



## **MONITORING, SURVEYS, & INVESTIGATIONS**

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- ☑ **ENVIRONMENTAL AND SOCIAL MONITORING**
- ☑ **BASELINE SURVEYS**
- ☑ **PHASE I AND II SITE INVESTIGATIONS (HSE AND SOCIAL DUE DILIGENCE)**
- ☑ **PRE-AQUISITION AUDITS**
- ☑ **LENDER ESAP IMPLEMENTATION MONITORING**

# About EcoSocio Analysts

Established in 2014 EcoSocio Analysts LLC (ESA) is a successor of CaspiEcology Environmental Services formed in 2001. We provide full spectrum of health, safety, environmental and socioeconomic services including HSE due diligence, impact assessment, management systems and monitoring; stakeholder engagement, information disclosure, resettlement and livelihood restoration, contamination assessment, cleanup, revegetation and waste management. We communicate and produce reports in the required language be so the English, Russian or Kazakh.

Our blend of western education with local experience has allowed us to provide commendable work for the international lending organizations like the EBRD, ADB, IFC, AIIB and HSBC and the companies that apply for their loans or for listing on the London Stock Exchange. When we lack specific experience for a project we join with our long-term partners from UK, Germany, Denmark, Italy, Spain and other countries as well as contract international free-lance experts. This allows us to accumulate experience in practically all industrial sectors present in the Central Asia despite specialisation on the international investors.

See [www.EcoSocioAnalysts.kz](http://www.EcoSocioAnalysts.kz) for **Statement of Qualifications**.

**ESA is licensed to conduct audits and present and defend its finding in a Kazakhstan court of law.**

## MONITORING AND BASELINE SURVEY EXPERIENCE



ESA staff have conducted 231 projects in various economic sections most of them according to the internationally recognised methodology: Oil & Gas (63); Energy (55); Transport (34); Property (35); Manufacturing (17); Infrastructure (12); Mining (12); Tourism (4); Agriculture (2) and Forestry. For the international financing organisations such as IFC, ADB, AIIB, HSBC and EBRD with its financial intermediates, it completed independently 2 Category A projects and 57 Category B projects and with the international partners managed the local part of 9 Category A projects and 21 Category B projects

## WHY MONITOR?

Most project co-lenders to include host governments want to be sure a project is in compliance with environmental issues as presented in the project's EIA and the laws of the country. These issues are further specified in detail in an Environmental Management Plan (EMP) (also called an Environmental Action Plan or EAP) which describes the technology and methodology used to monitor the actual environmental and social impacts of the project. In order to ensure the objects of these plans are met, monitoring is required which consists of collecting information on e.g., biological resources and ambient conditions and/or the projected effects on people.

These data must be submitted in quarterly or annual reports which are then evaluated by the appropriate lending and governmental authorities.

## WHAT DOES ENVIRONMENTAL MONITORING INVOLVE?

EM involves the collection of measurements that may be used to assess the condition of a selected area. The goals, strategies of collecting samples, and methods used to analyze must be defined in advance. This requires formulation of a sampling plan that considers the environment to include the chemical, physical, and biological variables and process involved. Essentially EM involves having a purpose, deciding on an objective and formulating an approach.

## WHAT DOES SOCIAL MONITORING INVOLVE?

SM involves the collection and measurement of data obtained from people by various methods such as group meetings and house-to-house interviews. Responses are recorded over a period of time that reflects people's reactions to new environmental developments that affect them and their way of life. Efforts are normally made to provide equal or better conditions than previous existed to those people potentially affected by the new developments such as the building of a factory nearby a living area. Residences relocated to other locations can be subjected to international banking regulations like the Equator Principals as well as local laws and regulations. This promotes extended monitoring procedures.

## WHAT SITES, SHOULD POTENTIALLY BE MONITORED, FOR WHAT PARAMETERS AND HOW?

### ENVIRONMENTAL MONITORING

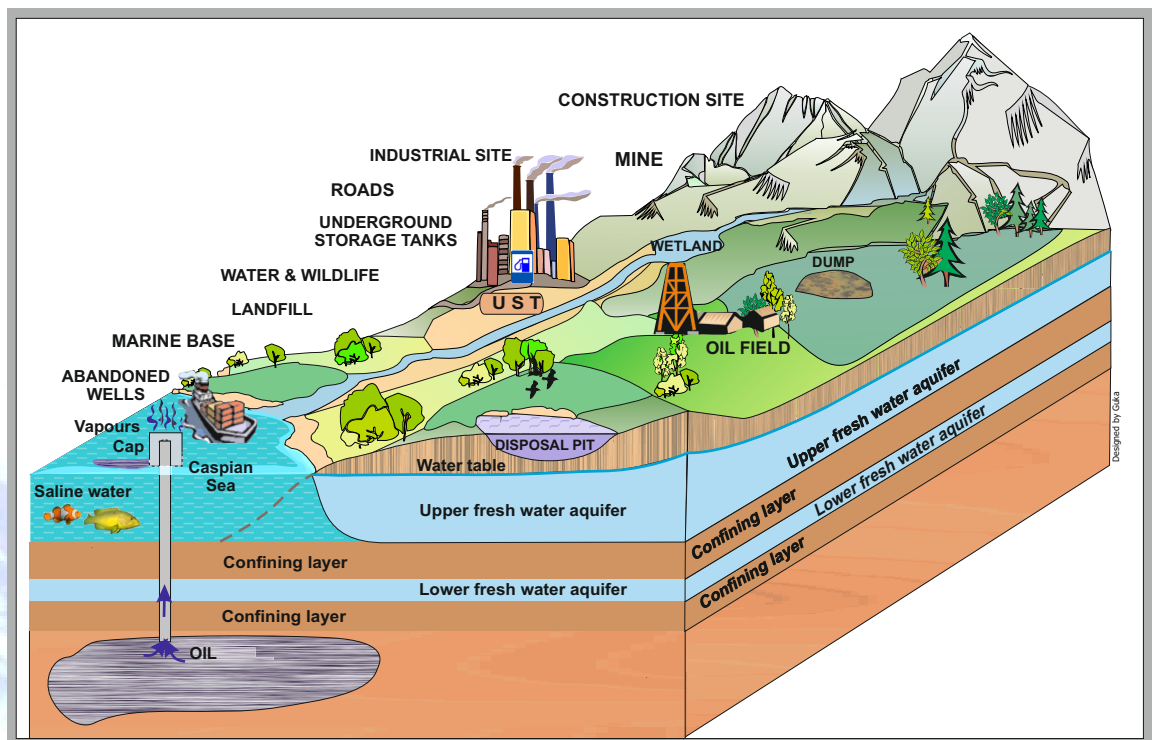
- Dredging
- Vehicle Operation
- Underground Tanks
- Abandoned Wells
- Roads
- Construction Sites
- Oil Fields
- Mines
- Unlined Disposal Pits
- Landfills
- City Development

- Air
- Water
- Noise
- Wastewater
- Wastes
- Soil
- Flora
- Fauna
- Radiation

### SOCIAL MONITORING

- Public Meetings
- Stakeholder Interviews
- Questionnaires
- Grievance database
- Internet Forum
- Coordination Activities

- Stakeholders
- Homeowners
- Public Groups
- Government Bodies
- Businesses



Environmental Monitoring checks the EIA evaluation of impact significance and effectiveness of the applied impact mitigation measures

## VARIOUS INVESTIGATIONS IN KAZAKHSTAN 2001 - PRESENT

	Air	Noise	Surface Water	Groundwater	Soil	Vegetation	Animals	Waste	Social
Ports and Harbours	●	●	●	●	●	●	●	●	●
Oil Fields	●	●	●	●	●	●	●	●	●
Mines	●		●	●			●	●	
Agribusiness		●		●	●			●	
Roads and Pipelines	●	●			●	●		●	
Energy Generation	●	●	●	●			●	●	
Chemical Industry	●		●	●			●		
Ferrous (Steel) Indust	●	●	●	●			●	●	
Plants/Factories	●	●		●			●	●	
Property Development	●	●	●	●			●	●	
Urban Development	●	●	●	●			●	●	
Traffic	●	●		●		●		●	
Resorts Development	●	●	●	●			●	●	
Cleanup/Remediation			●	●	●		●		
Landfills and Dumps	●		●	●			●	●	
Underground Tanks			●	●			●		
Abandoned Wells	●		●	●		●	●		

## VARIOUS INTERNATIONAL INVESTIGATIONS PERFORMED BY ECOSOCIO ANALYSTS STAFF 1987-2004

- Landfill: Shenyang, China, Environmental Protection Bureau: hydrological evaluations;
- Paper Factory: Mexico, Azipaco; groundwater monitoring well installation.
- Air Force Base (Russian): Hungary, investigation strategy;
- Steel Plant: Russia, investigation;
- City Area: Germany, Hamburg, groundwater monitoring;
- Oil Refinery: Bahamas, Freeport, investigation strategy;
- Oil Field: Russia, evaluated environmental issues, 1,300 production wells;
- Mines: Israel and Finland, sampling;
- Coal Mine: Russia, investigation.

## VARIOUS INVESTIGATIONS PERFORMED IN THE USA BY CASPIECOLOGY STAFF 1987-2001

- Burn Pits: Virginia for the USEPA Region 3 ARCS Program (Superfund Site), PCBs, Metals, VOCs.
- Abandoned Wells: Pennsylvania for the USEPA Region 3 ARCS Program, H2S, VOC air sampling.
- Landfill: New York for the New York State Dept. of Environmental Conservation (NYSDEC), groundwater, leachate, air, monitoring-well installation, sampling.
- Board and Paper Factory: New York for the NYSDEC, PCB-Contaminated Site, monitoring wells, seismic, electromagnetic, magnetometer surveys, sampling surface water, soil sediments, aquifer testing.
- Scrap Metal Yard: New York for the NYSDEC, PCBs, metals and VOCs.
- Plating Factory: New York for the NYSDEC, Metals.
- Unlined Disposal Pits: New York (Love Canal) for EPA (Superfund Site) and NYSDEC soil sampling, dioxin, assorted chemicals.
- Unlined Disposal Pit: New York, US Department of Defense, Army Corps of Engineers, Superfund Site.
- Groundwater: California Norton Air Force Base, monitoring well sampling, geology.
- Nuclear Waste Landfill: New York, radioactive and mixed waste, geology.
- Gas Transmission Pipeline: New York & Connecticut, radon, tectonic activity, groundwater, public health concerns.
- Brass Factory: New York, processes, contamination, environmental improvements.



Soil impact monitoring near Caspian Sea wetlands area



Marine base construction noise monitoring

## ENVIRONMENTAL AND SOCIAL MONITORING OF ATASH MARINE BASE, BALKHSHI, A CASPIAN REAL ESTATE SUBSIDIARY, 2007-2010

Monitoring was conducted to validate the predicted by EIA impact significance and the applied impact mitigation measures effectiveness. It is subjected to assurance review through a series of internal and external audits. The observations are recorded and reported and corrective actions issued for any non-compliance. Key performance indicators have been developed for the targets and objectives set. The monitoring included the following:

### 1. OPERATIONS CONTROL:

- Compliance with the company's and EBRD policies and RoK legislation
- Progress against internal environmental objectives and targets;
- Correct operation of the sewage treatment facilities; and
- Correct disposal of process wastes.
- Dredging and sediment transport into the reclaimed for the base area;
- Vehicle operation along the 8.2 km road from a limestone quarry;
- Heavy equipment operation at the base and quarry;
- Recruitment, supply sourcing and contract selection; and
- Interactions with the local authorities and the public.

### 2. MONITORING

- Sea water quality;
- Sea bottom sedimentation and sediments quality;
- Sea bottom invertebrates conditions;
- Coastal sedimentation and erosion;
- Revegetation of damaged land;
- Air quality and
- Near-shore currents.

### 3. PERMITS AND REPORTS

- Emission Permit;
- Permit to reduce the sea water protection belt at the base;
- Approval of the operational control plan and the impact mitigation measures plan implementation reports and the plans for the next year;
- Quarterly operation control reports including air emissions (hydrocarbons, Nitrogen oxide, sulphur dioxide, carbon dioxide and soot), noise, vibration, dust and waste disposal.



Groundwater well purging to obtain representative sample



Construction air pollutants tracing



Sea bottom impact monitoring

## GROUND CONTAMINATION, GEOTECHNICAL SURVEY AND CLEANUP PLAN IN DIFFICULT WETLAND CONDITIONS FOR THE CONSTRUCTION OF THE AGIP NORTH CASPIAN BASE



Logistically challenging work that involved placing nearly 100 boreholes to a maximum depth of 5m in reed choked and water-surge wetlands around the parameter of the Caspian Sea. Portable, non-destructive to the environment, percussion drilling methods were used. Study included:

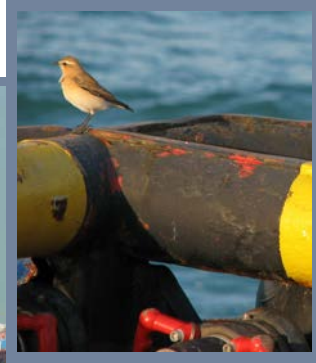
- Ground sampling using the American Society for Testing and Materials (ASTM) standards including field QC procedures;
- Samples analysis for petroleum hydrocarbons, metals, PCBs and radionuclides with in-laboratory verification;
- Analysis of cleanup options with selection of equipment and cost estimation.

## THE NORTH CASPIAN SEA SEAL MONITORING for AGIPKCO

For 4 years ESA specialists together with Rybovod LLP (Russia) performed this twice-yearly study (on icebreaker in the winter and helicopter in the summer) designed to assess Agip KCO impact on seals. The study included: assesment of whelping habitat, female barrenness and the level of chlorine-organic pesticides, heavy metals, and petroleum hydrocarbons in the seal's tissue.

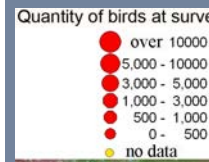


### Birds monitoring during the AgipKCO offshore platform wells testing



## THE NORTH CASPIAN SEA BIRDS MONITORING for AGIPKCO

For 4 years ESA specialists conducted twice-yearly helicopter birds observations along the North Caspian Sea coastline to evaluate Agip KCO impact on birds. The methodology was thoroughly designed to enable viable comparison of data with the previous observations.



## MONITORING IMPACT OF AGIPKCO ONSHORE INFRASTRUCTURE

The English-speaking field team maintained extended cooperation with the client to handle unrecognized field conditions which ensured compliance and integration with data from previous surveys and at the same time allowed the program to be improved. All objectives of the Sampling and Analysis Plan were met within the specified time and budget limits. ASTM standards were used to obtain representative samples and avoid cross contamination.

## MEDEU-SHYMBULAK PRE-GONDOLA AIR QUALITY AND SNOW CONTAMINATION MONITORING

The developed in cooperation with Kazgidromet (Almaty) survey was conducted for 3 years three times a year when the valley is most occupied (spring, autumn and winter). For 15 days air was analysed for NO<sub>x</sub>, SO<sub>2</sub>, CO, dust, Pb and the snow for acidity, salinity, sulphates, chlorides, nitrates, hydrocarbonates, ammonium, sodium, potassium, magnesium, calcium, and heavy metals.





## MEDEU-SHYMBULAK SKI RESORT RECONSTRUCTION CONTROL

**Client: Capital Partners LLP**

The daily environmental control of the construction contractors operation included monitoring of air and water quality, erosion, waste, noise, dust as well as adherence to the contractors contractual obligations and overall compliance.

## AMBIENT NOISE SURVEY FOR A SCHOOL AND COTTAGE ESTATE

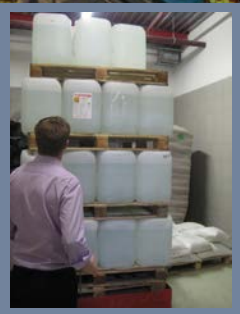
**Client: Capital Partners/Park Development LLP**

Noise data was monitored continuously over day, evening and night conditions between the proposed site for an international school and an upmarket cottage estate construction and the busy Al-farabi Avenue (Almaty). The results were used to determine appropriate sound insulation for the buildings.



## EBRD ESAP IMPLEMENTATION MONITORING

Together with Arup specialist ESA specialists assessed EBRD Environmental and Social Action Plan implementation at four Almaty based Beverage Producing Plants Efes, Carlsberg, Coca-Cola and RG Brands (Pepsi-Cola).



## SOCIAL IMPACT MONITORING

Public meetings, focus groups and individual interviews, door-to-door opinion surveys, internet forums, information board drop box and other feedback collection strategies were used to monitor social impact for a variety of projects that spanned from 1 to 18 months:

- Medeu & Chimbulak **Mountain Resort**;
- Atash **Marine Base** construction and Atash village resettlement
- McDermott **Fabrication Yard**;
- Halliburton **Mud Plant**;
- Opornayagas **Compressor Shop No. 4**;
- Shevchenkovskaya Ferronickel **Mine and Smelting Plant**;
- Satimola **Barite Mine**;
- Ravninnoye **Oil Field**.



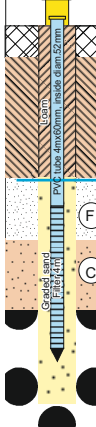
## BLOOD-SUCKING INSECTS MONITORING for AGIPKCO

For 3 seasons blood-sucking insects were monitored around Agip KCO Bautino Base. The program was designed to account for the insects' biology and life cycle. ESA specialists developed recommendations for sustainable reduction of insects attacks on the Agip KCO personnel and ensured that the insect dependent birds were not affected by the suggested reduction.



Sampling for contamination to 5m depth at an old petrol station

### Monitoring well passport

Profile	Depth interval, m		Thickness, m	Description	Sampling interval, m
	From	To			
	0.0	0.7	0.7	Decayed domestic garbage with loam	
	0.7	3.2	2.5	Brown hard loam	
	3.2	4.5	1.3	Brown fine moist middle-density sand	GW-2-1
	4.5	6.0	1.5	Brown coarse water saturated middle-density sand	GW-2-2 GW-2-3
	6.0	8.75	2.75	Pebble with up to 5-10 % of boulder in the matrix of medium to coarse water saturated sand with sand and clay sand interbeds	GW-2-4



Finished wellhead

German made PVC pipes were used with 0.2mm filter slots inachievable in conventional monitoring wells

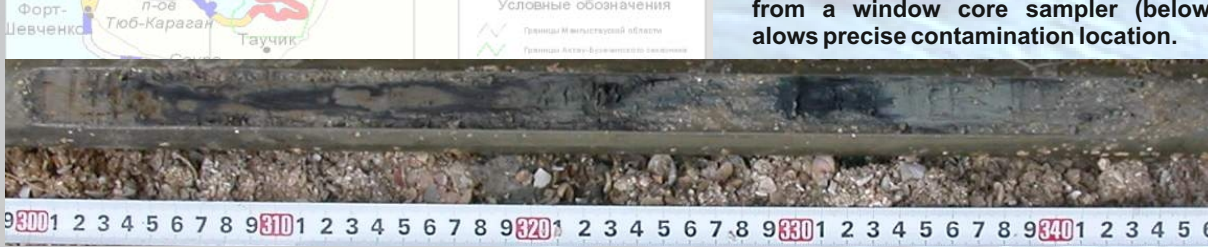


Sampling of ground contamination with minor disturbance to wildlife in the Ural Delta wetland nature reserve was only possible using window sampling method.

Ground sampling in an open pit (right, lines show intervals of each sample) and from a window core sampler (below) allows precise contamination location.

## CASPIAN COAST CONTAMINATION SOURCES INVENTORY

included examination of over 1000 km of Caspian Sea coastline and up to 500m offshore; mapping and use of GPS and GIS; priority and liquidation methods for each source and cost calculations for contamination removal.



## ABANDONED OIL WELLS ASSESSMENT AND MONITORING

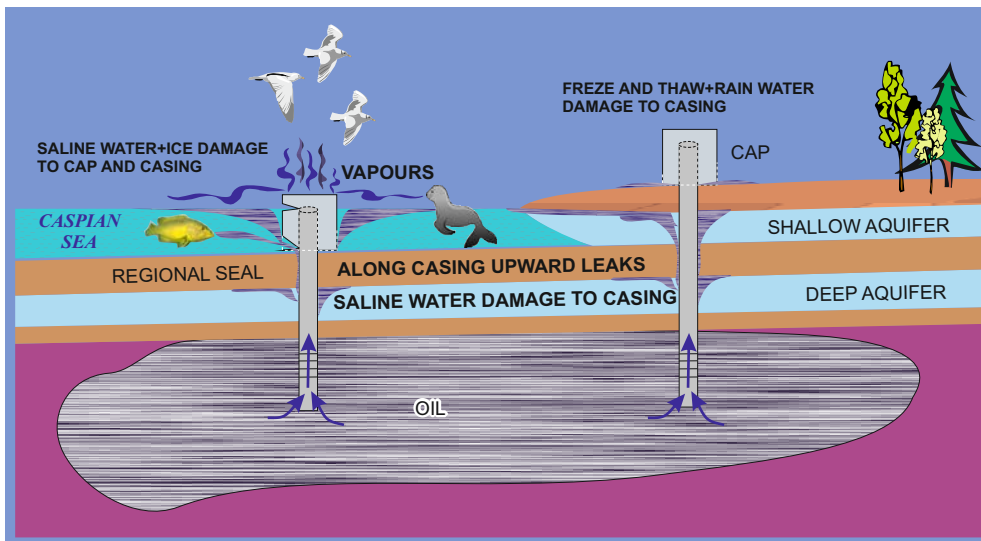
The status of abandoned wells is to be monitored (The Ecological Code, Article 220.1-11 and Article 268.2 and Kazakhstan governmental decree # 676 On National Oil Spills Prevention and Response Plan on the sea and inland water reservoirs of the Republic of Kazakhstan. 22.08.2007, Sections 4.2.2, Measures on preparedness to oil spills, and 9.3 Oil spills liquidation finance support).

The wells need to be sealed carefully to prevent pollution of associated ground and surface water and air. The most widely know abandoned well problems in the Central Asia are associated with the rising levels of the Caspian Sea.

It is estimated that over 2,500 oil wells near the shores of the Caspian Sea are in danger of flooding and some 15 abandoned oil fields already lie beneath the rising shallow waters in the Caspian flood zone. Several of these wells have already been reported as leaking oil into the Caspian Sea. To date no comprehensive inventory of the flooded wells has been taken and monitoring has not been carried out to determine the condition of the wells.



Environmental Assessment



**Desktop Study:** ESA will perform desktop searches, contact organizations, and amalgamate all available well data into a summary report. These data will include available information on well coordinates, construction, sealing efforts, groundwater levels, depth, associated infrastructure, effect on the environment and the owner/operator associated with the well. All information will be presented in data base fashion with an accompanying summary report.

### Well Property window in GIS database of abandoned wells.

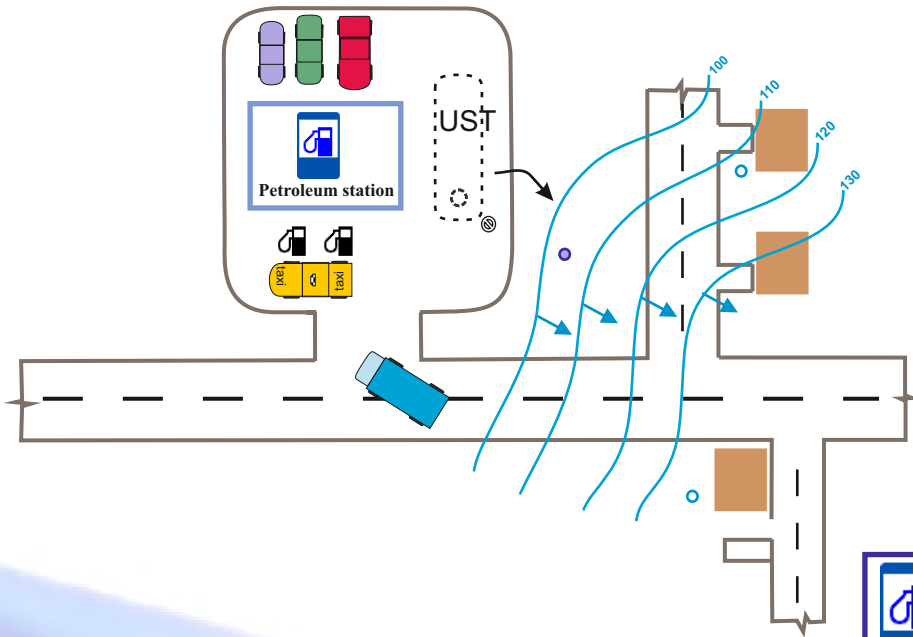
Properties of Pollution Source # 35	
Name of Pollution Source	Abandoned well
Information Source	Mangystau EPA
Year of Commissioning	1971
Year of Decommissioning	1989
Owner	Not Known
Location	Just offshore 4897455 Lat. 9652380 Long.
Condition	Minor leakage, no gas vapour
Environmental Impact	
Water	Low
Soil	N/A
Air	Negative
Pattern	Visible
Notes	No data on well construction Current condition: poor Should be plugged, possibly pulled
Contamination Volume	1-5 liters/day
Kind of Contamination	Oil
Number of Sources	One
Priority	2










**Data Gap Investigation:** ESA will provide all possible information not available from the desktop study. This effort may include new location aerial surveys and visual inspection of the abandoned wells. Physical measurements using gas detection meters will be taken to help determine well integrity. Each well will be categorized into actions to be taken such as "not essential to be plugged", "should be plugged", and "must be plugged".

**Abandonment Procedures:** The principal objective of sealing abandoned wells is to restore, as far as possible, the original hydrogeologic conditions and therefore not adversely effect the environment. Given that abandonment methods differ and in most cases cost is a strong consideration, ESA will work with the selected well contractors to ensure that all objectives are met within expected costs.

## MONITORING UNDERGROUND STORAGE TANKS

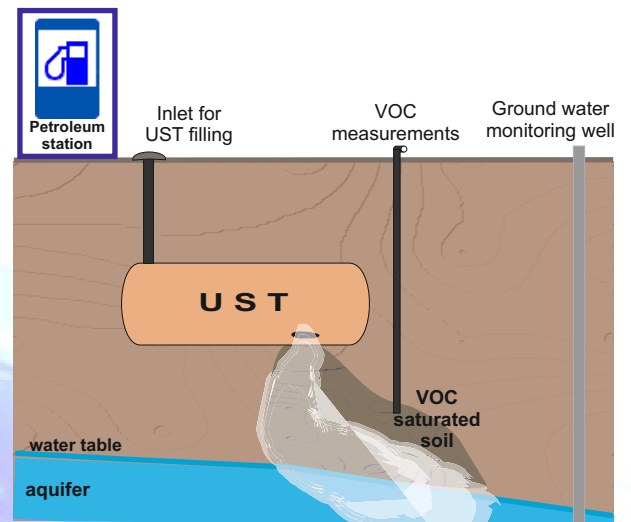
Most underground storage tanks (UST) in the Central Asian region were emplaced 10 years or more ago during the Soviet era and made of bare steel with no cathodic corrosion protection. Many of these tanks are found at the over 4,000 petrol stations found in the RoK. If they are leaking, then benzene, a naturally occurring chemical found in petrol, may find its way into the ground water system and this can presents a significant risk to human health. About 4-liters of petrol can contaminate 3-million liters of drinking water.



-  Monitoring well
-  Domestic water well
-  Direction of ground water
-  Houses
-  Ground water depth from surface
-  Petrol leakage from underground UST
-  Shallow borehole to measure fuel vapor concentration in soil
-  Inlet for UST filling
-  UST

## ASSESSMENT PROCEDURES

EcoSocio Analysts *discreetly* performs a 3-tier, cost-conscious, sequence of steps to determine the integrity of USTs and their remediation. Each step is discussed with the client and procedures are agreed upon.



Visual Inspection of the UST and surrounding area, review company records, and identify the proximity of those that may be affected. Present a short report and advise the owner if additional efforts are required.

Technical Investigation includes sampling of domestic water and available sources potentially affected, hydrogeological study to detect migration direction, and to determine extent and amount of fuel and fuel vapor underground by percussion punching of monitoring holes down to 10 metres deep. A report is provided and, if required, a mitigation plan.

Oversight of cleanup and final site report, establishment of monitoring conditions and a database enabling the owner to track future measurements for official use.



## European Bank

for Reconstruction and Development

EBRD (Senior environmental advisor)

- 1) What a heroic effort turning this around so quickly, thanks!!
- 2) "...As a result of our meeting, the references you sent about the experts and my review of the Atash Marine Base EIA. I can say there will not be a need for a Gap Analysis by an external party."
- 3) "I am very pleased to hear that you will be monitoring the project implementation. As I have always said I had been very pleased with the quality of your work and your cooperation during the EDD. I hope our close relation will continue during the implementation stage."
- 4) "I reviewed the Resettlement Action Plan... you have done a very good job on it!".
- 5) "The overall quality of the work done is very good. Nicely written in a concise manner, but without omitting important details."



## Ministry of Environmental Protection Office, Kyzyl Orda (Head of the State Environmental Expertise)

"We would like to note the high professionalism and quality of the project and analytical data of the prepared **cleanup and recultivation plan**. The

cleanup methods screening, accounting for all positive and negative aspects and the cost-benefit analysis for each screened method particularly impressed me. I hope that the **diligence and professionalism of your specialists will serve for the welfare of our Republic and the health of the people of Kazakhstan**. Thank you."

## Regional Center in Central Asia (CAREC) (Director)



"...thanks for your cooperation and support of sub-regional seminar on **"Strengthening of the Central Asia countries potential in the Assessment of Environmental Impact in transboundary context"**. Your contribution has made the seminar useful in a practical manner.



## Price-WaterhouseCoopers (Project Manager)

"... very pleased with **Assessment of Risk from Environmental Regulations** you did..." The work was used for technical assistance to three major Kazakhstan banks that were reviewed by EBRD as financial intermediary.



## Datoba Construction LLP (Director)

"We appreciate the special effort you put into its work, its ability to communicate and respond to the particularly demanding issues associated with construction work. Datoba is **happy to include you in all our related work** from extensive **high-level international projects for companies like McDermott and Halliburton** to projects associated with local construction firms and related laws and regulation of Kazakhstan."



## ILF GmbH (Senior Consultant)

"Thank you for the fine preEIA for the **Crude Oil Pipeline Kenkiyak-Atyrau** (which) is very impressive with special regards to the data collected, the evaluation of the results... and the professional interpretation and handling of the environmental issues addresses. To **accomplish** such work in the **short period** available denotes the **highest praise**."



## THE World Bank (Lead Economist and Lead Energy Specialist)

"...We appreciate the significant progress that has been made in a **pilot cleanup and oil recovery** (under the Uzen oil field rehabilitation project loan supported by the government of Kazakhstan) and note that it is in keeping with the Bank's policy of sustainable development and promotion of social development."



## Agip KCO OKIOC(Agip KCO) (HSE Manager Greg Cresswell)

"... prepared for the MENR the **Review of the North Caspian Sea Exploration Project EIA** is a very constructive tool for implementing exploration drilling. Because of the **exceptional quality** and usefulness of this product, OKIOC accepts and



## UzenMunayGas (Environmental Project Coordinator)

"Together with Ecology & Environment, Inc (USA) your team did a superior job in completing an **environmental audit** on a portion of the Uzenmunaigas oil field that was significantly complex in nature and contaminated from variety of sources. I understand the regional environmental authorities proclaimed it to be **'...the best environmental study they have ever seen'**. Professional work of this nature deserves to be complemented and I am happy to do



## ENVIRON Environ, UK (Senior Consultant)

"I am very happy indeed with you helping in audit of **2 oil terminals, 2 oil fields and a chemical plant** and will always contact you when we get future projects in Kazakhstan... **EBRD sounds delighted** with our tenacity."



## ATKINS WS Atkins (Associate Water and Environment)

"I would like to thank you for all your efforts in undertaking the **audit** and generating the report, which was **received very well by EBRD**. It was an **achievement to meet the very tight timescales** on this one."



## Roxi Petroleum (COO)

"**Great job!** The **due diligence** reports you compiled on each of seven of our oil fields **met all requirements of the Alternate Investment**

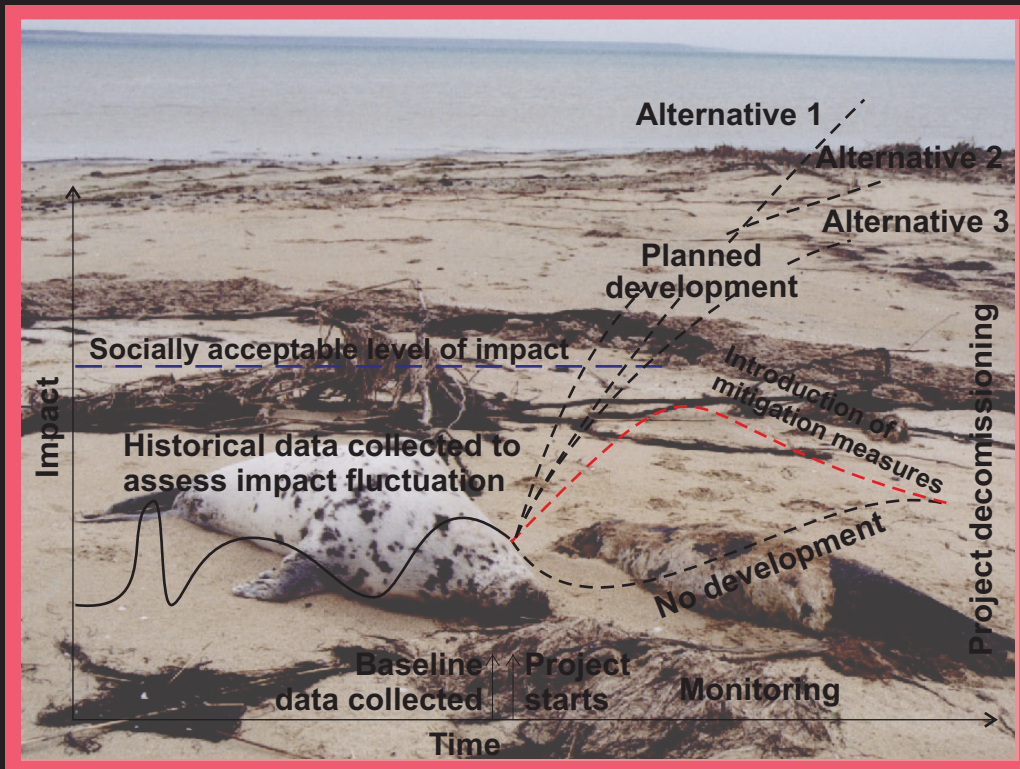
**Market (AIM) as well as our investors**. The **ESIA** was equally appreciated by our team as is your oil field **microbiological remediation** efforts. We hope we can continue to work with you into the future."



## Balykshi, a subsidiary of Caspian Services (Director)

"Thank you for providing continuous and **very reliable services** to our development company for the past two years. Your ability to solve problems, work with local people and organizations like the European Bank of Reconstruction and Development (EBRD) is commendable. We hope we will be able to work together for many years to come."

**WHAT NEXT?**  
Call us for help with your Environmental  
Monitoring problems



**Illustration of impact severity prediction  
and impact verification monitoring**

See [www.EcoSocioAnalysts.kz](http://www.EcoSocioAnalysts.kz) for Statement of Qualifications and other brochures:

- Socioeconomic Assessment and Stakeholder Engagement
- Contamination Assessment and Remediation
- Civil and Industrial Construction
- Environmental Management
- Energy and Energy Sources

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