecoshelf" + "Umitex"
Leftover ethylene glycol which lost consumer properties (leftover of heat carrier for absorber, antifreeze)	156.672	"Ecotex"
Mineral residue from gas cleaning	3.000	"Grotoil" / "Ecoshelf"
Residue from cleaning of tanks with thermal liquid	44.000	"Grotoil" / "Ecoshelf"
Waste from fire-extinguisher system		Landfil "Zeleniy Gorod" / "Poligon Tomsk" / MGUP Promotkhody (Ecocentr) / "Ecoinvest"
Plastic container from chemicals	21.170	"Ecoinvest"
Empty standard barrels for chemicals storage	117.640	"Ecoinvest"
Cutting waste	56600.000	CRI Well
Cans for varnish and paint materials	0.240	MGUP Promotkhody (Ecocentr)
Filters contaminated by MEG	12.000	Landfil "Zeleniy Gorod" / "Poligon Tomsk" / MGUP Promotkhody (Ecocentr) / "Ecoinvest"

Non-Landfill Wastes – End Points, Hazard Class, Tonnage and Endpoints		
Waste type within the Hazard Class	Total (te)	Final Destinations
Hazard Class 4		
Other solid mineral wastes (oil products polluted soil, oil polluted sand more than 15 %)	21.947	"Grotoil" / "Ecoshelf"
Metal scrap	8.904	"Umitex"
Polypropylene tare, contaminated by chemicals	4.305	"Loren" / OAO "Uglezavodskije ZhBK" / "Eurika - 2"
Drilling cuttings on the waters base	700.000	"UrekTransport"
Cuttings and drilling waste waters	132600.000	CRI Well
Wastes of mixtures of hardened heterogeneous plastic materials	10.740	"Loren" / OAO "Uglezavodskije ZhBK" / "Eurika - 2"
Used tyres	70.698	"EcoRTI" / ZAO "CHIR" / "Ecoshina"
Sorbents not included into other lines (used sorbent. polluted with oil products)	10.169	"Grotoil" / "Ecoshelf" / Nogliki / Smirnykh / Korsakov landfills
Medical wastes	0.098	ISOS Clinic
Ferrous tare contaminated by painting materials	26.305	"Umitex"
used cartridge for printers	16.610	MGUP Promotkhody (Ecocentr)
Used office equipment	50.620	MGUP Promotkhody (Ecocentr)
Water contaminated by hydrocarbons	2690.000	CRI Well
Nonferrous metal	10.710	"Umitex"
Polymer tare (polystyrene) contaminated by chemicals	8.000	"Loren" / OAO "Uglezavodskije ZhBK" / "Eurika - 2"
Used vegetable oil		
Hazard Class 5		
Wood article lost consumer properties	15.000	Re-use
Wastes of natural clean wood. unsorted	390.600	Re-use
Wastes of natural clean wood		Re-use
Broken concrete products, lumpy concrete wastes	25.000	Re-use
Lumpy cement wastes	78.000	Re-use
Remains and ends of steel welding electrodes	3.036	"Umitex"
Unsorted tin-coated steel scrub	16.720	"Umitex"
Scrap of ferrous metals. unsorted	1294.448	"Umitex"
Iron barrels that lost consumer properties	10.000	"Umitex"
Iron barrels not contaminated by chemicals		"Umitex"
Unsoiled Iron chips	13.570	"Umitex"
Unsorted nonferrous metal scrub	0.015	"Umitex"
Wastes of solid polystyrene. styrene foam or film	1.500	"Loren" / OAO "Uglezavodskije ZhBK" / "Eurika - 2" / Nogliki ; Smirnykh ; Korsakov landfills
Wastes of foamed polyurethane (heat insulation of tanks and pipes)	251.380	"Loren" / OAO "Uglezavodskije ZhBK" / "Eurika - 2"
Plastic containers non-polluted that lost consumer properties	82.672	"Loren" / OAO "Uglezavodskije ZhBK" / "Eurika - 2"

The proposed endpoint firms and destinations have been audited by Sakhalin Energy staff and found to be acceptable. Further audits will be carried out throughout the life-time of the project. AEA has requested to review some of the audits Sakhalin Energy has undertaken of their waste contractors and final endpoints. The Company has provided a selection of audit reports for AEA's review.

Sakhalin Energy still has a few wastes that are awaiting final endpoint solutions. The legacy wastes in the containers at OPF have yet to be fully identified, classified and waste passports generated through chemical testing, there is an on-going programme to sort and classify these.

Waxes from the pigging operations – while some of these have been incinerated there has been a greater volume of this waste stream than originally anticipated and other disposal options are being explored. It should be noted that there are potential industrial uses for this material such as the production of pharmaceutical quality Vaseline, optical cable filler and other products if the right manufacturing company can be found and the economics are right.

Sulphinol-contaminated sand at LNG – there is up to 1.5 tonnes of this material on site that has been stored for more than six months. During this visit, Sakhalin Energy confirmed that the relevant waste limits have now been obtained but the waste passport was not yet ready; an estimate of a further two months was made for this activity to be complete. AEA has recently been advised that the passport has now been obtained. The belief is that a hazard class will now be assigned to the material, and the waste will be sent to the mainland for disposal. An exact endpoint has not yet been identified.

8 Construction Camps

Under the requirements of the HSESAP, Sakhalin Energy is required to restore and reinstate camp sites according to the relevant referenced line items.

> *Ref: HSESAP Revision 2, Part 2: Table 2.5 Land Management Commitments*
>
> *Line Item 130 – Restoration and reinstatement - Revegetation - Construction camp --- The reinstatement of construction camps shall be to as near as possible to the original conditions or as otherwise agreed with the relevant authorities and/or landowner*
>
> *Line Item 131 - and reinstatement - General - Construction camp --- Mitigation measures put in place during decommissioning activities should focus on ensuring the long-term recovery of the environment at the site.*

To achieve this, Sakhalin Energy has firstly been seeking qualified buyers. In order to minimise waste generated on the island and maximise re-use of these facilities, parties would ideally be intending to run the camps (competently) as social accommodation projects such as children's camps. Once a buyer is identified, Sakhalin Energy HSE department will conduct an environmental assessment and provide recommendations prior to the property title change. Sakhalin Energy has indicated that the buyers will take on (within the contract) any future environmental liability associated with the camps. The sales contract will also reportedly specify that the new buyer shall be responsible for reinstating the land should the accommodation infrastructure be moved.

AEA has grouped the camps into three broad categories. The status of each camp is summarised in Table 4.

Category A Pipeline construction camps sites previously used for accommodation and general vehicle maintenance. Eight sites fall within this category, which are listed in Table 4 as A1 – A8 order from north to south along the pipeline.

Category B Pipeline construction camps previously used for accommodation/office space only. One or more of these were used as 'pioneer camps' at the start of the project. They were purchased abroad and imported tax free into the RF under the terms of the PSA. There are three sites in this category.

Category C Accommodation camps at large stationary facility construction projects, specifically OPF, BS2 and LNG.

Category A Camps
There are eight camps in this category. According to Sakhalin Energy, only one camp has actually been sold (Val). In addition there are five camps (Nogliki, Molodezhnoye, Onor, Leonidovo and Sokol) for which the sales contract has been awarded. Buyers have not been found for Tumanovo or Pugachevo camps. The tender to sell Pugachevo as one lot was unsuccessful so Sakhalin Energy is now attempting to sell it as multiple lots. Both Tumanovo and Pugachevo are likely to be marked for demolition, salvaging all that can be salvaged and the land reinstated. However it was disclosed that Sakhalin Energy had informed the RF that demolition will take place if no buyer or other party is interested in taking the camp, and that the RF is thus trying to convince the local authorities to accept the camps.

Category B Camps
The decommissioning of three temporary accommodation camps located at Yasnoye, Poronaysk and Sovetskoye is currently on hold. These camps are made of prefabricated, stand-alone, modular units which were purchased abroad and imported tax free into the RF under the terms of the PSA. Reportedly, RF customs authorities claim that the full import tax is due if these modules are no longer part of the Sakhalin Energy project and are sold or given away. These are high quality modules – demolition and subsequent disposal would be wasteful, expensive and will require a large disposal space in an already burdened landfill network. Subsequently, Sakhalin Energy is working towards achieving a resolution with the customs authorities.

Category C Camps
OPF construction camp – Reportedly, the OPF camp falls under the same PSA tax issue as the Category B camps, and demolition is currently on hold until there is a resolution with the customs authorities (estimated 2011).

BS2 construction camp – Scheduled to be demolished in August 2010 with reinstatement completed by the end of October 2010.

LNG construction camp – This is by far the biggest of the Sakhalin Energy camps. Ninety nine (99) housing units will be retained and mothballed to provide accommodation for future works at the facility. The rest of the camp is scheduled to be disassembled and removed before the end of current year. Sakhalin Energy is actively seeking buyers to come and remove housing units. This procedure will be followed to the extent possible, but any remaining buildings will then be demolished for salvage value. What cannot be salvaged will be landfilled.

Table 4 Sakhalin Energy Camp Decommissioning Status

Sakhalin Energy Camp Decommissioning Status			
Category	Camp Name	Status	Future Use
A1	Val	Sold – transfer completed	Accommodations for other island projects, e.g. construction camps. Land reinstatement not required
A2	Nogliki	To be sold to commercial construction company – sales contract awarded	Accommodations for other island projects. Land reinstatement not required
A3	Molodezhnoye	To be sold to commercial construction company – sales contract awarded	Accommodations for other island projects. Land reinstatement not required
A4	Onor	To be sold to local administration – landowner to purchase camps. Sales contract awarded	Used for social accommodation. Land reinstatement not required
A5	Leonidovo	To be sold to local administration – landowner to purchase camps. Sales contract awarded	Used for social accommodation. Land reinstatement not required
A7	Tumanovo	Exploring opportunities for re-use, but likely to be demolished	If demolished, land reinstatement required
A7	Pugachevo	Tender to sell camp as separate lots initiated. Exploring opportunities for re-use, but likely to be demolished.	If demolished, land reinstatement required
A8	Sokol	Bought by local authorities, but will be administered by local agriculture company – sales contract awarded	Children summer camp, other social / community uses. Land reinstatement not required
B1	Yasnoye	On hold – exploring re-use opportunities	Unknown
B2	Poronaysk	On hold – exploring re-use opportunities	Unknown
B3	Sovetskoye	On hold – exploring re-use opportunities	Unknown
C1	OPF Project Accommodations	On hold – disposal postponed until 2011	Unknown. Land reinstatement required following removal of disassembled units.
C2	BS2 Project Accommodations	To be demolished in August 2010	Land reinstatement required
C3	LNG Project Accommodations	Small portion in north corner mothballed and southern portion in the process of disassembly and removal	Mothballed portion for use in potential future facility expansion or major maintenance shut-downs. Land reinstatement required following removal of disassembled units

9 Other Matters

The following items are for discussion and information only, and in no way reflect a commitment requirement for Sakhalin Energy. They represent some observations made during the site visit and possible solutions and scenarios that could be adopted by the company if they felt that there would be a benefit either environmentally, financially or socially.

9.1 Food Waste Composting at OPF

During the visit it was noted that the canteen at OPF is well used with around 300 people utilising the facility, both fulltime facility staff and contractors on the site. As a general rule a construction camp would produce anywhere between 1 kg and 3 kg of food waste per person per day, or approximately 110 tonnes to 330 tonnes per annum. From the waste records it is noted that OPF had 120 tonnes of canteen waste in 2009 which is good, being close to the lower estimates, but is still sending potentially methane producing items to landfill. In general the climate on Sakhalin Island is not conducive to a composting operation with only a short period of the year when the ambient temperature is suitable for the biological activity required to turn putrescible waste into compost. However, there are now systems in place whereby all activity takes place in an enclosed system – in-vessel composting. This has the advantage of being self heat generating, odour-free, removing pathogens from the material and being modular to allow for increasing or decreasing material quantities passing through the system.

Good examples of the type of equipment available can be seen at the Hotrot website, a company with its head office in New Zealand, but working throughout Europe, America, Asia and Oceania: http://www.hotrot.co.nz/content/library/HotRot_models_May_08.pdf

In addition to food waste other wastes can also be put through the composting process:

- Treated Sewage Residuals from cleaning,
- Wood Scrap,
- Paper and Cardboard from offices

From the waste inventory for the OPF in 2009 the above list in combination with the canteen wastes comes to a total of approximately 500 tonnes of potentially compostable material that is currently sent to landfill by Sakhalin Energy.

The compost produced could either be used around the site for landscaping purposes or sent to the local villages for use in their market garden plots in order to increase the fertility of the land and boost production during the limited growing season.

Items for consideration are:

- **Advantages**: Reduction in road mileage for vehicle movements to landfill in Nogliki, reduction in landfill charges to Sakhalin Energy, improved growing media for local villages and therefore, potentially, good PR.
- **Disadvantages**: Initial CAPEX for the equipment, small OPEX costs, further waste sorting on the site potentially required.

9.2 Water Injection Wells

Following treatment, the process waste water at the OPF is disposed of down a 2000 m deep injection well, permitted for up to 4000 m^3/day. Compliance checks on water quality for discharge are carried out once a month by an external contractor. These are showing regular exceedence for phenol and occasional exceedence of permissible pH range. Iron is also shown as being elevated, hydrocarbons from the MEG are injected at 20 ppm. Concern has already been expressed regarding the potential

for the phenolic elements to enter other shallower aquifers that maybe in connection with the deep aquifer being used for disposal.

Part of the problem is that the filter system in place is one installed as a fix for two failed attempts of filters in the initial design, so that the filter deals with total suspended solids but has to have freshwater added to the treated waste stream to control the hydrocarbon concentration in the injected stream. This water is obtained from local surface water sources. The local surface water is generally from peaty, iron-rich sources that will have a low pH and therefore potentially easily mobilised metals within it. This water type frequently contains naturally occurring phenolic compounds.

Concern for the injection well, aside from the phenol, arises from the potential for fouling of the well slots at depth due to the metals in the disposal water precipitating out of solution on mixing with the receiving waters at depth. Iron and manganese fouling of screens has been a common occurrence in injection wells in the past and can be very costly in the loss of well performance and eventual work-over cleaning or even replacement of non-recoverable wells.

Further information regarding the extent of fouling assessments has been requested from Sakhalin Energy. Should this have not already been assessed, we would recommend:

- Further water treatment prior to injection – activated carbon for phenol removal, oxidisation and pH control for metals removal.
- Sample and test both disposal and receiving waters and carry out a full hydro-chemical assessment of the mixing properties.
- A CCTV well survey every five years to check for fouling build up on the well screen.

9.3 Treatment of Oil Contaminated Waste – Smirnykh

The Oily Waste Holding Area at Smirnykh has been assessed as a storage area for oil contaminated soils on previous visits and has been found to be fit for purpose. There still remains a concern regarding the proposed treatment of these wastes in order to remediate the contaminated material back to a usable standard. It is noted that the original intention was to use bio-remediation at the site. AEA stands by comments made previously in this matter (2007 report), in that bioremediation would only have limited use on Sakhalin due to the ambient temperature through the year only being suitable for biological treatment for three months in the summer and is only really effective in non-clay soils. It was suggested that other alternatives such as encapsulation, in-vessel bioremediation and thermal desorption should be considered.

During this visit AEA was made aware of the Sakhalin Energy document 'Note on Alternatives to Bioremediation of Oil Contaminated Soils, 15 April 2010' that indicated that encapsulation and in-vessel bioremediation would not be viable either for technical or financial reasons. However, the following paragraph was included regarding the potential for bringing a mobile thermal desorption unit to the site:

> ***'Thermal desorption*** *offers the most potential as an alternative to bioremediation. Ecoshelf (a contractor to Sakhalin Energy) operates a thermal desorption unit on Sakhalin that is approved and licensed by the Russian authorities. As detailed in the operating manual, the unit heats soil to evaporate hydrocarbons and combusts gas, targeting 800-900^{o}C in the utilization chamber and 350-450 ^{o}C in exit gas. Ecoshelf operate the unit to process soil at a rate less than 0.25 tons soil per hour to remain below RF and EC Incineration emission limits, which is determined by emissions sampling during an initial trial period of operation. Solid waste is disposed to landfill.'*

Given that this is a technique that can be used all year round, AEA would recommend that Sakhalin Energy explores this option more thoroughly, including negotiating costs and terms for the use of the equipment with Ecoshelf, so that everything is in place in the event of an oil spill generating contaminated material requiring remediation. AEA would further recommend that the 'solid waste' is also then used by the landfill as cover material rather than being treated as waste which may have the

added attraction of reducing the cost for disposal. As regards the emission limits, there are options to put in an oil recovery system should there be sufficient material to process, that would drastically reduce the hydrocarbon and other emissions to atmosphere. This would not be economically viable for small spills.

10 Summary and Conclusions

In summary, AEA found no issues of major environmental significance during this monitoring visit. The Company was found to be actively identifying and addressing the key environmental issues in relation to its Assets and Landfills. During the time between our visit and the issue of this report, Sakhalin Energy has already responded to many of the issues identified.

At the OPF, Sakhalin Energy's key challenge concerns the 540 containers of unknown content, a legacy from the construction contractor, BETS. Sakhalin Energy is currently classifying the contents of each container and preparing a plan for reuse, recycle or disposal of the contents as appropriate. The OPF's sewage treatment plants are now coping well due to reduced staff numbers on site, although the facility currently has some exceedences of phenol in its process wastewater stream, on which the Company is working to eliminate.

Sakhalin Energy is experiencing increased flaring at the OPF due to overhead compressor failure, resulting in 80% of the flaring allowance for the year being used during the first quarter. The cause of the failure is still subject to an ongoing investigation although design enhancements have been agreed upon and are planned for installation during 2011. Sakhalin Energy anticipates the total flared volume by the end of the year to be within its permitted allowance, however has committed to providing monthly updates on flaring volumes for the remainder of 2010.

Booster Station 2 is now fully commissioned and few environmental issues were noted. The facility has just commenced its environmental monitoring programme, with two parameters initially exceeding the permitted values at the first test. The Gastello temporary construction camp, still currently occupied by BS2 site personnel, has been confirmed as within the 700 m Sanitary Protection Zone (SPZ) and as such is not in compliance with RF law. Demolition of the camp will reportedly commence during early August 2010, with BS2 site personnel being relocated to the Temp Sakhalin Camp (outside the SPZ).

At the LNG facility, the main issue was the standard of general housekeeping. Improvements are required following the observation of several instances of poor storage of materials (lack of secondary containment, wastes stored with new materials, general clutter etc) although it is understood that a new warehouse is due to be commissioned soon and this may resolve some of the storage issues. The laboratory also needs more storage areas to allow gas bottles to be stored separately and safely, wastes to be stored separately and the offices to be moved outside of the immediate laboratory working area.

Housekeeping at PMDs was very good aside from secondary containment of drums containing fuel, oil and oil-contaminated materials. An action is placed on Sakhalin Energy to provide secondary containment (e.g. drip trays) and awareness training for employees, and since the visit AEA has learned the Company has raised a 'Management of Change' to install self-contained areas at each PMD to store oil (target completion date: October 2010).

Oil spill response equipment appeared well maintained, and scheduled OSR team training exercises were being undertaken. During this visit, AEA had the opportunity to see the building earmarked for the wildlife rehabilitation site at Prigorodnoye. AEA remains impressed with the ambitious plans and enthusiasm shown by the Company's wildlife response manager; however there has not yet been a test-run of turning the vehicle garage into the wildlife rehabilitation facility. AEA recommends that at least one full-scale practice run (under mock-emergency conditions) is undertaken at Sakhalin Energy's first opportunity, within six months of commissioning the new warehouse.

The three upgraded landfills are a vast improvement on the landfill capabilities on the rest of the island and seem to have adopted good working practices. Smirnykh and Nogliki landfills should be encouraged to adopt the working area catch-net system in use at Korsakov – this would help reduce the wind-blown litter problems around the site significantly. We note that Korsakov only has approximately two and a half years of further capacity and will require technical / financial assistance in order to be able to develop a further lined cell. Sakhalin Energy is aware of this and is looking at possible ways of working with the operator to secure further safe waste disposal in the future. Legacy landfill issues have been resolved with the regulator following a detailed survey of the island's landfill

sites, and where applicable, Sakhalin Energy has fulfilled its obligation to carry out remedial actions. AEA is awaiting the final endpoints for 'problem wastes' such as pigging waxes, sulphinol contaminated sands and legacy wastes from the OPF.

Sakhalin Energy is making good progress in selling or removing all existing construction camps – sales contracts have been awarded to buyers of many camps. Action on the three prefabricated pioneer camps and the OPF construction accommodations (brought into Russia under the PSA tax exemption) is currently on hold pending resolution of tax issues with the RF Customs Office. The remaining construction camp at BS2 and a significant portion of the LNG construction accommodation are scheduled to be disassembled and removed this calendar year.

New and open Findings remain in relation to secondary containment of hazardous materials, legacy/problem wastes, emissions and discharge limit compliance, construction camp decommissioning and oil spill response. Progress towards the resolution of these Findings will now be included in the IEC's monitoring reports going forward.

11 Findings Log

AEA has previously documented all observations, issues and recommendations arising from its environmental monitoring visits in the subsequent reports. The resolution and/or close-out of these issues have been tracked by AEA and Sakhalin Energy, although not always published.

This monitoring report contains a new section, **Findings Log**, which includes:

a) All issues not closed out at the date of the last report (i.e. all issues open at September 2009) plus new Findings identified during this visit;
   - In future visit reports, new Findings will be included and the status of open findings will be tracked to closure.

b) All actions from the Rivers, Erosion and Wetlands Remedial Action Plan (RemAP) 2007 for completeness;
   - Any future RemAPs will be added to the Findings Log and tracked to closure.

c) HSE Issues[5] raised in regular reports to Lenders since the date of the last report (i.e. from September 2009 to date) and still having open actions;
   - Findings WATER.02 – a permanent table has been established in the regular report to Lenders under Incidents and Non Compliances, to report any parameters exceeding limits and track the status of existing/new issues on an ongoing basis, hence this Finding is closed.
   - Similarly for Finding AIR.05 – the OPF flaring item status will be included in the above-mentioned permanent table, however this Finding remains open due to an additional commitment to provide monthly[6] updates of cumulative 2010 flaring volume.

d) Actions arising from HSESAP revision process (Findings AIR.01, WASTE.08, GEN.02, GEN.03).

While it is a long list, much progress was made during this monitoring visit to close out many of these outstanding issues, so the list carrying over to the June 2010 monitoring visit report will be much shorter (only new/open items).

Findings are listed in the **Findings** column, and have been categorised, put into chronological order (by date identified) and given a reference number (AIR.01, AIR.02 etc). Items have also been ranked according to Sakhalin Energy's Methodology[7], and where applicable, a reference to the relevant HSESAP, RemAP or other shareholder commitment has been provided.

The **Action Progress Review** column shows recent progress made towards resolving/closing the outstanding items, and any RemAP status updates.

[5] Note that issues/incidents shall be reported to the Lenders and tracked via regular reports in accordance with the Loan Agreement, and are not separately included in this Findings Log. If a new RemAP is subsequently agreed in relation to any issue/incident, then this will be included in the Findings Log because it includes formally agreed actions. Where a RemAP is not required, the issue/incident should carry over to the next report until its status is shown as closed. Lenders can request additional information on any issue/incident at any time (as per Loan Agreement).
[6] Note that the required regular reporting frequency changes following Project Completion Date, so this flaring update will be additional.
[7] Assessed as per Risk Assessment Matrix

Ref[8]	Rank[9]	Status	Date	Topic	HSESAP Ref.	Finding	Action Progress Review	Action#
AIR EMISSIONS AND ENERGY MANAGEMENT								
AIR.01	Low Amber	**Open**	Aug 07	Air emissions – community project	HSESAP Revision 2 Table 2.8 item 31, and Project / shareholder agreements	Commitment to reduce CO_2 emissions through the use of gas rather than current fuel supplies on the island. Note: This requires development of infrastructure by the local authorities.	**14.04.10**: Sakhalin Energy actions (e.g. gas transfer terminal) are in progress in accordance with arrangements under the project and shareholder agreements. However, the authorities' project for gas infrastructure provision is currently not in progress. **Action**: Complete and commission the Gas Transfer Terminal South project in support of community gas infrastructure.	XXXXXX[10]
AIR.02	Low Amber	**Closed**	Sep 08 (p 18)	Air emissions – flaring at LNG	0000-S-90-04-O-0258-00-E Appendix 1	AEA noted that commissioning process has the potential to reduce overall flaring during commissioning to below previous flaring estimates. AEA recommends that Sakhalin Energy update their flaring estimate in the light of current experience at the site in order to provide a more realistic assessment. AEA also needs recent emissions monitoring reports for flare stack. AEA also requests ambient air quality monitoring results for perimeter of SPZ (at dachas) as identified in draft May 09 social visit report.	**09.04.10**: Sakhalin Energy reported that based on other LNG sites commissioning and start up (CSU) experience, significant flaring was expected and included in the flaring estimate for 2009. However, due to successful planning and execution of CSU, actual flaring was lower than anticipated. Although the target included in the 2009 plan was not changed (these targets are fixed), a graph was provided lenders showing that actual flaring during 2009 was considerably lower than target. Relevant reports for emission monitoring for flare stack and air quality for monitoring results for perimeter of SPZ provided for lenders' review. Finding closed.	
AIR.03	Green	**Closed**	Nov 08 (3.4.2)	Air emissions – vehicles	0000-S-90-04-O-0257-00-E Appendix 1	Sakhalin Energy is required to undertake annual monitoring of motor vehicles during operations on diesel. Follow up is required in terms of Sakhydromet's June 2008 report (not available at the time of visit).	**09.04.10**: Report received and forwarded to Lenders. Finding closed.	
AIR.04	Low Amber	**New**	Apr 10	Air emissions – SPZ	0000-S-90-04-O-0258-00-E Appendix 1	AEA believes that the Gastello temporary construction camp, still currently occupied by BS2 site personnel, is certainly within the SPZ, and as such is not in compliance with RF law.	**21.06.10**: Sakhalin Energy confirmed that the BS2 Gastello temporary camp is within the SPZ and plans are in place for its demolishment. The plan is to commence demolishment early August 2010 and complete the reinstatement by end October 2010. Works will be carried out by Temp Sakhalin Contractor. BS2 site staff will be accommodated in the Temp Sakhalin Camp located close to the BS2 facilities. **Action**: Demolish BS2 Gastello temporary camp and reinstate the site.	XXXXXX

[8] This Findings Log includes all Findings that were open at the date of the previous report (September 2009 in this case), plus newly identified findings.
[9] **Ref**: Finding number. **Rank:** RAM Red/ High Amber/ Low Amber / Green. **Status:** New (Finding raised this visit), Open (Finding from a previous visit), or Closed. **Date:** date of report in which the Finding was initially raised. **HSESAP Ref.:** reference to relevant HSESAP document and requirement number. **Action Progress Review:** new information confirmed at this visit. **Action#:** Fountain database action reference number(s).
[10] Action# will be added by Sakhalin Energy following issue of this report.

Ref[8]	Rank[9]	Status	Date	Topic	HSESAP Ref.	Finding	Action Progress Review	Action#
AIR.05	High Amber	**New**	Apr 10	Air emissions – flaring at OPF	0000-S-90-04-O-0258-00-E Appendix 1	Operational difficulties with overhead compressors and on-going shutdowns at LUN-A has lead to OPF having used 80% of its permitted 2010 flaring limit during the first quarter of the year. It is expected that the OPF will exceed its flaring allowance and hence emissions limits for 2010.	**21.06.10**: Sakhalin Energy advised that, based on the cumulative flared volume to date and an expectation that both overhead compressors will continue to run without failure, the total flared volume by the end of the year is expected to be 3.0 Bscf, versus RTN limit 3.5 Bscf. The cause of the failure of the machines is still subject to an ongoing investigation with the manufacturer (Hitachi) and a specialist consultancy. Design enhancements have been agreed upon which are currently under manufacture. The plan is to install the enhanced components during 2011. **Action**: Provide monthly updates of cumulative 2010 flaring volume and six-monthly updates on progress towards rectification of overhead compressor and other operational issues.	XXXXXX
WATER USE AND AQUEOUS DISCHARGES								
WATER.01	Low Amber	**Closed**	Sep 07 (Table 6-11 and Item 6.51)	Water – effluent quality	0000-S-90-04-O-0255-00-E Appendix 1	Improve BOD5 level parameters in treated sewage waters, particularly in the construction camps, which will operate long after the pipelines start-up and commissioning and during the operation period. Reconcile discharge limits, stated in HSESAP, with actual discharge permits.	**09.04.10**: Sakhalin Energy reported that all construction camps have been closed and are unoccupied. **09.04.10**: AEA noted that the issue was not exclusive to construction camps and problems remained at LUN-A, BS2 and OPF. **23.04.10**: Finding closed, ongoing status reported via monthly/quarterly reporting as per WATER.02.	
WATER.02	Low Amber	**Closed**	Sep 09	Water – effluent quality	0000-S-90-04-O-0255-00-E Appendix 1	Sakhalin Energy identified and discussed issues relating to effluent concentrations at LUN-A and OPF and BS2 sewage treatment facility, which are operating above capacity. Solutions to resolve the issues were enacted and presented to AEA. Due to the duration of these issues, AEA has requested this data be included in future monthly and quarterly reports.	**23.04.10**: Emissions non-compliances are reported in monthly/quarterly reports to Lenders. Actions have been implemented by the company to correct several effluent water quality issues, and remaining actions (including previously listed assets plus PA-B) are in progress and receiving priority from management. Finding closed; status of existing issues and any future issues to be reported via monthly/quarterly reporting.	
WATER.03	Low Amber	**Open**	Apr 10	Water – effluent quality – phenol	0000-S-90-04-O-0255-00-E Appendix 1	The six most recent monthly compliance checks on process water discharges show significant exceedences of phenol over permitted levels. Part of the problem is that process water is filtered through a single filter rather than the three filter system originally in the plant design. The current system filters total suspended solids but still requires the addition of freshwater to avoid exceeding the hydrocarbon ppm discharge limits. This water is obtained from local surface water sources that are generally from peaty, iron-rich sources which frequently contain naturally occurring phenolic compounds.	**Action**: Install a permanent treatment system able to control suspended solids, hydrocarbons and phenol while not requiring additional dilution to achieve discharge consents. If the phenol source cannot be eliminated Sakhalin Energy needs to consider putting an activated carbon filter in-line to deal with this problem. **Action**: Status of existing issues and concentrations, and any future issues to be reported via monthly/ quarterly reporting as per WATER.02.	XXXXXX

Ref[8]	Rank[9]	Status	Date	Topic	HSESAP Ref.	Finding	Action Progress Review	Action#
WASTE MANAGEMENT								
WASTE.01	Green	**Open**	Sep 07 (p 235, section 8.3.8)	Waste – oily waste handling	0000-S-90-04-O-0258-00-E Appendix 9	Sakhalin Energy to develop the relevant facility for Oily waste storage. Sakhalin Energy to provide quarterly update on obtaining legal permits on operating the facility.	**23.04.10**: Sakhalin Energy reported that the relevant facility, Smirnykh Oily Waste Holding Area (OWHA), has been developed. Land allocation is an outstanding issue to be resolved by the local administration. A legal permit is required to operate facility thereafter. **Action**: Commission the Smirnykh Oily Waste Holding Area after resolution of the land allocation issue by the local administration.	XXXXXX
WASTE.02	High Amber	**Closed**	Sep 07 (Table 8-1 item 8.5)	Waste – legacy landfills	0000-S-90-04-O-0258-00-E Appendix 1	Sakhalin Energy to provide AEA with the waste remedial action plans for review & comment (in terms of legacy waste evaluation and its impact of earlier disposal at unlicensed landfills).	**09.04.10**: A document summarising identification, assessment and remedial actions taken in relation to Legacy Waste Landfills, with supporting information, was provided to AEA and discussed. Sakhalin Energy reported that all remedial actions have been completed except in relation to Val and Makarov sites. **23.04.10**: Sakhalin Energy reported that a MOU is in place with the local Makarov administration, in which Sakhalin Energy has committed to: • build a new municipal landfill (after the new site is chosen and made legal by the local administration), • then support closure and recultivation of the old municipal landfill (legacy waste issue). On this basis, this Finding is closed and a new Finding opened in relation to Val (refer WASTE.05).	

Ref[8]	Rank[9]	Status	Date	Topic	HSESAP Ref.	Finding	Action Progress Review	Action#
WASTE.03	Low Amber	**Closed**	Sep 08 (p18)	Waste - disposal routes	0000-S-90-04-O-0258-00-E Appendix 5 and 9	It was observed that waste was being disposed of (seemingly without being covered) in the area of the initial cell constructed at the new Smirnykh landfill site. It is unclear if this initial cell is still intended to be operated or if it is supposed to be closed. Status of the initial cell (closed / open) to be clarified by Sakhalin Energy and appropriate acts (e.g. cover or removal of visible wastes) undertaken.	**23.04.10**: In comparison to the original landfill, the site is well run and controlled. The investment put into the improvements to the infrastructure and training of the local staff have resulted in a site that is now fully compliant with Russian Federation regulations and meets many of the European standards. There are some minor improvements that could be made such as better compaction of the waste on initial placement and the use of catch nets around the working area to better control wind-blown litter, but overall the landfill development is a success. It has been noted that there is an issue with the land allocation for the site. The local authority allowed the construction of the lined cells and the oil contaminated storage area adjacent to the tip without ensuring that the land allocation had been changed from forestry use to industrial use. The result of this is that, technically, the landfill is an illegal site even while complying with Russian Federation laws in other ways. The responsibility for getting the land allocation issue resolved is down to the site owner and the local authority, this is proving to be a slow process and could taken another year to eighteen months. As a result of this Sakhalin Energy is also dumping waste into an illegal site. However, given the lack of alternatives and the engineered nature of this site as opposed to the unlined tips available elsewhere on the island, this is by far the best environmental option. Finding closed.	
WASTE.04	Low Amber	**Closed**	Sep 08 (p 18)	Waste management	0000-S-90-04-O-0258-00-E Appendix 8	Sakhalin Energy to consider other treatments in addition to Smirnykh site, such as thermal desorption, in-vessel bio-remediation, encapsulation etc.	**09.04.10**: Sakhalin Energy provided a briefing note on alternatives, proposing use of thermal desorption. **23.04.10**: Issue discussed. Bioremediation unlikely to be successful, use of thermal desorption is supported by AEA. **May 10**: The relevant specification(s) of the Waste Management Standard updated to allow thermal desorption treatment of oil contaminated soil. Finding closed.	
WASTE.05	Green	**New**	Apr 10	Waste – RemAP	0000-S-90-04-O-0258-00-E Appendix 1	Sakhalin Energy reported that physical works for remediation of Val landfill (legacy waste issue) are in progress, and only seeding is pending in Spring 2010.	**Action**: Complete landscaping work at Val landfill (legacy waste issue) followed by inspection and final act of acceptance from Nogliki Administration.	XXXXXX

Ref[8]	Rank[9]	Status	Date	Topic	HSESAP Ref.	Finding	Action Progress Review	Action#
WASTE.06	Low Amber	**New**	Apr 10	Waste management	0000-S-90-04-O-0258-00-E Appendix 1	Approximately 540 shipping containers, most of which are 40 feet in length, are located in various open fields at the OPF site. Reportedly, the containers were left by Project contractor BETS and are now the responsibility of Operations. Within the last year the OPF maintenance department has been systematically opening and surveying the containers, and classifying the contents and structural condition of the containers themselves to ascertain what content can be reused at the facility and what needs to be classified as waste and disposed of. To date 540 containers have been examined for lifting integrity and 488 examined for content.	**Action**: Complete examination and inventory of legacy waste containers at OPF. Prepare a plan (with timescales and end-points) for disposal of this waste.	XXXXXX
WASTE.07	High Amber	**New**	Apr 10	Waste – disposal end points	0000-S-90-04-O-0258-00-E Appendix 1	Sakhalin Energy to identify an end-point for sulphinol-contaminated waste. 1.5 tonnes contaminated sand has been stored at the facility for more than six months.	**Action:** Advise when an environmentally acceptable end-point has been identified for sulphinol-contaminated waste.	XXXXXX
WASTE.08	High Amber	**New**	Apr 10	Landfills	0000-S-90-04-O-0258-00-E Appendices 5 & 9	A review of the Waste Management Standards Comparison and Approved Waste Diversion and Disposal Facilities specification highlighted that some aspects of landfill engineering at the upgraded Smirnykh, Nogliki and Korsakov landfills might not comply with international standards (i.e. the Landfill Directive). This seemed to conflict with statements within these documents that the upgraded landfills met international standards. Risk Assessment reports for each of these facilities were prepared in 2004 and have been reviewed. The statement of full compliance with the European IPPC Directive (Directive 96/61/EC) and the landfill Directive (Directive 99/31/EC) cannot be justified from the contents of the Risk Assessment reports. It is recommended that Sakhalin Energy clearly confirm and clarify the relevant engineering measures that have been carried out at the upgraded landfills. These should be compared to the requirements of the Landfill Directive. Amendments should then be made to the appropriate parts of the Waste Management Standard, as necessary, to reflect the status of the landfills with respect to international standards.	**Action:** Review the Approved Waste Diversion and Disposal Facilities Specification (0000-S-90-04-O-0258-00-E Appendix 9) to ensure appropriate specification of landfill engineering measures within 12 months following Project Completion.	XXXXXX
WASTE.09	Low Amber	**New**	Apr 10	Waste – disposal end points	0000-S-90-04-O-0258-00-E Appendix 1	Currently there is no system for the disposal of correlation gas samples sent through as part of the Shell world-wise laboratory assessment.	**Action**: identify a disposal route for correlation gas samples.	XXXXXX

Ref[8]	Rank[9]	Status	Date	Topic	HSESAP Ref.	Finding	Action Progress Review	Action#
SOIL AND GROUNDWATER								
S&GW.01	Low Amber	**Closed**	Sep 07 (Section 6.3)	Soil contamination	0000-S-90-04-O-0004-00-E Appendix 1	Issue regarding how Sakhalin Energy intends to clean-up potential risk areas including (but not limited to) OPF, landfill sites and construction camps. AEA needs to review reinstatement plans, monitoring data and verify this information during site audits. AEA also requests to see details of Risk Based Corrective Action approach to site clean-up, and recent soil contamination monitoring reports.	**23.04.10**: Progress in relation to Landfill sites is addressed in WASTE.02. Progress in relation to temporary sites (e.g. construction sites) is incorporated in LAND.11. Finding closed.	
S&GW.02	Low Amber	**Closed**	May 09 (p 27)	Secondary Containment of Fuel Drums and Generators at Block Valve Stations	1000-S-90-04-O-0004-00-E Appendix 5	AEA recommends that Sakhalin Energy reviews their standards and procedures to meet better maintenance of secondary containment units at BVSs and monitors the success of this task. We recommend secondary containment units be delivered to sites when fuel drums are re-supplied.	**09.04.10**: The specification Soil and Groundwater Operational Controls 1000-S-90-04-O-0004-00-E Appendix 5 identifies spill containment requirements. **23.04.10**: Sakhalin Energy reported that although secondary containment units were arranged to be delivered to BVS when fuel drums were re-supplied, the BVS are now unoccupied. To be checked during June 2010 visit. Finding closed. New Finding S&GW.03 opened.	
S&GW.03	High Amber	**New**	Apr 10	Secondary containment of drums containing fuel, oil and oil-contaminated materials	1000-S-90-04-O-0004-00-E Appendix 5	Drums and other containers containing diesel, new and waste oil, and other oil-contaminated materials were noted to be without secondary containment at many Project facilities and all PMDs. This was of particular concern at Nogliki PMD since spills from the storage area could run directly to unmade ground.	**June 10**: Full OPF site survey identified three drums being stored outside a bunded area – this was immediately rectified. **21.06.10**: A Management of Change has been raised to install self-contained areas at each PMD to store oil. The works target completion date is October 2010. Sakhalin Energy Environmental Manager to visit Nogliki PMD on 22 June to advise on interim groundwater protection measures. **Action:** Provide secondary containment (e.g. drip trays) for drums and other containers to all facilities and PMDs. Provide awareness training to employees to encourage usage of these.	XXXXXX, XXXXXX

Ref[8]	Rank[9]	Status	Date	Topic	HSESAP Ref.	Finding	Action Progress Review	Action#
LAND MANAGEMENT								
LAND.01	High Amber	**Closed**	Aug 07	Land management – temporary erosion control	RemAP E1 item	1) Training: Carry out on-site demonstrations and instruction in temporary erosion control techniques. 2) Materials: Ensure that equipment and materials can be obtained on an as needs basis to allow repairs to control measures. 3) Installation of temporary erosion control measures compliant with HSESAP and fit for purpose. 4) Maintenance of temporary control measures. 5) Track-walking in accordance with HSESAP commitments where possible. 6) Temporary seeding carried out according to scope of works and taking results of 2006 seeding into account. 7) Turbidity monitoring for all Group 2/3 rivers.	**Jun 08**: Sakhalin Energy reported Temporary Erosion Control Campaign inclusive of RemAP E1 scope completed in 2007 (Monthly HSESAP Report June 2008). Finding closed.	
LAND.02	High Amber	**Closed**	Sep 07 (p133)	Land management – erosion control and reinstatement	RemAP E2 item, 0000-S-90-04-O-0254-00-E Appendix 8	1) Reinstatement schedule planned within time and construction constraints. 2) Procedures in place for issuing, approving and tracking reinstatement actions. 3) Resources identified for undertaking reinstatement work. 4) Reinstatement scope of works executed under Sakhalin Energy-PDP Reinstatement and Environmental coordinator supervision.	**Jan 09**: Sakhalin Energy reported reinstatement essential for start-up of hydrocarbons was 100% complete. Remaining reinstatement planning in progress for 2009. (Monthly Report January 2009). **Mar 09**: Sakhalin Energy reported (Monthly Report March 2009): • overall 95% of RoW Technical Reinstatement works completed and signed off by Sakhalin Energy, remaining reinstatement planning undertaken and works ongoing, • Biological Reinstatement – 99% of RoW seeded in 2008 where required (approximately 660 km seeded) and 90% of RoW works completed and signed off by Sakhalin Energy, • Riverbank Reinstatement – all riverbanks stabilized as part of 2008 activities to allow introduction of hydrocarbons, however 95 watercourses identified as still requiring some improvement or repairs. **Jun 09**: Sakhalin Energy reported that 100% of RoW Technical and Biological Reinstatement works were completed and signed off by the Company (Monthly Report June 2009). **Summer 2009**: Sakhalin Island was hit by three consecutive cyclones with heavy rain. The first cyclone was in June, the second in July and the last one late August. The damages were not limited to Sakhalin Energy's Assets but also to other areas on the Island. Sakhalin Energy and RTN identified a list of areas requiring repairs, and these works were subsequently completed on schedule and inspected	

Ref[8]	Rank[9]	Status	Date	Topic	HSESAP Ref.	Finding	Action Progress Review	Action#
							and accepted by RTN. **Sep 09**: (AEA September Report) In general, the RoW is in very good condition. The vast majority of the technical reinstatement – most prominent on steep slopes, sandy areas, river crossings and fault crossings – appear intact. Some minor maintenance issues were identified, as expected. Sakhalin Energy currently has a dedicated team, focused on RoW maintenance, walking the entire RoW and identifying areas where additional works may be required. The existing erosion control methods and their installation along the RoW are currently performing well, despite regeneration being slower than anticipated in most areas along the RoW. Several locations were identified along the RoW that will require attention in the future, however nothing was observed during this visit that would create any significant environmental hazard at this time. **09.04.10**: Sakhalin Energy reported that the full inspection programme is in place for 2010, to assess RoW condition. All river crossings remedial work scope that was identified in 2009 (after cyclones) will be completed in April 2010. Contracts are in place ready to commence RoW works when suitable conditions exist (thaw). RoW erosion control will continue, however Sakhalin Energy have inspection and implementation plans in place for any issues to be rectified. **23.04.10**: Finding closed because initial reinstatement scope completed (as per actions 1-4). Ongoing inspection and remedial action shall be addressed via new Finding in June Report (LAND.14).	
LAND.03	Green	**Closed**	Aug 07	Land management –spoil management	RemAP E3 item	1) Finalise design for remaining soil tips. Obtain regulatory engineering design approvals as appropriate. 2) Spoil management implemented according to design approved by Sakhalin Oblast. 3) Continue to investigate alternative uses of spoil particularly with regards to social improvement and community benefits (e.g. Makarov paper mill)	**Nov 08**: Sakhalin Energy reported 100% of spoil moved and Spoil Management E3 scope completed (Monthly HSESAP Report November 2008). Finding closed.	
LAND.04	High Amber	**Closed**	Aug 07	Land management – winterisation	RemAP E4 item	1) Determine winterisation requirements 2) Identify need for and carry out training on site 3) Dedicated resources (crews and materials) to execute the works 4) Track implementation	**Jun 08**: Sakhalin Energy reported Winterisation campaign inclusive of RemAP E4 scope completed in 2007/2008 (Monthly HSESAP Report June 2008). Finding closed.	

Ref[8]	Rank[9]	Status	Date	Topic	HSESAP Ref.	Finding	Action Progress Review	Action#
LAND.05	Low Amber	**Closed**	Aug 07	Land management – river monitoring during construction	RemAP R1item	1) Execute a summer and autumn construction monitoring campaign. 2) Report results of the summer/autumn monitoring campaign. 3) Carry out detailed analysis of the monitoring results 2004-2007.	**Jun 08**: Sakhalin Energy reported that River monitoring during construction phase was completed (Monthly HSESAP Report June 2008). Finding closed.	
LAND.06	Low Amber	**Open**	Aug 07	Land management – river monitoring	RemAP R2 item	1) Identify the most critical rivers affected by non-compliances during the winter crossing(s) 2) Set up a post-construction monitoring programme (2008) 3) Execute a medium term monitoring programme (2008-2011) 4) Evaluate the results.	**Sep 07**: (AEA Report Table 6-4 Item 6.26) Sakhalin Energy to implement remediation programme if monitoring report identifies any significant impact from the Project. **May 09**: Sakhalin Energy reported river monitoring scope for 2009 completed (May 2009 Monthly Report). **Jul 09**: Originally, fishery characteristics were being monitored for 84 rivers. Sakhalin Energy reported that an independent review of river monitoring was completed, and concluded that monitoring should continue in 10 rivers. An additional 5 rivers will be included to enhance understanding of spawning success at the crossings. (July 2009 Monthly Report) **May 10**: Sakhalin Energy report that the post-construction river monitoring report for 2009 was received, and results have been evaluated. Of the 15 rivers monitored in 2009, no impact was identified in11 rivers. Four rivers still show altered conditions downstream of crossings, including Leonidovka and Gornaya (which were impacted by the cyclones last year), Nitui (which has changed its course), and Lesnaya. These 4 rivers have been included in the 2010 monitoring programme. **Action**: Implement medium term river environmental sampling and monitoring programme (2008-2011) and provide evaluation of results.	XXXXXX
LAND.07	Low Amber	**Open**	Aug 07	Land management – remediation of river habitats	RemAP R3 item	1) Obtain expert input and agreement with Russian authorities on remedial actions, if any. Identify remediation benchmarks and criteria that indicate successful remediation. 2) Execute remedial actions, if any.	**May 10**: Based on analysis of river environmental sampling and monitoring results, additional intervention is not indicated at this time. The RoW inspection programme shall be implemented as per new Finding in June report (LAND.14). **Action**: Based on evaluation of results of 2010 river environmental sampling and monitoring programme, determine whether any rivers remedial actions are required as per RemAP R3.1.	XXXXXX

Ref[8]	Rank[9]	Status	Date	Topic	HSESAP Ref.	Finding	Action Progress Review	Action#
LAND.08	Low Amber	**Closed**	Aug 07	Land management – restoration of salmon spawning habitat	RemAP R4 item	1) Conduct reconnaissance survey and watershed assessment of the river to identify areas for restoration. 2) Carry out detailed ecological survey of the river sections. 3) Implement initial restoration measures at identified areas. Determine whether further river basins be selected for offset in the event that net fisheries loss is observed to have occurred as a result of construction. 4) Monitor the environmental conditions of river and control of the implemented measures.	**Aug 07**: Phase 1 undertaken 2006/2007. **May 09**: Sakhalin Energy reported river monitoring scope for 2009 completed (May 2009 Monthly Report). **Apr 10**: Sakhalin Energy reported that the Dzimdan River was selected as a Sustainable Development project. Vegetation cover in the Dzimdan River basin had been severely disturbed by two forest fires in 1989 and 1998, and soil erosion was affecting spawning areas. Project activities included soil preparation in August 2008 (square № 316 of the Nogliki District Forestry of the area of 38.2 ha), experimental plantings in October 2008, and reforestation work involving planting more than 142,000 trees, which was completed in June 2009. Act of work completion was signed and contract was closed (contract Y04228). **May 10**: Results of river monitoring programme identify no residual impact from construction activities in 80 of 84 rivers monitored. Hence, additional 'offset' restoration projects are not justified. Finding closed.	
LAND.09	High Amber	**Open**	Sep 07 (Table 6-4 Item 6.24)	Land management – temporary equipment/ bridges	0000-S-90-04-O-0254-00-E Appendix 8	Remove equipment bridges as soon as possible after permanent seeding.	**23.04.10**: Sakhalin Energy reported that 15 temporary bridges are planned to be removed. Construction was still ongoing for 5 access roads. A survey is planned to identify and evaluate remaining temporary bridges. **10.06.10**: As per LAND.12, the Orkunie River bridge will be modified to be able to contain any spillage on bridge surface and thereby protect the river from pollution. Survey must be conducted to identify what is required to make it permanent. Appropriate authority approvals to be obtained as required. **Action:** Complete additional survey of temporary bridges. Identify bridges to be removed, and requirements for bridge upgrade where applicable. Provide updated plan for temporary bridge removal and permanent bridge upgrade. **Action**: Provide to Lenders six-monthly updates on the status of implementation of the plan for removal/upgrade of temporary bridges.	XXXXXX, XXXXXX
LAND.10	Low Amber	**Closed**	Sep 08 (p 18)	Construction camp – LNG/OET	0000-S-90-04-O-0259-00-E Appendix 1	LNG/OET: Decommissioning plans to be developed for any construction facilities/utilities deemed not to be required. Sakhalin Energy to develop decommissioning plans in relation to facilities / work force in relevant Asset	**09.04.10**: Sakhalin Energy reported that overall demobilisation strategy was finalised and approved by the Tender Board, and supporting information was provided to AEA. **23.04.10**: Plan has been provided and ongoing implementation shall be tracked under LAND.11. Finding closed.	

Ref[8]	Rank[9]	Status	Date	Topic	HSESAP Ref.	Finding	Action Progress Review	Action#
LAND.11	Low Amber	**Open**	Sep 08 (p 18)	Construction camps – Pipelines	0000-S-90-04-O-0259-00-E Appendix 1	Detailed decommissioning plans are required for construction camps once the future disposal/ abandonment options are confirmed, including plans for the disposal of assets and materials and appropriate site investigation/remediation and to manage the termination of local employment. Guarantees must be in place to ensure camp emissions and effluents remain within legal limits. Sakhalin Energy to provide AEA with quarterly updates on current status of camp demobilisation/ decommissioning plans, including whether these will be sold or retained/mothballed by Sakhalin Energy.	**Jan 10**: Progress update provided. **23.04.10**: Detailed progress presentation provided to AEA in relation to pipeline construction camps. **Action**: Provide quarterly updates on decommissioning of temporary facilities (including Pipeline and Asset camps and other sites).	XXXXXX
LAND.12	High Amber	**Closed**	Nov 08 (p 15)	River bank reinstatement : Orkunie river	0000-S-90-04-O-0254-00-E Appendix 8	The steel bridge was still in place and requires removal. As riverbank reinstatement will be required in its place, it is recommended that the riverbanks both up and downstream of the bridge are reshaped on both sides at the same time, with placement of riprap and Reno mats to restore the river's natural shape and width.	**23.04.10:** Sakhalin Energy reported intention to retain the temporary bridge across the Orkunie river for a longer period of time. The reason for retaining the bridge is to ensure adequate access to the Nabil BVS and RoW. The bridge will be modified to be able to contain any spillage on bridge surface and thereby protect the river from pollution. Survey will be conducted to identify what is required to make it permanent – this will be tracked in new Finding in June report (LAND.15). Appropriate authority approvals are to be obtained as required. As this bridge will not be removed, this Finding is now closed.	
LAND.13	High Amber	**Closed**	May 09 (p 27)	Future monitoring of RoW	0000-S-90-04-O-0259-00-E Appendix 1	Specific plans are recommended to transfer the RoW capability and knowledge from Construction to Ops personnel during the 2009 handover period on: geological hazards, installed engineering solutions, re-vegetation.	**23.04.10**: Sakhalin Energy reported that information transfer from Project to operations regarding River Crossings, Geohazards etc, is completed. Risk-Register has been developed. Finding closed.	
BIODIVERSITY								
BIODIV.01	Low Amber	**Closed**	Sep 07 (Table 1.2 & 6.5.2)	Biodiversity – BAP Taimen	0000-S-90-04-O-0009-00-E Appendix 6	Sakhalin Energy to provide findings from the 2007 taimen studies, AEA to review the measures identified by Sakhalin Energy and comment on the applicability.	**09.04.10**: Document provided by Sakhalin Energy. Finding closed.	
BIODIV.02	Low Amber	**Closed**	Sep 07 (Table 1.2)	Biodiversity – induced access control	0000-S-90-04-O-0259-00-E Appendix 1	Sakhalin Energy to provide an induced access control document for AEA review. (N.B. Induced access refers to an increase in access to previously inaccessible/ difficult areas that has occurred as a result of the Project.)	**09.04.10**: Document provided by Sakhalin Energy. Finding closed.	

Ref[8]	Rank[9]	Status	Date	Topic	HSESAP Ref.	Finding	Action Progress Review	Action#
BIODIV.03	High Amber	**Closed**	Sep 07 (p141)	Biodiversity – Wetlands reinstatement W1	0000-S-90-04-O-0259-00-E Appendix 4, and RemAP W1	Complete the wetlands reinstatement as per RemAP scope W1, which is: • To remove temporary roads identified for removal and that are physically possible to remove, • Road removal assessment and road removal, • Site assessments staged across all wetlands on the RoW according to the Technical Reinstatement Schedule for each Section taking account of actual road construction type i.e. materials used and whether segregated by geotextile, the wetland type, depth, hydrology and the extent of surface revegetation.	**Sep 09**: Wetland reinstatement seems to be progressing well with one major exception in the Dolinsk wetland (see BIODIV.06). In general, the wetlands areas throughout the island show very positive sign of recovery. Successful reinstatement of wetland area requires 80% vegetative cover after 5 years; most wetland areas previously disturbed by Sakhalin Energy appear to be approaching this requirement. **23.04.10**: Sakhalin Energy reported that scope of work completed with the exception of Dolinsk wetlands which will be tracked as a separate issue: Finding BIODIV.06. Finding closed.	
BIODIV.04	High Amber	**Open**	Sep 07 (p141)	Biodiversity – Wetlands monitoring W2	RemAP W2, 0000-S-90-04-O-0009-00-E Appendix 6	Complete post-construction monitoring of wetlands as per RemAP scope W2, which is: 1) Appoint suitably qualified Third Party Contractor(s) for delineation and classification work. 2) Wetlands delineated on baseline data sets. 3) Wetland classified by ecological and physical characteristics into wetland "Classes". 4) Field observation for desktop studies verification and impact assessment. 5) Completion of classification work. 6) Appoint suitably qualified Third Party Contractor(s) for carrying out field surveys. 7) Reference Surveys and Year 1 Post Construction Monitoring surveys completed. 8) Monitoring reports from Reference Survey and Year 1 Post Construction Monitoring submitted to Sakhalin Energy for review. 9) Post construction monitoring completed during the second and third years after construction 2008-10.	**Nov 08**: Sakhalin Energy reported that 2008 wetland monitoring scope was executed (Monthly Report November 2008). **May 09**: Sakhalin Energy reported that scope of work for 2009 was completed (Monthly Report May 2009). **Aug 09**: 2009 wetland monitoring programme has been completed and draft report is currently being prepared. **06.04.10**: Sakhalin Energy reported that: • 2007-2009 monitoring scope has been completed, • a contract is in place for 2010 and 2011 for wetlands monitoring, • RemAP requirements have been incorporated into ongoing Local Monitoring programmes, and the HSE Monitoring Overview (previously Annex C, now 0000-S-90-04-O-0009-00-E Appendix 6), which includes wetlands monitoring requirements, is to be reviewed with Lender approval within 6 months following Project Completion. **23.04.10**: Items 1-8 have been completed, item 9 is in progress. **Action**: Complete wetlands environmental sampling and monitoring 2010 scope.	XXXXXX

Ref[8]	Rank[9]	Status	Date	Topic	HSESAP Ref.	Finding	Action Progress Review	Action#
BIODIV.05	High Amber	**Open**	Sep 07 (p141)	Biodiversity – Wetlands remediation W3	RemAP W3, 0000-S-90-04-O-0009-00-E Appendix 6	Complete remediation of wetlands as per RemAP scope W3, which is: 1) Assessment of immediate remediation works required. 2) Development of practical tools to be used by the construction team for wetland remediation upon completion of the construction activities. 3) Immediate remediation measures implemented (as determined on a site by site basis) by Sakhalin Energy Reinstatement and Environmental coordinators and carried out under their supervision. 4) Remediation Plan and Prioritisation list developed. 5) Remediation measures implemented under Reinstatement and Environmental Coordinators' supervision. 6) The need for post-construction remediation measures identified via inspection and monitoring 2008-2010 and advice sought from wetlands expert. Remediation measures implemented under Operations supervision.	**23.04.10**: Items 1-5 completed. **Action**: Based on evaluation of results of 2010 wetlands environmental sampling and monitoring programme, determine whether any wetlands remedial actions are required as per RemAP W3.6.	XXXXXX
BIODIV.06	High Amber	**Open**	Sep 09 (p7)	Biodiversity – Dolinsk Wetlands	0000-S-90-04-O-0259-00-E Appendix 4, and RemAP W1	AEA notes that running track consisting of cut trees, and bog mats (steel and wooden) and other construction debris still remain in Dolinsk wetland. If not removed, this debris can restrict the hydrological flow through the wetland and hence the successful and timely recovery of the area.	**Sep 09**: AEA understands that Sakhalin Energy has since surveyed the area to identify the type, location, and quantity of debris to be removed, and has initiated a removal plan. **Feb 10**: Sakhalin Energy reported that an assessment to determine the safest and most effective removal method was completed. Some of the wetlands works planned for February 2010 were suspended due to unsafe working conditions. The situation will continue to be assessed and work will recommence when conditions allow. **23.04.10**: Sakhalin Energy reported that work was commenced however stopped due to inaccessibility (deep snow). Works to be resumed in Spring if safe and possible. **21.06.10**: Sakhalin Energy reported that works removing the debris in the Dolinsk Wetlands have commenced, and an update on progress will be provided as requested end October 2010. **Action**: Sakhalin Energy to remove debris from Dolinsk Wetland where safe and physically possible.	XXXXXX

Ref[8]	Rank[9]	Status	Date	Topic	HSESAP Ref.	Finding	Action Progress Review	Action#
OIL SPILL RESPONSE								
OSR.01	High Amber	**Closed**	Sep 07 (p 253, section 10.1.5)	Oil Spill Response – Hokkaido	0000-S-90-04-O-0014-00-E Appendix 15	Hokkaido OSR Handbook and Hokkaido sensitivity maps to be reviewed based on agreed approach.	**09.03.10**: Sakhalin Energy provided information and proposed that it is not justified to develop a Hokkaido-specific handbook based on: the Prigorodnoye Offshore OSRP, the MoU for notification of Japanese authorities, responsibilities for transboundary response with the relevant authorities, trajectory modelling software and ESI maps being available, stakeholder engagement, and the significantly reduced risk of impact. **23.04.10**: Agreed. Finding closed.	
OSR.02	Low Amber	**Closed**	Sep 07 (p 254, section 10.1.5)	Oil Spill Response – Wildlife response	0000-S-90-04-O-0014-00-E Appendix 15	Sakhalin Energy to develop wildlife response (plan and handbook), AEA / PCCI to review.	**Sep 09**: The "Oiled Wildlife Responders Field Manual" was considered very well written and a few minor modifications were agreed. **09.03.10**: Wildlife Rehabilitation Site Implementation Manual and Oiled Wildlife Response Plan provided for review. Finding closed.	
OSR.03	Low Amber	**Closed**	Sep 07 (p 254, section 10.1.5)	Oil Spill Response – Wildlife response	0000-S-90-04-O-0014-00-E Appendix 15	Sakhalin Energy to provide a schedule of equipment delivery.	**09.03.10**: Sakhalin Energy reported that Wildlife Response Equipment has been delivered to sites, and provided relevant acts. Finding closed.	
OSR.04	Green	**Closed**	May 09 (p 27)	Oil spill response at PMDs	0000-S-90-04-O-0014-00-E Appendix 15	AEA recommends that consideration be given to providing each PMD with a wildlife response kit.	**09.03.10**: Sakhalin Energy provided detailed information on response times, based on wildlife response kits located at three PMDs, and it was agreed that additional kits are not justified. Finding closed.	
OSR.05	High Amber	**Open**	May 09 (p 27)	Oil Spill Response Plans	0000-S-90-04-O-0014-00-E Appendix 15	Current versions of the OPF and Onshore Prigorodnoye plans assume 100% secondary containment 100% of the time and therefore do not contain measures for reacting to an incident in which a spill breaches the facility containment. International best practice requires this to be analysed in a worst-case scenario. AEA recommends the plans be revised to accommodate international best practice procedures.	**09.03.10**: Sakhalin Energy agreed that the plans should be revised as indicated. However, the schedule for revision and associated regulatory review timelines make it impractical to complete this in the short term. Hence addenda will be prepared. **Action**: Review capabilities for response to loss of secondary containment on OPF and Onshore Prigorodnoye and document response arrangements in temporary internal addenda to the OSRPs.	XXXXXX
OSR.06	Low Amber	**Closed**	May 09 (p 27)	Oil Spill Response Plans	0000-S-90-04-O-0014-00-E Appendix 15	The current OSRPs do not contain Wildlife Oil Spill Response Guidelines. AEA understands these are currently in draft form and will be ready for review around the end of May or early June 2009. AEA is eager to review these plans.	**09.03.10**: Documents were provided. Finding closed.	

Ref[8]	Rank[9]	Status	Date	Topic	HSESAP Ref.	Finding	Action Progress Review	Action#
OSR.07	Low Amber	**Closed**	Sep 09 (p 16)	Oil Spill Response	0000-S-90-04-O-0014-00-E Appendix 15	Sakhalin Energy provided a full demonstration of its newly acquired wildlife rehabilitation kits at the Aniva Bay shoreline, including equipment for wildlife deterrence, capture and stabilisation, constituting industry best practice. Sakhalin Energy's equipment was found to be of very high quality. It is recommended to provide more float booms at the site and provide more frequent training on the use of equipment.	**17.05.10**: Sakhalin Energy has 4520 meter of float booms at LNG/OET plant, which is a sufficient amount of float booms based on spill scenarios. Table showing LNG booms was provided. Training on the use of equipment is based on Russian Federation requirements, training matrix was provided. Finding closed.	
OSR.08	High Amber	**Closed**	Sep 09 (p 16)	Oil Spill Response	0000-S-90-04-O-0014-00-E Appendix 15	It is recommended that a much larger OSR exercise be conducted within a year, ideally enabling the Japanese authorities to participate, providing a great training opportunity to facilitate international co-operation.	**May 10**: Sakhalin Energy will seek to promote the undertaking of annual desktop planning exercises with relevant RF and Japanese authorities. This commitment has been included in HSESAP Revision 3 (Oil Spill Preparedness and Response Specification). Sakhalin Energy to participate in practical exercises wherever possible. Finding closed.	
OSR.09	Green	**Closed**	Sep 09 (p 11)	Oil Spill Response	0000-S-90-04-O-0014-00-E Appendix 15	It is recommended that Sakhalin Energy updates page 12 (and any subsequent reference to particular filter № 95) of the draft "Sakhalin Energy Oiled Wildlife Responders Field Manual" to ensure it is clearly stated that the filter will NOT protect workers against vapour exposure normally encountered during oil spill response. It is recommended that additional information needs to be provided in "Sakhalin Energy Oiled Wildlife Responders Field Manual" to clearly identify and discuss selection and wearing of appropriate respiratory protection for field workers involved in the wildlife rehabilitation programme.	**May 10**: Updates were completed; page 12 has been updated to state that full face masks are provided and required to avoid contamination with zoonotic diseases and can be used for respiratory protection when Oiled Wildlife Responders enter an area with fresh oil. It provides clear photos of the required masks. As this document is already published, Sakhalin Energy agrees to specify the filter type required for hydrocarbon vapour protection in the next revision of the Oiled Wildlife Responders Field Manual. Finding closed.	
OSR.10	High Amber	**Open**	Sep 09 (p 11)	Oil Spill Response	0000-S-90-04-O-0014-00-E Appendix 15	It is recommended that Sakhalin Energy adds information and procedures on "electrical hazards" to the discussion on health and safety in the draft "Sakhalin Energy Oiled Wildlife Responders Field Manual". Electrical hazards pose an imminent threat to responders once the treatment centre is set up and operating.	**Action**: Consider and respond to consultant PCCI's recommendation to add information and procedures on "electrical hazards" to the discussion on health and safety in the "Sakhalin Energy Oiled Wildlife Responders Field Manual".	XXXXXX

Ref[8]	Rank[9]	Status	Date	Topic	HSESAP Ref.	Finding	Action Progress Review	Action#
OSR.11	Low Amber	**Open**	Sep 09 (p 11)	Oil Spill Response	0000-S-90-04-O-0014-00-E Appendix 15	Since the Wildlife Rehabilitation Centre doubles as a vehicle maintenance and washing depot, it is recommended that Sakhalin Energy conducts an exercise in setting up the Wildlife Rehabilitation Centre to ensure that it can be changed over quickly and set up appropriately, and that all parts are available and in proper working order. Sakhalin Energy states that the centre can be changed from the vehicle maintenance depot to the Wildlife Rehabilitation Centre within 48 hours.	**Action**: Schedule and undertake a full scale exercise in establishing the WRC under mock-emergency conditions within 6 months of commissioning the LNG warehouse. Document any difficulties and delays encountered and any appropriate actions to improve the process in the future.	XXXXXX
OSR.12	Low Amber	**Open**	Sep 09 (p 11)	Oil Spill Response	0000-S-90-04-O-0014-00-E Appendix 15	It is recommended that Sakhalin Energy establishes and conducts appropriate training and refresher training for all personnel involved in the Wildlife Rehabilitation Programme.	**Action**: Identify target group for Wildlife Rehabilitation training. Identify/develop training programme (content, trainer, frequency). Conduct training for all personnel involved in the Wildlife Rehabilitation Programme.	XXXXXX
OSR.13	High Amber	**Open**	Sep 09	Oil Spill Response	0000-S-90-04-O-0014-00-E Appendix 15	AEA was informed at the pre-exercise meeting that the size of the field exercise was to be scaled back and that observers would not be allowed on the OSR vessels or the TLU. The last minute changes to the volume and simulated discharges, as well as the positioning of the observers, reduced the effectiveness and ability of the observers to evaluate response operations. As a result, this exercise did not provide the Lenders representatives with an opportunity to observe and evaluate Sakhalin Energy's offshore operations or evaluate the activation and processes associated with the Emergency Coordination Team (ECT) and Crisis Management Team (CMT).	**Action**: Provide an opportunity for the Lenders' representatives to observe an OSR Exercise, including to undertake adequate on-site observation and evaluation of the activation and decision-making processes associated with the ECT or CMT and particularly Offshore operations.	XXXXXX

Ref[8]	Rank[9]	Status	Date	Topic	HSESAP Ref.	Finding	Action Progress Review	Action#
OSR.14	Low Amber	**Open**	Sep 09	Oil Spill Response – redacted/ summary plans	0000-S-90-04-O-0014-00-E Appendix 15	PCCI discussed the current asset-specific OSRPs, specifically where the OSRPs were considered to fall short of international best practice and standards; Sakhalin Energy concurred with PCCI's suggestions, and planning for a potential breach of secondary containment would now go forward. Sakhalin Energy to publish redacted/summary OSR Plans as per PCCI's recommendations.	**09.03.10**: Sakhalin Energy proposed to revise the redacted plans to include the information as recommended by PCCI (however of course we reserve the right to omit commercial, legal, and security-sensitive information): - Primary, secondary and worst case oil spill risks - Discovery and notification process - Spill pathways, receptors (i.e. environmental, economic, cultural and historic resources), and sensitivities and priorities for protection - Sakhalin Energy response resources (personnel and equipment) and strategies for protection, recovery, disposal, and restoration and recovery of the environment - Sakhalin Energy readiness in terms of equipment maintenance, upgrade, compatibility with the operating environment, and also in terms of personnel qualifications and experience - Sakhalin Energy compliance with RF standards and industry best practice. Also proposed to change the terminology from "redacted" to "summary" of plans as indicated in the attached Draft 3 specification. This was supported. **Action**: Update and republish Summary OSR Plans for Assets, as per item OSR.13. Provide to AEA/PCCI for review.	XXXXXX
OSR.15	High Amber	**New**	Apr 10	Summary ER Standard	0000-S-90-04-O-0014-00-E Appendix 15	Sakhalin Energy has committed to publish a "Summary of the Corporate ER Standard in relation to oil spill preparedness and response".	**Action:** Provide a draft "Summary of the Corporate ER Standard in relation to oil spill preparedness and response" for Lender comment.	XXXXXX
OSR.16	Green	**New**	Apr 10	Wildlife Oil Spill Response	0000-S-90-04-O-0014-00-E Appendix 15	All newly procured wildlife rescue and rehabilitation equipment is currently stored different places in a general warehouse, alongside other workshop supplies, spares and equipment, ready to move into the new warehouse. As a result, the existing warehouse has become overstocked and untidy, with housekeeping standards slipping as more items are temporarily moved in. This equipment is currently at risk of being mislaid and/or damaged.	**Action:** Ensure all wildlife OSR equipment is moved to a dedicated part of the new warehouse, once it is commissioned.	XXXXXX

Ref[8]	Rank[9]	Status	Date	Topic	HSESAP Ref.	Finding	Action Progress Review	Action#
HEALTH AND SAFETY								
H&S.01	Green	**Closed**	Sep 08 (p 18)	Health and safety	0000-S-90-04-O-0261-00-E Appendix 1	The need for appropriate security fencing around the Sokol laydown area to restrict entry from unauthorised personnel, including local community members.	**May 09:** Needs appropriate security fencing. **23.04.10**: Fence only partially erected, as observed during visit April 13-23rd. **21.06.10**: Sakhalin Energy advised that the fence was repaired in May 2010 and a site visit by the Company on 19.06.10 showed the perimeter fence secure. AEA viewed photos of newly repaired fence and now considers the situation satisfactory. Finding closed.	
H&S.02	High Amber	**Open**	May 09 (p 27)	Health and safety	0000-S-90-04-O-0261-00-E Appendix 1	Four security-related incidents occurred at Block Valve Stations in which fences and electrical cables were cut. Sakhalin Energy stated that motion detectors and cameras will be installed to prevent future occurrence.	**23.04.10**: Sakhalin Energy reported that Security Up-Grade Plan started on 01.08.09. CCTV system and detection sensors "radio barrier" were installed at 73% of most critical BVS by end March 2010. **Action**: Complete 100% BVS Security Up-Grade Plan.	XXXXXX
H&S.03	High Amber	**Closed**	Sep 09 (p 8)	Health and safety	0000-S-90-04-O-0261-00-E Appendix 1	Booster Station 2: The building used for inert gas storage was not ventilated and could be hazardous to anybody inside in the event of a leak.	**17.05.10**: Sakhalin Energy reported that the building is ventilated naturally via a 2 m high vent duct mounted on the roof of the building. No inert gases are currently stored in the building. All inert gases are now stored externally in open air. Finding closed.	
H&S.04	Low Amber	**New**	Apr 10	Health and Safety	0000-S-90-04-O-0261-00-E Appendix 1	There is insufficient storage room in the Prigorodnoye site laboratory. Clutter and overfilled shelves/cupboards present a health and safety risk to lab personnel.	**Action**: Consider optimisation of laboratory area and/or moving the offices out of the lab to enable better storage of consumables/equipment/waste, and report outcome to lenders.	XXXXXX
H&S.05	Low Amber	**New**	Apr 10	Health and Safety	0000-S-90-04-O-0261-00-E Appendix 1	Two unidentifiable samples of glycol from the turbine coolers had been delivered to the lab for testing in plastic water bottles rather than the appropriate sample bottles. No paperwork had been submitted with the sample.	**Action**: Conduct an awareness session and distribute materials on the use of correct sample containers and the scheduling requests and enforce the sample procedure.	XXXXXX
GENERAL								
GEN.01	High Amber	**Closed**	Sep 07 (Table 6-14 Item 6.69)	Monitoring plans for Operation phase	0000-S-90-04-O-0009-00-E Appendix 6	Sakhalin Energy to develop an Annex C for Ops phase, considering changes in EMP, and to provide for AEA review.	**22.03.10**: Annex C (now HSE Monitoring Overview specification 0000-S-90-04-O-0009-00-E Appendix 6) was revised and provided to AEA, and draft was reviewed and found acceptable by AEA in the immediate term (see item GEN.02). Finding closed.	
GEN.02	Low Amber	**New**	Apr 10	Monitoring	0000-S-90-04-O-0009-00-E Appendix 6	HSE Monitoring Overview is to be revised considering monitoring results to date and operational requirements.	**Action**: Review HSE Monitoring Overview (0000-S-90-04-O-0009-00-E Appendix 6) and update where appropriate within 6 months of formal Project Completion date.	XXXXXX

Ref[8]	Rank[9]	Status	Date	Topic	HSESAP Ref.	Finding	Action Progress Review	Action#
GEN.03	Low Amber	**New**	Apr 10	General	International Requirements specifications	"International Requirements" and "Standards Comparison" specifications are based on original project data and standards in force at date of signing. These documents shall be reviewed based on operational data and revised standards where applicable, within 12 months following Project Completion.	**Action**: Review "International Requirements" and "Standards Comparison" specifications referenced in HSESAP and update where appropriate within 12 months of formal Project Completion date.	XXXXXX

Appendices

Appendix 1 – Photographs

Photo 1 **Non-hazardous waste collection bays, OPF**

Photo 2 **Hazardous waste storage bays, OPF**

Photo 3 MEG filter cleaning area, OPF

Photo 4 New waste transit station, OPF (1)

Photo 5 New waste transit station, OPF (2)

Photo 6 New waste transit station, OPF (3)

Photo 7 OPF Legacy waste containers, buried in deep snow

Photo 8 OPF chemical storage area (1)

Photo 9 OPF chemical storage area (2)

Photo 10 OPF sewage treatment system

Photo 11 Addition of PAC at OPF STP

Photo 12 Labelled waste containers, Nogliki OPF

Photo 13 Labelled waste oil containers, although without secondary containment, Nogliki

Photo 14 Absorbent material for spills and leaks, OPF

Photo 15 Immediate rectification of lack of secondary containment, OPF

Photo 16 OPF waste storage area, exposed to the elements

Photo 17 Neatly stored Oil Spill Response equipment, Nogliki PMD

Photo 18 OSR PPE at Nogliki – neatly stored and readily accessible

Photos 19 OSR trucks pre-stocked with equipment, OPF and Gastello PMDs

Photo 20 Wildlife Response Kits stored at Gastello PMD

Photo 21 Small vehicles and plant at Nogliki PMD

Photo 22 Emergency first aid and eye wash stations, Nogliki PMD

Photo 23 HSE notice board, Nogliki PMD

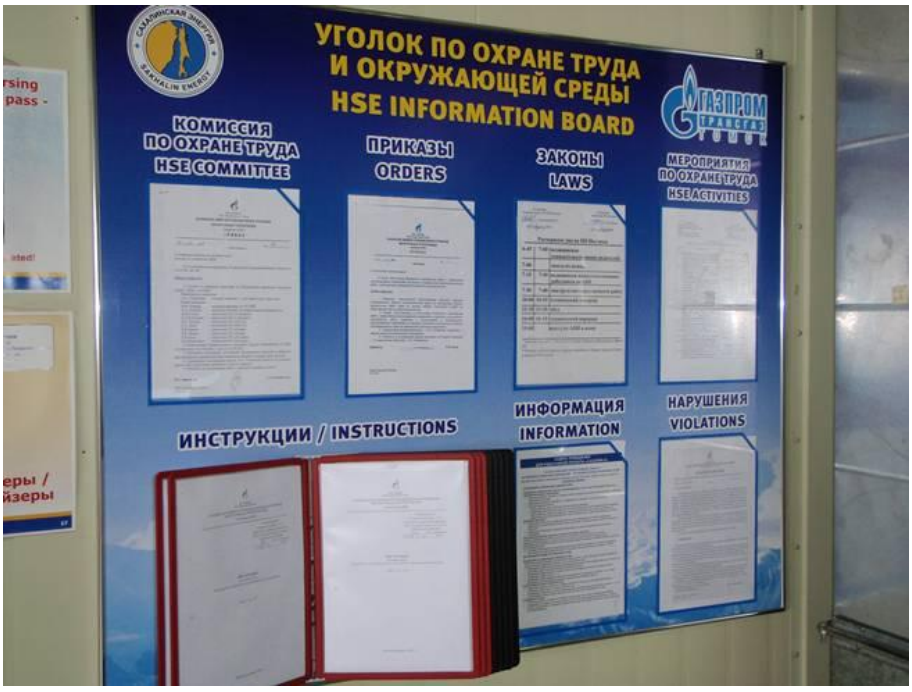


Photo 24 Waste batteries in secondary containment, OPF

Photo 25 Acid store cupboard, OPF

Photo 26 Drums in fuel storage area, without secondary containment, Nogliki PMD

Photo 27 Un-bunded drum of biocide, Nogliki

Photo 28 Disinfectant solutions for treating clinical wastes, ISOS clinic at OPF

Photos 29 Hazard class B waste bins – coloured liners distinguish contents, ISOS clinic, OPF

Photo 30 Covered temporary waste storage, Nogliki landfill

Photo 31 Waste battery storage, Nogliki landfill

Photo 32 Smirnykh landfill vehicle storage area

Photo 33 Storage for wastes generated on-site, Smirnykh landfill

Photo 34 Smirnykh landfill Phase 1

Photo 35 Compaction of landfill waste, Korsakov landfill

Photo 36 Catch fences around the working area, minimising wind blown rubbish, Korsakov landfill

Photo 37 Disinfecting wheel wash (right of picture) Korsakov landfill

Photo 38 Makarov landfill, uncovered waste being pushed down towards river

Photo 39 Makarov landfill, uncovered wastes

Appendix 2 – OPF Waste Streams

OPF Waste Streams, Quantities and Final Destinations		
Waste Type	Quantity In Tons	Final Destination
Class 1 Waste		
Mercury lamps	1.3	OOO "Regional Ecological Center of Demercurization"
Class 2 Waste		
Batteries, used non damaged with electrolyte	15	Landfil "Zeleniy Gorod" / OOO "Poligon Tomsk"
Chemical waste - Various	38.2	Landfil "Zeleniy Gorod" / OOO "Poligon Tomsk"
Class 3 Waste		
Filters contaminated by hazardous material	6.3	Landfil "Zeleniy Gorod" / OOO "Poligon Tomsk" / MGUP Promotkhody (Ecocentr) / OOO "Ecoinvest"
Unsorted nonferrous scrap and waste	19.4	OOO "Umitex"
Used oil – various – motor, diesel, transmission, turbine compressor and hydraulic	94	OOO "Grotoil"
MEG residue	12	OOO "Grotoil" / OOO "Ecoshelf"
Sludge from tanks and pipeline cleaning	7.3	OOO "Grotoil" / OOO "Ecoshelf"
Oily rags	12.3	OOO "Grotoil" / OOO "Ecoshelf"
Used oil and air filters	5.6	OOO "Grotoil" / OOO "Ecoshelf" + OOO "Umitex"
Leftover Ethylene Glycol which has lost its properties	78	OOO "Ecotex"
Filters contaminated by MEG	12	Landfil "Zeleniy Gorod" / OOO "Poligon Tomsk" / MGUP Promotkhody (Ecocentr) / OOO "Ecoinvest"
Class 4 Waste		
Other solid mineral wastes (oil products polluted soil. oil polluted sand more than 15 %)	15	OOO "Grotoil" / OOO "Ecoshelf"
Wastes of wood construction materials. including generated from demolition and putting down of buildings	30	Nogliki landfill
Heterogeneous wastes of paper and paperboard	35.5	Nogliki landfill
Welding Slag	0.1	Nogliki landfill
Wastes of hardened polyvinylchloride and foam plastic on basis of PVC	2.5	Nogliki landfill
Wastes of mixtures of hardened heterogeneous plastic materials	8.1	OOO"Loren" / OAO "Uglezavodskije ZhBK" / OOO "Eurika - 2"
Used tyres	44.8	OOO "EcoRTI" / ZAO "CHIR" / OOO "Ecoshina"
Rubber-asbestos wastes (used brake-shoe lining)	1.6	Nogliki landfill
Sorbents not included into other lines (used sorbent polluted with oil products)	9.2	OOO "Grotoil" / OOO "Ecoshelf" / Nogliki / Smirnykh / Korsakov landfills
Wastes from dwellings. unsorted (excluding large-sized)	77	Nogliki landfill
Garbage from domestic compartments of organisations. not sorted out	381	Nogliki landfill

(excluding large-sized)		
Used air filters elements	1.7	Nogliki landfill
Waste from water preparation.	6.0	Nogliki landfill
Wastes (residues) generated during mechanical and biological treatment of sewage waters	359.1	Nogliki landfill
Wastes of hardened poly vinyl chloride and foam plastic on basis of PVC	2.5	Nogliki landfill
Residue generated when sewage waters treatment	6.0	Nogliki landfill
Residue from car cleaning	28.4	Nogliki landfill
Medical wastes	0.1	ISOS Clinic
Broom dust from territory	219.5	Nogliki landfill
Ferrous tare contaminated by painting materials	3.7	OOO "Umitex"
used cartridges for printers	1.3	MGUP Promotkhody (Ecocentr)
Chemical waste	202.4	Nogliki landfill
Water contaminated by hydrocarbons	2690	CRI Well
Carbon filters contaminated by MEG	12.2	Nogliki landfill
Class 5 Waste		
Wood scrap	3.2	Nogliki landfill
Wastes of natural clean wood, unsorted	5.1	Re-use
Absorbent carbon wastes not polluted by hazardous substances	1.0	Nogliki landfill
Broken concrete products. concrete wastes in a lumpy form	25	Re-use
Containers and packing made of lead-coated steel non-polluted that lost consumer properties	0.3	Nogliki landfill
Remains and ends of steel welding electrodes	0.1	OOO "Umitex"
Scrap of ferrous metals. unsorted	165	OOO "Umitex"
Iron barrels that lost consumer properties	10	OOO "Umitex"
Wastes of solid polystyrene. styrene foam or film	1.5	OOO"Loren" / OAO "Uglezavodskije ZhBK" / OOO "Eurika - 2" / Nogliki; Smirnykh; Korsakov landfills
Plastic containers non-polluted that lost consumer properties	2.0	OOO"Loren" / OAO "Uglezavodskije ZhBK" / OOO "Eurika - 2"
Wastes of polyethylene in a form of film	5.0	OOO"Loren" / OAO "Uglezavodskije ZhBK" / OOO "Eurika - 2"
Wastes of polypropylene in a form of debris. molding channels	1.0	OOO"Loren" / OAO "Uglezavodskije ZhBK" / OOO "Eurika - 2"
Wastes of polyethylene terephthalate (including a film on its basis)	3.5	OOO"Loren" / OAO "Uglezavodskije ZhBK" / OOO "Eurika - 2"
Rubber scrap	0.6	OOO "EcoRTI" / ZAO "CHIR" / OOO "Ecoshina"
Snips and patches of fabric. mixed	2.8	Nogliki landfill
Food wastes of kitchens and public catering organisations. unsorted	120	Nogliki landfill
Wastes of insulated wires and cables	0.5	OOO "Umitex"

Appendix 3 – BS2 Waste Streams

BS2 Waste Streams, Quantities and Final Destination		
Waste Type	Quantity In Tonnes	Final Destination
Class 1 Waste		
Mercury lamps	0.018	OOO "Regional Ecological center of Demercurization"
Class 2 Waste		
Batteries, used non damaged with electrolyte	0.4	Landfil "Zeleniy Gorod" / OOO "Poligon Tomsk"
Class 3 Waste		
Ceramics contaminated by hazardous material	0.006	
Filters contaminated by hazardous material	0.47	Landfil "Zeleniy Gorod" / OOO "Poligon Tomsk" / MGUP Promotkhody (Ecocentr) / OOO "Ecoinvest"
Used oil – various – diesel, industrial, transformer (free of halogens), compressor and turbine.	9.67	OOO "Grotoil"
Leftover of diesel fuel that lost consumer properties	5.58	OOO "Grotoil"
Floating film from oil traps (gas traps. sewage units and washing cars)	1.23	OOO "Grotoil"
Residue from tanks and pipeline cleaning	0.59	OOO "Grotoil" / OOO "Ecoshelf"
Oily rags	0.11	OOO "Grotoil" / OOO "Ecoshelf"
Class 4 Waste		
Grit and dust generated from grinding of ferric metal (metal content no less than 50%)	0.012	Smirnykh landfill
Welding Slag	0.013	Smirnykh landfill
Filter not polluted by hazardous materials	1.82	Smirnykh landfill
Slag from natural gas filters and turbine blading section	0.003	Smirnykh landfill
Non contaminated ferric metal dust	0.037	Smirnykh landfill
Garbage from domestic compartments of organisations. not sorted out (excluding large-sized)	1.05	Smirnykh landfill
Wastes (residues) generated during mechanical and biological treatment of sewage waters	1.33	Smirnykh landfill
Residue generated when sewage waters treatment	6.2	Smirnykh landfill
Broom dust from territory	19.2	Smirnykh landfill
Class 5 Waste		
Wood scrap		Local Community/Smirnykh landfill
Waste of packing paper non-polluted	0.25	Smirnykh landfill
Waste of packing paperboard non-polluted	0.25	Smirnykh landfill

Containers and packing made of lead-coated steel non-polluted. that lost consumer properties	0.003	Smirnykh landfill
Remains and ends of steel welding electrodes	0.014	OOO "Umitex"
Scrap of ferrous metals. unsorted	2.5	OOO "Umitex"
Snips and patches of fabric. mixed	0.138	Smirnykh landfill

Appendix 4 – LNG Waste Streams

LNG Waste Streams, Quantities and Final Destination		
Waste Type	Quantity In Tonnes	Final Destination
Class 1 Waste		
Mercury lamps	21.5	OOO "Regional Ecological center of Demercurization"
Used Mercury thermometers	0.005	Landfil "Zeleniy Gorod" / OOO "Poligon Tomsk"
Used absorbent carbon contaminated with sulphinol	190.2	Landfil "Zeleniy Gorod" / OOO "Poligon Tomsk"
Class 2 Waste		
Batteries, used non damaged with electrolyte	7.9	Landfil "Zeleniy Gorod" / OOO "Poligon Tomsk"
Dry charged elements of chemical supply	28.3	Landfil "Zeleniy Gorod" / OOO "Poligon Tomsk" / MGUP Promotkhody (Ecocentr) / OOO "Ecoinvest"
Used filters contaminated by sulphinol	17.8	Landfil "Zeleniy Gorod" / OOO "Poligon Tomsk" / MGUP Promotkhody (Ecocentr) / OOO "Ecoinvest"
Used absorbent carbon contaminated by hazardous material	30.6	Landfil "Zeleniy Gorod" / OOO "Poligon Tomsk" / MGUP Promotkhody (Ecocentr) / OOO "Ecoinvest"
Sorbent contaminated by chemicals	18.8	Landfil "Zeleniy Gorod" / OOO "Poligon Tomsk" / MGUP Promotkhody (Ecocentr) / OOO "Ecoinvest"
Sorbent / Waste water contaminated by chemicals (sulfinol)	812	Landfil "Zeleniy Gorod" / OOO "Poligon Tomsk" / MGUP Promotkhody (Ecocentr) / OOO "Ecoinvest"
Sorbent / Sand contaminated by chemicals (sulfinol)	145	OOO "Grotoil"
Used filters from thermal liquid	9.1	OOO "Grotoil"
Other chemical waste / Used thermal liquid Dowtherm Q	60	Landfil "Zeleniy Gorod" / OOO "Poligon Tomsk" / MGUP Promotkhody (Ecocentr) / OOO "Ecoinvest"
Other chemical waste / Used sulphinol	809	Landfil "Zeleniy Gorod" / OOO "Poligon Tomsk" / MGUP Promotkhody (Ecocentr) / OOO "Ecoinvest"
Class 3 Waste		
Filters contaminated by hazardous material	6.3	Landfil "Zeleniy Gorod" / OOO "Poligon Tomsk" / MGUP Promotkhody (Ecocentr) / OOO "Ecoinvest"
Unsorted nonferrous scrap and waste	19.4	OOO "Umitex"
Used oil – various – motor, diesel, transmission, turbine, compressor and hydraulic.	94	OOO "Grotoil"
MEG residue	12	OOO "Grotoil"
Sludge from tanks and pipeline cleaning	7.3	OOO "Grotoil"
Oily rags	12.3	OOO "Grotooil"
Used oil and air filters	5.6	OOO "Grotoil" + OOO "Umitex"
Leftover Ethylene Glycol which lost its properties	78	OOO "Ecotex"
Filters contaminated by MEG	12	Landfil "Zeleniy Gorod" / OOO "Poligon Tomsk" / MGUP Promotkhody (Ecocentr) / OOO "Ecoinvest"

Class 4 Waste		
Other solid mineral wastes (oil products polluted soil. oil polluted sand more than 15 %)	15	OOO "Grotoil"
Wastes of wood construction materials. including generated from demolition and putting down of buildings	30	Korsakov landfills
Heterogeneous wastes of paper and paperboard	35.5	Korsakov landfills
Welding Slag	0.1	Korsakov landfills
Wastes of hardened polyvinylchloride and foam plastic on basis of PVC	2.5	Korsakov landfills
Wastes of mixtures of hardened heterogeneous plastic materials	8.1	OOO"Loren" / OAO "Uglezavodskije ZhBK" / OOO "Eurika - 2"
Used tyres	44.8	OOO "EcoRTI" / ZAO "CHIR" / OOO "Ecoshina"
Rubber-asbestos wastes(used brake-shoe lining)	1.6	Korsakov landfills
Sorbents not included into other lines (used sorbent. polluted with oil products)	9.2	OOO "Grotoil" /Korsakov landfills
Wastes from dwellings. unsorted (excluding large-sized)	77	Korsakov landfills
Garbage from domestic compartments of organisations. not sorted out (excluding large-sized)	381	Korsakov landfills
Used air filters elements	1.7	Korsakov landfills
Waste from water preparation.	6.0	Korsakov landfills
Wastes (residues) generated during mechanical and biological treatment of sewage waters	359.1	Korsakov landfills
Wastes of hardened poly vinyl chloride and foam plastic on basis of PVC	2.5	Korsakov landfills
Residue generated when sewage waters treatment	6.0	Korsakov landfills
Residue from car cleaning	28.4	Korsakov landfills
Medical wastes	0.1	ISOS Clinic
Broom dust from territory	219.5	Korsakov landfills
Ferrous tare contaminated by painting materials	3.7	OOO "Umitex"
used cartridge for printers	1.3	MGUP Promotkhody (Ecocentr)
Chemical waste	202.4	Korsakov landfills
Water contaminated by hydrocarbons	2690	CRI Well
Carbon filters contaminated by MEG	12.2	Korsakov landfills
Class 5 Waste		
Wood scrap	3.2	Korsakov landfills
Wastes of natural clean wood. unsorted	5.1	Re-use
Absorbent carbon wastes not polluted by hazardous substances	1.0	Korsakov landfills
Broken concrete products. concrete wastes in a lumpy form	25.	Re-use

Containers and packing made of lead-coated steel non-polluted. that lost consumer properties	0.3	Korsakov landfills
Remains and ends of steel welding electrodes	0.1	OOO "Umitex"
Scrap of ferrous metals. unsorted	165	OOO "Umitex"
Iron barrels that lost consumer properties	10	OOO "Umitex"
Wastes of solid polystyrene. styrene foam or film	1.5	OOO"Loren" / OAO "Uglezavodskije ZhBK" / OOO "Eurika - 2" / Korsakov landfills
Plastic containers non-polluted that lost consumer properties	2.0	OOO"Loren" / OAO "Uglezavodskije ZhBK" / OOO "Eurika - 2"
Wastes of polyethylene in a form of film	5.0	OOO"Loren" / OAO "Uglezavodskije ZhBK" / OOO "Eurika - 2"
Wastes of polypropylene in a form of debris. molding channels	1.0	OOO"Loren" / OAO "Uglezavodskije ZhBK" / OOO "Eurika - 2"
Wastes of polyethylene terephthalate (including a film on its basis)	3.5	OOO"Loren" / OAO "Uglezavodskije ZhBK" / OOO "Eurika - 2"
Rubber scrap	0.6	OOO "EcoRTI" / ZAO "CHIR" / OOO "Ecoshina"
Snips and patches of fabric. mixed	2.8	Korsakov landfills
Food wastes of kitchens and public catering organisations. unsorted	120	Local farmer / Korsakov landfills
Wastes of insulated wires and cables	0.5	OOO "Umitex"

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