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| ECOSOCIO ANALYSTS LLC EXPERIENCE |

EcoSocio Analysts 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.

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| **ENVIRONMENTAL AND SOCIO-ECONOMIC IMPACT ASSESSMENTS AND ANALYSES** |

**98. ENERGY *Environmental and Social Assessment for Phase 3 of the Wind and Solar Plants with Battery Storage Tender Preparation for EBRD with GOPA Intec. Uzbekistan.*** Ongoing.

**97. MANUFACTURING *Aktau Special Economic Zone Logistical Base Environmental and Social Assessment for Lianyungang Asia-Europe Belt Road Supply Chain Base Co., Ltd and Eurasia Supply Chain Aktau LLC. 2022*** This EBRD funded project involved development of a high capacity continuous supply chain between the Chinese port on the Yellow Sea in Lianyungang and the Caspian Sea port in Aktau as well as assembling and manufacturing products in the Aktau Port Special Economic Zone. The work involved ambient noise, ionising radiation and traffic surveys and assessment of the adjacent housing estate occupied mainly by the expatriates from Turkmenistan who initially opposed the project but grew more neutral in the course of the interviews and group discussions.

**96. ENERGY *Mirnyy 1GW WPP Environmental and Social Constraints Assessment for Total-Eren, 2022.*** Two sites of 189km2 have been assessed for constraints and cameras with machine learning bird recognition system were suggested for installation on this large area birds to fill the gaps in the available data. The system can also be used during the WPP operation to stop the blades rotation on a targeted bird approach.

**95. ENERGY *Giperboreya Wind Power Plant 50MW Environmental and Social Impact Assessment for Giperboreya LLP***. ***2022***. After the WindPro® model showed that the shadow flicker impact exceeded the IFC Environmental, Health and Safety Guidelines for Wind Energy, measures to bring the project in compliance were developed. They included the turbines siting, key houses assessment after commissioning, households feedback collection, automatically feathering blades on a signal from the sun detector and planting evergreen trees at the houses that are still affected.

**94. ENERGY *Almaty Combined Heat and Power Plant 2 Modernisation for EBRD with Tractebel. 2022.*** Within the preliminary Green Economy Transition assessment in line with the EBRD GET Handbook, the team analysed of gaps in the existing detailed design and EIA, prepared the environmental and social action plan and stakeholder engagement plan and helped Samruk Energy with their implementation. The ESA environmental engineer mapped heat and power distribution network, gathered statistics on household sizes, structure of consumer groups, expected economic growth by sectors that may affect heat/electricity demand, forecasted demand for thermal and electrical energy until 2060 and identified historical, current and planned tariff schemes for various renewable energy sources.

**92-93. ENERGY *Borey 230MW and Energotrust 50MW Wind Power Plant through the year birds migration, bats and animals survey and Environmental and Social Impact Assessment for Sungrow. 2021-2022.*** As the projects were planned to be financed by EBRD, the monitoring and prediction of birds mortality was conducted according to the Scotish Natural Heritage (SNH) Methodology 2017 and SNH Guidance 2000. Visual, noise and shadow flicker impacts were predicted with the help of the WindPro® software. Some turbines were removed and others moved to bring the project in compliance with the IFC EHS Guidelines for Wind Energy on shadow flicker time limits. A corporate social responsibility program was introduced to ensure that the local community benefit from the project.

**91. ENERGY *Zhongar Wind Power Plant Summer-Autumn and Spring Migration Survey and Environmental and Social Assessment for Sungrow, 2021-2022***.It took three seasons of day-long weekly monitoring using the Scotish Natural Heritage (SNH) Methodology 2017 to disapprove the common perception that massive birds migration occurs through the Zhongar Gates. The birds appeared to avoid the Gates gusty winds by descending to the lakes east of the Gates from the mountains. Mortality calculated using the SNH Guidance 2000 was well below the industry statistics.

**89-90. ENERGY *Khromtau 100MW and Ekibastuz 50MW Wind Power Plants Environmental and Social Assessment for Transnational Company Kazkhrom JSC and Energy Resources Group, with Gopa/Intec. 2021***. Despite that the plants were set near the mining water bodies where protected species of birds were recorded, study of the flights patterns suggested little use of the blades rotation area with the estimated according to the SNH Guidance 2000 mortality figures being below the industry statistics.

**86-88. ENERGY *Renewable Energy Auctions Support for EBRD with Gopa-Intec, 2020-2022.*** After assessment of constraints for 7 potential windfarms locations in Kostanay, Ekibastus, Karaganda, Zhezkazgan and Arkalyk areas, environmental and social impact was assessed for 3 sites selected for the first wind energy auction in Kazakhstan. The team of ecologists, engineers and lawyers identified all the risk to an auction winner and attempted to reduce them to ensure the lowest possible price of produced be the windfarm power.

**85. INFRASTRUCTURE *Kazakhstan Wastewater Treatment Plants Reconstruction and Modernisation for EBRD with SWECO. 2020-2021***. Feasibility study and ESA of 5 WWTPs modernisation included detailed socio-economic assessment and the water use and discharge dynamics in Karaganda, Aktobe, Kapshagay, Ridder and Ayagoz cities, in which challenges varied from the weekend tourists influx and sewage seepage into the lake in Kapshagay to the risk of treated sewage retention dam breakage in Aktobe.The team of the engineers, economists, layers, ecologists and sociologists worked in close interface to resolve the existing constraints to improvement and to bring the operations in compliance with the EBRD ESP 2019 requirements.

**82-84. ENERGY *Zhanatas 100MW Wind Power Plant Through the Year Wildlife Survey, Environmental and Social Assessment and the Financing Banks (EBRD and AIIB) action plans implementation for China Power International Development (SPIC), 2019-2022***. The plant stretched 23km along two edges of a highland plateau with multiple IIBC – VIIIAD burial mounds and several land plots that were rented by the local farmers for pasturing. The mounds that could be affected by the construction were properly excavated. Several communities of 3 endemic protected flowers were deliniated and measures developed to reduce impact on them during construction. After completion of the assessment, ESA prepared and implemented the plans for bringing the project in compliance with the banks requirements and build the Company and EPC contractor EHS and social capacity. Among the tasks were helping with the **benchmarking, negotiation and compensation the farmers for the acquired land and** **birds mortality survey** and methodology development.

**81. ENERGY *Zhanakorgan 10MW Solar Power Plant Environmental and Social Assessment for EBRD, Kyzylorda Region, 2019.*** Risk of mortality of birds that flew daily from two water reservoirs to the Syrdarya River over the plant site due to the ‘lake effect’ of the panels was evaluated. Procedures for involving local women in the plant construction and operation was developed. The connecting powerline was asked to be moved to the road right of way by this avoiding impact on the land users.

**80. ENERGY *Zhangiz 50MW Solar Power Plant Environmental and Social Assessment for EBRD East Kazakhstan Region, 2019.*** To identify impact of the land withdrawal, traditional daily pasturing patterns of three herds were studied and data collected on changes in the patterns through the year and the livestock numbers and composition with time.

**79. TRANSPORT *Atyrau Bypass ESIA for EBRD with WSP, 2019.*** The bypass crossed the Ural River and required restoration of livelihood of multiple land owners and users. The ESA team interviewed the affected parties and updated the local requirements to the project.

**78. TRANSPORT *Atyrau-Astrakhan Road ESIA for EBRD with WSP, 2018, 2019.*** The main challenge was to minimise vehicles collision with unattended livestock that frequently crosses the road in the day and at night in search of sparse fodder. The livestock count and crossing points were inserted into Google Earth project together with the road project components for further analysis and identification of mitigation measures.

**77. ENERGY *Akadyr Solar Power Plant Environmental and Social Assessment for EBRD, 2018.*** The study identified the ways to avoid impact of the pastureland acquisition on the daily pasturing patterns.

**76. ENERGY *Saran Solar Power Plant Environmental and Social Assessment for EBRD, 2018.*** Blockage of the daily livestock path of two housing estates by the plant fence was identified and resolved before the ESA report was out by arranging an alternative path that did not increase the path length and satisfied the herdsmen and the local council requirements.

**75. ENERGY *Chulakkurgan Solar Power Plant Environmental and Social Assessment for EBRD, 2018.*** Interviews were held with the groups of young females in the local town to identify willingness to be involved in solar panels assembling. The outcomes were provision of specific training, pairing a woman with men partner, higher mechanization and sufficient supply of biotoilets. Making arrangement with the local uranium mine to use their railway spur was suggested to reduce road related risks of part transportation.

**74. ENERGY *Nomad Solar Power Plant Environmental and Social Assessment for Access Power, 2018.*** The project was brought in line with the EBRD ESP2014 requirements. Impact to the local town schoolchildren from the plants parts transportation was removed by suggestion to use the railway spur that allows to avoid the streets commonly cross by children.

**73. ENERGY *M-KAT Solar Power Plant Environmental and Social Assessment for Access Power, 2018.*** The project was brought in line with the EBRD and ADB requirements. Timely identification of impact on a graveyard and transit irrigation channel allowed to alter the plan design without entailing excessive cost. Livestock pathways study and interviews with herdsmen and livestock owners were conducted to confirm that the land acquisition would not affect livestock products yield.

**72. ENERGY *Shelek Wind Power Plant Environmental and Social Assessment for Access Power, 2018.*** The project was brought in line with the EBRD and ADB requirements. Environmental sensitivities were identified during through-the-year ecological monitoring conducted twice a month. As a result, the transmission power line was moved away from a creek and the turning towers erection in the gorge was timed to minimise impact on nesting birds. One of the four identified at the plant area Early Iron Age burial mounds was excavated, the design changed to preserve integrity of the remaining mounds and information on them sited at the motorway rest area opposite the mounds.

**71. TRANSPORT *Kapshagay-Kurty Road Reconstruction ESIA 62km for EBRD, with WSP 2018.*** ThisEBRDCategory A project aimed to redirect transit traffic from the Almaty roads network and reduce travel distance by 70km. Managing the local population crossing and access to the road that was planned to be fenced all the way from both sides, was the biggest challenge. Vladimir managed the local part of the project.

**70. ENERGY *Baikonur Solar Plant Environmental and Social Assessment for EBRD and ADB, 2017.*** The methodology of preserving the Red Book protected saksaul shrub that grew in abundance at the designated for the plant site was developed. Risk of flooding by leman (flood based) irrigation system 7km from the site was evaluated and measures suggested to reduce the risk to the acceptable level.

**69. ENERGY *Arys Solar Power Plant Environmental and Social Assessment for EBRD, 2017.*** Assessment of the site set for the plant revealed presence of Greig’s tulip the rare and disappearing ancestor of all commercial tulips protected under the Red Book of Kazakhstan. To preserve it, the plants were GPS marked and once the stem died out, the bulbs were excavated, treated and stored to be replanted at the site after the construction. To reward the local school assistance in this work, it was suggested to include in the developer Corporate Social Responsibility Program an option to build sport facilities to this school that had only a bare dirt patch outside.

**68. ENERGY *Shar Windfarm Environmental and Social Assessment for EBRD, 2017.*** Impact on the road users from transportation of up to 52m long turbines components along one lane spans and steep rises of the road from the Chinese border was considered. New databases of the Birdlife International and IUCN were used to exclude impact on endangered birds. Measures suggested to minimise earthwork impact on the recently inserted in the Red Book of Kazakhstan tulip *Tulipa patens* located inside the shrub habitats. Procedures for the escorts patrolling and safe overtaking were developed. To convey the expected visual impact to the local population, results of the visual impact modeling from eight sensitive viewpoints were disclosed to the residents.

**67. TRANSPORT *Circle Maritime Invest Vessels Refinance Environmental and Social Assessment for EBRD, 2017.*** Impact of the vessels constructed in the Arab Emirates and the company HSE performance were assessed. The developed action plan will allow the company to comply with the bank requirements and eliminate any affect to the vessels crew and the valuable for migratory birds Khazar Nature Reserve.

**66. ENERGY *Kulan Solar Power Plants Environmental and Social Assessment for EBRD, 2016.*** Increase of a village flood risk due to surface flow water diversion and taking land from veterinary college were the main issues. Measures for these risks reduction to acceptable level included installation of emergency gates in the diversion dyke and suggestion to finance the college field clinic rehabilitation within the Corporate Social Responsibility Program.

**65. ENERGY *Gulshat Solar Power Plant Environmental and Social Assessment (2016) and update (2018) for EBRD.*** Excessive concentration of lead in airborne dust that flew from a 19th century refinery plant tailings was the main issue. Measures for these risks reduction to acceptable level included dust control, arrangement of the lead ‘clean’ and ‘dirty’ zoning and staff and contractor urine and blood tests for lead to control the exposure.

**64. INFRASTRUCTURE *Kazakhstan Irrigation System Rehabilitation Feasibility Study for EBRD with SWECO, 2016.*** The project aimed to return of 1 000 km2 of arable land under irrigation in three regions using gravity, sprinkle and flood methods of water supply. Additionally a drip-feed irrigation was evaluated for 200 km2 of the new land to be developed for vegetables growing. ESA specialists were in charge of the local part of the environmental and social aspects of the project, prepared the environmental and social baseline, reworked the ESIA and assisted the gender expert in her assessment.

**63. TRANSPORT *Big Almaty Ring Road (BAKAD) ESIA Scoping and Gap Analysis with Atkins for EBRD, 2016.*** The project team updated the 3 years old scoping study, identified gaps and prepared new scope for the ESIA to bring the project in compliance with the standards of the nine involved international funding organisations. ESA conducted the local part of the project and developed the scope for ecological study.

**62. MANUFACTURING *Oskemen and Makinsk Poultry Farms ESIA for EBRD with WSP, 2015.*** The project team assessed the impact from the planned Makinsk farm development and the Oskemen poultry farm operation in terms of compliance with the EBRD ESP 2014 and the international standards specifically related to the resettlement and livelihood restoration, water pollution and animals welfare.

**61. ENERGY *Zhuzimdik Wind Farm ES Analysis for EBRD, South Kazakhstan Region, 2015.*** Visual impact of 12 offshore size turbines was modeled for various viewpoints at the farm houses, villages and graveyards. Impact and risks of oversize and heavy parts transportation along the roads were evaluated. An opportunity was used to assess the loan benefactor Kazakhstan Utility Systems LLP EHS and social performance on the example of two combined heat and power plants 1 and 3 in Karaganda.

**60. INFRASTRUCTURE *Semey Water and Waste Water Modernisation ES Analysis for EBRD, 2015.*** The assessment updated the initial SEURECA Feasibility Study 2012 according to the changes in the Priority Investment Program (PIP) and in the EBRD Environmental and Social Policy. The preliminary Environmental and Social Action Plan has been updated and augmented with new actions, specifically with addressing the risk of the water intakes flooding, control of discharges at source, reduction of resources use, waste volumes and toxicity and impact of the filtration beds on the nearby river. The risk of the Irtysh River sewage pipe crossing leakage has been addressed. The existing mechanism of stakeholder engagement has been substantially improved and the internet based tools added to the conventional methods of feedback collection.

**59. ENERGY *Atyrau 11MW Combined Heat and Power Plant ES Analysis for******EBRD, Kazakhstan, 2015*.** AtyrauNefteMash LLC created a successful example of a reliable and effective energy source that can use associated gas at the remote from the grid oil fields which development has been hindered by high grid connection cost. The 1MW modules can be added incrementally as the power demand increases. The study paid specific attention to heat utilization, NOx emissions adherence to the proposed EU Directive for Medium Scale Plants and impact on the local power distributers and consumers.

**58. ENERGY *Badamsha 48MW Wind Power Plant ES Analysis for EBRD, Khromtau, 2015*.** The main challenge was to minimise impact on the road users from transportation of up to 77t, 10m wide and 56m long components along one lane spans of the road from the sea port and on the bats that roost in the nearby abandoned houses and a school from 16 offshore size turbines with 120m diameter blades. Mitigation measures included procedures for the escorts patrolling and safe overtaking and lighting that does not attract insects. To convey the expected visual impact to the local population, models of the turbines were juxtaposed on the panoramas taken at the key viewpoints like houses and recreational areas, sent to the residents and uploaded to Google Earth.

**57. ENERGY *Burnoye Photovoltaic Solar Power Plant Phases 1 and 2 ESDD and ES Assessment for EBRD, 2015 and 2016.*** Fencing the plant first and second stages took 30% of the pasture traditionally used by the nearby village occupied by the Kazakhs that left Kazakhstan in 1918 and returned from Turkmenistan and Uzbekistan in 1990s. Inability to differentiate their income from cattle herding, poor integration with the local population, poor education and knowledge of their rights made these oralmans vulnerable to the pasture reduction and fragmentation. The livelihood restoration plan provided targeted simple and cost effective compensation to the impacted groups.

**55-56. TRANSPORT *Astana-Almaty Road km2115-2214 and km2214-2295 Upgrade ESIAs with WSP International for EBRD, 2015 and 2016***. The assessment for these Category A projects was coupled with the road safety audit that once again challenged strict adherence of the design to SNiPs. The environmental and social part of the project concentrated on managing contractors EHS and social performance and jeyran antelopes and cattle road crossing provisions.

**54. MINING *Koktaszhal Coper-Gold Mine ESIA for EBRD, 2014.*** This greenfield open pit development with 4Mt of ore processing annually capacity was classified by the bank as a category A project. The otherwise compact and state-of-the-art mine stretched its influence along 200km high voltage line, 100km road, a 117ha lake and a 64km long river. The body of documentation was processed to identify the project impact, associated risks and stakeholders and develop impact mitigation and benefit enhancement measures to bring the project in compliance with the bank policy. Mining specialists from SRK helped to identify risks related to the mine design.

**53. TRANSPORT *Pavlodar Tram System Modernization and Acquisition of New Tramcars ES Analysis for EBRD, 2014.*** This largest in Kazakhstan tram system built in 1965 to transfer workers to the rapidly developing industrial areas, had some of its components not been updated since the start. By 2008 estimated 5 000 000 passengers was lost to busses. Vulnerable to the alternative scenarios of modernisation stakeholders were identified in time to consider their interests in decision making. Improvements to stakeholder engagement mechanismrf were suggested. The team also helped the Spanish INECO, Deloitte, UPM, ICloud and ETT specialists with their part of this feasibility study.

**52. TRANSPORT *ES Analysis of Khorgos China Border Free Economic Zone Railway Port Development for EBRD, 2014.*** The project aimed to double the Kazakhstan-China border traffic bringing to 50Mt/y by 2020. Apart from shipment of goods, the project included establishment of financial, producing and tourist capacities. Development on a sand massif with unprotected fresh groundwater reserves beneath it required introduction of nonstandard approaches to construction. By this, dust generation was minimized and the risk of contamination and desertification reduced.

**51. OIL&GAS *Tengizchevroil North-Caspian Sea Channel and Pier EIA Expert Review for TenizService, 2014*.**

**50. OIL&GASTengizchevroil Integrated Petrochemical Complex Phase 2 ESIA Supervision with ENVIRON PLC, 2013**

**49. ENERGY *Balkhash Thermal Power Plant Environmental Analysis for Samsung with WS Atkins, 2013.*** Compliance of the plant design with the **Equator Principles** was assured to obtain funding from international banks. ESA specialists monitored the baseline noise and air quality by measuring PMs, NOx and SO2, with PM meter and diffusion tubes and conducted social survey of the Ulken town constructed in the Soviet time to accommodate the plant workers.

**48. TOURISM *Kokzhaylau Ski Resort Development Preliminary EIA, for Kokzhailau Ski Resort Ltd, Kazakhstan, 2012-2013.*** As part of the international team of the mountain planners (Ecosign), civil engineers (Arup), economists (Howath) and natural hazard management specialists (Engineerisk) the ESA specialists participated in development of the resort master plan by providing environmental and social support (e.g. constraints and sensitivities mapping in GIS) and preparing preliminary EIA for this part of the National Nature Park. To evaluate alternatives for the project, the 420km2 and 6 other potential ski areas were studied.

**47. TOURISM *ES Analysis of Ski Tourism Development in Almaty, for Kazakhstan Institute of Development of the Industry with Ecosign Mountain Resort Planners Ltd., Kazakhstan, 2012-2013.*** Together with the Ecosign Mountain Resort Planners the 2 180 km2 mountainous area near Almaty City was analysed and recommendations on the Mountainous Tourism Development Strategy was given together with the priorities for the 9 potential mountainous areas development.

**46. TRANSPORT *Shymkent-Tashkent Highway km742-804.2 Environmental analysis, stakeholder engagement and resettlement plans for EBRD, Kazakhstan, 2012.*** The project concentrated on safe road crossing by schoolchildren and cattle and on ensuring adequate irrigation water supply and access to the road for local population during construction. But the main challenge was taking the large number of curb traders off the road without jeopardising their living conditions and livelihood. The analysis addressed EBRD PRs 1-5 and 10.

**45. TRANSPORT *Khujand International Airport Modernisation ESDD, ES Analyses and SEP, Client EBRD, Tajikistan, 2012.*** Originally built to deliver the first Soviet nuclear bomb, the airport aimed to improve its international status by bringing landing and takeoff safety to the required by ICAO level. The work concentrated on assessment of impact on the housing and illegal settlements that gradually surrounded the airport, the construction material supply routes, workers health and the groundwater. A cost effective mechanism to monitor impact from aircraft noise and their physical presence on adjacent households was suggested. Suggested actions also included simple measures to reduce risk of medium and large kerosene spills at the fuel tank farm.

**44. TRANSPORT *Somoni Avenue Reconstruction ES Assessment for EBRD, Dushanbe, Tajikistan, 2011.*** The bank considered a loan to Tajikistan Government to reduce congestions along the international road routes through Dushanbe.  The conceptual idea was to build two flyovers and add a carriageway in both directions along 5km of one of the main avenues in the city.  The environmental analysis included traffic flow and air pollution modeling projected 10 years ahead. To identify whether resettlement was required and to account for stakeholder’s opinion at this early stage the project team polled residents and conducted a census and focus interviews among the avenue residents, public institutions and businesses. The resulting environmental and social action plan (ESAP) suggested specific cost effective measures for improving safety for the avenue crossing and reduction of impact on drivers and residents during construction. The SEP promoted simple and culturally acceptable mechanisms for engaging local and neighboring country stakeholders. Local communication and consultation material were in Tajik and Russian.  Reports for the EBRD were in English.

**43. OIL&GAS *Environmental and Social Surveys of Mangistau Region Caspian Sea Coast Line, for Shell Development Kashagan B.V., 2011.*** Survey identified the baseline conditions, issues, constraints for development and needs for additional studies.

**42. ENERGY *Ereymentau Wind Farm Preliminary Environmental Impact Assessment, for New Smart Energy LLC, Kazakhstan, 2011.*** Among the standard for Kazakhstan content, the report included a list of stakeholders, their engagement process and information disclosure mechanism as well as the action plan with recommendations for additional baseline studies with estimation of cost.

**41. OIL&GAS *Zhanros Drilling Operation Expansion Environmental and Social Audit and Analysis for EBRD, Kazakhstan, 2010-2011.*** The work ensured that the company operation and planned purchase of state-of-the-art well testing equipment complied with the applicable EBRD Performance Requirements (1-6, 8 and 10). All parts of the operation were assessed from the headquarters to the industrial base and to oil field drilling pads to check compliance with the company policies and procedures and Kazakhstan regulations. An Environmental and Social Action Plan was agreed with the company to cover noncompliance issues in a manageable and cost-effective way.

**40. MANUFACTURING *Stepnogorsk EBC Bearing Plant ESIA for EBRD with Atkins PLC, Kazakhstan, 2010.*** Within the ESIA ESA specialists conducted Environmental and Social Due Diligence, social survey, analysis of the local EIA for gaps and prepared the stakeholder engagement plan.

**39. MANUFACTURING *Bredero Shaw Pipe Manufacturing and Coating Plant Construction Statement on Environmental Consequences, Kazakhstan, 2010.*** In addition to the statement,ESA specialists ensured compliance with the Kazakhstan requirements for work place conditions in respect of noise, air quality, light, working hours etc. by giving recommendations that included installation of sound-proof facings, walls, and cabins.

**38. MANUFACTURING *ArcelorMittal Steel Plant Expansion ESIA for EBRD with ENVIRON International Corp., Kazakhstan, 2009-2010.*** Within the ESIA prepared by ENVIRON, ESA specialists conducted local EIA gap analysis, identified existing and possible future constraints related to legislative and social issues. Specific attention was paid to analysis of the wastewater collection, treatment and disposal including cooling tower, boiler blow down, oily and sanitary water. ESA specialists also proposed wastewater handling and treatment facilities.

**37. MANUFACTURING *Chlorine and Caustic Soda Membrane Plant construction ESIA for EBRD with ENVIRON, Kazakhstan, 2009-2010.*** For this new JSC Caustic installation at the former Pavlodar Chemical Plant ESA specialists prepared the environmental and social due diligence, local EIA gap analysis, Public Consultation and Disclosure Plan, non-technical summary and addendum to the ESAP.

**36. MINING *Kuvaky Silver Mine and Mironovskoye Vismut Mine ES Baseline Assessment Plan, Kyrgyzstan, 2010*.**

**35. OIL&GAS  *Tengizchevroil Industrial Base Construction Environmental Support with Datoba Engineering LLC, Kazakhstan 2009.***

**34. OIL&GAS *EIA of McDermott Bautino Fabrication Yard for Datoba Construction LLC, Kazakhstan, 2008-2010.*** The EIA of this designed on the reclaimed from the North Caspian Sea area fabrication yard addressed significant impacts such as: load on the existing utilities and infrastructure, use of local labour, subcontractors and natural resources, risk of hazardous materials escape into the environment, and waste management. Legislative requirements, air pollutants dispersion modelling and calculation of the maximum permitted emission, payments for pollution and waste disposal, comparative risk analysis, stakeholders engagement and information disclosure were important aspects of the study. The work was performed according to international standards for environmentally sensitive areas.

**33. ENERGY *Ekibastuz GRES-2 Coal Power Plant Expansion ESIA for EBRD with Black & Veatch, Kazakhstan, 2008-2009.*** The project team addressed impacts of this massive plant with the highest in the former Soviet Union stack that disperses ash hundreds of kilometers to Pavlodar city and into Russia with a large lake being filled with 2500ha of ash and social problems related to sheep early death as a result of teeth abrasion over the ash covered grass. Thus finding ways to reduce ash emission and its safe disposal was the main objective of the project. The overall objectives of the project were to review the environmental standing and compliance of the Company with Kazakh and EBRD requirements, assess potential environmental issues and risks and evaluate potential environmental and social impacts associated with the planned expansion. The prepared by ESA specialists Public Consultation and Disclosure Plan helped prepare the ESAP. The project was put on hold due to inability to fulfil EBRD requirements on emission standards.

**32. TRANSPORT *Environmental analysis and audit of Nico International PLC ship yard “MOBY” for EBRD, Kazakhstan, 2008.*** Set to service about 160 vessels a year, the yard was planned on reclaimed from the sea land, The facility was to provide lifts, dry berthing, mooring facilities, hull survey and repair facilities and propulsion overhaul workshops. The reports were prepared in a very tight schedule and were accepted by the bank as submitted.

**30-31. OIL&GAS  *Declaration of Intent, Pre-EIA and EIA of Halliburton International Inc. Mud Plant, for Datoba Construction LLC, Kazakhstan, 2007-2009.*** Due to operational constraints having to be positioned right at the sea, the production process required thorough evaluation of risk from accidents and development of additional risk abatement measures especially for the low probability-high significance events. Discussions started at the early stage of conceptual design allowed effective introduction of such measures. The work was conducted according the international HSE requirements.

**27-29. OIL&GAS  *Three seismic and wells workover ESIAs for oil fields in the Manghystau Region, for Roxi Petroleum PLC 2006-2008.* The client required quality assessments that not only complied with local legislation but fulfilled expectations of London based (AIM) shareholders.**

**26. TOURISM *Medeu and Shymbulak Mountain Resort Development ESIA for Capital Partners, Kazakhstan, 2006-2007.*** This world class project was intended to be a showcase for mountain resort development. Located near Almaty, it was designed to meet the standards of international tourism, the **2011 Asian Winter Games** and, in prospective, the Winter Olympics. For this reason, the environmental and social sustainability aspects of the project were given top priority. EcoSocio Analysts, working with highly respected international architects, engineers and business consultants from firms such as HOK, Arup, Landbase Developments, Kinetik and Locum Consulting, conducted all environmental investigations and provided these team members with detailed information on Kazakhstan requirements and associated matters.

**25. OIL&GAS  *Pearls Offshore Platform Baseline Survey for Shell, Kazakhstan, 2006.*** ESA chemist developed the sampling and analysis plan and controlled quality of the survey and database development and reviewed the report.

**16-24. PROPERTY *Nine EIAs for AFD Business Centers and School for Capital Partners PLC, Kazakhstan, 2005-2007.*** For these variable in size and design business centers (B, C, D, Kazkom, Turan and North Aliance Buildings 1-3) and Haileybury school air emissions and water consumption and discharge was calculated and impact mitigation measures and waste management system developed. Apart of the main building, some developments contained community/social and underground parking areas, supply services, and shopping/eating places.

**15. TRANSPORT *Environmental Chapter for FS and ESIA of Atash Marine Base of the Caspian Services Group PLC for EBRD, Kazakhstan, 2005-2006.*** This EBRD Category A project was done without support from a western partner. The team worked in close alliance with the Client’s engineers in order to account for environmental risks and constrains at the early design stage. This has prevented costly delays and ensured international financing. The EBRD stated that there was no need for a gap analysis by a western consultancy as the work met all requirements. This recognition saved the client considerable money and time.

**14. MINING *ESIA of Satimola Borite Mine, for Hambledon Mining PLC (UK), West Kazakhstan Region, 2005-2006.*** Through-the-year environmental and social baseline information was collected to comply with the requirements of the western lenders and the shareholders. To account for the opinion of the inhabitants or this remote area steeped in local custom and tradition, local knowledge and Kazakh language was required.

**13. PROPERTY *Atyrau Housing Estate and a Business Centre Environmental Protection Chapter, MPD and MPE Projects for Capital Partners PLC.***

**12. OIL&GAS  *Kashagan Oil Field Development Social Impact Assessment for Agip KCO with Arthur D Little LLP, 2003****.*

**11. MINING *Shevchenkovskaya Ferronickel Mine and Smelting Plant SocioEconomic Baseline for EIA for Oreal Resources with Wardell Armstrong, International PLC, Kazakhstan, 2005.*** ESA specialists conductedsocial-economic assessment of the mine and plant reopening in accordance with Equator Principles. Over 50 000 population of 19 villages around the project territory, who depended on the mine and the plant in the past directly or indirectly, were engaged in the project discussion. The impact of the mine and plant opening on the existing asbestos and gold mines was evaluated. Participative Rural Assessment and Autodidactic Learning for Sustainability methods were used. Interviews focused on identification of social problems, vulnerable groups and criteria for evaluation of livelihood alteration by the project. Knowledge of local traditions and Kazakh and English languages helped the ESA specialists team to obtain in depth information and quickly convey it to its international partners to alter the assessment ‘on-the-go’.

**10. MINING *Sekisovskoye Gold Mine Baseline Gap Analysis for Humbledon Mining PLC, with Wardell Armstrong International,******2005.*** Action plan was developed to fill gaps in the environmental and social baseline assessment made by a local company to bring it to the Equator Principles and international ESIA level.

**9. OIL&GAS  *EIA of North Caspian Emergency Response Base, for AgipKCO, Kazakhstan, 2005.*** Positioning of the base near the environmentally sensitive Ural River delta with wind induced water surges to 68cm was necessary for quick response to oil spills in the open sea. Because of the close attention to the project from variety of stakeholders, ESA specialists group used internationally recognized methods of impact assessment and stakeholder engagement. The detailed design of a mooring basin, jetty, slipway and hovercraft landing/turning facilities and protection of the 507m of the Ural river bank made by Witteveen & Bos Kazakhstan and CJSC “NIPINeftegas was analysed. Alternatives for future expansion in the river delta on which livelihood of majority of the local population depends were considered.

**7-8. OIL&GAS  *PreEIA (2004) and EIA (Dec 2005- Dec 2006) of Opornaya Gas Compressor Station Shop 4 for MAN Turbo, Kazakhstan.*** The project was the first stage of the State Program for upgrading of the Central Asia – Europe Gas Export System. These fast-track projects required flexibility, forward thinking and close interface with the international team of engineers to meet very tight deadlines. The new all-in-one approach to pre-development survey included not only social surveys and stakeholders consultation but also topographic, geotechnical, hydrogeological surveys with drilling and monitoring wells installation. The team focused on identification and mitigation of impacts on local community from air emission, noise and disruption of social structure and local economy.

**4-6. OIL&GAS  *Three EIAs of 3D Seismics at Aktoty and Kayran Offshore Oil Bearing Structures, and of Aktoty Appraisal Drilling, for Agip KCO, Kazakhstan, 2004.*** For these projects the local environmental compliance documents (MPE/MPD and waste management reports and calculation of environmental damage) were prepared. The work that required effective coordination of local and western participants was done within a very tight schedule.

**3. MANUFACTURING *Water Use and discharge Passport and Expert review of Environmental Protection Report for Phillip Morris Plant, Kazakhstan LLC (FMK), Kazakhstan, 2004.*** The purpose of the review of the sections Water, Soil, Waste, Noise and Amenity Planting was to amend the Report in line with the plant expansion and changes in pollution, waste and natural resources use qualitative and quantitative parameters. Prepared in a short time recommendations brought FMK in compliance with Kazakhstan regulations, the ISO 9000/14000 standards and the best international practices. As a result of investigation of phenols pathways their concentration in the Philip-Morris Almaty plant effluents could be brought to compliance.

**2. OIL&GAS  *Kashagan Offshore Oil Field Oil Pipeline preEIA Gap Analysis for OKIOC, Kazakhstan, 2003.*** The reviewers checked that the data necessary to reach the conclusions presented in the report is present and noted how the document could be structurally improved for better understanding. The report identified and compared environmental sensitivities along the two truck line routes that potentially could restrain or prohibit construction, as well as the preliminary requirements for flora, fauna and water quality protection.

**1. OIL&GAS  *Expert review of additional data for PreEIA of Feasibility Study for Selection of Pipeline Route Options, for Agip KCO with ECOTERA, Kazakhstan, 2003.*** The purpose of the review was to ensure the data included full and adequate information to support the decision making process regarding the selection of one of the indicated pipeline route alternatives. The selected route provided the least negative environmental impact upon the North Eastern Caspian Sea. ESA specialists experts determined gaps and inadequacy of data necessary to achieve conclusions as well as contradictions in the supplied information. The constructive comments for improvements to the document were well received. Of the 4-5 organizations selected to review the study, only CE’s comments were all accepted, most of them were submitted word for word by ECOTERA to the Ministry of Environmental Protection.

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| **ENVIRONMENTAL DUE DILIGENCE AND AUDITS** |

**75. TRANSPORT *Almaty Airport Fuel Storage and Import/Export infrastructure Phase 1 Audit for TAV Airports (Turkey), 2022.*** The audit included the new passenger and cargo terminals, fuel pump station and the drainage treatment plant. Stage approach for phase 2 intrusive investigation included reservoirs and oil traps pressure tests, borehole and drainage channels bottom sediments sampling and analyses plan.

**73-74. ENERGY *Karaganda Zharyk and Ontustyk Zharyk Transit (Shymkent) Power Distribution Companies ESDD and Modernisation Programs ES Assessment for EBRD, 2018.*** The project was conducted for the electrical networks of the industrial and the largest in Kazakhstan Karaganda Region (428 000km2 just under Iraq territory) and agricultural Turkestan Region with the highest population density. It focused on reduction of risks of birds electrocution and collision with wires and prevention of the line electricians injury and death through mapping the network components where hazard is above the expected (e.g. with deviations from the current construction standards) and through ensuring that the work admission orders accounts for these components.

**72. MINING *West China-West Europe Motorway Borrow Pits Closure ESDD for World Bank, 2018.*** This assessment facilitated resolution of conflict between the motorway EPC contractor and the borrow pits land owners related to inability to use the reinstated after material extraction land. Recommendations were developed for re-profiling the pits to enable gravity irrigation.

**71. TRANSPORT *KazAeroNavigation ESDD and ES Assessment of Backup Systems and Mobile Control Rooms Replacement at 17 Kazakhstan Airports with WSP, 2018.*** ESA team provided local content and its previous knowledge gained in the airports modernization projects.

**70. MANUFACTURING *Amcor Tobacco Packaging Plant ESDD for Ramboll Environ PLC, 2018.*** ESA team provided local content in the Amcor internal EHS audit of its plant in Almaty, Kazakhstan.

**69. ENERGY *Mangystau Power Distribution Company JSV ESDD and Modernisation Program ESIA for EBRD, 2018.*** After having been purchased by Kazakhstan Utility Systems Holding, MREK applied for a loan to finance its Modernisation Program. The work focused on building capacity to manage EHS and social performance of the contractors and to develop safety culture among MREK workers. Several culturally acceptable instruments to progress in these directions have been suggested.

**68. TRANSPORT *Kazavtozhol Corporate ESDD within Toll Roads Introduction Feasibility Study for EBRD with WSP, 2017.*** Additionally to the ESDD a SEP for the wide range of stakeholders of this socially complex project was prepared.

**67. ENERGY *Uralsk Combined Heat and Power Plant Modernisation ESDD and ESA with Clean Energy Solutions GmbH for EBRD, 2017.*** To change from a heat provider to an electricity utility with heat generation as by-product, installation of a 18 MWe condensing steam turbine and rehabilitation of another steam turbine was planned. Installation of Variable Speed Drive in hot water boiler air fans reduced the plant power consumption and thus CO2 emission per kW output. The ESA team participated in field visit, analysed the environmental and social baseline conditions and the company HSE data and prepared the compliance table, ESAP and SEP.

**66. INFRASTRUCTURE *Shymkent Waste Water Treatment Plant Expansion EHS and Social Assessment and Resetlement and Livelihood Restoration Framework for Collapsed Wastewater Collector, for EBRD, 2016.*** Both, the plant footprint and the plant managing company EHS and social performance was assessed and the existing ESAP updated and augmented with additional items. The contagious issue of squatting the wastewater collecting pipework right of ways was dealt with to avoid resettlement and displacement and minimise material losses while maintaining the required level of public health, safety and engagement in the project.

**65. TRANSPORT *CMI Offshore Service Vessels ESDD for EBRD, Turkmenistan, 2016.*** Operation of the company 26 vessels (AHTS/PSV units, Standby/Rescue vessels, tugs, crew boats, fast ferries, barges, survey/diving ships) used in the Caspian Sea for supporting oil and gas offshore field development in Turkmenistan, Kazakhstan and Russia has been assessed and report provided in a very tight schedule given by the bank. The report was accepted in the first reading with only minor changes made.

**64. ENERGY *Sogrinsk Combined Heat and Power Plant ESDD for EBRD, Oskemen, 2015.*** The company performance against the initial EBRD audit in 2012 was reviewed and BAT assessment and ESAP updated with the items that were originally overlooked.

**63. MANUFACTURING *Sunpaper Tissue Production Plant ESDD for ADM Capitals (EBRD FI), Karaganda, Almaty, 2015.*** The working conditions, health and safety and historic ground and groundwater contamination gained prime attention during assessment of the former bus depot where the new plant has established and a poorly controlled warehouse estate in Almaty. An ES action plan has been developed to bring the company in compliance with the EBRD ESP 2014. To keep the cost of the suggested measures down and to verify their viability, close interlink with the process and equipment engineers was required.

**62. OIL&GAS *Weatherford PLC Wireline Base Exit Audit for Ramboll Environ, 2015.*** Within the Ramboll Environ Framework Agreement, ESA team conducted audit of the base with 45 years history of geophysical services, isotopes, explosives, fuel and oil storage, a wash pad effluent leakage and a small fire in the proximity of an ecologically important area of the Emba River floodplain. Ground and groundwater contamination liability risks were assessed and recommendations given for the risks management.

**61. TRANSPORT *Astana Airport Modernisation HSE and Social Due Diligence for EBRD, 2015*.** Modernisation was to provide for the expected 10% annual growth in air traffic and the EXPO 2017 while maintaining compliance with ICAO requirements. The work concentrated on risks of flooding and inundation, kerosene leakage from ASTs and kerosene hauling tank trucks. Identification of impact of aircraft noise on the nearby residents and increased HV traffic on the drivers and pedestrians, especially on unattended school children required thorough social analysis along the streets that are expected to be affected.

**60. ENERGY *Kyzylorda Power Distribution Company HSE and Social Due Diligence for EBRD, 2014.*** The bank financed the medium term capex program including the installation of modern electricity meters and automatic control systems, strengthening the capacity and efficiency of transformers, and distribution lines aimed at reducing distribution network losses and increase in energy efficiency. The company delivers 780GWh annually to 150,000 consumers through 9,000km of electricity lines and nearly 1,500 distribution units and transformers. The customers range from private cottages to large oil fields. The resulted from the audit ESAP recommended to trace PCB content in transformer oil in order not to mix it with PCB free oil and send them to the transformer repair plant for destruction separately. The plan also included HSE and social aspects in the performance targets and expanded the performance indicators from satisfaction in power supply to wider concerns of the stakeholders. The SEP ensured that the indicators were available for the stakeholders.

**59. TRANSPORT *Kazakhstan Temir Zholy (KTZ) National Railway Company HSE and Social Due Diligence of Sakura Project Extension for EBRD, 2014.*** To finance the acquisition of two cargo vessels and various equipment for Kazakhstan rail lines maintenance, the bank requested an audit of KTZ HSE management system and operations, review of the existing Environmental and Social Action Plan implementation and its update in view of the planned procurement. Balkhash Wagon Repair Depot was assessed to check the HSE management system effectiveness. The report recommendations concentrated on seamlessly joining the current traditional HSE system with the ISO-style Integrated Management System currently applied only to the offices of KTZ and its 26 structural units but planned to be expanded to all 96 operation units.

**58. TRANSPORT *UL Cor (The Netherlands) Railway Logistics and Wagons Repair Operations HSE and Social Due Diligence for Asia Debt Management Hong Kong Ltd, 2014.*** Being an EBRD financial intermediary ADM required due diligence that would clearly separate the risks related to noncompliance to the local legislation and deviations from the international standards and best practices. Two UL Cor wagon repair depots in Burabay and Atbasar and the Kazakhstan headquarters operation were assessed and recommendations were given on reduction of risk of injury and professional illness, ground and groundwater contamination, as well as risks related to hazardous materials and waste management and emergency response. Deviations from good HSE management practices were highlighted and ESAP prepared.

**57. MINING/MANUFACTURING *ShymkentCement (Italcementi Group) Wet to Dry Operation Change ESDD for EBRD with MWH Global PLC, 2014.*** The audit focused on the existing operation HSE and social impact and its implication to the planned Category A development. Energy and resources use and air emissions per unit production was given particular attention. Encroachment of illegal settlers into the plant Sanitary Protection Zone had to be dealt with. The project team also helped with ES analysis, ESAP, SEP.

**56. TRANSPORT *ESDD of Kyzylorda Public Transport System Modernization including construction of a depot and procurement of up to 100 compressed natural gas busses, for EBRD with Arup PLC, 2013.*** Together with the Arup PLC team, which conducted the technical, legal and financial evaluation, ESA specialists defined the existing public transport problems and risks related to the depot construction on the former district heating plant territory, identified and polled the key stakeholders and vulnerable groups within the public transport passengers. ESA specialists also helped with the other parts of the project that included preparation of ESA, ESAP and SEP, the bus fleet and routes optimisation, establishment of a CNG bus depot and refueling infrastructure, CBA, development of an integrated ticketing and public service contracts and a management and monitoring system.

**55. MINING/MANUFACTURING *PreBalkhash Gold Refining Plant ESDD for Topaz-NS LLC, 2013.*** Current environmental and social impact and compliance with environmental legislation was assessed, stakeholders identified and recommendations were made to improve the plant related environmental and social conditions of the area and to ensure that the planned operation is in line with the relevant national standards in the field of environmental, social and labour protection, occupational health and safety. Specific attention was paid to evaluation of potential impact of tailing dust. Tailings were analysed for water retention and dust generation capacity and dust was tested for harmful for health characteristics (metals, sulphate, radionuclides).

**54. ENERGY *Shardara Hydro-power Plant EHS and Social Due Diligence for EBRD, Kazakhstan, 2012.*** This assessment of the lowest dam on the Syrdarya River considered interests of the Shardara Reservoir shore land users and the risk to the downstream cotton fields from the groundwater level fluctuation. The audit addressed EBRD PRs1-6 and 8 and included SEP, ESAP and greenhouse gas reduction assessment.

**53. MINING/MANUFACTURING *ZhambylGips Gypsum and Marble Extracting and Construction Material Producing Company EHS and Social Due Diligence for ADM Capital (EBRD financial intermediary), 2012, Kazakhstan.*** The prepared action plan allowed the target company to avoid costly relocation of its old gypsum binding and calcination facilities. Suggested measures would cost-effectively cut gypsum dust spreading to the neighboring residential area and improve working conditions to the extent that high staff rotation can be stopped. The audit addressed EBRD PRs1-4 and 10 and included ESAP.

**47-52. PROPERTY Six ATF Bank property Due Diligences for UniCredit Group, Kazakhstan, 2012**. To fulfill the UniCredit Group requirements, ESA specialists conducted environmental, labour protection, health and safety and social due diligence for the repossessed by the ATF bank property in Kokshetau (a gas transporting company base), in Aktau (a business center) and in Almaty (a business center, a restaurant and two agricultural plots).

**46. PROPERTY *Cyber Entertainment LLP EHS and Social Due Diligence for Kazakhstan Growth Fund (FI of EBRD), 2011***. The Fund planned to invest in this up market chain of “Omega Sector” internet cafes positioned in 7 cities. Money was to be used for buying rented property to release income for the chain expansion. The assessors paid particular attention to the company procedures in relation to staff and public safety and security including neighbors, schoolchildren, disabled, and other potentially vulnerable groups. Implementation of the suggested action plan brought the company to full compliance, improved working conditions for night shift staff and introduced simple HSE management practices with no significant cost to the company.

**45. MINING *Zhumys Story Services LLC and Industrial Energy Alliance LLC coal gas extraction operation Audit for CaspKaz Pty Ltd, Kazakhstan, 2011*.** Coal deposits gas utilisation reduced risk of explosions in the mines, air pollution and greenhouse gas emission. Yet, unusual for Karagandy gas exploration produced other risks that had to be dealt in the frame of this audit to ensure that an international founder is free of future noncompliance claims.

**44. OIL&GAS *Ravninnoye Oil Field Audit for Canamens Energy Ltd., Kazakhstan 2010.*** Purpose of the audit was to define changes in the field environmental and social status occurred since the previous audit conducted by ESA specialists in 2007 to sell the field. Key findings concerned minor oil leakage, degradation of soil and vegetation at road crossings, lack of vegetation recovery signs at various wells due to spills of saline production water, buried small oil pits. The recommendations could allow the client to rectify these issues cost-effectively in reasonable time without the need to lower the field price.

**43. ENERGY *Central Asian Electric Power Company EHS and Social Due Diligence for EBRD with Atkins, Kazakhstan, 2010.*** For CAEPCO that operates combined heat and power stations and distributes power, EcoSocio Analysts assessed how the corporate and site activities meet the requirements of EBRD, the Islamic Development Bank and the Islamic Infrastructure Fund Environmental and Social Management System which conforms to the environmental and social safeguard requirements of the Asian Development Bank.

**37-42. PROPERTY *Environmental Due Diligence* Phases 1 and 2 *for Nine METRO Cash and Carry LLP Sites in major cities of Kazakhstan, 2010-2011.*** ESA specialistsworked on a variety of sites including an old municipal waste dump, a helicopter plant, two vehicle markets, a former airport area, a trolleybus repair plant with a petrol station, a flood plain and an agricultural field. The work included installation of permanent groundwater monitoring wells according to international requirements and the comprehensive sampling and analysis of soil, surface and ground water for VOC, PAHs, PCBs, EOX/CHC and CFC. Reports, produced in a very tight schedule minimized financial and reputation risks associated with land contamination and suggested practicable and cost effective remediation measures. These costs could be offset against the land value.

**36. AGRICULTURE/MANUFACTURING *Environmental and Social Due Diligence of the Agricultural Holding KazExportAstyk and Its Partners for EBRD, 2009.*** Assessment of the headquarters polices plans and procedures and environmental, health and safety and labour protection conditions at numerous sites with operation ranging from growing of various cereals, production of milk, flower, meat and meat products to products storage, transportation and retail. Preparation of a ESAP and SEP. This audit performed without western specialists at a very short notice earned high praise of the client for the content and timing.

**35. TRANSPORT *ESDD of KazTemirTrans and 3 Depots that Serve Its Wagons for EBRD, Kazakhstan, 2010.*** The work completed in a short period allowed the National Railway Company Kaztemirzholy to secure the bank loan to purchase 200 modern wagons. One KazTemirTrans depot in Oral and two depots of KTZ daughter company Kamkor Wagon LLC in Karagandy and Pavlodar were assessed. The developed ESAP was consequently used as a base for evaluation of further lending to the company.

**33-34. OIL&GAS *Environmental and Social Due Diligence (ESDD) of 2 oil production fields, for Canamens Energy Ltd, Kazakhstan, 2009.*** Report to be submitted to IFC and EBRD. In line with the Bank’s desire for full information to confirm the company’s current environmental and social obligations related to contractual areas for the proposed oil production ESA specialists provided a summery ESDD with an analysis of legislation compliance. Data was praised by all concerned

**32. MANUFACTURING *Kazakhstan Aluminium Smelting Plant ESDD for EBRD with Atkins PLC, Kazakhstan, 2009.*** The bank required a corporate audit of the current status on the first aluminum smelting construction in Kazakhstan and a review of compliance issues to determine if they were in keeping with the EBRD PRs (performance requirements) and the national EP legislation. The ESDD included a top level review of operations and assets as well as the institutional capacity of the company to implement the relevant PRs. An ESAP was developed based on the ESDD, inclusive of an environmental and social management plan to be implemented by the company over the next few years to ensure that the company fully complies with all the PRs.

**25-31. ENERGY *7 ESDDs for Modernisation of 3 Energy Producing and 4 Distributing Enterprises for EBRD with WS Atkins, Kazakhstan, 2008-2009.*** Producers were: Ekibastuz GRES and Karagandy TEC 1 and 3 and distributors were: SevKazEnergo Petropavlovsk, AstanaEnergoSbyt, Ontustik Zharyk Shymkent and Karagandy Zharyk.

**24. OIL&GAS *Environmental Assessment of Expansion Areas for the Industrial Base for Weatherford Kazakhstan LLP, Aktau, 2008.*** Phase 1 assessment of 5 distinct plots in 1km radius around the base was made according to ASTM standards. Specific attention was made to potential sources of emissions, noise, asbestos, PCBs and man-made and naturally occurring radioactive material (NORM). Background measurements of radioactivity and noise levels were made and soil profiles studied. Site survey and available data sources search confirmed that **the area could be used for expansion in compliance with BAT principle and health, safety and environmental legislation.**

**23. PROPERTY *Ecological Assessment of Algabas Residential Development Site for Mouchel Ltd., Kazakhstan, 2008.*** The planned for development site was positioned within the Aksayka river protection zone with shallow groundwater and associated specific vegetation and animals including invertebrates. ESA specialists advised the client how to effectively minimise the impact during the construction and use of the area.

**22. OIL&GAS *Summary of Environmental Regulations for the Construction of a Facility Near the Caspian Shoreline, Production Services Network, UK, OMV / Petrom, 2008.*** The study consisted of a summary of the environmental regulations and environmental risks, which are likely to impact the design, construction and operation of a facility planned within the Caspian Sea water protection zone.  The work was completed within a very short period.

**15-21. OIL&GAS *Pre-acquisition ESDD of 7 Oil Fields for Roxi Petroleum PLC, Kazakhstan, 2007.*** To accomplish these pre-acquisition assessments of three principally different oil fields (Bashenkol, Zhanatan, Egizkara and NW Konys, Zhalgyztobe, Beybars and North Karamandybas) in a very tight schedule to the internationally recognized standards, ESA specialists used the accumulated over the years experience to ensure the required quality objectives in challenging surroundings. The extent of oil spills, their characteristics, the cleanup options and their costs were evaluated, indigenous people resettlement was dealt in internationally accepted manor. The client was pleased with the reports that gave international shareholders a good chance to evaluate risk related to environmental and social responsibility.

**14. OIL&GAS *Pre-acquisition Audit of the Ravninnoe Oil Field for Roxi Petroleum PLC, Kazahstan, 2007.*** Assessment of environmental, health, safety, hygiene conditions, emergency response and the use of natural resources was conducted in close link with designated attorneys as required. The work is intended to allow the client to maintain good relationships with the regulatory authorities and avoid fines and risks of costly disruptions in the operation process.

**7-13. PROPERTY *ESDD of Seven Sites for Business Centers and Housing Estates in and Around Almaty for Base MK LLC, 2007.*** The assessment was performed in the scope and format to satisfy AIM London Stock Exchange requirements. The team assessed risk associated with the land squatters and illegal waste dumping and developed recommendations to minimise it to acceptable level without entailing excessive cost and in compliance with the Equator Principles.

**6. MANUFACTURING *EHS and Social Due diligence of the five KazNefteKhim sites (2 oil fields, 2 oil terminals and a polyaramid plant) for EBRD with Environ PLC, Kazakhstan, 2006.*** ESA specialists reviewed existing data and identified key issues, participated in site visits and organised a site visit to an oil field and a social study and prepared a resettlement plan for an oil terminal. KazNefteKhim indicated its satisfaction with the work quality by asking to develop an environmental management system.

**4-5. PROPERTY *Two, due diligence of the sites for Renaissance Hotel construction in Aktau and Atyrau, for Capital Partners, Kazakhstan, 2004***. The work was conducted to the international standards to satisfy investors into these ambitious projects.

**3. INFRASTRUCTURE *Audit of the Caspian Sea Pollution Sources and Cleanup Plan Development for Mangystau Regional Council, Kazakhstan, 2003***. Work included audit of the sea polluting sources along the 1 350 km coastline, with its environmentally sensitive habitats of pink flamingo, Dalmatian pelican and other endangered species. The Plan concentrated on assessing and minimizing risk of various pollutants migration to the sea. The program of geophysical testing of inundated old oil wells for further plugging and abandonment was developed. Recommendations were made for the improvement of monitoring system for Aktau port, sewage management and scrap metal utilization. The cost for each suggested improvement was calculated and alternatives prioritized. GIS was used for creation of pollution sources database.

**2. OIL&GAS *Environmental Audit of Arman oil field for Kerr-McGee OIL&GAS Corporation with WALSH Environmental, Kazakhstan, 2002.*** Work included the assessment of the coastal zone, soil and ground water sampling for contamination, radiological survey, baseline study. The field equipment and infrastructure was assessed, the operations which are necessary for modernization were determined to provide the correspondence with international and Kazakhstan standard; any environmental consequences and operator responsibilities were determined; environmental impact of the operation, including the environmentally sensitive parameters and social and economic situation in the region was also determined.

**1. OIL&GAS *Audit under the Uzen oil field rehabilitation project for Kazmunaygaz with Ecology & Environment, Inc (USA), Kazakhstan, 1999.*** An all-inclusive HSE audit performed by 20 foreign and 20 local specialists resulted in four volumes, which were approved by the State Environmental Expertise and the regional environmental authorities that gave the report high marks.

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| **HSE MANAGEMENT SYSTEM AND MONITORING** |

**31 ENERGY *Zhanatas 100MW Windfarm Birds and Bats Mortality Monitoring for China Power International Company (SPIC), 2022***. During the autumn birds migration period, survey methodology was developed and tested by conducting daily searches of corpses and running tests of the search effectiveness and losses of corpses to scavengers in order to develop miss and loss multipliers for the actual finds. The methodology was tailored to enable the windfarm workers to conduct it with an ornithologist remote support. In the course of the project, it was decided to compromise the small birds miss multiplier in favour of the search area extension to ensure that all large birds deaths were recorded.

**30. BIODIVERSITY *Biodiversity Conservation Capacity Building in Turkmenistan for EBRD with RINA. 2020-2023***. Twenty-two protected areas take large proportion of the non-desert part of the country including the rivers, mountains and Caspian Sea where oil extraction has been conducted since 1970s. The team of Italian, UK, Kazakh and Turkmen experts has developed an approach to conservation practices improvement and conducted several training sessions for the Ministry of Environmental Protection and the protected areas specialists.

**29. INFRASTRUCTURE *Green City Action Plan Almaty for EBRD with RWA Group (Romania). 2020-2022***. The local project team of ecologists, sociologists, architects, municipal infrastructure engineers and lawyers participated in technical assessment of the existing situation in the city, preparation of the State-Pressure-Response database with 122 indicators, stakeholders identification and engagement in public consultation via various events, workshops, presentations and meetings, preparation and discussion of the long list of actions and issuing 30 short term actions in the energy, industry, transport, buildings, water, land use and waste management sectors. Liaison with the city council was particularly challenging as it was fanilising its own city development plan and acceptance of an alternative approach required some persuasion over several meetings with senior officials.

**28. INFRASTRUCTURE *Kazvodkhoz Corporate Development Program for EBRD with KPMG, 2021-2023.*** The project team was responsible for the EHS and social aspects of the program that included analysis of the current planning, procurement, construction, operation and management practices and identification of gaps in compliance with the EBRD requirements, developing recommendations on the current practices alteration, addition on new procedures (e.g. critical habitat assessment and pasturing farmers livelihood restoration) and staff training and responsibilities restructuring with estimation of the associated budgets. A Stakeholder participation program was developed and assistance provided in this plan and the EBRD ESAP implementation.

**27. TRANSPORT *Big Almaty Bypass (BAKAD) Construction Monthly Monitoring for EBRD with Arup, 2021-2023.*** Together with the EPC Contractor Alsim Alarko (Turkey) the project team has made improvement in the local and Turkish subcontractors HSE and social performance. Particular attention was paid to work at height, houses integrity, safe crossings maintenance and ecology of the multiple watercourses crossed by this 66km toll motorway, which commissioning is expected to greatly improve air quality in the city.

**26. ENERGY *Shokpar Wind Power Plant Through the Year Wildlife Monitoring*** ***for Sungrow, 2020-2021.*** This work continued the year monitoring at Zhanatas WPP just west of the Shokpar area.It was arranged according to the Scotish Natural Heritage (SNH) Methodology 2017 Mortality of the birds that flew into the expected blades rotation area was calculated using the SNH Guidance 2000. It was below the industry statistics.The project was consequently funded by EBRD***.***

**25. ENERGY *Saumalkol 50MW Wind Power Plant Annual Wildlife Monitoring for Universal Energy, Kokshetav, 2019-2020.*** The study shown high sensitivity of the area selected for the plant between the lake and woods with high numbers and diversity of birds and Parti-coloured Bat flying through the site between feeding and roosting places. The Kazakhstan Red Book protected Whopper Swan, White-tailed Eagle, Common Crane and Demoiselle Crane and various species of ducks fly daily in the risk window during the time with reduced visibility and the ducks flight route will not change with time. As a result, the client has moved to another site.

**23-24. ENERGY *Abay 100 and Abay 50MW Wind Power Plants Through the Year Wildlife Monitoring and Ionising Radiation Survey for Universal Energy, Aktogay, 2019-2020.*** The monitoring was conducted according to the Scotish Natural Heritage (SNH) Methodology 2017 to enable international financing. In the course of the summer survey, Abay 100 was identified as an old firing range with the target poles used by prey birds for scanning and the bomb shelters used from swallows. The ornithologist recorded locations of encountered artillery shells and missile bodies scattered around. Despite the found shells collection by the mine sweepers and the gamma radiation survey showing no hazard, the site was considered to be ecologically sensitive and hazardous and was moved south to the old military base territory that turned out to be less used by birds. The Abay 50 territory was considered as more sensitive due to presence of shrub thickets and more remote location. To obtain better view, the 10m high weather mast platform was used for observation. At the end, the impact and footprint reduction measures have been suggested.

**ENERGY *Renewable Energy Auctions Support. Kostanay 100MW, Arkalyk 50MW and Zhezkazgan 100 MW Windfarms Wildlife Monitoring for EBRD, 2020-2021*** See description in EIA section

**ENERGY *Zhongar 50 MW WPP Summer-Autumn and Spring Wildlife Monitoring for Sungrow, 2021-2022.*** See description in EIA section

**22. TRANSPORT *Almaty International Airport Reconstruction Environmental Baseline Assessment for TAV Airports (Turkey), 2020-2022.*** Three assignments were completed: one with Mott MacDonaldand two on the direct contracts. For 3 months Ambient air quality was assessed at 8 key locations around the airport using the NOx SO2, volatile organic compounds diffusion tubes and dust and PM10/4/2.5/1 with the DustTrak DRX 8533 meter. Contamination sources and transfer pathways were identified, chronic contamination and risk of spills assessed and plan developed for the Phase 2 intrusive assessment. Ionising radiation and asbestos surveys were conducted at the buildings to be demolished and in the old aircrafts set for removal. Biodiversity and the airport wildlife management practices were assessed.

**ENERGY *Borey and Energotrust 206 MW WPP Annual Wildlife Monitoring for Sungrow, 2021*** See description in EIA section

**21. ENERGY *Ybyray Windfarm Birds Bats and Other Animals Spring-Autumn Survey for Universal Energy, 2019.*** The internationally recognised methodology was adapted for the area and results were used to calculate likely birds mortality in order to compare it with the average mortality at the on land windfarms and enable the international finance institution to categorise the project.

**20. TRANSPORT & WASTE MANAGEMENT *Dushanbe Trolleybus Network Reconstruction and Waste Management System Audit for EBRD, with WSP, 2018.*** EBRD financed reconstruction of 4 tranction substations, 30km of cable network and 20km of overhead wiring as well as purchase of equipment for the trolleybus repair. The city waste management was audited to define scope for future improvement. Our Tajikistan representatives, experienced in environmental and social protection and the local legislation, helped WSP to bring these companies in compliance with the EBRD ES Policy requirements.

**19. TRANSPORT *Shymkent-Tashkent Road RAP and ESAP Implementation Monitoring with Arup for EBRD, 2016, 2017.*** Despite that the submitted to the bank annual ES reports indicated no issues with this B category project, during the visits significant gaps in ESAP implementation and absence of any effort in resettlement have been identified. Constrained by the depleted funds and time for the construction, the consultant attempted to find plausible solutions by working with the regional council, the project implementation unit and the affected and grieved parties. The criteria for the lost income compensation has been developed. Alteration of the road design was ensured to provide safe access to the existing road services and minimise hazard to the road users.

**18. TRANSPORT *Corporate Development Program for Environmental and Social Capacity Building of the National Railway Holding Kaztemirzholy PLC for EBRD, 2016-2017.*** ESAPs from 5 credit agreements have been amalgamated preserving split of responsibilities in the complex structure of the holding that was actively changing at the time. The main accent was put on reduction of the number and severity of the staff injuries, ESAPs implementation and timely and complete reporting to the bank. The known EMS tools like ISO standards have been used to achieve these aims across three levels: head office and the structural and operational units in Almaty Region. The holding operational HSE reporting software has been studied and suggestions made for improvement.

**17. PROPERTY *BREEAM Certification of St. Regis Hotel Astana. Ecological, Traffic and Flood Risk Assessment for Hill International, 2015.*** ESA has conducted specific assessments for BREEAM sustainable certification to identify the site ecological value, the risk of flooding from different sources and the existing traffic conditions and traffic change after the hotel construction. A qualified ecologist, hydrologist, botanist, entomologist and zoologist inputs complied with the BREEAM International New Construction Technical Manual 2013 requirements. The reports were verified by ARUP and merit positive comments.

**16. INFRASTRUCTURE *Aktobe Water, Waste Water and District Heating Reconstruction ESDDs Update and ESAPs Reworking for EBRD, 2015.*** Three years after the initial feasibility study, the loans documentation for two utility companies Akbulak and TransEnergo was updated, the companies’ performance evaluated in EHS and social terms, and the action plans reworked to include the initially unnoticed issues and the impacts generated by the changes in the priority investment programs.

**15. OIL&GAS *HSE Management System for Uzen’ Oil Field. Field Rehabilitation Project for Uzenmunaigaz and World Bank, 1999-2003 and annual update, Kazgeokosmos, 2004.*** The existing health and safety and emergency response practices and the risk of oil spills were assessed. The new HS and ER plans were developed to reduce the risks to health and environment and the personnel was trained in new work culture and practices. The training included courses abroad and at the client site, on-the-job training, seminars, presentations and publications. The range of trainees included laboratory engineers, ER officers, HS and environmental managers, GIS operators. The environmental monitoring laboratory and field equipment was procured from various international vendors. The specifications for the new laboratory building and the mobile lab were developed to accommodate the equipment. Instruments were installed, certified and personnel trained to work on them. ESA specialists managed the transfer of environmental, infrastructure, reservoir and operational data into GIS which allowed develop oil leakage prevention and handling procedures. To achieve the system sustainability, data collection and incorporation procedures were designed that accounted for local working culture and forthcoming operational requirements for information.

**14. MINING *Sekisovskoye Gold Mine EBRD ESAP Implementation, for Hambledon Mining, Kazakhstan, 2012-2013.*** To implement Sekisovskoye Mining Company environmental and social action plan prescribed by EBRD, the project team assessed mine impact on terrestrial and water plants and animals (including invertebrates) and the local community health, safety and security and prepared biodiversity remedial action plan, workers and contractors housing strategy, land acquisition and resettlement policy and retrenchment plan for transferring the operation from the open pit to underground.

**13. TRANSPORT *Atash Base Construction HSE Management System for Caspian Services Group PLC, Bautino, May 2007-2010.*** Plans to meet ISO14001 for environmental compliance and to ILO OHS and OHSAS requirements for worker and social protection include waste, hazardous material, monitoring and environmental performance evaluation, emergency response etc.

**12. OIL&GAS *Ravninnoye and Beybars Oil Fields HSE Management Systems for Roxi Petroleum PLC, Mangystau Region, 2007-2008.*** The systems were created to comply with Kazakhstan legislation and international requirements.

**11. PROPERTY *Traffic and Noise Survey for Haileybury School and Housing Estate planning for Capital Partners PLC, Almaty, 2007.***

**10. MANUFACTURING *Environmental Operational Procedures for KazNefteKhim facilities, Kazakhstan, 2007.*** The client required step-by-step H&S procedures to be presented and subsequently followed in order to comply with EBRD loan requirements. Accordingly, procedures on waste management, risk assessment, emergency response, hazardous material handling and storage tanks cleaning was drafted in compliance with the Kazakhstan, EU, and international standards and guidelines.

**6-9. MANUFACTURING *4 monitoring reports of ESAP implementation by Beverage Producing Plants Efes, Carlsberg, Coca-Cola and RG Brands (Pepsi-Cola). for EBRD with Arup PLC, Kazakhstan, 2011.*** Together with an Arup specialist ESA specialists assessed the plants and prepared some parts of the report to the bank.

**5. TOURISM *3 years HSE Control and Monitoring of Medeo and Chimbulak Resorts Construction for Capital Partners, Kazakhstan, 2007-2009.*** Daily monitoring of road making equipment, waste management procedures, health and safety, ski lift piling and terminals construction, and all activities associated with this fast-track development which was ready for the 2011 Asian Winter Games.

**4. OIL&GAS *Insects Monitoring in the Vicinity of Agip KCO Bautino Marine Support Base, for Agip KCO, Kazakhstan, 2006-2007.*** The purpose of the study was to define sources of the mass blood-sucking population in the area researched and provide reasons related to the intensity of their attacks with a view to develop effective measures to combat and protect personnel without impacting the environment. The survey captured all stages of the insect's life cycle. Six large congregations were determined. The main troublesome object was determined to be black gnats but little data on their ecology and biology existed in the literature so additional studies were conducted. Initial protective measures were then recommended.

**3. OIL&GAS *AgipKCO Onshore Facilities impact Monitoring, for AgipKCO, Kazakhstan, Spring, 2005.*** ESA specialistsmaintained extended cooperation between the English-speaking field team and 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.

**2. OIL&GAS *Seal Population Monitoring in the Kazakhstan Sector of the Caspian Sea, for Agip KSO, 2004-2007.*** EcoSocio Analysts together with Rybovod LLC (Russia) performed this twice-yearly study designed to assess any impact on seals in the area of the Agip KCO offshore operation and to continue monitoring observations of the reproductive seal population in the Kazakhstan sector of the Caspian Sea. Observations are essentially performed using an icebreaker in the winter and helicopter in the summer

**1. OIL&GAS *Bird Monitoring in the North Caspian Sea, Agip KSO, 2004-2007.*** Essentially this twice-yearly work analyses data collected during helicopter observation flights of migrating birds in concentration places along the coast line of the Kazakhstan part of the North Caspian Sea. The work compares these data with similar data from previous studies. The purpose of the study is to continue long-term, **regular monitoring surveys and bird species diversity and population registration in the areas close to the Agip KCO** operational sites in the NE Caspian

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| **SOCIAL PLANS DEVELOPMENT AND IMPLEMENTATION** |

***As a stand-alone projects:***

**3. TRANSPORT *ESAP Implementation Monitoring and Preparation of Response to an NGO Complaint on Social Issues of Aktobe-Mortuk Highway Construction, for EBRD, Kazakhstan, 2014*.** An NGO consortium used new online instrument the Project Complaint Mechanism (PCM) to file a combined grievance directly to the bank site. The project team worked with the road project players and the local stakeholders to prepare a response that satisfied the consortium and developed methods to bring the road project in compliance with the ESAP requirements. Further, ESA assisted a PCM independent expert with an eligibility assessment that has been submitted to the bank president.

**2. MINING/MANUFACTURING *Stakeholeder Engagement Plan Development and Implementation according to the Equator Principles for Kazphosphate LLP Taraz Mineral Fertilizer Plant Sulphuric Acid Workshop construction, for HSBC, Kazakhstan, 2010-2012***. ESA specialists has managed to develop the plan and put it to work in a month given by the client. The assignment included house-to-house surveys, interviewing the project stakeholders and focus groups meetings in the affected residential areas. An internet forum was created for the project to involve non local stakeholders and provide the mean of control over the process in a real time. The client’s staff was trained to handle the grievances and to monitor the mechanism effectiveness. Following the HSBC UK requirement, the plan was undersigned by Ove Arup & Partners International Ltd London, UK. During the next 2 years the plan implementation was supervised, the periodic audits conducted and reports prepared for HSBC.

**1. OIL&GAS *Resettlement and Implementation of Rozhkovo Village for the Development of an Oil Field under EBRD conditions 2009-2010.*** ESA specialists developed a Resettlement Action Plan (RAP) for the relocation of 300 people from Rozhkovo village to the city of Uralsk some 100 km away. The EBRD stated “You have done a brilliant job on this…” As a result ESA specialists was commissioned by the client to implement the project which has proceed smoothly.

***Within the abovementioned projects:***

**TRANSPORT *Resettlement of Atash village for construction of Atash Marine Base, Caspian Services Group, 2008-2009.***Within the overall environmental management, ESA specialists has prepared the Resettlement Action Plan for relocation of 45 houses from the Caspian Sea shore near Bautino, which has been designated for industrial development. The work was done in accordance with the **EBRD** requirements and received its praise. ESA specialists also managed the plan implementation and monitoring which was postponed during the World Financial Crisis. During this period ESA specialists continued to inform the affected people by newsletter, personal communication, and board displays on the status of the project as requested by the EBRD standards.

**OIL&GASResettlement of Ganyushkino village for expansion of Ganyushkino Oil Terminal, for KazNefteKhim, Kazakhstan, 2006**. The plan to relocate 30 houses has been prepared according to the **EBRD** requirements.

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| **WASTE MANAGEMENT, RECULTIVATION AND CLEANUP** |

**10. OIL&GAS *An Insurance Company Court Defense Against KazTransOil PLC Claim of Compensation for the Cost of Cleanup of Oil Spilled from Illegal Hot Tapping Into a Cross Country Oil Pipeline with CASLAB LLP, 2014*.** In the group oflawyers and engineers ESA team has built a successful defense which proved that the claimant mislead the court in the cost and duration of the spilled oil cleanup.

**9. OIL&GAS *Technical Data Review: Treated Sewage Disposal from Sunkar Drilling Offshore Rig, for ExxonMobil Kazakhstan Inc., 2011.*** The purpose of the project was to study sewage treatment and effluent discharge practice at the Sunkar Rig. ESA specialists concentrated on the prevention and minimization of pollution from the installation using BATNEEC approach and on developing the system with which the waste streams can be easily and regularly examined for availability of a more appropriate option in the future.

**8. MANUFACTURING *Waste Analysis for ESIA of ArcelorMittal Steel Plant Expansion, Kazakhstan, 2009.*** Analysis included the overall wastewater collection, treatment and disposal including all wastewater streams, cooling tower, boiler blow down, oily wastewater, sanitary wastes and proposals for wastewater handling and treatment facilities.

**7. OIL&GAS *Abandoned Wells Assessment, for MaxPetroleum Group/Samek International, Kazakhstan, 2009.*** In keeping with compliance requirements, 11 old and abandoned wells were studied to define the volume and character of contamination and develop a clean-up plan. The work included examination of old well logs to identify stratigraphy that could speed up the casing erosion or act as a conduit for contamination entering the surface or the groundwater.

**6. OIL&GAS *Contaminated Soil Cleanup, Plan and Bioremediation, for Roxi Petroleum PLC, Kazakhstan, 2007-2009.*** A 20-year old oil contamination was worsened by the recent spills resulted from the well workover activities. The contamination has been transported by water from artesian well to affect 28 ha of ground. The task was complicated by dependence of shepherds and rare migrating birds on this water. The project team used GPS/GIS technology and soil sampling and analysis to delineate and characterize the contamination and suggested socially acceptable, practical and cost effective cleanup techniques with estimates of the cost and schedule and selection of specific equipment. Bioremediation by landfarming was suggested instead of conventional ground removal to a hazardous waste landfill that normally costs millions of dollars. After the Cleanup Plan was approved by the environmental protection authorities and the cleanup started, the client stopped paying sizeable amount of money for this land contamination. The main challenges of conducting bioremediation by landfarming in the Caspian Sea region were lack of agricultural machinery and agricultural experience, soil overheating and tension with the shepherds over hours of fresh water usage as well as numerous buried metal pieces that hindered ploughing. Despite these obstacles bacterial activity that was monitored by measuring soil CO2 transpiration, was good and the ground was cleaned in two warm seasons. After the environmental office inspection, the area was taken off the Contaminated Land Register.

**5. FORESTRY *Irtysh Pine Forest Protection and Reforestation for IBRD and******GEF with Helsinki Consulting Group Ltd, 2004*.** The Environmental Assessment and Management Plan was part of the Forest Protection and Reforestation Project in Kazakhstan**.** EcoSocio Analysts assessed ecology and control practices of pests in relict pine strip forests of Irtysh, social problems related to livestock pasturing, illegal logging and burning forest to justify consequent logging. ESA specialists also suggested forest rehabilitation procedures. Stakeholders were identified and their opinion accounted during the Plan preparation.

**4. OIL&GAS *Binagadi-Baladzhary Oil Field Land Contamination Sampling and Analysis Plan for SOCAR and World Bank, Azerbaijan 2004.*** ESA specialists prepared the Site Investigation and Cleanup Monitoring Sampling and Analysis Plan according to ASTM standards and World Bank requirements. It included a GIS integrated data collection approach.

**3. OIL&GAS *Geotechnical Survey, Ground Contamination Assessment and Cleanup Plan for the North Caspian Emergency Response Base Construction, for Agip KCO, 2004.*** This logistically challenging work involved placement of nearly 100 boreholes to a maximum depth of 5m in reedchoked and water-surge prone wetland conditions. Due to the high environmental sensitivity and impassability of the site the sampling was performed using the perforation, which let to reduce the impact to the minimal level. Soil sampling was conducted according to the American Society for Testing and Materials (ASTM) standards and protocols including field QC procedures such as rinsate and field blanks, proper containers, preservatives, and complete chain of custody. Data on hydrocarbons (including polyaromatic), metals, PCBs and radionuclides content were collected and analysed in several laboratories with proper QC procedures to include blind duplicates and matrix spikes. Different analytical methods were used to avoid false negatives associated with total petroleum hydrocarbons concentrations. All acquired data was incorporated into the client’s GIS.

**2. OIL&GAS *Contaminated Soil Cleanup Plan, for Hurricane Kumkol Munay (PetroKazakhstan), Kazakhstan 2003.*** The position and volume of contaminated ground at Kumkol oil field was assessed using GPS/GIS technology and soil sampling and analysis. According to the calculated volumes, characteristics of spilled oil, soil and hydrogeology and existing infrastructure components, six cleanup techniques were selected and their cost calculated. The specific equipment was defined. The Plan was approved by the environmental protection authorities and received their praise.

**1. OIL&GAS *Cleanup, Waste Oil Recovery and Revegetation under the Uzen oil field rehabilitation project, for Kazmunaygaz with Ecology & Environment, Inc (USA), Kazakhstan, 1999-2003.*** After examination of over 40 cleanup methods the pilot cleanup efforts was concentrated on 4 most feasible and cost effective techniques for the site condition: high soil clay content and paraffin rich oil. The specific contaminant collection and cleaning equipment was defined and procured from US, Europe and Russia. The methods and equipment was tried in the field over a year period covering operation in all seasons. Three new methods of highly weathered oil collection and recovery were tested and their costs and benefits were calculated. Experimental revegetation plots were established to model conditions in various parts of the oil field. Cost-effective techniques were developed for revegetation of the entire field that had over 70% vegetation cover removed as a result of 35 years industrial activities.

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| **RISK ASSESSMENT** |

**3. OIL&GAS *Pre-acquisition environmental and social risk assessment of Karazhanbas oil field, for CNOC with Baker McKenzie CIS Ltd, Kazakhstan, 2006.*** Critical impacts were identified and evaluated, risk mitigation strategy developed and the cost of measures necessary to control the risk estimated.

**2. OIL&GAS *Assessment of Risk from Environmental Regulations for EBRD with PriceWaterhouseСoopers, 2002.*** The work that focused on environmentally related risks for banks and other investors was used for capacity building and technical assistance to three major Kazakhstan banks that were reviewed by EBRD as potential clients.

**1. TRANSPORT *Assessment of Risk of Propane and Butane Transportation in Railway Tanks for Tengiz Transportation Company, 2002.*** Risk Assessment was performed to secure the loan from Kazakhstan Development Bank for purchase of 300 railway tanks, to transport propane and butane from Tengiz oil field to Kazakhstan, former Soviet Union and Eastern Europe. Environmental risk assessment of the tanks use and decommissioning was carried out with respect to the transported gases characteristics, existing operation procedures as well as the accident statistic data for the railways planned for use.

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| **EMERGENCY RESPONSE** |

**4. OIL&GAS *TengizChevroil Emergency Oil Spill Response Plan Part 1. Assessment of environmental sensitivity in the Middle Caspian along the route of crude oil transportation pipeline (Aktau – Baku), Kazakhstan, 2001.*** This project was implemented as the component of the Action Plan for oil spills. Under the requirement of the Ministry of Natural Resources and Environmental Protection of RoK it was necessary to study the oil spill environmental sensitivity of the transportation area. ESA specialists team worked with coordinators of Caspian Environmental Program and specialists in Atyrau, Astrakhan and Baku in order to search the available environmental status data for the studied area. The strong contacts with Institute of Geography in Baky and Institute of Fishery in Astrakhan were established. The project included the general management, and coordination of sub-contractor activities. Phase 1 included the inventory of existent data and maps, location of culturally and environmentally important areas, protected zones, description of bio-diversity and status of flora and fauna, bird population and diversity, to include the species, listed in Red Book, bird, fish and Caspian seal migration. The analysis of physical and biological environment of the marine areas and coastal zone was performed, their seasonal sensitivity to the oil spill was determined.

**3. OIL&GAS *Oiled Wildlife Response Planning for Oil Spill Training Company LTD, Kazakhstan, 2004***

**2. TRANSPORT *Atash Base Construction HSE Management System for Caspian Services Group PLC, Bautino, May 2007-2010.*** *See above*

**1. OIL&GAS *Emergency Response Plan preparation under the Uzen oil field rehabilitation project, for Kazmunaigaz with Ecology & Environment Inc. (USA), Kazakhstan, 1999-2003.*** *See above*

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| **TRAINING AND CAPACITY BUILDING** |

**8. GENERAL *Capacity Building in Environmental Information Management in Central Asia for ADB, Regional, 2008***

**7. GENERAL *National Training expert for the EU/TACIS project. Capacity Building for the Introduction of International Environmental Standard (EUROPEAID/119860/C/SV/multi), 2006.*** The overall objective of the project was to facilitate further **integration of Kazakhstan into the international economy**, while improving environment protection and to assist the Ministry of Environmental Protection (MEP) in capacity building for introduction of international environmental standards. ESA team was responsible for organizing two training seminars (in Astana and Almaty, Kazakhstan) for more than 70 participants in total. Specialists attending the seminars included personnel from the minister of environmental protection (MEP) and interested groups regarding matters relating to technical regulations for environmental safety. Also, attending were specialists interested in international standardization as well as EU experience in developing technical regulation for environmental safety (legal, regulatory, institutional and technical aspects). The seminars also included analysis of the existing situation in industry with regard to the introduction of ISO 14000 and the development of a set of recommendations for the MEP to include increasing awareness and the stimulation of enterprises, etc). The intention was the promotion of a rapid and efficient introduction of ISO 14000 in enterprises and development of environmental management in enterprises based on ISO 14 000.

**6. OIL&GAS *Public Information on Engineering, Environmental and Social Aspects of Kashagan Oil Filed Project for Agip KCO, Kazakhstan, 2006***

**5. GENERAL *National expert on Analytical Laboratories and Monitoring in Kazakhstan for Asian Development Bank project: Capacity Building in Environmental Information Management Systems in Central Asia, 2004-2006.*** The project took place in 4-countries to include Kyrgyzstan, Tajikistan and Turkmenistan. ESA specialists duties include: country analysis and reviewing related materials, design laboratory services and standardized methods, institutional capacity building and advising beneficiary staff, developing regional co-operation in laboratory technology, needs assessments for training, purchases and development, establishing of standardised data bases for environmental indicators, case studies implementation, planning and conducting workshops and meetings, reporting and preparing manuals and training materials. ESA specialists prepared the analysis and cost evaluations for the Unified State Environmental Monitoring System in the Republic of Kazakhstan (for the Ministry of Environmental Protection) for its modernisation and operation, including air, surface water, land and hazardous wastes monitoring (laboratories and information system).

**4. OIL&GAS *Training and technology transfer under the Uzen oil field rehabilitation project, for Kazmunaigaz with Ecology & Environment Inc. (USA), Kazakhstan, 1999-2003.*** The training included courses abroad and at the client site, on-the-job training, seminars, presentations and publications. The range of trainees included laboratory engineers, ER officers, HS and environmental managers, GIS operators. The “training trainers” principle was used during the technology transfer.

**3. OIL&GAS *Creation of environmental laboratory under the Uzen oil field rehabilitation project, for Kazmunaigaz with Ecology & Environment Inc. (USA), Kazakhstan, 1999-2003.*** The appropriate environmental laboratory and field equipment was defined and procured from various international vendors. The specifications for the new laboratory building and the mobile lab were developed to accommodate the equipment. Instruments were installed, certified and personnel trained to work on them.

**2. OIL&GAS *Environmental laboratory for Agip KCO with Ecology & Environment Inc., Kazakhstan, 2003-2004.*** The project included the design, procurement, quality control and overall management of creation of a self-sufficient environmental laboratory to support Kashagan oil field exploration drilling.

**1. GENERAL *ESA EHS Training.*** This 50-hour workshop/training program developed in-house is given to all EcoSocio Analysts (ESA) personnel includes classroom and field training. The program continues to be revised and updated as necessary. The first six lessons make up a stand-alone 24-hour health and safety course applicable to any enterprise that deals with hazardous processes, materials or waste.