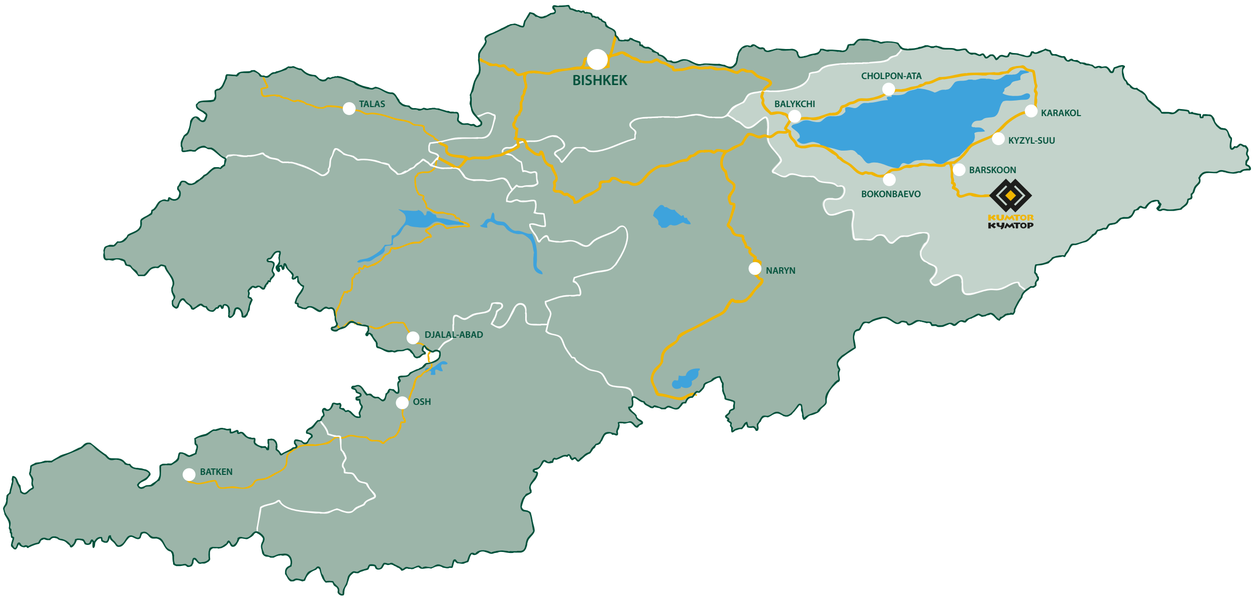
ANNUAL ENVIRONMENTAL REPORT

2011

KUMTOR
КУМТОР

centerraGOLD



The Kumtor open pit mine, located in the Kyrgyz Republic, is the largest gold mine in Central Asia operated by a Western-based producer. It has been operating since May 1997 and, as of December 31, 2011, has produced approximately 8.4 million ounces or 260.7 tonnes of gold.

Kumtor Operating Company is the operator of the Kumtor project responsible for the entire production cycle.

Centerra Gold Inc. is a gold mining company focused on operating, developing, exploring and acquiring gold properties primarily in Asia, the former Soviet Union and other emerging markets worldwide. Centerra is a leading North American-based gold producer and is the largest Western-based gold producer in Central Asia. Centerra's shares trade on the Toronto Stock Exchange (TSX) under the symbol CG. The Company is headquartered in Toronto, Canada.

The Kyrgyz Republic, via Kyrgyzaltyn JSC, is Centerra's largest shareholder owning 77,401,766 shares (about 33%). As of March 1, 2012, Kyrgyzstan's interests are estimated at more than $1,546,000,000.

Currently, Centerra has two producing gold mines located in the Kyrgyz Republic and Mongolia. Also, also has interests in promising exploration properties located in Mongolia, Turkey, China and Russian Federation.

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LIST OF ACRONYMS

ABA	**A**cid **B**ase **A**ccounting
ACLSC	**A**dvanced **C**ardiac **L**ife **S**upport **C**ertification
ARD	**A**cid **R**ock **D**rainage
ASA	**A**lex **S**tewart **A**ssayers
ATLS	**A**dvanced **T**rama **L**ife **S**upport
BCM	**B**ench **C**ubic **M**eters
BMY	**B**alykchy **M**arshalling **Y**ard
BOD	**B**iological **O**xygen **D**emand
Cameco	**Cameco** Corporation
CGI	**C**enterra **G**old **I**nc
CBF	**C**ommunity **B**usiness **F**orum
CCP	**C**onceptual **C**losure **P**lan
CIL	**C**arbon **In** **L**each
CN-T	**C**yanide **T**otal
CN-WAD	**C**yanide **W**eak **A**cid **D**issociable

CPAL	**C**orrective **P**reventive **A**ction **L**edger
EBRD	**E**uropean **B**ank of **R**econstruction and **D**evelopment
EITI	**E**xtractive **I**ndustries **T**ransparency **I**nitiative
EMAP	**E**nvironmental **M**anagement **A**ction **P**lan
EMS	**E**nvironmental **M**anagement **S**ystem
EMZ	**E**nd of **M**ixing **Z**one
ER	**E**mergency **R**esponse
ERP	**E**mergency **R**esponse **P**lan
ERT	**E**mergency **R**esponse **T**eam
ETP	**E**ffluent **T**reatment **P**lant
FCP	**F**inal **C**losure **P**lan
FS	**F**easibility **S**tudy
GGTN	**G**os**G**or**T**echnadzor
GPS	**G**lobal **P**ositioning **S**ystem
HAPE	**H**igh **A**ltitude **P**ulmonary **E**dema
HDPE	**H**igh **D**ensity **P**oly-**E**thyne
HIARC	**H**azardous, **I**dentification, **A**ssessment, and **R**isk **C**ontrol
HSMS	**H**ealth and **S**afety **M**anagement **S**ystem
ICU	**I**ntensive **C**are **U**nit
IFC	**I**nternational **F**inance **C**orporation
IMP	**I**nternational **M**anagement **P**ractices
IME	**I**ndependent **M**ining **E**ngineer
ISO	**I**nternational **S**tandards **O**rganization
JEOHSC	**J**oint **E**nvironment **O**ccupational **H**ealth and **S**afety **C**ommittee
JSC	**J**oint **S**tock **C**ompany
KGC	**K**umtor **G**old **C**ompany
KGP	**K**umtor **G**old **P**roject
km	**k**ilo**m**etres
KOC	**K**umtor **O**perating **C**ompany
KR	**K**yrgyz **R**epublic
LDD	**L**ow **D**iversion **D**itch
LOM	**L**ife **of** **M**ine
LTI	**L**oss **T**ime **I**njury
LR	**L**akefield **R**esearch
MAC	**M**aximum **A**llowable **C**oncentration
MAD	**M**aximum **A**llowable **D**ischarge
MAE	**M**aximum **A**llowable **E**mission
MES	**M**inistry of **E**mergency **S**ituations
MMER	**M**etal **M**ining **E**ffluent **R**egulations
m	**m**eters
mm	**milli**m**eters
MSHA	**M**ining **S**afety and **H**ealth **A**ssociation (U.S.)
NGO	**N**on **G**overnmental **O**rganization
OMA	**O**ntario **M**ining **A**ssociation (Canada)

POL	**P**etroleum, **O**il & **L**ubricants
ppm	**P**arts **P**er **M**illion
QA	**Q**uality **A**ssurance
QA/QC	**Q**uality **A**ssurance/**Q**uality **C**ontrol
QMC	**Q**uality **M**anagement **C**entre
QMS	**Q**uality **M**anagement **S**ystem
RIF	**R**eportable **I**ncidents **F**requency
RLC	**R**egional **L**iaison **C**ommittee
ROM	**R**un **O**f **M**ine
SAG	**S**emi **A**utogenous **G**rinding
SCER	**S**ary **C**hat **E**rtash **R**eserve
SMA	**S**askatchewan **M**ining **A**ssociation (Canada)
SRC	**S**askatchewan **R**esearch **C**ouncil
SSCR	**S**askatchewan **S**pill **C**ontrol **R**egulations
STP	**S**ewage **T**reatment **P**lant
SW	**S**outh **W**est
SWPS	**S**urface **W**ater **P**rotection **S**tandards
TDS	**T**otal **D**issolved **S**olids
TLV	**T**hreshold **L**imit **V**alues
TMF	**T**ailings **M**anagement **F**acility
TSP	**T**otal **S**uspended **P**articulate
TSS	**T**otal **S**uspended **S**olids
UUD	**U**pper **D**iversion **D**itch
WAD	**W**eak **A**cid **D**issociable
WE	**W**ater **E**quivalent
WTP	**W**ater **T**reatment **P**lant
WR	**W**aste **R**ock
µm	**M**icro-**m**eters
µSv/hr	**M**icro-**S**ieverts Per **h**our

SECTION 1

INTRODUCTION

1.1 Requirements

1.2 Overview

1.1 REQUIREMENTS

According to Kumtor Operating Company's (KOC) Environmental Management Action Plan (EMAP version 5, dated June, 2010), KOC will submit to the Agency Lenders, within 120 days after the end of each Fiscal Year, an *Annual Environmental Report* which includes the following information and items:

- All monitoring results as a monthly average on a station-by-station basis;
- All exceedences of the relevant limits or requirements set by the EMAP or by any of the laws, regulations, policies or guidelines, with an explanation of actions taken to correct the situation and their results;
- Details of any spills, related clean-up procedures, and the status of the clean-up;
- Any changes to the monitoring protocols or station locations;
- The status of the closure plan including any reclamation studies or work that has been done, and attendant revised estimates of the total reclamation cost;
- Data gathered during the year on acid-mine drainage, waste rock piles, rock pile stability, volumes of waste rock and tailings generated, and glacier conditions;
- A yearly estimate of all discharges and fresh-water usage including a water balance of the tailings area;
- Any studies related to the site's environmental affairs;
- A brief outline of the activities, studies and surveys planned for the next reporting period;
- Worker health protection and safety initiatives undertaken by KOC.

This report meets the aforementioned requirements for the 2011 reporting year as well as streamlining the format and structure of previous annual reports.

1.2 OVERVIEW

The report was prepared and edited by the KOC Environmental Department and contains the following sections:

Section 1- Provides a summary of the requirements as per EMAP and an overview of each section of the report.

Section 2 - Presents an overview of KOC's 2011 operational performance with a brief description of processes, equipment and systems in place.

Section 3 - Presents an overview of Environmental, Health & Safety Management Systems (EMS, HSMS), the HSE Compliance issues and the data with regard to the received permits, approvals, inspections and audits in 2011.

Section 4 - Provides information on improvement of HSM and EMAP measures, accidents, injuries, major incidents and spills during a year with the remediation strategies and action plans to prevent reoccurrence, review of Emergency Response Plan.

Section 5 - Provides information regarding the KOC Medical Aspects and Medical Data.

Section 6 - Provides a summary of EMAP, the results of 2011 monitoring program performed by the Environmental Department as well as plots of key water quality parameters, the data, collected from the KOC's Meteorological Station.

Section 7 - Provides a summary of all Environmental based studies done on or near the Kumtor Property in 2011, summary of Closure Conceptual Plan (CCP).

Section 8 - Presents the data of river flow rates estimation used in a water balance for Petrov Lake, operation of the Tailings Management Facility (TMF) including the results of the tailings dam monitoring; the summary of operations of Effluent Treatment Plant (ETP), Sewage Treatment Plant (STP) and Water Treatment Plant (WTP).

Section 9 - Provides monitoring data of glaciers and waste rock studies, snow and avalanche situation, data on the pit dewatering program.

Section 10 - Provides information on Corporate Relation in 2011.

Section 11 - Provides information on Media Relation in 2011.

Section 12 - Outlines future plans for 2012 including the Targets and Objectives established under the HSE Management Systems and new projects.

Appendix A - Provides the history, geology, location, characteristics, and description of KOC's operations for new readers of the KOC Annual Environmental Report.

Appendix B - Presents the Environmental Monitoring Program

Appendix C - Water quality data for 2011 (monthly).

Appendix D - Water quality data (annual for 5 years)

Appendix E - HSE Policy

SECTION 2

KOC SUMMARY

2.1 Operations Summary

The Kumtor open pit mine, located in the Kyrgyz Republic, is the largest gold mining company in Central Asia operated by a Western-based producer. It has been operating since May 1997 and, as of December 31, 2011, has produced approximately **8.4 million ounces or 260.7 tonnes of gold**.

Kumtor Operating Company is the operator of Kumtor project and responsible for the entire production cycle.

Centerra Gold Inc. ("Centerra") is the gold mining company focused on operating, developing, exploring and acquiring gold properties primarily in Central Asia, the former Soviet Union and other developing countries. Centerra is the leading North American gold producer and is the largest Western gold producer in the Central Asia. Centerra's shares are traded on Toronto Stock Exchange (TSX) under the symbol CG. The Company is headquartered in Toronto, Canada.

The Kyrgyz Republic, via Kyrgyzaltyn JSC, is the largest shareholder of Centerra and owns **77,401,766 shares** (about 33%). As of December 30, 2011, Kyrgyzstan's holding of shares are estimated at more than **$1,347,000,000 US**.

Currently, Centerra has two gold mines:

- Kumtor Mine Site, Kyrgyz Republic (100% shares)
- Boroo Mine, Mongolia. (100% shares)

Besides, Centerra has also exploration interest in the properties located at the following promising territories:

Mongolia:

- Gacuurt Deposit, near the Boroo Mine (100% shares)
- Sambert project, where Centerra is authorized to have 75% of shares via Altairgold LLC. Joint-stock company

USA:

- "Tonopa Divide" enterprise, State Nevada, where Centerra has purchased 60% of interest under its agreement with "Tonogold Recourses Inc.
- "Oazis" enterprise, State Nevada, where Centerra is authorized to have up to 75% of shares through its joint venture with Redstar Gold. Corp.

Turkey:

- "Akarcha", "Samly" and "Elmaly", where Centerra is authorized to have 75% of shares through its joint venture with Eurasian Minerals Inc.
- "Oksut" project, where Centerra is authorized to earn up to 70% shares through its joint venture with Stratex Internnational Plc.

Russian Federation:

- "Kara-Beldyr" project in Tuva Republic where Centerra has purchased 50% of shares and is authorized to purchase 20% more shares via Central Asia Gold AB Joint-Stock Company.

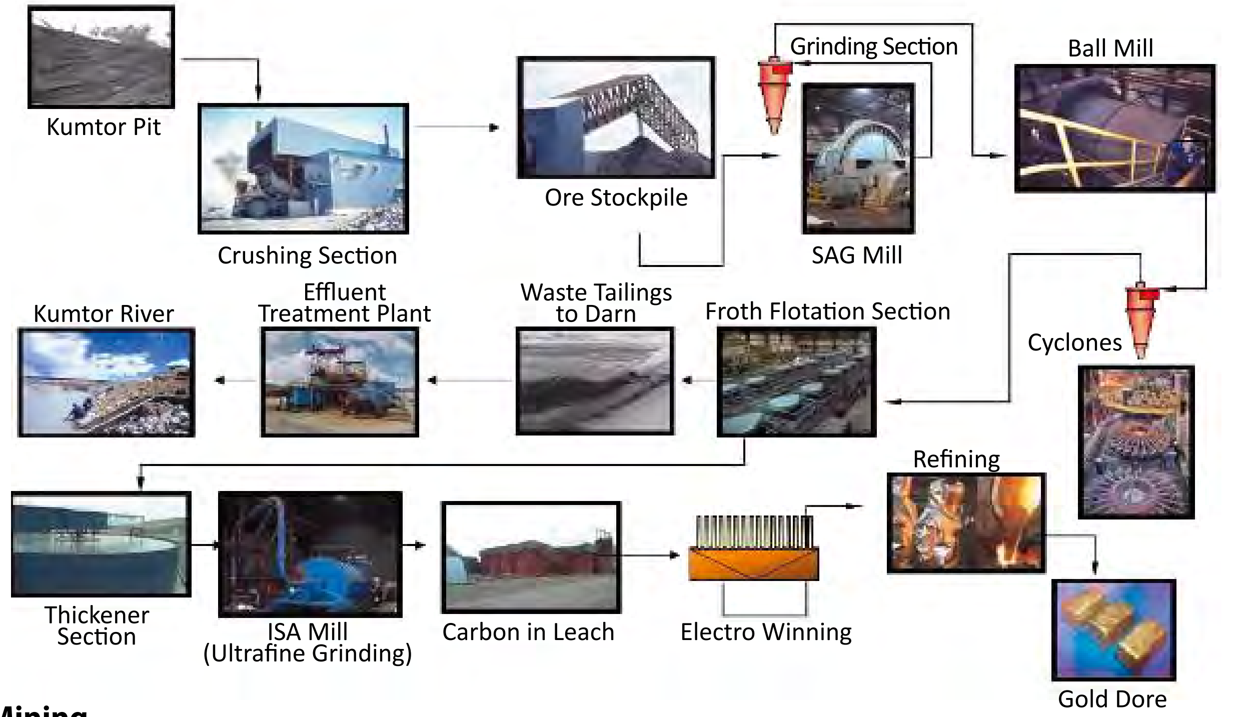
The additional information on "Centerra" is available at site SEDAR **www.sedar.com** and at Company site **www.centerragold.com**.

Centerra Gold Inc. (CGI) and Kumtor Operating Company (KOC) made a summary of 2011 operational year. Last year, KOC produced 583,156 ounces or 18,1 tonnes of gold. Thanks to the successful exploration, the lifetime of open pit has been extended up to 2021.

2.1 OPERATIONS SUMMARY

A simplified flow chart of KOC's operations is shown in figure 2-1 with a detailed historical description provided in the Attachment A.

Figure 2-1: Basic Flow Chart KOC's 2010 Operation



Mining

In 2011, the mine operations continued in the central pit.

The average production of the Central pit mining was 206,111 m^3 per day or 412,616 tonnes / day.

KOC open pit operation mainly used conventional mining methods for open pits: moving of ice (when cutting back benches) conventional drilling, blasting and hauling.

The Drilltech D45KsH-type mobile rotary/percussion diesel drilling rigs and the new diesel drilling rigs DR460 (215 mm; borehole diameter - 172 mm) were used for blasthole drilling.

Drilling by new drilling rigs increased the labor productivity and blasthole spacing with 43m/hour that was 12% faster than Drilltech D45KsH.

Stemming vehicle on the base of KAMAZ and two Bobcat mini loaders were used for blasthole tamping.

ANFO trucks mixed ammonium nitrate with diesel fuel (AC-DT) or emulsion components and loaded the holes. As a stemming material they used crushed stone from gravel crasher that made possible to decrease the fragmentation of blasted mass and the quantity of well shooting at blast.

Charging was conducted by special charging machines, mixing the ammonium nitrate and diesel (AC-DT), and emulsion charging machines. During the process the components were mixed.

The mine loading fleet consists of 5 diesel-hydraulic shovels CAT 5130B with front shovel type of 12m3, 3 front-end loader CAT 992C and 9 excavators Liebherr 9350 of 16 m3 buckets. Transportation was made by 23 CAT 777B-85 ton haul trucks, 32 CAT 785-136 tone trucks and 36 CAT 739-177 tone trucks.

In 2011, the capital expenditures were $180.7 millions USD spent mainly for the construction of roads to the new mines, fixed assets modernization (purchasing of Liebherr 9350, haul trucks CAT 789, drilling unit and capital repair of the trucks CAT 785 and CAT 777B and excavators CAT 5130 and Liebherr 9350, and drilling unit) and for development of Portal I and Portal II of underground SB zone.

In 2011, it was drilled at Kumtor mine open pit

- 182 hydrogeological holes, total volume – 17,639 rm.
- 170 vertical holes, total volume – 16 058 rm.
- 12 horizontal holes, total volume – 1 581 rm.

The measures on removal of melting water made possible to increase the strength of moraine structures and to improve the geotechnical characteristics in the pit walls.

Depending on the operational area, the waste rocks were transported to the different waste dump areas.

The ore was directly transported to the crasher or to the ore storage area for further mixing and processing.

In 2011, mining operations from the Central Pit resulted in a total of 75,230,554 BCMs (Bank Cubic Meters) or 150,604,826 tonnes including 21,932,547 BCMs (20,177,944 tonnes) of ice, 12,279,654 BCMs (34,933,782 tonnes) of cutting materials, 30,583,651 BCMs (70,342,396 tonnes) of waste, 8,342,173 BCMs (19,186,998 tonnes) of moraine and 2,092,528 BCMs (5, 963,706 tonnes) of ore. 5,814,861 million tons of ore with average gold content 3.79 g/t was operated on the Mill.

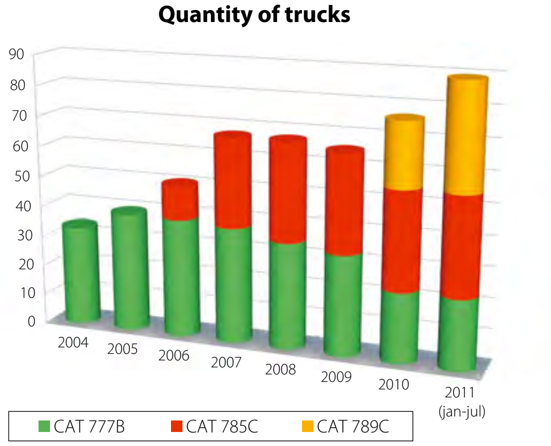
Modernization of mining works

The increase in productivity of rock mass removal was required with expansion of open pit borders and increase of mine operation term.

A considerable increase of production capacity of the pit trucks usage was required to achieve the targets on removal of rock mass. In 2011, the Mine Engineering Department renewed the HDM pit fleet. After delivery of high-capacity CAT 789B trucks, the CAT 777 trucks will be decommissioned.

The renewal of HDM Fleet has made possible to increase the productivity of rock mass removal and to decrease the operational costs.

Figure 2-1 HDM Fleet quantity increase



The effective performance of mining operations in the pit requires a sophisticated dispatching system. The implementation of the "Modulyar" system and the optimization program has made to reduce the industrial fails and effectively regulate the flow of mining material on the basis of data received in a regime of real time.

A graphic map is developed on the basis of exact data of faces and dumps; all factors for productivity increase are constantly analyzed.

One of the achievements of the Mine Department team is the reduction of general cycle time. Nevertheless, they continue to work on it.

Picture 2-1. Mine trucks.

Mineral Processing (Milling)

The Kumtor flow sheet for ore processing is a standard layout that consists of crushing, grinding, flotation, cyanide leaching and gold recovery in a carbon-in-leach ("CIL") circuit. The milling process reflects the fine-grained nature of the gold and its intimate association with pyrite and consists of crushing, grinding, pyrite flotation and re-grinding the flotation concentrate. Two separate carbon-in-leach ("CIL") circuits separately recover the gold from the re-ground concentrate and from the flotation tails respectively, with final gold recovery accomplished by electro winning and refining. The grade of the ore changes at different stages of on-going pit development but the higher level of gold extraction is reached with the usage of the ultrafine grinding mill.

Mill Automated Cycles

The process regulation of the Mill hydrometallurgical leaching requires a usage of sodium cyanide and therefore, a strict control of cyanide free ions level. A traditional control of carbon-in-leach cycle is based on a manual mode of determination of cyanide ions level in the pulp liquid phase. Thus, an automated control system, which has the following advantages, has been implemented at this section:

- Decrease of cyanide free ions level in the tanks allow reducing of sodium cyanide consumption;
- Reduce of the hand-labor proportion and minimization of "human factor" influence;
- Prevention of emergency situations associated with an overdose of NaCN;
- Cost reduction for decontamination of tailings;
- Provision of more efficient gold leaching from the pulp solid phase and decrease of gold content in the tailings solid phase;
- Inspectability of cyanide ions level in carbon-in-leach cycle due to the leaching of sorbent (carbon) from the pulp sample;
- High accuracy of the analysis due to the usage of potentiometric titration;
- Multiple functions of system's self-diagnosis.

Photo 2-2. Process Analyzer ADI 20-40

To optimize the Mill performance of grinding and flotation sections, the streaming automated analyzer fraction Termo Multipoint PSM 400 was implemented.

Photo 2-3: Termo Multipoint PSM 400 analyzer

The flow analyzer makes a rapid analysis of granulometric composition and density of pulp, coming to the flotation section.

The measurement is conducted from 1 to 3 minutes. The analyzer operates continuously 24 hours a day, which allows to:

- Improve the performance of a ball mill for 5-10%;
- Increase by 1% the flotation recovery with an increase on 3% (from 78 to 81%) of ore grindability minus 150 microns. This gives about $30,000 USD as a daily profit;
- To stabilize the grain size and maintain the required pulp density;
- Lower operating costs per ton of processed ore, which follows from:
    - increase the life of the lining of ball mills;

- reduce the consumption of grinding balls;
- reduce water consumption;
- economy of electricity.

For optimum process control and the corresponding response, the measurement results are displayed on monitors in the Control Room and the Mill Metallurgical Laboratory.

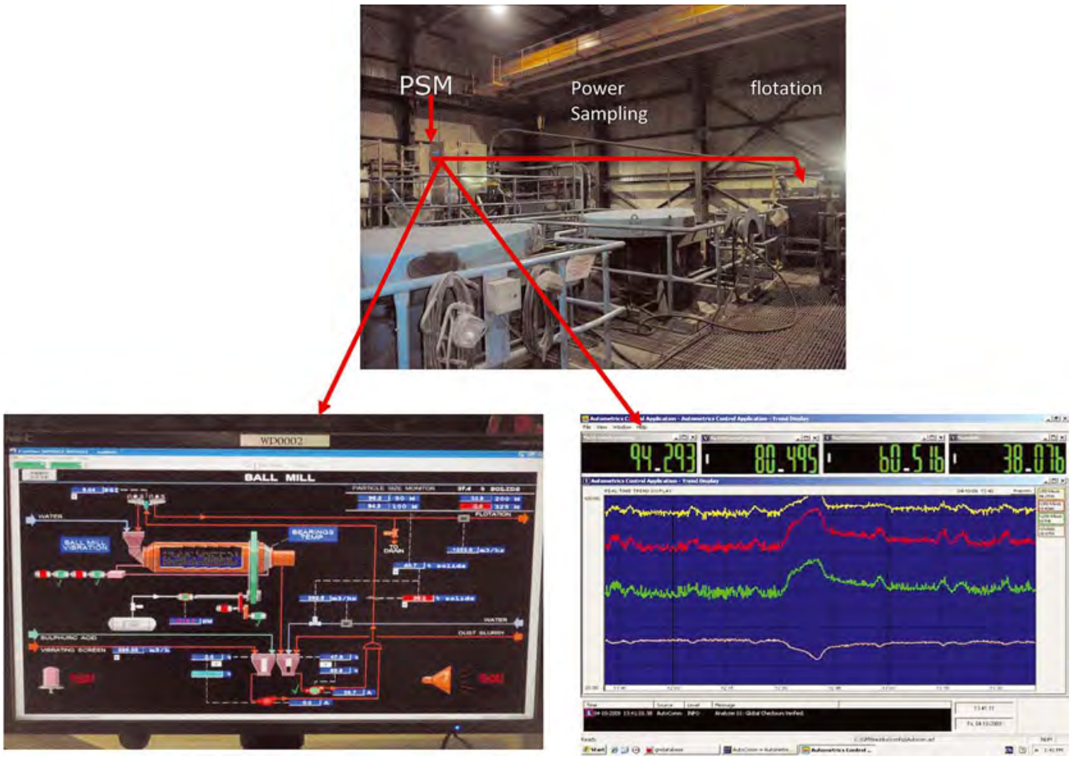


Photo 2-4: Process controlling

Replacement of coal's type

Since January, 2011, the Mill started to use the new type of coal - Coconut Haycarb. The new type of fuel unlike the Norrit coal is steadier against a destruction that allows prolonging its resource. It has more absorbing ability, but Coconut Haycarb absorbs copper, iron and calcium less than Norrit that is positively reflected in the process of gold extraction.

The usage of the new type of coal has facilitated to save the considerable funds.

Tailings Dump and Tailings Management Facilities

KOC Tailings Management Facility (TMF) consists of two tailings pipelines, tailings dam, Effluent Treatment Plant (ETP), and two diversion ditches.

The pulp from the Mill is transported by gravity in one of the pipelines (7 km length), and the other one is on standby.

The tailings continued to be discharged and contained in a single tailings basin created by the construction of tailings dam across the former Arabel-Suu River, in the lower part of its valley. A synthetic geo-membrane antifiltration liner was placed on the upstream side of the dam to prevent erosion, seepage, freezing of dam body (both on initial stage of construction and in the course of operations).

All the works, planed for 2011, regarding the construction of tailings dam, shear-key and buttress were completed from May 1 till October 15.

An acceptable safety coefficient of the dam is provided with the help of 'shear-key and buttress', designed by BGC Engineering Company and the Institute of Physics and Rock Mechanics under the National Academy of Science of the KR. These measures will provide the dam stability in the post closure period as well.

The effluents are treated at Effluent Treatment Plant during the cycle of cyanide destruction; heavy metals are removed to ensure that water quality complies with the standards before to be discharged to the Kumtor River. In 2011, the ETP treated 5.01 M m3 of effluents. About 5 M m3 of treated water including surface melted water accumulated in the Pond #3 during the winter-spring period were discharged to the environment.

Exploration and Mine Expansion

According to the Exploration Development Plan 2011, the exploration was performed at the Central Pit and six exploration areas within the expanded concession area which was approved under the new Investment Agreement (2009).

For the purpose of tracking extensions of known ore bodies and zones of gold mineralization, the exploration drilling was conducted at the immediate Central pit area (underground and open pit).

In 2011, 63 wells were drilled in open pit (the total length of 22,380.8 rm) and 25 wells were drilled in underground (the total length of 6,920.4rm).

The exploration drilling at the areas located outside the Central Pit (Sarytor, Southwest, Muzdusuu, and Northeast) was also conducted during the entire calendar year

Exploration drilling was performed at the South-West area for the purpose of testing the epicenters of geochemical anomalies among the rocks of oxidation area, to the North-West of Kumtor fault. 7 wells, of total length 987rm were drilled at this area.

The exploration drilling performed in the Sarytor area was focused on testing of mineralization below the planned open pit, perspective for the future underground. 5 holes were drilled for a total of 2,168.1 rm.

Exploration at Muzdu-Suu was performed by drilling and bulldozer cuttings and was focused on assessment of geophysical and geochemical results. 2 holes of total length of 582.7rm were drilled and 1,390 м^3 of rocks were cut.

Exploration at North-East has been focused on drill testing of near surface low grade mineralization of hanging Kumtor fault. Total number of drilled holes was 26 with total length of 5,168 m.

For the purpose of disclosure of geophysical and geochemical anomalies the exploration drilling was performed in the Boordu area where 3 holes were drilled (total length was 900.9rm and the volume of bulldozer cutting was 7,050 м^3.

At the Akbel, 3 holes were drilled (total length of 851.4rm).

In 2011, exploration costs for the entire concession area was $12.7 M USD.

The Exploration results confirm the perspective of exploration conducted at the deep horizons of Central area located between the Stockwork and SB Zone and at the South flank of SB.

A full list of the drilling results and supporting maps of Kumtor pit are available in the System of Electronic Document Analysis and Retrieval ('SEDAR') and at the company's web site at: www.centerragold.com.

Reserves and Resources

In 2011, exploration was continued in the Central Pit and in the limits of concession area.

In 2011, due to the active exploration program, including in the Central Pit, and taking into account the processed 709 thousand ounces, the total reserves were 6.3 million ounces. The researches of the South-West part of the SB zone in the Central Pit provided the increase of the reserves available to be processed in open pit.

Table 2-1: Reserves and Resources of Kumtor Deposit

Reserves and resources at Kumtor as of December 31, 2011[1]	Thousands of tonnes	Grade(g/t)	Contained gold		Mining Method
			Thousands of oz	Tonnes	
Gold reserves:					
proven	3 023	1,6	153	4,76	OP
probable	56 671	3,4	6 125	190,51	OP
Total Reserves	**59 694**	**3,3**	**6 278**	**195,27**	

Resources:					
measured	43 262	2,3	3 141	97,70	OP
indicated	22 687	2,3	1 658	51,57	OP
Total Measured and Indicated Resources	65 949	2,3	4 799	149,27	
Inferred Resources					
Central Pit, Southwest and Sarytor deposits	9 195	2,4	694	21,59	OP
Underground Stockwork Zone	1 633	12,0	629	19,56	UG[2]
Underground SB Zone	4 040	13,6	1 760	54,74	UG
Total Inferred Resources	**14 868**	**6,5**	**3 083**	**95,89**	

[1] Reserves and resources include the Central pit, South-West, North-East and Sarytor areas.
* "OP" means open pit
** UG" means underground.

Underground

In 2011 Declines #1 and #2 were developed for opening and supplementary exploration of SB stockwork explored under the Davydov Glacier.

Portal #1 is situated to the South-West of Central Pit, on the south part of Davydov Glacier.

Portal #2 is located in the north of the Central Pit at 3,866m above sea level.

At the end of 2011, 730.6 rm were passed on the decline #1: remuck bays - 132.5 rm, sump - 13.5 rm, safety bays – 26.3 rm. 902.9 rm in total.

479.2 rm were passed on the decline #2: safety bays – 16.6 rm, drill bays – 14 rm, remuck bays– 126.3 rm, sump – 9.8 rm; break through of the decline #3 with break through of the decline #2 is 6.5 rm.; Stockwork zone drive – 308.3 rm. Totally, 960.7 rm. were passed as of the end of 2011.

Ground support

In driving decline and excavation of bays four rock classes will prevail.

Rock bolts, spillings, welded wire mesh and shortcrete are provided for the first and second rocks classes.

Rigid and flexible steel sets, SVP or I-beam in combination with welded wire mesh and fibercrete up to 200-300 mm thickness are provided for poor and extra poor rock masses.

For the areas with extra poor rock, which do not allow exposure, the spiling around the perimeter of the back and walls of headings to the depth of four meters from the face are provided. This consists of 45-mm diameter metal rebar grouted with the use of microcement. When pumped, the grout partially fills in the cracks in the rock mass, thus consolidating it. As a result, the back of the next cycle is secured by spiling installed in two rows and rock consolidated with the use of grout.

Location of bays is provided for in relatively stable rocks, therefore, rock bolts, welded wire mash and shortcrete are used for ground support. Installation of cable bolts and straps are provided by design for reinforcement of intersections before excavation of bays.

Dewatering of underground mine

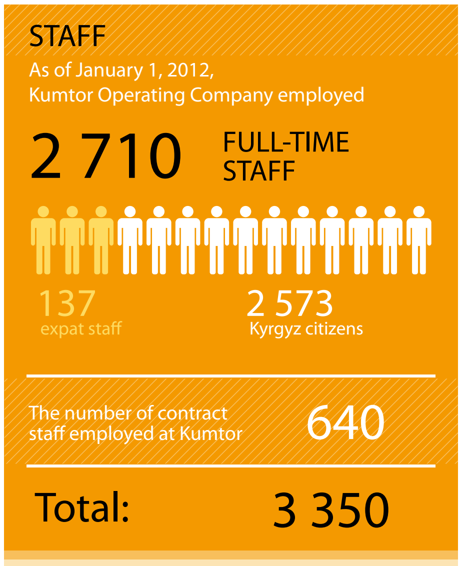
Dewatering of underground mine is conducted by pumping the water to the surface with the use of face pumps and pump stations installed in the bays. The underground water is delivered to the oil-water separator tank located on the surface of Portals #1 and #2.

In the course of advancing declines, the remuck bays are excavated at every 90-100m. With excavation of the next remuck bay the previous is not used as remuck. Every unused remuck bay can be modified to temporary sumps.

KOC Staff

At the end of 2011 KOC had 2,710 full time employees including 122 employees of Exploration Department and 146 employees of Underground mine. 2573 employees (95%) are the citizens of the Kyrgyz Republic, and 137 (5%) employees are the citizens of the other countries.

In addition, the KOC has employed 326 people on a basis of long-term and short-term contracts or as the employees of the following Contractor organizations: Enilchek, Kyrgyzaltyn, Helper, Cross Inc.; it is resulted in the increase of total number to 3,036 persons.



SECTION 3

ENVIRONMENTAL AND INDUSTRIAL SAFETY COMPLIANCE

3.1 Health, Safety and Environmental Management Systems (HSMS/EMS).

3.2 Environmental Permits

3.3 State Registration of Chemicals

3.4 Transportation of Hazardous Chemicals

3.5 Licenses for Importation and Transit Permits for dangerous goods

3.6 Inspections

3.7 Audits

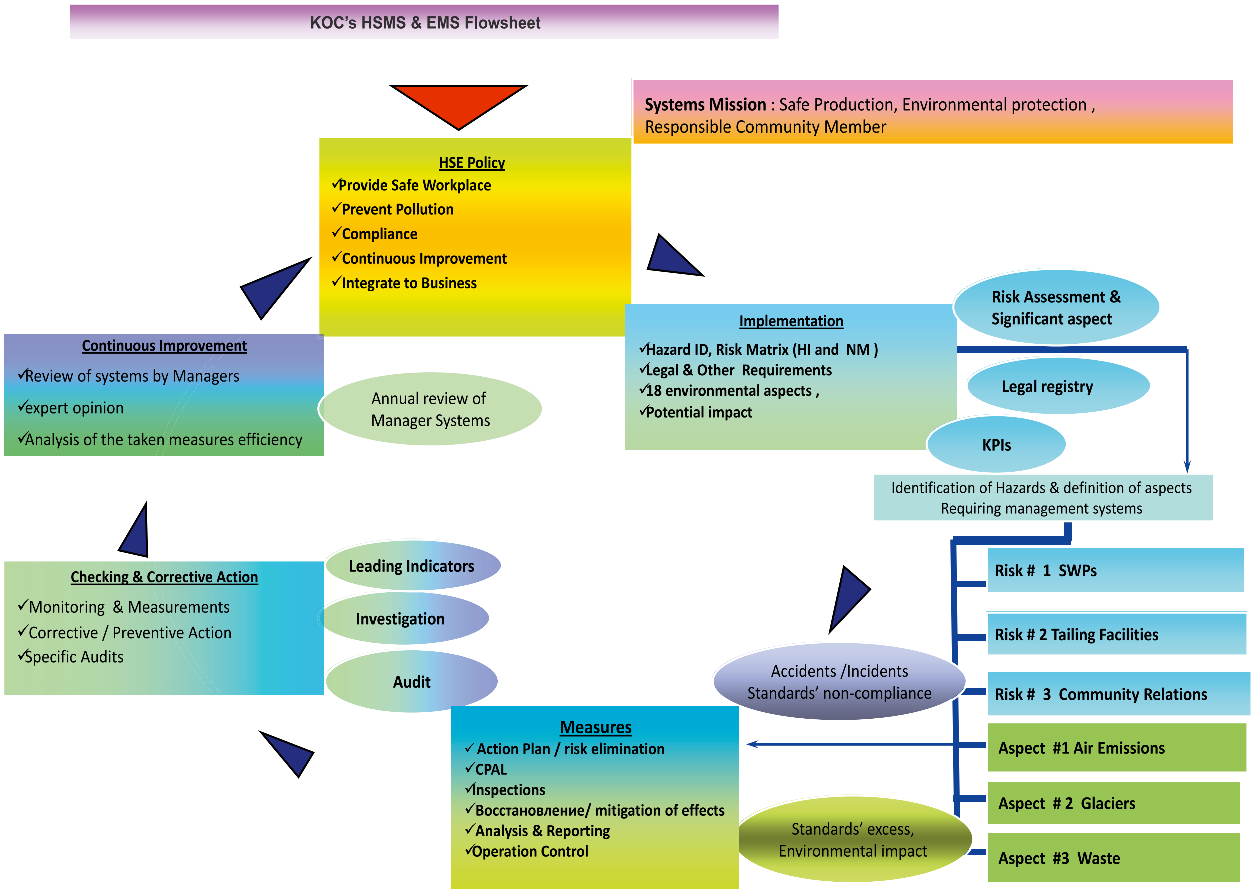
3.1 HEALTH, SAFETY AND ENVIRONMENTAL MANAGEMENT SYSTEMS (HSMS/EMS)

KOC has aggressively managed all safety and environmental issues associated with its mining operation using separate formal Environmental and Health and Safety Management Systems. In 2011, keeping with Centerra Gold corporate requirements, KOC continued to use these formal systems and combine their functionality where possible.

Both KOC's EMS and HSMS provide an international, audible standard and are very similar in their ongoing operation and maintenance. Figure 3-1 illustrates how KOC's EMS and HSMS are related and function in a similar manner as they are based on the ISO-14001 and OSHAS 18000 models involving the Plan, Do, Check and Act cycle.

The Corrective Preventive Action Ledger (CPAL) tracking system was placed on the Kumtor site Intranet to allow both the Safety and Environmental departments to enter corrective action items and allow all other departments responsible to address and respond to deficiencies or non-compliances, and react to the recommendations.

Chart 3-1: KOC's HSMS & EMS Flowsheet



3.2 ENVIRONMENTAL PERMITS

In 2011, KOC continued to obtain permits, approvals and agreements according to the applicable Kyrgyz Republic (KR) safety and environmental legislation and regulations. As required annually, KOC submitted reports (based on actual discharge data for 2010) on the Maximum Allowable Emission (MAE) for air pollutants discharged into the atmosphere and Maximum Allowable Discharges (MAD) of pollutants discharged into surface water bodies and the volumes of water consumption by Kumtor mine and KOC Balykchy Marshalling Yard. A variety of import and transportation permits were received for chemicals used at the mine site and are explained in detail in this section.

Table 3-1 provides a summary of the environmental permits required for KOC, 2011.

Table 3-1: KOC Environmental Permits

Permit	Date of Issue	Valid To	Validity	Regulatory Agency
Ecological Passport Mine Site	December 3, 2009	December 3, 2014	5 years	SAEP& Forestry
Ecological Passport BMY	December 2, 2009	December 2, 2014	5 years	SAEP& Forestry
Emergency Response Plan	December 15, 2011	Until ERP Changes	Until ERP Changes	KR MEM
ETP Winterization Design	December 13, 1999	Until Design Changes	Until Design Changes	SAEP& Forestry
General License #2 - Disposal of Tailings Waste	May 30, 2011	May 30, 2014	3 years	SAEP& Forestry
General License #3 - Disposal of toxic materials and substances	May 30, 2011	May 30, 2014	3 years	SAEP& Forestry
Air Permit-Stationary Sources	March 3, 2011	December 31, 2011	11 months	MNR
Update of Maximum Allowable Air Pollutant Emissions	March 3, 2011	December 31, 2011	Until MAE Changes	MNR
MAD for Effluents	May 27, 2011	December 31, 2011	7 months	MNR
Permit for treated Effluents discharge	May 27, 2011	December 31, 2011	7 months	MNR
MAD for Sewage	May 27, 2011	December 31, 2011	7 months	MNR
Permit for treated Sewage discharge	May 27, 2011	December 31, 2011	7 months	MNR
Water Usage License № 2/120 (KOC, Minesite)	December 29, 2010	December 31, 2011	1 year	DWS
Water Usage License № 2/120 (BMY)	December 29, 2010	December 31, 2011	1 year	DWS
Permit to Operate (ETP)	June 9, 1999	Until Design Changes	Until Design Changes	MEES
Common Conclusion (ETP Design)	September 25, 1998	Until Design Changes	Until Design Changes	SCED
Conclusion (ETP Facilities)	July 15, 1999	Until Design Changes	Until Design Changes	SCED
Government Resolution about approval of the Statement on Kumtor Gold Tailings Facility Commissioning	December 8, 1999	N/A	N/A	KR Government
Statement on Kumtor Gold Tailings Management Facility (TMF) Commissioning	December 7, 1999	N/A	N/A	SAC
Statement on Commissioning into Service of Completed Construction of the TMF	May 17, 1999	N/A	N/A	WAC
Statement on Commissioning into Service of Completed Construction of the TMF	June 24, 1999	N/A	N/A	WAC
Statement on Commissioning into Service of Completed Construction of the TMF	June 9, 2001	N/A	N/A	WAC
Conclusion (Cyanide Destruction)	September 14, 1998	Until Design Changes	Until Design Changes	NAC
Approval Letter (Criteria of Technological Process Designing)	November 2, 1998	Until Design Changes	Until Design Changes	SAEP& Forestry
Conclusion #12 (ETP Design)	March 4, 1999	Until Design Changes	Until Design Changes	SSEID
Hydro geological Conclusion (ETP Design)	November 20, 1998	N/A	N/A	KCHGE

CDH - Civil Defense Headquarters KR
MAD - Maximum Allowable Discharge
DWS - Department of Water Supply
SAC - State Acceptance Committee
WAC - Working Acceptance Committee
SAEP& Forestry - State Agency of Environmental Protection & Forestry
ETP - Effluent Treatment Plant
NAS - National Academy of Sciences
SSESD - State Sanitary Epidemiol.Supervision Dpt.
SCED - State Construction Expertise Department
KCHE - Kyrgyz Complex Hydro Geological Expedition
MNR - Ministry of Natural Resources

3.3 STATE REGISTRATION OF CHEMICALS

According to the KR Government Decree # 103 as of February 25, 2004, revised in July 15, 2009 potentially toxic chemical substances (PTCS) are not registered in the KR and the Ministry of Health Protection does not issue the certificates on PTCS state registration.

As per December 31, 2011, KOC has 115 State Registration Certificates for PTCS which were issued earlier.

3.4 TRANSPORTATION OF HAZARDOUS CHEMICALS

Under KR legislation, the transportation route for hazardous chemicals must be approved by GAI (State Traffic Police) in addition to permits being issued for the vehicles transporting the specific materials. Both approvals fall under Order # 542 of the Kyrgyz Interior Ministry dated December 1, 2003. Table 3-2 lists the chemicals and expiration dates for these permits.

Table 3-2: Transportation Permits & Route Approvals

Chemical	Validity term
Explosive Materials	Transportation by « Vzryvprom » company
Sodium Cyanide	Route Approval – May 25, 2012
Nitric Acid	Route Approval – May 25, 2012
Caustic Soda	Route Approval – May 25, 2012
Ammonium Nitrate	Route Approval – May 25, 2012
Motor Oils	Route Approval – May 25, 2012
Xanthate	Route Approval – May 25, 2012
Sulfuric Acid	Route Approval – May 25, 2012
Flotanol M	Route Approval – May 25, 2012
Hostaflot	Route Approval – May 25, 2012
Sodium Nitrite	Route Approval – March 1, 2012
Acetic Acid	Route Approval – May 25, 2012
Diesel Fuel	Route Approval – May 25, 2012

3.5 LICENSES FOR IMPORTATION AND TRANSIT PERMITS FOR DANGEROUS GOODS

There are the licenses for the importation of the blasting materials and sodium cyanide from Kazakhstan and China to Kumtor mine which are approved and issued by the different KR Ministries and government departments. Importation License and Transit Permits for sodium cyanide, which is imported from China into the KR via Kazakhstan, are required too. Table 3-3 illustrates these licenses and permits.

Table 3-3: Licenses for importation and transit permits

Name	Basis	Issuing Authority	Validity Term
License for the import of blasting accessories from Kazakhstan (Detonators, Connectors EXEL)	Resolution #709 of the KR Government dated October 29, 1998. Attachment to KR Parliament Resolution #1100-1, dated 8.06.1998	KR Interior Ministry by agreement with Gosgortechnadzor	Up to 31.12.2012
License for the import of blasting accessories from China (pentolyte-detonators, detonating cord, wave conductor)	Resolution #709 of the KR Government dated October 29, 1998. Attachment to KR Parliament Resolution #1100-1, dated 8.06.1998	KR Interior Ministry by agreement with Gosgortechnadzor	Up to 31.12. 2012
License for the import of Sodium Cyanide from China	Resolution #709 of the KR Government dated October 29, 1998	KR Ministry of Economic Development and Trade by agreement with Gosgortechnadzor, Interior Ministry, Ministry of Health Protection, SAEP& Forestry	Up to 31.12 2012
Transit permit for transport of Sodium Cyanide through Kazakhstan	Resolution #130 of Kazakhstan Government as of February 11, 2008	Kazakhstan Ministry of Industry and Trade	Up to 6.01.2013

3.6 INSPECTIONS

Representatives of different Kyrgyz Governmental Authorities continued to conduct inspections of KOC operations in 2011. The inspections fell under the jurisdiction of the Ministry of Emergency Management (MEM), which includes Gosgortechnadzor (GGTN) and also under the jurisdiction of the State Agency of Environmental Protection & Forestry (SAEP& Forestry), Issyk-Kul Regional Center of State Sanitarian Epidemiological Inspection (IRCSSEI), Geoecological Department of the Ministry of Natural Resources. According to the Regulatory Acts of Kyrgyz Republic, SAEP& Forestry, MEM, GGTN, Issyk-Kul Province Department of Internal Affairs, and KR Fire Protection Inspectorate inspected the cyanide storage pad at BMY and at the mine site as part of the sodium cyanide permitting process.

3.6.1 GOSGORTECHNADZOR (GGTN) UNDER KR MINISTRY OF NATURAL RESOURCES

April 5: K.E. Ermatov, GGTN Director and I.V. Gilfanov, GGTN Departments Chief conducted an unplanned inspection of Mill facilities. The inspection results were discussed with the mine Management.

April 13: Ch. Sadabaeva, GGTN State Inspector and A. Stetsiuk, Chief Specialist of Kyrgyzstandart, conducted an unplanned calibration of the Mill gas analyzers.

May 17: O. Tashmatov, GGTN State Inspector, conducted a planned industrial safety inspection of Contractors, operating at Kumtor mine, storage conditions and usage of explosive materials. The Act was drawn up as per the inspection results and the appropriate recommendations to eliminate the impairment of industrial safety normative documents were issued.

June 23: The representatives of GGTN and Geo-Ecological Department of the KR Ministry of Natural Resources together with the representatives of Eco-Service designed organization conducted an inspection of Kumtor mine Effluent Treatment Plant at the area of build up of pump station #1 up to 3,662.5m bellow sea level for commissioning.

June 24: The representatives of GGTN and Geo-Ecological Department of the KR Ministry of Natural Resources conducted an inspection of tailing dam and gravel pit of Kumtor mine for commissioning.

November 28: I. Gilfanov, Ch. Sadabaeva, A. Apuhtin, together with GGTN Department Chief and state inspectors under KR MNR, with participation of T. Ajibaeva, Advisor of Natural Recourses Minister, and G. Shabaeva, Geo-Ecological Department Chief conducted a control inspection on industrial safety of mining, explosive and exploration industrial safety, conditions of storage, production, and usage of explosive materials, an inspection of operation of loading cranes, pressurized vessels, steam boilers, oil storages, refueling station and area of gas-flame machining of metals, Mill and TMF facilities of Kumtor mine and environmental management. The Act was drawn up as per the inspection results and the appropriate recommendations to eliminate the impairment of industrial safety normative documents were issued, the responses to any concerns were dealt with during the required response time.

3.6.2 THE ISSYK-KUL TERRITORIAL DEPARTMENT OF ENVIRONMENT PROTECTION AND DEVELOPMENT OF FOREST ECOSYSTEMS OF THE STATE AGENCY OF ENVIRONMENT PROTECTION AND FORESTRY UNDER THE KR GOVERNMENT (ITDEPDFE)

March 18: M. Junusov, the SAEPF inspector, and J. Seikebaev, the ITDEPDFE inspector, conducted inspection of KOC transport for smoking of exhaust gas.

March 28: Inspector Ch. Chukumbaev and O. Shestova, Chief Specialist of ITDEPDFE, with participation of T. Chynybaev, Engineer of Eco-Service Design Organization, conducted inspection of KOC Sewage Treatment Plant (STP) and Effluent Treatment Plant (ETP); samples of wastewater before and after treatment, and after disinfection were taken in order to analyze effectiveness of STP and ETP operations. Based on the findings of inspection and sample analysis conducted at the certified SAEPF laboratory, a permit was issued to start discharge of treated water to the Kumtor River.

October 20: O. Shestova, Chief Specialist and T. Ibraev, the ITDEPDFE inspector, conducted water control sampling from the Tailings Dump (before the discharge treatment), at the discharge point of industrial waste water and at the control point (end of mixing zone). The protocols of analysis samples based on the inspection findings were issued and a relevant Act was drawn up.

November 11: J. Kojoeva, Chief Specialist of SAEPF, A. Bukarova, Chief Inspector, and M. Karagulov, Chief Specialist of ITDEPDFE, conducted a planned inspection of environment protection activities at the Kumtor mine. The Mine facilities were observed, and availability of permits was checked. Based on the findings of inspection, the Order was issued, which was replied within established deadlines.

December 9: With the purpose of identifying the impact of industrial waste, particularly of the Tailings Dump, to the Kumtor mine fauna, T. Ibraev, the ITDEPDFE inspector, jointly with A. Davletbakov, Zoologist of the KR National Academy of Science, conducted shooting of birds for further submission of bird organs to the Center of Veterinary Diagnostics for analysis. Findings of analysis are given in the Chapter 7 of this Report.

December 14: T. Ibraev, the ITDEPDFE inspector, with participation of the specialist of Central Laboratory under the Ministry of Natural Resources, conducted control sampling for content of arsenic in the water. Samples were taken from the Petrov Lake and the dining facility of the Mine Camp. Findings of analysis proved that there was no arsenic contamination.

3.6.3 ISSYK-KUL PROVINCE STATE SANITARY AND EPIDEMIOLOGIC SUPERVISION CENTER (IPSSESC)

August 29: G. Tailakova, B. Satybaev, and G. Jakypova, IPSSESC lead specialists and laboratory assistant, in presence of E. Kojomkulov, Manager of HSE Systems, Sh. Tynystanov, Safety Manager, and M. Esenalieva, Camp Administrator, inspected the sanitary and hygienic conditions of labor and dwelling facilities of the camp and production facilities of the Kumtor Mine.

September 5: G. Tailakova, L. Bekturova, and R. Mambetova, IPSSESC lead specialists and laboratory assistant, in the presence of E. Kojomkulov, Manager of HSE Systems, Sh. Tynystanov, Safety Manager, M. Esenalieva, Camp Administrator, and A. Voitenko, Doctor, inspected the sanitary and hygienic conditions of the kitchen, took samples of water and food supplies, and swabs from dishes, hands, and working clothes of the kitchen staff for further sanitary and hygienic analyses.

October 27: G. Tailakova, B. Satybaev, and G. Jakypova, IPSSESC lead specialists and laboratory assistant, in the presence of E. Kojomkulov, Manager of HSE Systems, Sh. Tynystanov, Safety Manager, and M. Inkijekov, Dewatering Coordinator, inspected the working station of the driller helper of the Kumtor Mine Dewatering Department, and performed sanitary inspection of the Mine facilities.

3.6.4 MINISTRY OF EMERGENCY MANAGEMENT

August 27: Colonel N. Kadyraliev, Head of Rescuer Training Center under the KR Ministry of Emergency Management, and Colonel T. Seidikerimov visited Kumtor Mine as the observers in terms of the 12th annual competition among mine rescuer teams (4 KOC teams, Kyrgyzaltyn and Ministry of Emergency Management teams). According to the competition results there was a discussion between the KOC and Ministry representatives with respect to improvement of rescuer training program.

3.6.4 ECO-SERVICE DESIGN ORGANIZATION

In terms of designer's supervision the Eco-Service representatives conducted totally four inspections.

June 30: T. Chynybaev, Design Engineer, inspected the Kumtor Mine ETP facilities in part of build-up Pump Station No.1 pad up to 3,662.5 meters above see level.

July 12: V. Erohin and O. Filonenko, Design Engineers, made an examination of the area in terms of the project to move the ETP facilities..

3.6.7 ASIARUDPROJECT DESIGN ORGANIZATION

June 24-26: S. Pak and I. Degtarev, Design Engineers, in terms of design supervision, made an examination of gravel pit.

3.7 AUDITS

June - July: **WESA Consult Company** **www.wesa.ca** conducted an audit assessment of KOC readiness to comply with International Cyanide Management Code.

November: **WESA Consult Company** **www.wesa.ca** conducted an audit regarding the Company compliance with International Cyanide Management Code

SECTION 4

IMPROVEMENT OF ENVIRONMENTAL MANAGEMENT, HEALTH AND SAFETY MEASURES. INCIDENTS' ANALYSIS

4.1 Environment Incident Classification

4.2 Reportable and Non-Reportable Spills

4.3 Environmental Exceedances

4.4 Continuous improvement of system that ensures health and labor protection at the industry

4.5 Analyze of Safety Incident Reporting

4.6 Emergency Response Plan

In 2011 there were no reportable incidents based on the criteria of KOC's EMAP reporting requirements of Kyrgyz Republic and the new system of spills classification of "Centerra Gold".

In 2011, the accidents preventive measures facilitated the company to achieve the good health and safety results.

4.1 ENVIRONMENT INCIDENT CLASSIFICATION.

In case of an accidental release of hazardous products, KOC continued to use the reporting procedure outlined in the ERP Rev.9 and EMAP Revision 5. This procedure ensures that the company provides the compliance with current Kyrgyz and Canadian (Based on Saskatchewan Spill Control Regulations) legislation and International standards.

Table 4-1 presents the classification system of the environmental spills over the secondary containment.

Table 4-1: Spills classification

Quantity / Level	I	II	III	IV	V
< 50 м^3 Tailings < 200L Fuel Oil < 25 kg cyanides < 50 l/kg chemicals or reagents	Loss of containment, but retained within secondary containment	Loss of containment, not retained by secondary containment and which does not affect surface or groundwater	Loss of containment, not retained by secondary containment which affects surface or groundwater, Or offsite impact not affecting surface or groundwater	Loss of containment causing offsite release affecting surface or groundwater	Release causing significant offsite environmental impact or community concern
> 50 м^3 Tailings > 200L Fuel Oil > 25 kg cyanides > 50 l/kg chemicals or reagents		Loss of containment but retained within secondary containment	Loss of containment, not retained by secondary containment and which does not affect surface or groundwater	Loss of containment, not retained by secondary containment which affects surface or groundwater, Or offsite impact not affecting surface or groundwater	Loss of containment causing release of contaminant offsite affecting groundwater or surface water/ or causing significant offsite environmental impact or community concern
Compliance with Legislation and other regulated requirements	Incidents resulting in loss of containment but where permit or regulated limits are not exceeded	Minor, transient non-compliance with permit conditions	Non-compliance with permit conditions or regulated requirements. May result in administrative penalties or fines.	Major- non compliance with regulated requirements or serious and /or repeated excursions from permit conditions. Likely to result in prosecution	Massive non-compliance with major legal implications and likely to damage the reputation of the Company

Type I, II – There are no external reporting requirements for these categories and they are not-reportable to the Board of Directors.

Type III, IV, V - These categories are reportable to the Board of Directors. In addition, according to the KR Legislation, there are the immediate external reporting requirements for these categories, according to ERP.

The Senior Environmental person on the scene makes an immediate decision upon receiving notification of a spill as to its classification (reportable or non-reportable). If any doubt arises about its classification, a spill should be classified in the highest reasonable category.

As part of its Environmental Management System shown in Section 2, KOC set the targets for the number of incidents, both reportable and non-reportable as well as tailings line incidents. In 2011 the targets were as follows:

- < 10 Non-Reportable Incidents – (Incidents involving minor leaks);
- No Reportable Spills;
- No Tailings Line Incidents;
- No Exceedence of Air or Water Discharge Standards.

4.2 REPORTABLE AND NON-REPORTABLE SPILLS

In 2011, the incidents reportable to the inspectorate agencies were not registered at Kumtor mine and in KOC.

In 2011, 21 incidents were registered. They were classified as I type non-reportable incidents, i.e. with minimal environmental impact.

However, though all the incidents in 2011 were I type - non reportable, the index of ecological incidents is rather critical and increases almost 2 times the annual target.

Table 4-2 briefly describes the incidents. All the incidents were classified as minor Environmental impact incidents. All the spills were cleaned immediately. Figure 4-1 illustrates both the reportable and non-reportable spills over the past 5 years.

Figure 4-1: Environmental Incidents at KOC over the past 5 years

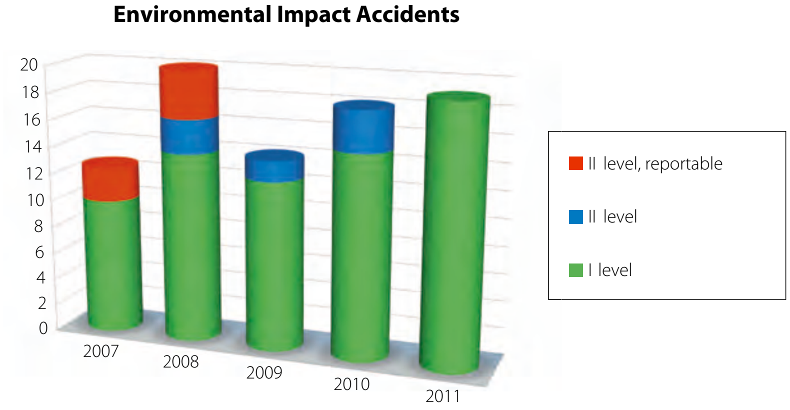


Table 4-2: Environmental Incidents in 2011

##	Date	Location	Description	Department	Type
1	January 2	Mine, Central Pit	During the loading of a truck a stone rolled down the rock, hit a loader's tank and damaged it. It caused a leakage of 120 liters of diesel.	Mine Operations	I
2	January 31	Mine, North-East zone	Water carrier truck fell down on its left side while descending from the diamond drilling site in the North-East. As a result, 40 liters of gasoline leaked from its fuel tank.	Exploration/ Cross Inc.	I
3	February 4	Mine, BATCH Plant	The Operator of forklift caught a container with reagent (stabilization – inhibitor for gunite) while unloading 1 tone container from the BATCH Plant. A leakage was ~ 50 liters.	Underground	I
4	February 27	Mine, Central Pit	A water carrier truck watering the road by the dust depressing solution fell down on its side while descending. The leakage of diesel was ~50 litters and motor oil was ~10 litters.	Mine Operations/ Karkyra Service	I
5	March 5	Mine, Central Pit	As a result of collision of two trucks ~20 liters of coolant have leaked.	Mine Operations	I
6	March 8	Mine, Central Pit	A stone fell on excavator in the course of its loading operation. The excavator's hydraulic hose was damaged and ~90 liters of oil leakage occurred.	Mine Operations	I
7	May 9	Mine, Central Pit	A driver of a haul-truck drove into the old pipes sticking out from the ground. It caused a drain hose damage and a leakage of ~50l. of motor oil.	Mine Operations	I
8	May 15	Mine, Central Pit	The driver of the dump-truck drove into the iron stake and damaged drain hose. A leakage of ~15l. of hydraulic oil occurred.	Mine Operations	I
9	June 7	Mine, Central Pit	The driver of the dump-truck drove into a berm, which caused the leakage of 15l. of motor oil.	Mine Operations	I

##	Date	Location	Description	Department	Type
10	July 18	Mine, Central Pit	At the road cleanup a bulldozer drove into the stone and damaged the lower part of transmission. It caused the leakage of 80 liters of transmission oil.	Mine Operations	I
11	July 29	Mine, Mill	At the starting of water- carrier truck driving there was a leakage of ~25 l. of motor oil from oil filter.	Mine Operations	I
12	July 30	Mine, Central Pit	During evacuation at the Central pit the "Ural" truck fell down on its right side. The leakage of diesel was ~80 liters.	Mine Operations/	I
13	August 6	Underground, Portal #2	The driver of the dump-truck drove into the large piece of rock, during the haulage; it caused the damage of running gear and the leakage of ~60 liters of transmission oil.	Underground	I
14	August 10	Mine, Central Pit	The driver of the dump-truck drove into the stone and damaged the hydraulic hose. A leakage was ~180 liters of oil.	Underground	I
15	August 20	БПБ	At the BMY gas station there was a leakage of ~35l. of diesel from the fueling hose while fueling a vehicle.	BMY	I
16	September 4	Mine, Central Pit	Due to the collision of dump-trucks at the pit there was a leakage of ~25 liters of antifreeze.	Mine Operations	I
17	September 12	Mine, Lysyi Pit	Due to the deterioration of the hydraulic hose on the loader while lifting the bucket there was a leakage of ~20 liters of hydraulic oil.	Earthworks Department	I
18	October 6	Mine, Central Pit	While drilling the well the Operator of boring rig found the damage of hydraulic hose on a mast. The operator while lifting the bar didn't follow the proper sequence in operation that caused two hose collapse and the leakage of hydraulic oil in the amount of ~50 liters.	Mine Operations	I
19	November 30	Mine, Central Pit	The driver of the dump-truck lost the control over driving, drove into the road edge and fell down on to the right side. The damage caused leakage of diesel in the amount of ~170 liters and ~30 liters of motor oil.	Mine Operations	I
20	December 3	Mine, Top Shop	While moving an excavator approached the verge at workshop parking and the dipper cylinder were pulled out. It caused the leakage of ~200 liters of hydraulic oil.	Maintenance	I
21	December 30	Mine, Central Pit	While working by bucket tooth of bulldozer the rod of the working cylinder of bulldozer ripper was pulled out. It caused the leakage of ~20 liters of hydraulic oil	Mine Operations	I

Having analyzed the table 4-2, we can see that 60% of accidents have occurred at the Pit; 30% of all environmental impacts were related to fuel spills (diesel/gasoline), 60% of incidents were occurred due to the oil leakage and about 65% of incidents were the result of road accidents.

4.3 ENVIRONMENTAL EXCEEDANCES

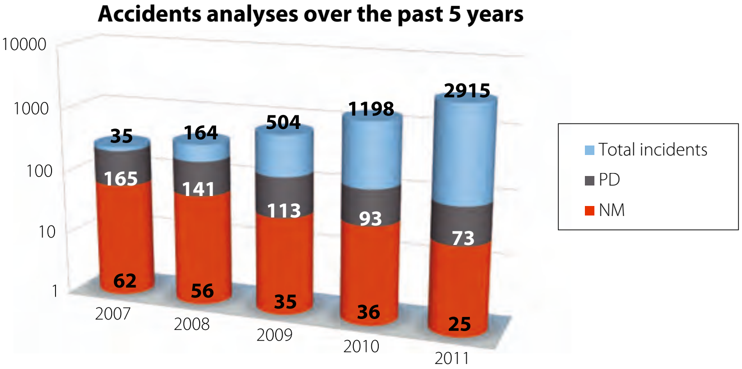
In 2011 there were no any environmental exceedances of KOC discharges in water and emissions in the air. In 2011, KOC continued the periodic usage of salines of Calcium Chloride and Magnesium Chloride to ensure the decrease of suspended particles levels in the road dust, which allow the company not to exceed the required regulatory limits.

4.4 CONTINUOUS IMPROVEMENT OF HEALTH AND INDUSTRIAL SAFETY SYSTEM

In 2011, the implementation of program on identification, assessment, elimination and control of industrial hazards (Hazard Identification (HI)) was conducted as a part of continuous improvement of HSE Management System. When any employee identifies a hazard (risk) at operational area, the HI form is filled up and submitted to the Coordinator of Safety Department. The Risk Assessment Coordinator evaluates the risk level and according to the risk classification takes the further measures to eliminate it.

Effectiveness of measures taken by KOC on decrease of potential industrial hazards is illustrated in the diagram 4-2.

Diagram 4-2: KOC accidents number over the past 5 years v(KOC and Contractors)



Near Miss Incidents and Hazard Identification, preventive measures.

PD -incident with property damage

NS -indicator of accidents including cases with lost work time, immediate medical aid.

The main goal of the VARP reduction program which was on-going on 2011 is as follow:

- Reduction in overall vehicle accidents by 15%
- Reduction in high potential light vehicle accidents by 15%
- Maintain in-pit heavy vs. light vehicle collisions at ZERO
- To have ZERO injuries due to vehicle accidents
- To improve the skill level of KOC LV drivers by job assessments and training (same for HD equipment operators).

The KOC Management took a decision to implement an individual incentive bonus system from 2011, thus motivating the employees to the understanding of new level and positive approach to the industrial safety. SAFEmap 'Green Cards' are rewarded to the employees for contribution to the general company success. The slogan of the system is **"Security is under our control"**.

The main aspects of the system are:

- Compliance with safety rules each day
- New ideas on safety improvement
- Identification and recognition of risk
- Prevention of hazar.

The following programs on industrial safety improvement implemented in the previous years were continued:

- 5 "Golden rules"
- SAFEmap Program.

4.5 ANALYSIS OF SAFETY INCIDENTS

In 2011, despite the taken measures and visible tendencies to the improvement of safety indicators, there were lost time injuries (LTI), which required the medical aid.

In 2011, there were 2 LTI and 8 cases with medical aid provision: 1 LTI and 6 cases with medical aid occurred with KOC employees and 1 LTI and 2 cases with medical aid occurred with contractors.

LTI incidents

1. **January.** The Central Warehouse of the mine. A warehouse employee slipped and injured his right leg while working at the warehouse yard. The diagnosis was "closed spiral fracture with displacement of diathesis of femoral bone on the right".

2. **February.** "Karkyra" Company. The driver of KAMAZ truck after watering the road didn't install wheel choke properly to repair the diffuser pipe that consequently caused spontaneous moving of the truck. He tried unsuccessfully to stop it. While descending, the truck rolled over. The driver got the injuries "closed fractures of 3-4-5 metacarpal bones of his left hand"

The cases with medical aid (MA) provision

May. Underground. The Drifters were installing a gerter steel set at the face in the SWD. One of the drifters was standing close to the equipment while the manipulator was moving. The steel leg of the set was not secured properly and fell back towards a crew member. An employee has been injured; medical aid was rendered at the place.

June. Dewatering Department. The employee stumbled over and injured his right shoulder while maintaining a pump. The casual was provided by medical aid.

July. Helper Company. Welder was performing the exhaust duct assembling in receiving bin within the context of ventilation boxes assembling works. He ordered a crane operator, who was upper the metal set of exhaust duct, to lower a crane hook. Then the welder started to correct harness giving order to operator to lower hook, but it suddenly began to rise. His left hand was suppressed between cable and exhaust duct thus his left hand's finger was injured. Medical aid was timely rendered.

July. Exploration. A Drilling crew was undoing casing rods, getting ready to take off PW casing rod. Drill Helper was using pipe wrench for unscrewing rods. Rod wrench was placed at head level, but wrench was not properly secured. Operator began slow rotation to the left to unscrew rods, then wrench slid off the rod and after hitting drill mast hit employee's left cheek. First aid was rendered at the place.

August. Maintenance Department. Mechanics of the central garage were performing the assembling of a new bulldozer. Being in a rush, the mechanic forgot to remove the cylinder holes plugs and began to pull cylinder rod with a small pry bar. While doing so the cylinder accumulated a vacuum and the cylinder rod suddenly retracted taking the bar which was in his hand at this point and the bar was on the level of his face. As a result of the sudden cylinder rod retraction, the mechanic was hit in the lower part of his face on the right cheek. The patient was delivered to the medical office; where he received a medical aid.

October. Helper Company. Construction area of new wash station. A steel framework caught a mechanic right thigh by the sharp edge while he was carrying it. Medical aid was provided in time.

November. Dewatering Department. Drilling Trainer decided to dismantle the drilling string using sledgehammer. As the parts were frozen the bushing did not get out easily. Thus, he decided to knock it out with the club hammer handle from inside. After the knock the handle slide off and moved down quickly that resulted into pinching his finger between the club hammer and the edge of the swivel discharge. The injured person received first aid.

November. Mine operations. The driver of the haul truck fell asleep and drove with its left front wheel onto the safety berm wall. The truck lost control and flipped over on its right side. The driver has got many injuries and bruises.

The reportable accidents statistics and KOC targets for 2011 are shown in the table 4-3.

Table 4-3: LTI statistics data and provided medical aid in 2011 .

KPI	Quantity in 2011	Targets in 2011
Lost Time Injuries (LTI)	2	0
Medical Aids	8	< 15
RIF	0,32	<0,6

Table 4-4 shows the statistics of the most serious incidents for the period 1995-2011.

Table 4-4: Annual injury rate with property damage (both KOC and contractor employees)

Year	Hours Worked	# of Lost Time Injuries	Medical Aid	First Aid	Days Lost	LTI Frequency	LTI Severity	Q-ty with property Damage
2011	6,446,936	2	8	19	134	0.31	4.57	73
2010	6,198,860	4	7	23	189	0.35	6.10	93
2009	5,956,936	5	2	28	6020	0,24	175.36	113
2008	5,746,458	4	7	45	6086*	0.38	1271	141
2007	5,542,012	12	19	31	6082*	0.43	506.83	165
2006	4,819,703	7	18	38	6257*	0.29	893.9	141
2005	4,051,207	4	21	24	80	0.20	8	122

Year	Hours Worked	# of Lost Time Injuries	Medical Aid	First Aid	Days Lost	LTI Frequency	LTI Severity	Q-ty with property Damage
2004	3,507,182	1	38	10	1	0.06	1	149
2003	3,530,604	6	57	5	139	0.34	7.9	140
2002	3,313,375	3	51	27	6,161*	0.18	371.9	100
2001	3,629,157	2	87	35	85	0.11	4.7	101
2000	3,655,857	2	81	61	6,141*	0.11	336	97
1999	3,419,650	8	27	48	6,302*	0.47	381	93
1998	3,086,868	8	26	104	113	0.52	11.53	117
1997	2,881,349	6	27	99	6,043*	0.41	419	90
1996	3,254,098	47	129	269	24,383*	2.98	1,499	113
1995	2,086,956	36	103	103	96,051*	3.45	9,229	70

* 6000 days are attributed to any fatality in accordance with Saskatchewan Mining Association reporting
** 1995 had no reporting system until July.

In 2011, the number of property damage accidents reduced to 21.5% (from 93 cases in 2010 to 73 cases in 2010). Medical aid cases increased for one more than in 2010, but first aid cases decreased by 17%.

A total of 1,781 incidents were investigated in 2011. 1,647 were Near Miss (NM). Besides, 1,268 sources of hazard were identified and eliminated.

Statistic data show that two hundred of revealed NM accidents prevented thirty cases with property damage (PD), there were fifteen various accidents and one serious accident. Identification of NM accidents contributes a reducing of industrial accidents. Statistic data over the 5 past years presented in the figure 4-2 prove that.

KOC recognizes a high priority of health and safety of KOC employees, contractors, and local population during the whole period of the project implementation including exploration, operations and closure of KOC facilities – **"There is no such important job that would worth to disregard safety measures"**.

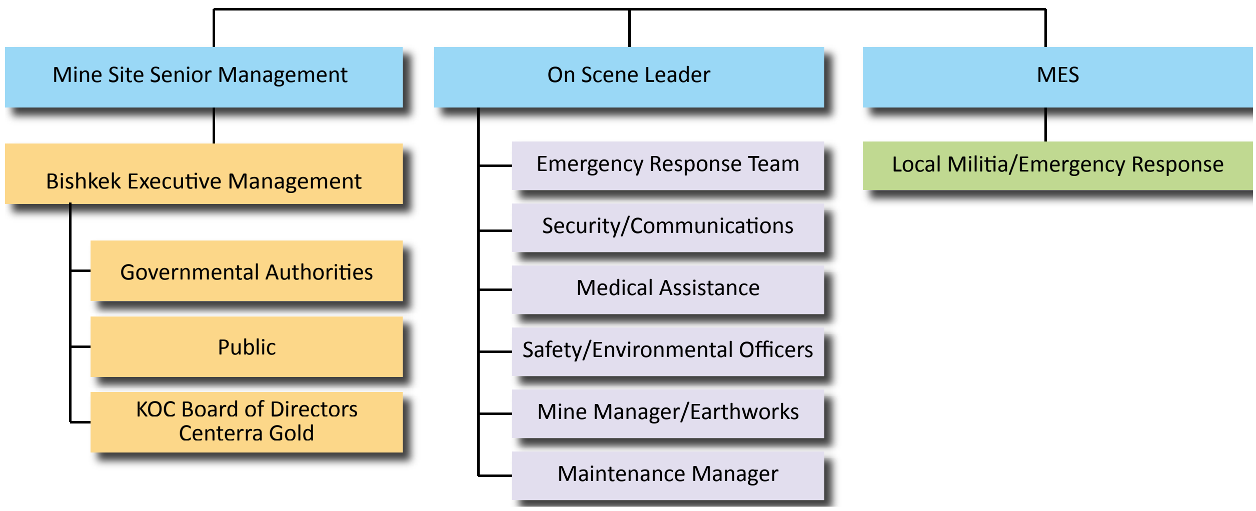
4.6 EMERGENCY RESPONSE PLAN

The general initial Emergency Response Plan (ERP) was originally developed by KOC and reviewed by Cameco, the Agency Lenders, the Ministry of Emergency Management (MEM), and international experts.

Revision 9 of ERP was updated on December, 2011 to reflect the improvements in training exercises and to update the company changes in positions, responsibilities, personnel and state agencies reorganizations.

The Emergency Response Organizational Chart is presented on figure 4-3.

Chart 4-3: Emergency Response Organizational Chart



As part of the emergency preparedness and response program KOC continued to:

- Assess the potential for reasonably foreseeable accidents and emergency situations by hazard identification and risk assessment;
- Act to prevent those incidents and their associated environmental impacts;
- Develop plans / procedures for responding to those incidents;
- Carry out periodic testing of the emergency response plan and internal procedures;
- Mitigate impacts associated with incidents.

A total of six simulated emergency response tests were conducted on 2011. See the table 4-5.

Table 4-5: Simulated Emergency Response Tests

Date	Scenario of Emergency Response Tests (ERT) at Kumtor Mine
I quarter January	**Chemical spill, Mill cyanide preparation area**. Target – interaction of the departments in emergency situation. Working out of ERT preparedness in negative impact mitigation using equipment of emergency reaction and first aid provision. Brief description: Mill, cyanide preparation area. When unloading, a box with cyanide has pressed an Operator Helper. As a result, the employee received trauma of feet and hands (several fractures), there is a cyanide spill.
II quarter May	**Cyanide spill (Na CN)** Target: Practical training on interaction services in emergency situation. Chemical spill consequences' liquidation. Brief description: After cyanide loading from HAPM storage to the Mack truck, an Operator was moving on the route for cyanide transportation from HAMP storage to the Mill. During that time, a Grader cleaning the road came out the MACK direction. Trying to avoid a collision, the MACK Operator quickly turned to the right. As a result, one (380kg) cyanide box fell on the ground. There is a partially damage of the box resulting in chemical spill.
Date	**Scenario of ERP training at Balykchy Marshaling Yard (BMY)**
III quarter July	**Cyanide spill (Na CN)** Target: Interaction between BMY departments in ES, employees' actions during evacuation, and training of BMY ERT during the mitigation of negative impact from chemical spill (NA CN). Brief description: When loading cyanide to the Mack trailer, c-can with cyanide falls from the trailer. As a result, a door of the c-can opens and one 380 kg box of cyanide falls out. Rainy weather generates reaction (hydrocyanic acid vapors' emission). When running away from the scene, a spotter stumbles and falls on the ground. BMY Security guard who was at the scene reports on the radio to the Security post #1 about the satiation. Security Shift Sr. of post #1 reports to BMY Security, Safety Coordinators and to BMY Coordinator. BMY Safety Coordinator is acting as per ERP and gives signal on switching of emergency alarm for evacuation of BMY employees.
III quarter September	**Cyanide spill (Na CN) (BMY).** Purpose: Interaction between BMY departments in ES, employees' actions during evacuation, training of BMY ERT in mitigation of negative impact from chemical spill (NaCN). BMY alarm operation inspection. Brief description: When loading cyanide to the Mack trailer, c-can with cyanide falls from trailer. As a result, a door of the c-can opens and one 380 kg box of cyanide falls out. Due to partial damage of box, a small amount of cyanide is spilled. Because of the contact with water (after rain) there is a reaction producing hydrocyanic acid emissions. A Spotter who was close to the c-can gets intoxicated with vapors in short period of time (he was in the emission area)
Date	**Scenario of Emergency Response Tests (ERT) at Kumtor Mine**
IV quarter December	**Road accident with serious injuries, fire** Target: Practical training of actions between ERT and Exploration supervision in ES at the SW with traumatism presence. First aid provision to the injured person, who received trauma during exploration work. Brief description: Negative weather conditions: poor visibility and black ice on the road. Driver of HOWO truck transporting gravel was traveling from Lysyi pit towards Administration. At the moment, Ford truck was coming on its own lane from the opposite direction. Ford driver lost control on the vehicle and collided with HOWO truck. After collision, Ford flipped on the road side. As a result, Ford driver received different severity traumas. Due to the short circuit of wiring, ignition in motor compartment has started.
Date	**Scenario of Emergency Response Tests as per ERP in Uchkun Office, Medical Clinic and Guest House in Bishkek.**
II quarter May	**Electrical shock of an employee – heavy injures and fire** Purpose of the training: Practical training of rescue skills of survival and rescue team on rescuing the victim and rendering first premedical aid. Brief description: An employee fell down from ladder, got injured and touched the electrical cable while performing repairing works at ventilating shaft on 11th floor. Sparks caused by short circuit got stored paper boxes and the smoldering and smoke occurred in the building

SECTION 5

MEDICAL DEPARTMENT

5.1 Medical Department Staff Changes

5.2 Medical Office in Bishkek

5.3 Balykchy Marshalling Yard

5.4 Kumtor Mine Site Clinic

5.5 Medical Screening Clinic

5.6 Medical Department Monitoring Projects

5.7 Safety Measures

The Medical Department of Kumtor Operating Company provided a medical service which was efficient and directed towards the objectives of the company during 2011.

- A re-evaluation of the medical emergency support was carried out with a specific view to the developing underground mining operation and the demands if might make on the medical service;
- This will involved the appointment of additional staff to undertake emergency medical care as well as adequate staff training in trauma and cardiovascular emergency care;
- Primary Health Care, Occupational Health Care as well as screening of employees and contractors in Bishkek, the Balykchy Marshaling Yard and at the KOC mine site continued on a daily basis;
- A system of patient referral both locally and internationally which was efficient and reliable was conducted and the contract with International SOS for emergency medical evacuation is to be renewed;
- Annual medical examinations to assess the general health and fitness for employment and the effects of altitude on all KOC employees, contractors and visitors to the mine site were carried out to comply with KR Regulations on industrial mining and fitness to work at high altitude;
- The KOC medical doctors received training in September-October in an Advanced Cardiovascular Life Support which was presented in Bishkek by a trainer from overseas;
- The Smoking Cessation Program which is ongoing has shown a gradual but progressive decline in the prevalence of smoking on KOC mine site; besides, professional counseling to heavy smokers suffering from COPD was offered at mine site by a trained doctor. Medication to assist patients with smoking cessation was offered by the company;
- An intensive influenza immunization program was continued and approximately 1000 individuals were immunized on the KOC mine site in the months prior to winter;
- A nutrition study undertaken by the Kyrgyz State Medical Academy to assess the nutrition needs of employees on the mine site is ongoing. This is linked to categories of jobs and the specific caloric needs of each group of workers i.e. light, medium or heavy manual work. Throughout the entire year a counseling service was introduced for the benefit of employees suffering from metabolic disorders. Almost 95% employees had a chance for individual counseling sessions with a professional nutritionist offered to all employees during annual screening. Counseling was supplemented with brochures handed out to each patient either in Kyrgyz or Russian.

5.1 MEDICAL DEPARTMENT STAFF CHANGES

Dr Denis Vinnikov has been appointed as Director of MedExpert with effect from 1st January 2011. He replaces Dr. Arina Davletalieva who is immigrating to Canada with her family.

Dr. Vinnikov was replaced by Dr. Kalys Djumabaeva as the physician on the MedExpert panel. Dr. Djumabaeva has been transferred from the KOC Training Dept.

Table 5-1: Patient Visits to the Geologicheskiy Medical Office from 2002 to 2011

Geologicheskiy Medical Office	2007	2008	2009	2010	2011
Total Visits, Including Medicals	11475	12141	11655	13925	11864
First Visits for Medical Consult/Treatment	1917	1697	1752	1606	879
Nationals Bishkek	973	923	972	1156	719
Nationals-Site	1741	2289	2063	839	364
Expats Bishkek	428	365	318	377	266
Expats from Site	167	163	339	354	205
Contractors	240	234	175	65	115
Baseline Screening for Visitors to Altitude	356	414	302	1052	265
Follow-Up Consultative Visits	2456	2834	2425	1185	686
Annual Screenings	1665	1782	1958	1980	2296
Pre-Employment Screenings for KOC & Contractors	349	382	202	431	232

Geologicheskiy Medical Office	2007	2008	2009	2010	2011
Daily Drivers Medicals Screening	7187	7889	7536	7671	4820
Sick Leave days for Nationals	133	163	117	203	267
Sick Leave Allocated to Expats	0	0	12	26	27

5.2 MEDICAL OFFICE IN BISHKEK

The KOC medical office continues to provide screening medical examinations for all visitors proceeding to the KOC mine site as well as screening for annual medical examinations for KOCs national employees. Primary health care needs to employees are served from this clinic as employees report to this clinic when ill or injured. The second clinic in Tynystanova street is still in operation and serves to provide the MedExpert specialists with a venue for periodic examinations. National employees are now examined five days per week and the clients using this service are satisfied with the manner in which they are now examined. Contractors are not examined in this clinic as yet.

For the purpose of more comfortable annual screening for people older than 40 years old a new intraocular pressure measuring machine was purchased and installed in 2011. This has replaced the old manual method of intraocular pressure measurement.

The awareness and importance of the incidence of Coronary Artery Disease in the general population of Kyrgyzstan cannot be overemphasized and a program to screen out all drivers and vehicle operators who possibly might have this illness in an occult form continues. Employees in high risk occupations, who are diagnosed with this illness, receive special investigations.

Table 5-2: Balykchy Marshalling Yard Medical Clinic Statistics – 2002 to 2011

Balykchy Clinic	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Total Drivers Examined	3,512	4418	4711	5192	6378	7427	7480	7824	8880	10696
KOC Drivers	3300	3955	4496	4437	5553	6799	6898	6930	7421	9544
Contractors	212	463	212	755	825	628	582	883	1459	1152
Abnormal B/P	53	43	40	17	4	34	3	3	0	0
Abnormal Alco sensors	11	44	8	8	19	26	8	8	2	2
Other Patients Seen	1321	2000	2541	2961	3735	6978	8673	8733	9049	13715
Referred Problem Pts	61	71	45	19	47	68	30	58	22	62

5.3 BALYKCHY MARSHALLING YARD

The number of patient consultations continues to grow year on year at this medical office. The blood pressures of employees are under control and no abnormal blood pressures were recorded for the year which reflects effective patient care and counseling. This is a favorable trend as it illustrates the importance of patient education and one to one counseling of patients by the present incumbent.

The rest of the medical service at Balykchy was provided to employees without incident or any other significant problems being encountered during the year under review.

As part of nutrition improvement programme the BMY nurse was trained to counsel drivers in healthy eating habits. This was done in December 2011 by the dietary consultants.

5.4 KUMTOR MINE SITE CLINIC

Table 5-3: Mine Site Clinic, Patient Visits & Illness categories for 2002 to 2011

Kumtor Mine Site Clinic	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Total sick Patients seen	14089	10080	9324	10371	13141	14633	16220	15199	14217	17373
Nationals	10968	7888	7227	7226	7985	8925	10200	9919	8307	10999

Kumtor Mine Site Clinic	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Expats	1203	910	793	807	772	798	901	769	868	1086
Contractors	1088	1177	1196	2104	3979	4788	4890	4319	4936	5068
Visitors	830	105	108	148	405	122	229	192	106	220
Annual Medical Screenings	668	869	702	132	341	313	462	954	791	981
Daily Drivers Medicals	7078	6420	5986	5513	6748	7258	7140	6005	6530	6611
Safety Reports	62	59	47	54	68	69	57	44	41	50
Medical Referrals off site	126	190	142	214	349	576	1066	906	957	1399
Predominant Ailments & illnesses										
Acute Respiratory Conditions	10	6	3	2	6	3	9	3	4	2
Mountain Sickness	293	374	292	307	406	449	442	494	339	363
Hypertension	7	22	11	28	25	29	46	57	47	40
Tonsillitis	126	116	126	192	163	216	174	148	142	194
Sore Throat & Colds	1843	1919	1790	2107	2864	3638	4187	3300	3612	3892
Total: Upper Respiratory Infections	2255	2674	2210	2542	3810	4387	5139	4673	4135	5505
Total: Lower Respiratory Infections	137	169	172	129	183	143	135	212	103	152
Cardiovascular Incidents	1	7	8	7	6	11	11	5	2	9
Dental Problems	150	162	156	220	304	424	453	456	470	509
GI/GU	806	439	547	674	810	903	1211	966	1026	1410
Follow Up Visits	2398	2665	2541	2593	3454	3665	3953	2773	2673	3485
Trauma Major	3	6	2	1	5	5	7	3	4	4
Trauma Minor	83	73	98	66	67	80	98	72	51	82

The medical clinic continues to provide a service to all employees and contractors on the mine site and ensures that the medical staff is prepared to manage emergency situations and provide primary health and emergency care. An important aspect of the primary health care provided was the immunization of approximately 1000 persons against seasonal influenza in the October – November 2011 period. Despite these immunization campaigns upper respiratory tract infections and pharyngitis still appears to be the main cause for the loss production shifts. The advantage of immunizing the greater portion of the mine site workforce against seasonal influenza is less person to person transfer of illness and less severe complications of influenza for instance, pneumonia and hence, less time off work.

The nutrition study conducted on mine site has now reached the stage of implementation and employee education and counseling of cases with metabolic illness will now be undertaken as a part of the periodic medical examinations of national employees. In addition brochures will be available to employees explaining the dangers to health of obesity and the wrong dietary habits. This service will be under taken by the MedExpert by a nutritionist from the Kyrgyz State medical academy in Bishkek.

The Smoking Cessation Program is ongoing and has produced a modest reduction in the prevalence of smoking amongst KOC employees. A new anti-smoking drug was introduced into a study of KOC employees who suffer from Chronic Obstructive Airways Disease and its efficacy assessed. The preliminary results are already available. This study was conducted with an aid from the Chair of Internal Diseases of KSMA. One doctor from this institution visited mine site few times during 2011 to collect and collate data.

The patient care and administration software system which has been in use for two years and has enabled all KOC employees to have their records entered onto the system. Meaningful information will now become available for reporting purposes in the areas of Occupational Health and Primary Health Care.

The American Heart Association course in Advanced Cardiovascular Life Support was presented to seven Kumtor doctors to refresh their skills in the management of cardiovascular emergencies. All the candidates passed the examination with the required pass mark.

5.5 MEDICAL SCREENING CLINIC

Annual and pre employment medical screenings of Kumtor employees are performed by MedExpert, a private medical institution licensed by the Ministry of Health of the Kyrgyz Republic. Established in September 2004, MedExpert functions within KOC facilities of the Geologicheskiy and Tynystanova Clinic. Up to fifteen workers are sent to the Clinic every day (Monday till Friday) on their time off, for blood work, urinalysis, chest X-ray, lung functions, cardiac ultrasonography, and ECG, vision and hearing tests. The patients are examined by the panel of eight doctors which include an Internist, Surgeon, Psychiatrist, Ophthalmologist, ENT Specialist, Dermatologist, Neurologist, and a Gynecologist for the females, who identify if they are fit to work at high altitude. A problem list is compiled for each employee that is further investigated, resolved or referred to the 'home' family physician to follow up. After each session the patients are discussed and declared fit or unfit to work at high altitude in accordance with the Regulations # 225 issued by the Government of Kyrgyz Republic on May 16, 2011.

Table 5-4: Number of the Patients Examined

	2006	2007	2008	2009	2010	2011
Annual medicals	1228	1638	1818	2086	1972	2411
Pre employment medicals	441	339	387	233	378	227
Total number of employees screened	**1669**	**1977**	**2205**	**2319**	**2350**	**2638**

Table 5-5 Medical screening results

Group	Description	2007		2008		2009		2010		2011	
		Number of Patients	%	Number of Patients	%	Number of Patients	%	Number of Patients	%	Number of Patients	%
Group 1	Healthy with no problems	146	**7.4**	107	**4.9**	91	**4**	68	**2.8**	62	**2.4**
Group 2	Healthy with minor conditions requiring no investigations. Back to work	1393	**70.5**	1341	**60.8**	1507	**64.9**	1489	**63.3**	1602	**60.7**
Group 3	Patients with minor problems requiring investigations and treatment. Back to work	256	**12.9**	522	**23.7**	491	**21.2**	629	**26.7**	788	**29.8**
Group 4	Patients with more serious problems requiring treatment, serial examinations, and follow-up visits. Back to work	162	**8.2**	205	**9.3**	180	**7.8**	78	**3.3**	153	**5.8**
Group 5	Declared not fit for their current positions at high altitude	20	**1**	30	**1.4**	50	**2.1**	86	**3.6**	33	**1.3**
Total		1977	**100**	2205	**100**	2319	**100**	2350	**100**	2638	**100**

Table 5-6 Diseases and Syndromes Detected during Medical Screening

Diagnosis	2007		2008		2009		2010		2011		Comments
	N	%	N	%	N	%	N	%	N	%	
Hypercholesterolemia (>6.2.mmol/L)	644	32.6	335	15.2	249	10.7	168	7.1	430	16.3	This is the main risk factor for cardiovascular diseases, stroke and heart attacks. Caused by high fat intake but can be determined by family predisposition. Controlled by low-fat diet or cholesterol-reducing agents if the diet is ineffective.
Fungal infections (dermatophytes, skin candidosis)	238	12.3	278	12.6	237	10.6	226	9.61	312	11.8	Risk factors are addressed: Tight fitting shoes, rubber shoes, moisture, hyperhidrosis, contamination in common bathrooms, poor hygiene, etc. antifungal medications are administered for treatment.
Obesity (BMI > 30)	%	16.3	238	10.8	361	15.6	321	13.7	523	19.8	Results from sedentary lifestyle, low-calorie diet, and genetic predisposition. Lifestyle modification is strongly advised.

Diagnosis	2007		2008		2009		2010		2011		Comments
	N	%	N	%	N	%	N	%	N	%	
Hypertension (>140/90 mm Hg)	173	8.8	195	8.8	198	8.5	170	7.2	245	9.3	All risk factors are addressed: Positive family history, diabetes, hypercholesterolemia, obesity, sedentary lifestyle, high sodium intake, high dietary fat intake, alcohol use, smoking, and a stressful lifestyle. Grade 1 Hypertension is treated with lifestyle modifications. Grade 2 requires constant hypotensive therapy and can be controlled at desirable level. Grade 3 is a contraindication for work at high altitude.
Chronic urinary tract infection i.e. pyelonephritis	79	3.5	84	3.8	68	2.9	86	3.7	102	3.9	Seen mostly in female patients. Often asymptomatic and left untreated, which can later result in renal insufficiencies. In uncomplicated cases, antibacterial medications cure the urinary infection.
Spondyloarthrosis, including disk disease.	107	5.4	124	5.6	177	7.6	111	4.7	111	8.2	Most often manifest with spinal/cervical pain or headache. Decreases quality of life but is not dangerous, apart from relatively rare cases of disk herniations that can require neurosurgery.
Chronic obstructive pulmonary disease	149	7.5	173	7.8	131	5.6	119	5.1	138	5.2	Related to cigarette smoking. 52.5% of Kumtor employees are current daily smokers. The number of ex-smokers is 23.1%. Only 24.4% of KOC staff never smoked.
Dental problems	43	2.2	114	5.2	386	16.6	324	13.8	424	16.1	Acute toothache often results in unnecessary urgent evacuation from site. Untreated teeth can become the focus of chronic bacterial infection.
Problem of alcohol consumption	360	18.2	50	2.3	103	4.4	43	1.8	115	4.4	Alcohol abuse at home is a common problem. Most do not show significant mental, physical or social dysfunction. Such key features are present in the risk group as intolerance, withdrawal, and persistent abuse despite counseling.
Elevated fasting blood sugar (>6.1 mmol/L): IFG, IGT & Diabetes	62	3.1	46	2.1	52	2.2	49	2.1	100	3.8	Predetermined genetically. Type 2 Diabetes requires life-long medical therapy and constant blood sugar control. Patients with IGT/IFG are regularly monitored for early detection of diabetes.
Peptic ulcer	25	1.3	13	0.6	2	0.1	8	0.3	15	0.6	Can be cured with triple therapy. If untreated, can cause gastric bleeding that may be fatal.
Anemia (Hemoglobin <110 g/L)	20	1	14	0.6	9	0.4	25	1.1	14	0.5	Seen mostly in women. Main causes: Blood loss due to gynecological diseases or hemorrhoids, poor iron intake (malnutrition), poor iron absorption due to gastric problems. Treatment of the underlying disease is required.
Severe color blindness dichromasy & achromasy	47	2.4	55	2.5	58	2.5	53	2.3	65	2.5	Always congenital and incurable. The only resulting restriction is prohibition of driving KOC vehicles.
Chronic viral hepatitis	21	1.1	41	1.9	41	1.8	38	1.6	38	1.4	Treatment is extremely expensive – $3600 to 7200 per year, thus none of local KOC employees can afford it. The disease is slowly progressive, resulting in liver cirrhosis and hepatic insufficiency.

Notes:

1. *We analyzed only chronic conditions detected during annual/pre employment medicals, thus acute conditions (e.g. acute mountain sickness) are not included.*
2. *Most of the conditions listed above are modifiable, i.e. they can be cured or controlled, with the possibility of negative consequences minimized. To achieve this goal, compliance of patients to treatment is most important.*

Table 5-7: Failed Medical Examinations

Total N = 33	
Failed annual medicals N=18	**Failed pre-employment medicals N = 17**
Diabetes mellitus – 1	Sensory-neural deafness – 5
Sensory-neural deafness – 2	Pulmonary hypertension – 1
Ventricular extra systoles – 2	Achromasy or dichromasy – 2
Severe essential hypertension – 3	Cataract – 1
Chronic alcoholism – 2	Artificial lens – 1
Pulmonary hypertension – 1	Echinococcus – 1
Achromasy – 1	Chronic hepatitis D – 1
Regurgitating mitral valve prolapse – 1	Bronchial asthma – 1
Other cardiac defects – 1	WPW syndrome – 1
COPD – 2	Hypogonadism – 1
Chronic glomerulonephritis – 1	Peptic ulcer – 1
Pupil sphincter rupture – 1	Severe obesity – 1

5.6 MEDICAL DEPARTMENT MONITORING PROJECTS

- Annual medicals examinations for all KOC employees and biannual medicals for Health & Kitchen Workers and pre-employment medicals for all new KOC employees and contractors;
- Monitoring of all medical examinations done for contractors on arrival at site i.e. pre placement which are repeated annually;
- Driver fitness screening, on a daily basis, for drivers on and off site and all equipment operators;
- Smoking Policy compliance in cooperation with the Safety Department;
- Smoking monitoring of employees at site in cooperation with the Chair of Internal Diseases of Kyrgyz Medical Academy;
- Lead Toxicity – Medical surveillance and biological monitoring of Assay Laboratory Workers;
- Personal Protective Equipment and universal precautions in the Medical Clinic (x-rays, blood and blood products as well as patients with infectious diseases);
- Altitude Adaptation: Ongoing monitoring and education of site employees and visitors;
- Patient database maintenance;
- Patient statistical data capturing;
- Development and application of the Coronary Artery Disease (CAD) Screening Program and the surveillance of diagnosed CAD cases;
- The support and implementation of the Smoking Cessation Program which was introduced on the mine site with effect from 1st January 2009.
- Individual and public nutrition profile analysis is an ongoing project since 2009; will continue in 2012.

5.7 SAFETY MEASURES

Safety Measures taken in regard to Health Hazard Precautions in 2011 were largely carried over from 2010 and included:

- Support and cooperation with the Safety Department in conducting the Vehicle Accident Reduction Program and the use of Safety Commitment Cards;
- Being a committed section of the company's Safemap program and encouraging medical staff to report defects and deviations from normal through the scratch card system;
- Availability to advise on Basic Life Support matters;

- Medical department interaction with the safety training at site for the Mine Rescue Team to facilitate good interaction in a crisis situation;
- Participation in quarterly, simulated emergency response practice sessions;
- Monthly Medical Department safety meetings with the staff in the workplace, where practical issues and problem situations are analyzed, discussed and solved. These include coordinated paramedical training in association with the emergency response teams;
- Training Safety and Security Department staff for medical support in medical emergencies.

SECTION 6

ENVIRONMENTAL MONITORING PROGRAM

6.1 Environmental Management Action Plan

6.2 Environmental measures general data

6.3 Surface Water Quality

6.4 Potable Water Quality

6.5 Air Quality Monitoring

6.6 Radiation

6.7 Solid Waste Disposal

6.8 Operation of the vertical drainage system at Kumtor mine

6.9 Water Quality Assurance / Quality Control

6.1 ENVIRONMENTAL MANAGEMENT ACTION PLAN

Environmental Management Action Plan (EMAP) was originally approved by Kumtor Gold Company (KGC) Executive Committee and Kumtor Operating Company (KOC) Board of Directors on June 28, 1995 года. The first time it was updated in 1999 (edition 1) to show the performance data for two years.

In 2010, due to the expansion of operational areas (Central Pit and flanks, underground and exploration) a new version of EMAP (version 5) was edited; Conceptual Closure Plan (CCP), closure reclamation and monitoring programs were updated as well. Section 7 represents the details of the development stages and the key components of EMAP.

EMAP, version 5 of 2010 contains the environmental policy changes and the changes related with alienation by Cameco of its capital share in Centerra Gold.

KOC activity is performed in compliance with environmental legislation, health and safety regulations effective in the Kyrgyz Republic and on the basis of Centerra Gold requirements of 2009 Agreement which represents the commitments on production activity using the best world practices, and taking into consideration legislation, regulations, instructions, policies and directives of Canada and the World Bank in the area of health, safety and environment protection, which are effective currently and regulate the following aspects:

- usage of hazardous materials, labeling, storage, transportation and emergency response;
- roads' construction;
- protection of the environment including wildlife conservation, operation of the drainage system at the area of facilities, emissions/discharges from the facilities (to the atmosphere and water bodies), disposal of waste rocks etc.;
- measures on containment, control and elimination of seepage/spills;
- policies, programs, training, regulating documents, reporting procedures etc.;
- mine closure, including reclamation of the area, regeneration of vegetation and post closure monitoring.

KOC provides the significant funds for HSE management to be complied with the aforesaid standards.

6.2 ENVIRONMENTAL MEASURES GENERAL DATA

Industrial ecological monitoring is the most important element of KOC environmental activity. Kumtor mine ecological monitoring program for 2011 is provided in the Attachment B of EMAP, and it is its considerable part.

A flow diagram of the monitoring station locations are indicated in a Diagram 6-1 and described in a Table 6-1. The monitoring data is presented in the Appendices C and D as monthly averages and annual averages for the last five years. Comparisons can be made between the 2011 results and historical data.

"Total" (without filtration) sample values are determined as per Canadian Regulations. At Kumtor, all non-filtered samples are preserved as required. For metals determination, nitric acid is added. However, this acid not only maintains dissolved metals in solution but also leaches additional metals from the suspended solids. Therefore, the values generated by this method are considered to be conservative. Due to the naturally elevated suspended solids in the streams around the Kumtor site, this conservatism overestimates the impact that the water may have on aquatic life. The metals contained within solid particles are not likely to be 'bio-available 'for uptake by aquatic species under the slightly alkaline conditions of these waters.

In 1996, tests were conducted to determine the impact of acid addition on metal concentrations in the water before and after solids were settled. The test showed that immediate acidification of the "raw" sample leached metals from the solids present in the sample. This system of preservation without settling or filtration was therefore misleading when applying values to the surface water quality guidelines. Due to this reason, as in previous years, the 2011 samples were left to stand for one hour to allow the heavier solids to settle. The samples were then carefully decanted and preserved. This methodology also gives a more accurate value of the Total Suspended Solids (TSS)

The results of environmental monitoring are discussed in terms of water quality evaluated at Station W1.5.1 (Control Station) of the Kumtor River, where the stricter standards of Canada and the World Bank for Surface Water Protection for Livestock and the KR Surface Water Protection Standards (SWPS) for "communal use" waters, are applied. The Kumtor River is classified as a "communal use" river due to high sediment content from the contributory streams. By the Kyrgyz Republic legislation the sample results can be evaluated as per the quality of water at the Station W1.8, which is 2 km upstream of the nearest river user. The results of the Station W1.8 (Naryn) show that many mountain river systems downstream the mine and beyond the Kumtor River system affect the water quality of the Naryn River.

The parameters used for discussion purposes in this report are Aluminum, Copper, Iron, Nickel, Sulphate and TSS. The levels of Cyanide and Ammonia are discussed in Section 8 as they relate specifically to the Effluent Treatment Plant (ETP). Other parameters are reviewed in the appendices of this report. It should be also noted that the results of water monitoring for the first three years of mine operations were generally elevated comparing to the last years. It is explained by the further modernization of analytical equipment and usage of more perfect examination methods in the laboratory which makes the analysis of Kumtor mine samples. In 2002, improvements in the contract laboratory continued with Method Detection Limits being lowered for arsenic, lead and mercury to be consistent with Canadian Drinking Water Standards. Quality Assurance (QA) sample data is addressed under a separate heading (Section 6.9). The averages of the regular samples from the independent contract laboratory are presented hereunder.

6.3 SURFACE WATER QUALITY

The results of Aluminum, Copper, Iron, Nickel, Sulphate and TSS are shown graphically following their sample locations or flowing into the Kumtor River, starting from the headwaters of Petrov Lake. The parameter's mean and standard deviation for each sample location, using a point and vertical line respectively, is shown to demonstrate the variation with the results over the year.

Chart 6-1: Locations of monitoring stations

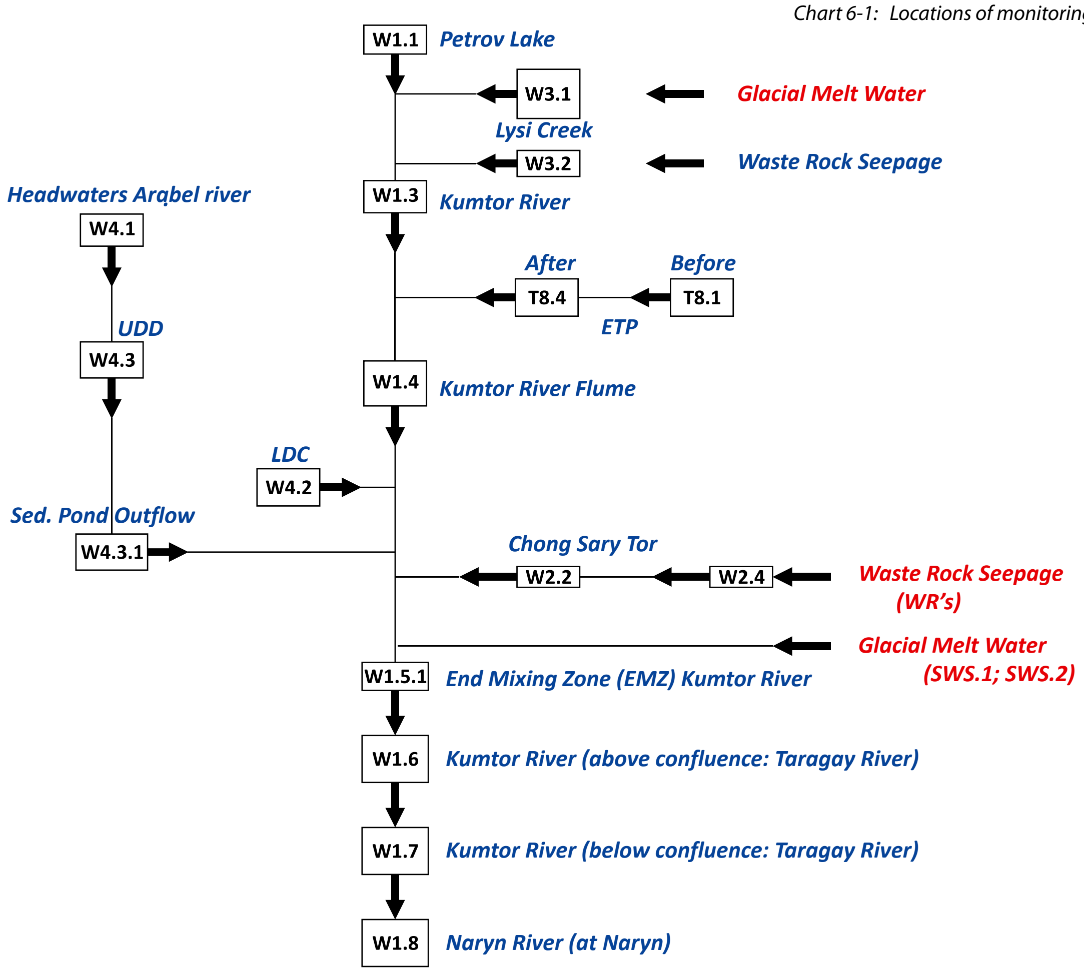
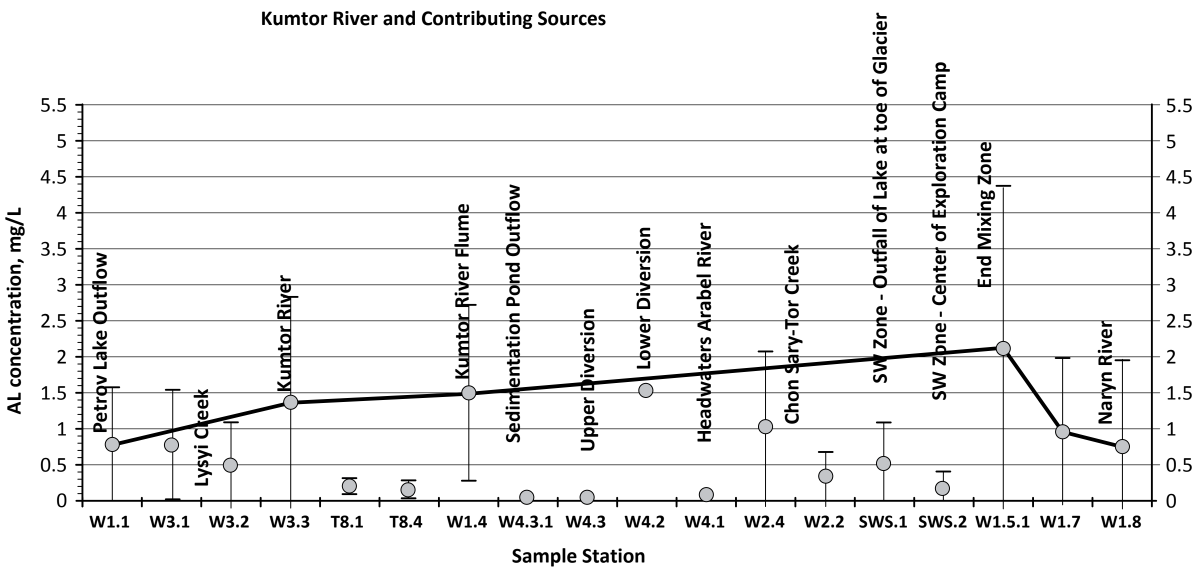


Table 6-1: Description of surface water sampling locations as per EMAP

Station	Location	Comments
W1.1	Petrov Lake Outflow – Kumtor River Head Waters	Alpine glacier fed lake – elevated Al, Fe
W3.1	Lysyi Glacier Toe	Head Water of Lysyi Creek
W3.2	Close to Waste Dump Area in Lysyi Basin	Small stream close to Waste rock
W1.3	Kumtor River after confluence of Lysyi Creek	Measures influence of Lysyi on Kumtor River
T8.1	Tailings Pond	Feed to Effluent Treatment Plant
T8.4	Treated Effluent Discharge Pipe at ETP	EMAP discharge regulations apply
W1.4	Between Kumtor Bridge and Flume	1 km down from ETP Discharge
W4.1	Head Water of Arabel Suu Diversion Ditch	Natural Background level of Arabel Suu
W4.2	Low Diversion Ditch (LDD)	Show Water Quality in Diversion
W4.3	Discharge of Upper Diversion Ditch (UDD) to Sediment Pond	Water Quality from UDD to Sediment Pond
W4.3.1	Discharge of UDD Sediment Pond to Kumtor River	Effectiveness of Sedimentation Pond
W2.2	Head Waters of Chon Sary-Tor River	Waste rock dump drainage area
W2.4	Chon Sary-Tor River below camp area	Camp area + waste rock drainage
SWS.1	Natural overflow at glacier toe – South West Zone	Includes monitoring stations SSS1, SSS2
SWS.2	Exploration Camp Center in South West	Includes monitoring stations SSS1, SSS2
W1.5.1	Kumtor River Five km from ETP Discharge	End of Mixing Zone (EMZ)
W6.1	Kumtor River, 17 km from mine site	Taragai River
W1.6	Kumtor River, 40 km from mine site	Taragai + Kashka Suu + Maitor River
W1.7	Naryn River at Naryn-200 km from mine site	KOC closest down stream river user
W1.8	Natural overflow at glacier toe – South West Zone	Includes monitoring stations SSS1, SSS2

Aluminum (Al)

Diagram 6-1: Aluminum levels



The Aluminum is a parameter that is naturally elevated in alpine glacier fed streams with high- suspended sediments and is prevalent along the Kumtor River and its contributories. The graph of Aluminum Sample stations demonstrates the natural Aluminum variability that existed with the streams on site.

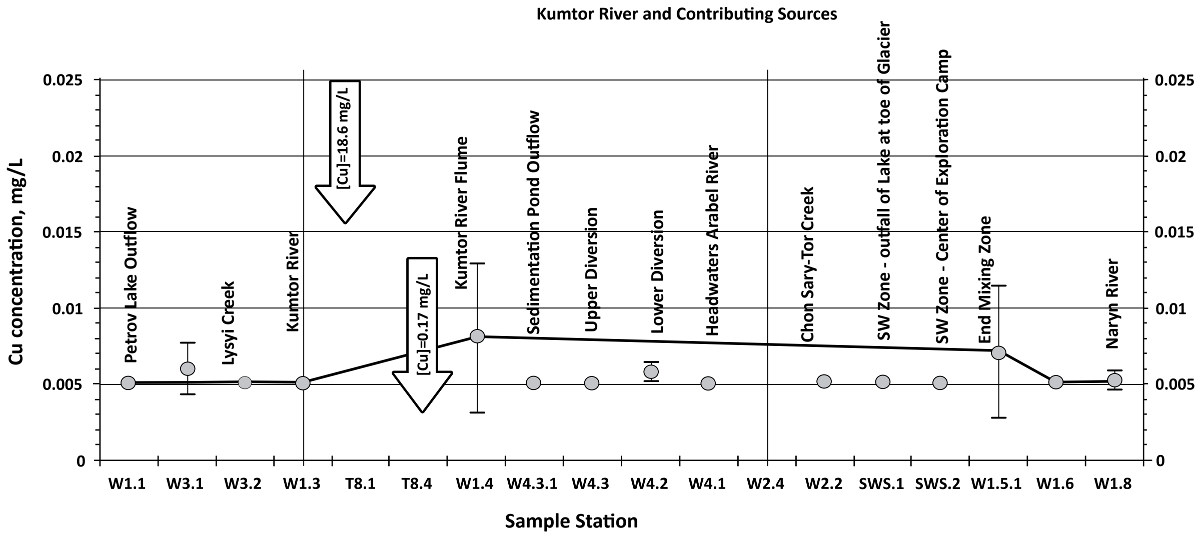
In 2011, the Aluminum level at the initial point of the water basin (Petrov Lake) in Kumtor Valley was almost the same as in 2010 (0.65 mg/l), it was 0.76 mg/l. The same level was the previous years.

In 2011, Lysyi Creek water basin showed the increased Aluminum levels. On the contrary, the Aluminum level has decreased in the samples of South-West zone which caused its decrease in the control station from 2.8 mg/l in 2010 to 2.07 mg/l in 2011.

As Aluminum is a regulated parameter for drinking water; it continued to be removed at the Potable Water Treatment Plant. This is further described in details, in the Section 8.4.3.

Copper (Cu)

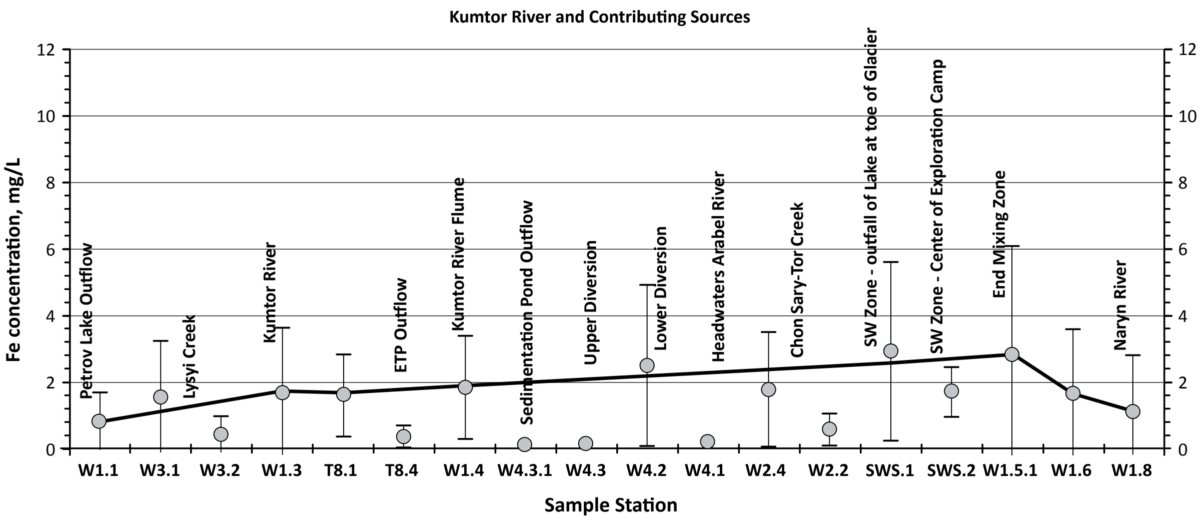
Diagram 6-2: Copper levels



Copper is a common element in mineralized areas containing sulphides such as the Kumtor Deposit. It is an impurity in the milling process and needs to be removed during the water treatment process to meet the EOP discharge requirement of 0.3 mg/l. The only significant input stream to the Kumtor River containing copper was the discharge from the ETP shown with the red arrow at station T8.4. In 2011, the annual average of T8.4 copper was 0.11 mg/l, i.e. almost three times less than MAC. The graph of Copper along the EMAP Sampling points shows that the levels were low at all locations including Southwest zone.

Iron (Fe)

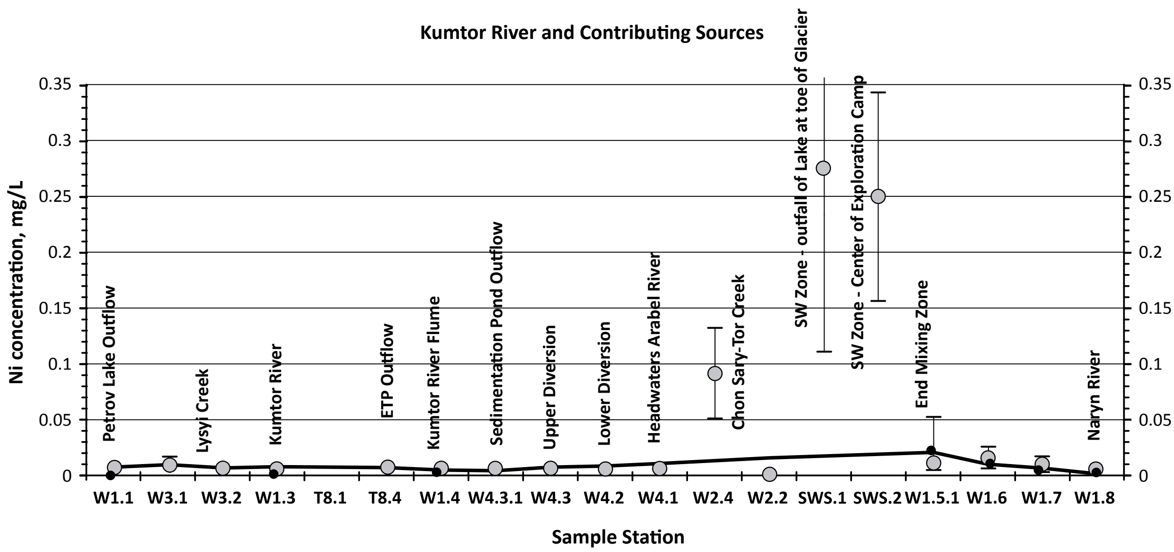
Diagram 6-3: Iron levels



Iron is very similar to Aluminum as it is naturally present along the Kumtor River System due to the presence of suspended sediment. The average levels with their standard deviations show that the levels varied significantly along the Kumtor River and the contributing streams. The Iron level at W1.1 station was not practically changed; it was 0.80 mg/l in 2011. In the Stream Lysyi the Iron level was increased from 0.99 mg/l (2010) to 1.53 mg/l in 2011, which affected the stations W1.3 and W1.4. The Iron level in the water of South-West zone has lowered ten times, which decreased the data of control station from 3.9 mg/l in 2010 to 2.8 mg/l in 2011..

Nickel (Ni)

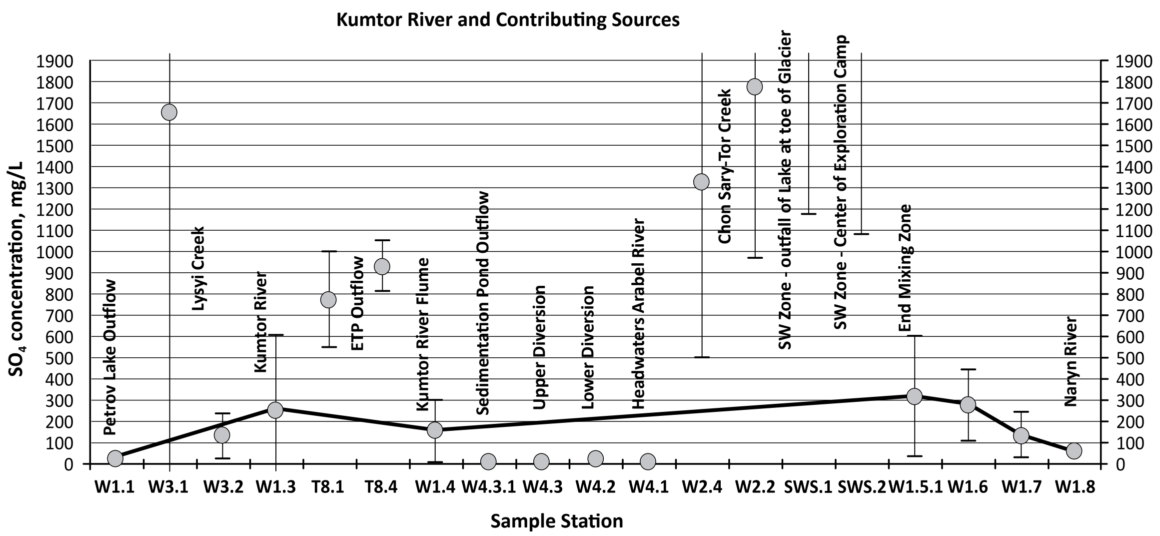
Diagram 6-4: Nickel levels



Nickel is similar to copper in that it can be found in mineralized areas containing sulphides. Nickel has a higher solubility compared to copper in terms of pH and requires pH levels greater than nine to be precipitated from water. As the pH of the Kumtor River and its contributory streams varies between 7.5 and 8.5, minor levels of Nickel were significantly decreased in the streams coming from waste rock dumps at Lysyi (W3.1 and W3.2) and South-West input. However, its level in the waste discharges in the West and South-West areas of the pit has increased insignificantly. In the control station the Nickel level is in the MAC limits.

Sulfate (SO_4^{2-})

Diagram 6-5: Sulfate levels



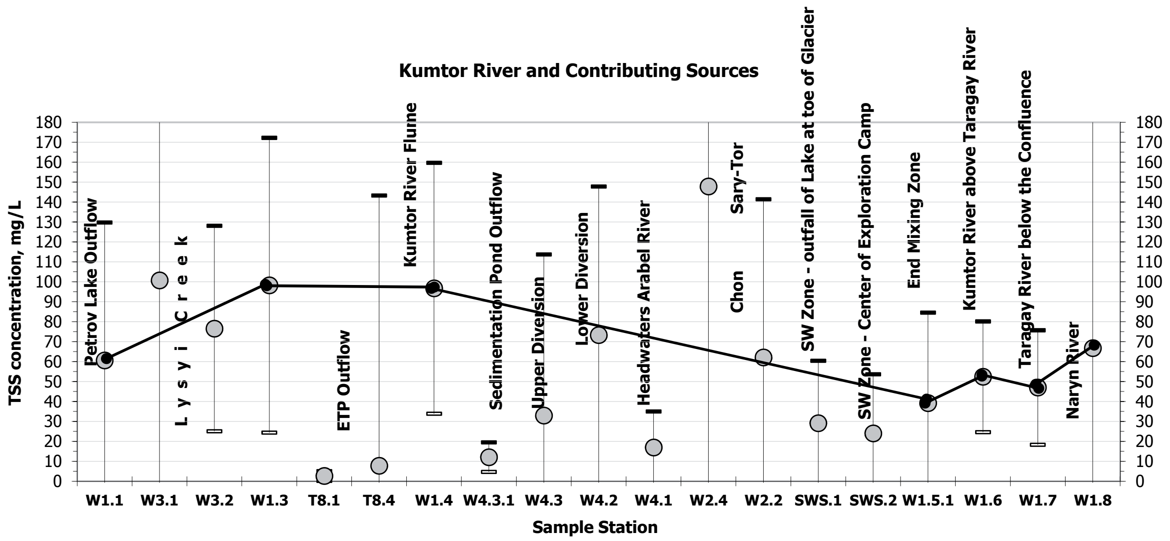
Sulfate is a product of sulfide oxidation and is present in the drainage from waste dumps and in tailings derived water. This is shown with the elevated sulfate levels in the ETP discharge water and Chon Sary-Tor River, Lysyi Creek. This caused a rise in the SO42- in the Kumtor River system at the control station. The levels continued to be below the control station standard of 500 mg/L, which has never been exceeded.

SO_4^{2-} has shown a slight upward trend in the past eight years due to the oxidation of the waste dump material due to the continued development of Kumtor mine. Samples collected from the Southwest Waste Rock Dump toe show a higher sulfate level. In the course of the last years, it is observed a small increase of sulfate level due to acidification of waste rocks at the area of waste dumps; it is related with continued development of Kumtor mine. The samples from South-West dump show the highest sulfate level. At the same time the pH level of superficial drainage is slightly alkaline as usual, and the level of calcium, magnesium and other main ions is not exceeded. This shows that the waste rock is able to consume any oxidation products and that Acid Rock Drainage will not occur due to the natural occurring buffering capacity. In 2011, the sulfate level did not increase the standards in the control station and was 317 mg/L.

It is required to keep the waste rocks "higher and dry" to minimize a contact of wastes with local waters. In 2012, a qualitatively new approach is planned with regard to pit dewatering and superficial water drainage; its results will be presented in the next annual environmental report.

Total Suspended Solids (TSS)

Diagram 6-6: TSS levels



The TSS level in the River Kumtor and its tributaries was in the limits of 2010 values or lower a little. In the samples of South-West zone its level has decreased to 2-3 times comparing to 2010 data. The TSS level in the sample station located lower the sediment pond is the same as background values, which shows a stability of UDD walls. The TSS levels at the station W1.8 were at the same levels as in 2010

Potable Water Quality

The Lake Petrov is a source of Kumtor mine water supply. The main pipeline is constructed from the lake to the Mill and Water Treatment Plant (WTP). Before the entrance to the distribution system and at the points of water intake, the quality of potable water must comply with the hygienic standards. The analysis of water sample at the station W1.1 (Lake Petrov) is conducted to examine the water quality. The quality of potable water is examined as well at the stations P5.2, P5.3, P5.4 of water system. Every day control of residual chlorine is conducted before water is supplied to the water system. The microbiological data of water quality (general coliform bacteria) are examined weekly.

The Table 6-2 illustrates the concentration of the general substances in the camp potable water for 2011 (station P5.2) compared to the data of 5 last years and its compliance with the Kyrgyz Republic and Canadian hygienic standards.

The analysis results show that the potable water is of good quality and that all parameters meet the regulatory standards. In 2011, the annual average level of Aluminum, Cooper and Iron was like the levels of 2010 and the level of Chlorides, Sulfate, and Nitrates was considerably lower the standards due to the installation of the additional third WTP which decreased the loading of the facilities.

Potable water quality data at the monitoring stations P5.3 and P5.4 are available in the Attachments C and D.

Potable water of Kumtor mine water supply system is epidemiologically safe, chemically harmless and has the favorable organoleptic properties.

Table 6-2: Drinking water concentrations vs. Regulatory Limits

			KR	Canada	Potable water quality data (P5.2)				
			Limits		2007	2008	2009	2010	2011
Metals	Aluminum	Al	**0.5**	-	0.21	0.11	0.086	0.093	0.12
	Copper	Cu	**1**	**1**	0.013	0.015	0.013	0.012	0.019
	Iron	Fe	**0.3**	**0.3**	0.078	0.069	0.038	0.043	0.06
	Lead	Pb	**0.03**	**0.01**	0.005	0.005	0.005	0.005	0.005
	Mercury	Hg	**0,0005**	**0.001**	<0.0005	<0.0005	<0.0005	<0.0005	0.0005
Nutrients	Chloride	Cl	**350**	**250**	2.05	0.82	1.22	2.03	1. 88
	Sulphate	SO_4	**500**	**500**	23.3	27.5	27.75	31	28.2
	Nitrates	NO_3	**45**	–	0.3	0.35	0.3	0.43	0.36
Other data	General mineralization		**1000**	**500**	71.1	74.3	79.23	74.88	71.3
	General coliform bacteria			**0/100 ml**	0	0	0	0	0
	pH		**6.0-9.0**	**6.5-8.5**	7.79	7.77	7.72	7.64	7.7

6.4 AIR QUALITY MONITORING

Six High Volume samplers to measure Total Suspended Particulate (TSP) in the air were installed at the Kumtor Mine Site. The frequency of sampling for each station is once every six days on a 24-hour cycle. Station A1.1 is located approximately 500 m northeast of the camp and 1,500 m south of the tailing area. Station A1.2 is located in the area of Portal #1. A1.3 is located approximately 1,000 m northeast of the north end of the tailings dam. Station A1.4 is located in the North-East of the pit within Lysyi Creek Basin. Station 1.5 is located on the South-West pit, area of the old camp of exploration. Station 1.6 is located on the border of South-West part of Sarychat-Ertash Reserve.

Total Suspended Particles (TSP)

At all stations, the TSP annual average concentration has been under 100 µg/m³ for the past five years as shown on the Diagram 6-7. The Kyrgyz 24 hour limit for TSP is 500 µg/m³ and it was elevated one time, at the station A1.4, on February 20, 2011. An intensive earth works were performed at this area at the time of air sampling. After receiving the measurements results the dust suppression actions were taken immediately. Dust collected on the filters was also analysed for CN, S, As, Ni, Se, Zn, U, Ra226 and Sr90.

The filter from the first sampling event of each month is collected and sent to the laboratory for analysis. At the laboratory, for each station, filters are halved - one half from each sample is made into a composite sample for the analysis of radio-nuclides. Each remaining half is analysed individually for CN and metals. All results, shown in Table 6-3, are adjusted to whole filter numbers and in previous years split into January-June and July-December time periods. As the filters' analysis was showing low levels of TSS over the past 10 years, in 2006 it was decided to analyse just one filter at each of the stations. In 201 the filters' samples were analyzed in the same manner.

Dust suppression activities performed at the mine site and outside show the effectiveness of measures. In 2011, the TSP average index was at the level of 85 mkg/m³ at all monitoring stations.

Diagram 6-7: TSP annual average values

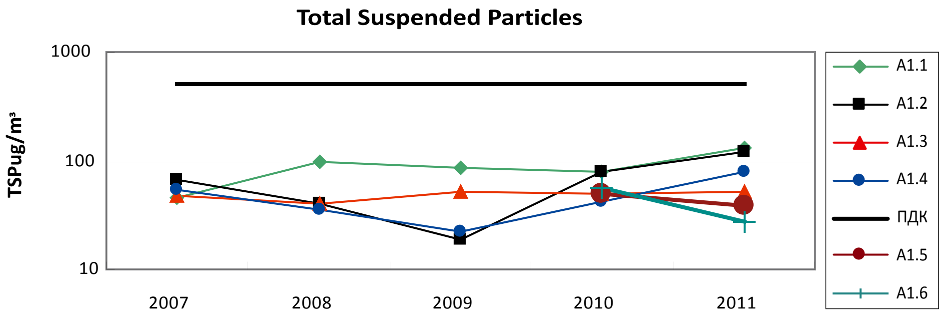


Table 6-3: TSP Metals and radio-nuclide analyses data

Station A1.1		CN	S (1)	As	Ni	Se	Zn	U	Ra226	Sr90	Pb210
		ng/m³							mBq/m³		
2007	Annual	0.014	121.2	0.635	1.30	0.020	42.3	0.255	0.003	0.014	0.062
2008	Annual	0.003	47.1	0.23	1.53	0	353.6	0.232	0.004	0	0.035
2009	Annual	0.010	112.6	0.47	1.94	0.027	1330.0	0.36	0.011	0	0.082
2010	Annual	0.215	2.8	1.05	1.33	0.03	2457.4	0.221	0.008	0	0.056
2011	Annual	0.000	148..8	6.44	9.88	0.218	1064.8	1.42	0.051	0	1.1
Station A1.2		**CN**	**S (1)**	**As**	**Ni**	**Se**	**Zn**	**U**	**Ra226**	**Sr90**	**Pb210**
2007	Annual	0.014	125.7	0.70	1.314	0.018	32.2	0.32	0.003	0	0.148
2008	Annual	0.003	76.5	0.35	1.946	0.003	114.3	0.24	0.007	0	0.099
2009	Annual	0.004	34.4	0.30	1.207	0.012	1081.1	0.31	0.000	0	0.008
2010	Annual	0.020	64.4	1.63	2.014	0.035	3771.7	0.41	0.004	0	0.069
2011	Annual	0.020	18.5	12.36	19.317	0.27	5639.0	2.64	0.043	0	1.31
Station A1.3		**CN**	**S (1)**	**As**	**Ni**	**Se**	**Zn**	**U**	**Ra226**	**Sr90**	**Pb210**
2007	Annual	0.015	40.6	0.22	0.5	0	32.7	0.14	0.001	0.015	0.183
2008	Annual	0.008	56.2	0.29	1.7	0	265.7	0.24	0.003	0	0.094
2009	Annual	0.045	73.4	0.80	1.9	0.034	3692.4	0.43	0.003	0	0.096
2010	Annual	0.032	59.1	1.48	1.8	0.022	2452 5	0.40	0.001	0	0.052
2011	Annual	0.032	863.8	14.67	23.8	0.293	21643.1	2.21	0.033	0	0
Station A1.4		**CN**	**S (1)**	**As**	**Ni**	**Se**	**Zn**	**U**	**Ra226**	**Sr90**	**Pb210**
2007	Annual	0.014	71.6	0.60	1.1	0.007	32.8	0.29	0.001	0	0.078
2008	Annual	0.005	56.1	0.46	0.8	0	123.3	0.11	0.003	0	0.019
2009	Annual	0.004	2.9	0.00	1.4	0.007	2034.4	0.00	0.007	0	0.000
2010	Annual	0.010	49.9	1.59	1.8	0.027	2841.8	0.36	0.005	0	0.051
2011	Annual	0.010	55.8	15.24	22.1	0.301	5688.2	3.00	0.043	0	2.27
Station A1.5		**CN**	**S (1)**	**As**	**Ni**	**Se**	**Zn**	**U**	**Ra226**	**Sr90**	**Pb210**
2010	Годовой	0.010	5.2	0.73	0.9	0.016	682.4	0.15	0.000	0	0.04
2011	Годовой	0.010	139.5	6.61	9.9	0.043	4078.4	1.29	0.064	0	1.57
Station A1.6		**CN**	**S (1)**	**As**	**Ni**	**Se**	**Zn**	**U**	**Ra226**	**Sr90**	**Pb210**
2010	Annual	0.007	4.0	0.43	0.7	0.011	486.4	0.10	0.000	0	0.053
2011	Annual	0.007	83.7	13.29	18	0.172	10968.6	2.55	0.043	0	1.93
TLV (2)		21,00,000	5,200,000	200,000	1,000,000	200,000	10,000,000				
DAC (2)								24,000	9,500	52,000	

(1) No value for elemental S, therefore the value for SO_2 is used.
(2) ACGIH Threshold Limit values for non radioactive elements in ng/m³
KBB ICRP Derived air concentrations for radionuclides in mBq/m³ except for U in ng/m³

Monitoring of the airborne dust level inside the Barskoon Tract.

Three large-volume samplers were installed twice in Barskoon Tract in 2011 (summer) to measure the Total Suspended Particulate (TSP) as before. The first sampler was located in 100 m to the North from the road towards the Barskoon River. The second sampler was installed in 50m north from the road in the opposite side of KAMAZ truck monument, towards Barskoon River. The third sampler was located 50m south from road, upper KAMAZ truck monument. All large-volume samplers had been working uninterruptedly around the clock.

Table 6-4: Analyses results of dust samples in Barskoon Tract, 2011

Sampling stations	Dust level	
	June	August
A1 (100m to the North)	11 μg/m³	15 μg/m³
A2 (50m to the North)	12 μg/m³	18 μg/m³
A3 (50m to the South)	19 μg/m³	47 μg/m³

The results of the sampling analysis of June and August 2011 have shown the less dust level of the examined area which was registered since 2002 till 2007, when TSP concentration varied from 20μg/m³ to 157 μg/m³. Sampling analysis data of 2011 have shown that the dust level was below MAE standard in 100 μg/m³, fixed for the non industrial zone.

As the sampling area is used by locals for recreation purposes and grassland for cattle, dust suppression works on a daily basis have been continued by the KOC in 2011 following the agreement with local water trucks drivers.

Meteorological Station.

The Meteorological Station was installed on August 19, 1996. This station is located approximately 350 m west of the camp at an altitude of 3659.6 m. It is a fully automated weather station, with measurements of barometric pressure, wind speed and direction, temperature, relative humidity, rainfall, dew point, soil thermistors and long and short wave solar radiation. Readings are taken every five seconds, with hourly averages recorded. A manual snow gauge is monitored daily whenever sleet or snow occurs. The precipitation is recorded as Water Equivalent (WE). The weather station collects and reports data as per Canadian Atmospheric Environment Services protocols. The Saskatchewan Research Council (SRC) located in Saskatoon, Saskatchewan, Canada is contracted on a yearly basis to calibrate the sensors and ensure the instruments function as designed. A calibration report is available for Kyrgyz Hydromet and State Standards when required. The weather station data logger is directly linked with a computer into a building which allows for constant monitoring of the Kumtor site conditions. Personnel from Kyrgyzhydromet transmit the data to Bishkek. The weather report of Tian-Shan Weather Station is provided by Kyrgyz Hydro meteorological Service staff to Bishkek and placed on internet meteorological sites.

The lowest relative humidity at the mine site was recorded in August e (13.5 %). The warmest and coldest recorded temperatures at the mine were: +19.0°C и -33.8°C. Diagram 6-8 illustrates the maximum and minimum weekly temperatures. 6km/hr and approximately 61 % of the winds were 10 km/hr, 3 % of which were light. The predominant wind directions were from the northeast and southwest in 22% cases showed that the wind follows the direction of the Kumtor River Valley. As in previous years, the barometric pressure continued to be low in the winter and fall season and increased in summer (Diagram 6-11).

A total of 428.8 mm of precipitation, including the water equivalent, derived from melting snowfall, was recorded in 2011. Less precipitation was registered in 2011 in comparison with 2010 but more than in 2008 and 2009 (Diagram 6-12). In the freezing months, the water equivalent value is used as the total precipitation amount; the automatic raingauge data is used when the temperature is positive. In 2011, approximately 82 % of the total annual precipitation occurred in the spring and summer months from April to September. Table 6-5 provides a summary of 2011 meteorological data.

Diagram 6-8: Average Weekly Temperatures

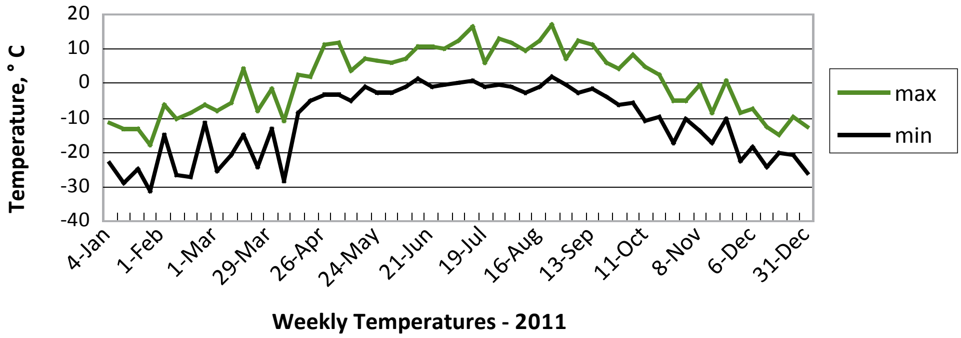


Diagram 6-9: Historic Ambient Temperatures over KOC Life of Mine

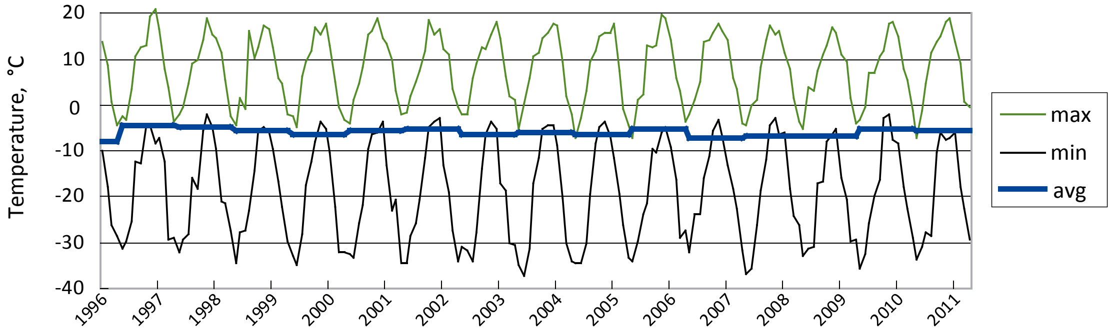


Diagram 6-10: Annual wind Speed and Direction

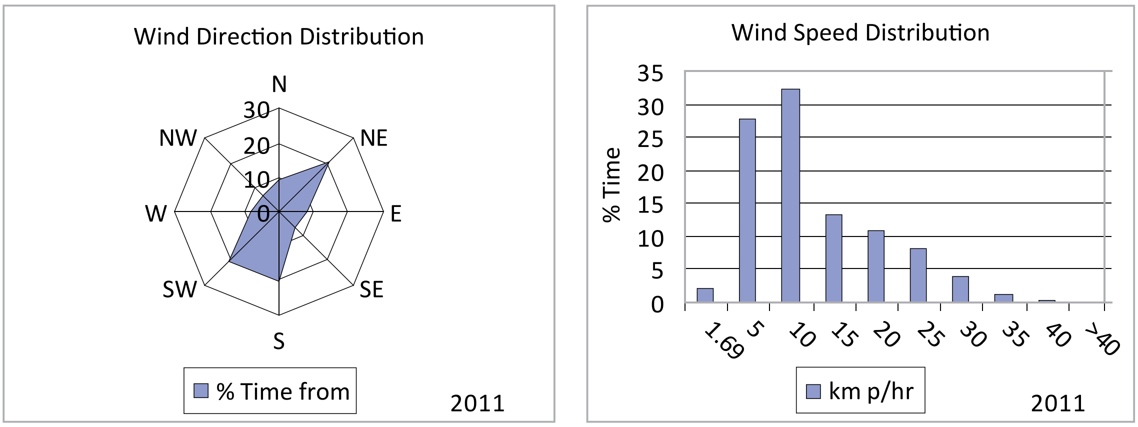


Diagram 6-11: Annual Barometric Pressure

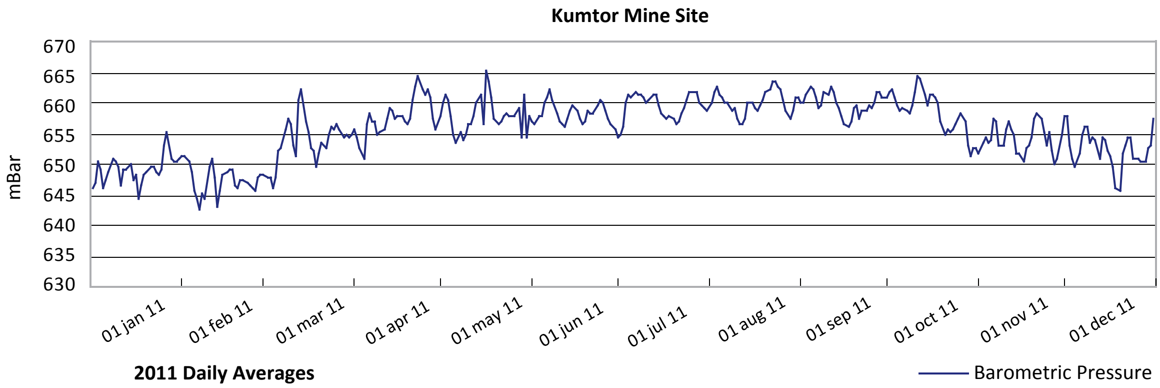


Diagram 6-12: Annual precipitation

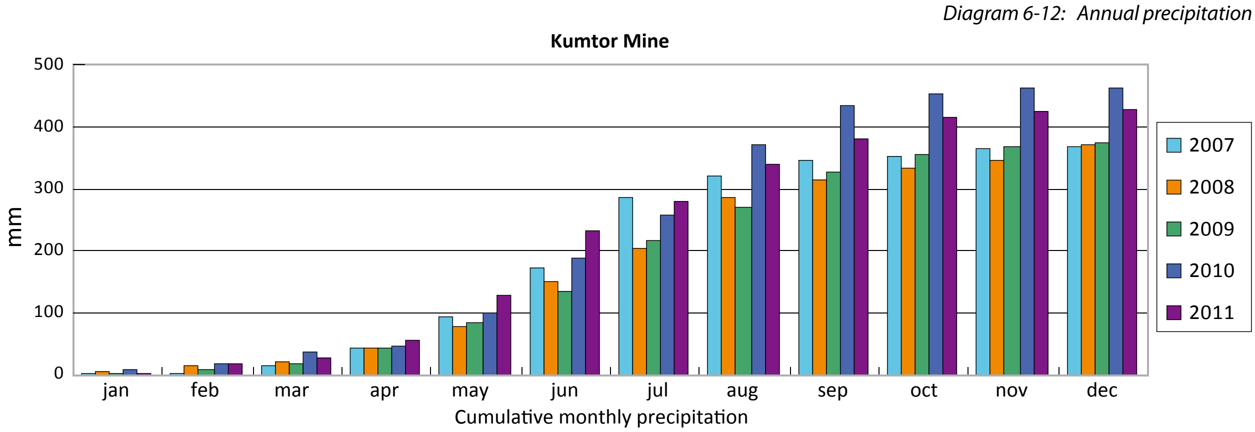


Table 6-5: Kumtor Weather Station – 2011 Summary

2011		Hourly Average Readings for 2011									hr./rdg. Total precip, mm	Avg 5 sec. Rdgs			
					Температура, °C										
		W. Spd. 10 m, km/h	Wind dir.deg. true N	W. Spd. 0.5 m, km/h	Avg./h	Max., 5 s.	Min., 5 s.	Rel. hum., %	Dew.point, °C	Solar rad., KW/m³		Temp. °C	Rel. hum., %	Rel. hum., %	Barom. press., mbar
	Max	39.1	359.8	24.9	-7.5	-7.2	-7.9	88.1	-13.3	0.5		-7.7	88.0	-13.7	656.1
Jan	Min	0.7	1.1	0.0	-31.9	-31.1	-33.8	16.6	-43.4	0.002		-32.4	16.0	-45.4	643.4
	Avg	8.0	128.3	4.4	-20.6	-19.5	-21.6	58.9	-29.5	0.1		-20.5	59.0	-29.4	649.1
	Tot										2.1				
	Max	35.3	359.7	23.3	-2.2	-1.3	-2.9	93.1	-8.1	0.7		-1.7	92.9	-8.1	652.7
Feb	Min	1.1	0.04	0.0	-28.0	-26.0	-31.0	27.5	-41.8	0.002		-29.0	27.4	-41.6	641.9
	Avg	8.4	142.6	5.3	-14.9	-13.7	-15.9	70.3	-20.5	0.1		-14.8	70.4	-20.4	647.3
	Tot										15.3				
	Max	39.7	359.8	22.4	3.4	4.5	3.1	93.5	-5.4	0.8		3.5	93.5	-5.5	662.9
Mar	Min	0.2	0.8	0.0	-25.4	-23.9	-28.0	28.3	-39.3	0.002		-25.4	28.0	-38.8	645.7
	Avg	8.3	164.1	5.6	-12.3	-11.2	-13.3	66.9	-18.3	0.2		-12.3	66.9	-18.3	653.6
	Tot										10.2				
	Max	38.3	359.9	24.3	11.0	11.5	10.5	99.3	0.7	0.9		10.8	99.3	0.4	664.9
Apr	Min	0.38	0.5	0.0	-28.0	-27.5	-28.5	19.8	-36.7	0.000		-27.8	20.9	-36.4	649.5
	Avg	9.8	199.5	3.9	-3.6	-2.8	-4.4	64.1	-10.0	0.2		-3.6	64.1	-10.0	657.8
	Tot										28.6				
	Max	42.6	359.5	25.6	13.0	13.7	12.7	99.9	1.7	1.1		13.1	99.8	2.2	666.4
May	Min	0.4	3.2	0.00	-9.9	-9.5	-10.3	16.5	-18.1	0.002		-10.0	19.1	-14.7	652.5
	Avg	13.2	195.5	8.8	1.0	1.8	0.2	68.3	-4.4	0.3		1.0	68.2	-4.4	658.7
	Tot										72.6				
	Max	34.6	359.8	23.2	14.0	15.1	13.3	99.9	4.6	1.1		14.0	99.9	4.6	662.7
Jun	Min	0.8	1.4	0.00	-5.4	-4.9	-6.0	22.2	-10.2	0.002		-5.4	23.1	-9.7	653.1
	Avg	12.0	188.1	7.4	3.5	4.4	2.7	71.2	-1.2	0.2		3.5	71.5	-1.2	658.0
	Tot										103.0				
	Max	54.6	359.5	21.9	17.0	18.0	15.8	99.9	4.8	1.1		16.4	99.9	4.7	663.5
Jul	Min	0.7	0.2	0.0	-7.2	-6.3	-7.8	18.6	-8.8	0.002		-6.9	20.6	-8.6	653.6
	Avg	10.8	177.7	3.2	5.3	6.1	4.4	65.6	-0.6	0.2		5.3	65.8	-0.6	659.4
	Tot										49.3				
	Max	41.9	359.7	13.0	18.2	19.0	17.6	99.8	5.5	1.0		18.3	99.8	5.5	664.5
Aug	Min	0.6	0.2	0.00	-5.6	-5.2	-7.1	13.5	-12.7	0.002		-5.7	12.5	-14.0	655.6
	Avg	12.1	175.2	0.4	5.4	6.3	4.4	64.3	-1.1	0.2		5.5	63.6	-1.2	660.1
	Tot										58.5				
	Max	36.2	358.8	21.9	12.6	13.7	12.0	99.8	2.9	1.0		12.9	99.7	2.4	663.7
Sep	Min	0.2	0.4	0.00	-5.6	-5.0	-6.2	14.4	-13.5	0.002		-5.8	15.7	-14.1	655.5
	Avg	10.1	168.1	4.0	1.6	2.4	0.8	67.4	-4.0	0.2		1.6	67.5	-4.0	659.9
	Tot										40.4				
	Max	36.8	359.6	21.9	8.4	9.1	7.6	98.9	-0.9	0.8		8.7	98.8	0.2	665.3
Oct	Min	0.7	0.5	0.00	-17.6	-17.4	-18.1	15.2	-23.7	0.002		-17.6	14.8	-24.2	650.0
	Avg	9.8	158.3	1.6	-4.4	-3.6	-5.3	70.8	-9.4	0.2		-4.4	70.7	-9.4	658.6

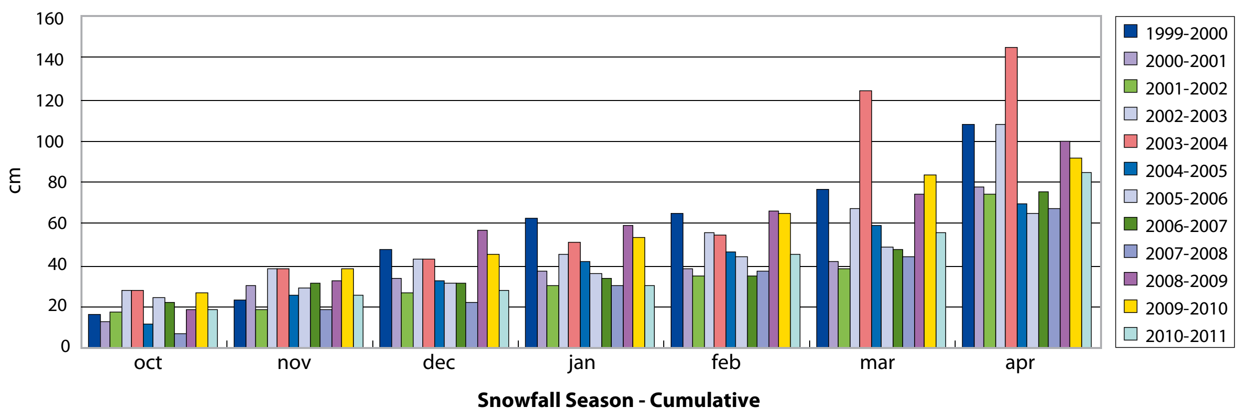
2011		Hourly Average Readings for 2011									hr./rdg. Total precip, mm	Avg 5 sec. Rdgs			
					Температура, °C										
		W. Spd. 10 m, km/h	Wind dir.deg. true N	W. Spd. 0.5 m, km/h	Avg./h	Max., 5 s.	Min., 5 s.	Rel. hum., %	Dew.point, °C	Solar rad., KW/m³		Temp. °C	Rel. hum., %	Rel. hum., %	Barom. press., mbar
	Tot										19.1				
Nov	Max	37.7	399.6	15.6	0.2	0.8	-0.3	95.0	-7.2	0.7		0.0	95.0	-7.2	659.3
	Min	1.2	6.2	0.00	-20.9	-19.4	-22.8	31.8	-27.0	0.002		-18.6	32.0	-26.1	649.1
	Avg	11.3	161.4	1.7	-9.9	-9.0	-10.9	72.7	-14.5	0.1		-9.6	72.2	-14.3	654.8
	Tot										8.4				
Dec	Max	43.6	359.9	0.0	21.0	-0.6	25.8	90.1	-11.0	0.8		-8.5	87.4	-15.1	659.3
	Min	1.1	0.1	0.00	-28.1	-27.5	-29.5	28.7	-37.7	0.002		-28.8	29.6	-38.5	643.8
	Avg	9.1	144.9	0.0	-17.2	-16.2	-18.2	65.7	-23.9	0.1		-17.8	65.5	-24.5	652.0
	Tot										4.7				
	Max	54.6	399.6	25.6	21.0	19.0	25.8	99.9	5.5	1.1		18.3	99.9	5.5	666.4
	Min	0.2	0.04	0.0	-31.9	-31.1	-33.8	13.5	-43.4	0.0		-32.4	12.5	-45.4	641.9
	Avg	17.0	177.1	7.9	-4.7	-4.5	-5.5	61.6	-13.2	0.4		-5.6	61.6	-13.3	655.7
	Tot										428.8				

Snow Sampling

Diagram 6-13 shows the precipitation data as snow from 1998 to 2010. Snow sampling associated with the air-monitoring program, commenced in late 1997 and has continued to date. The objective is to determine the impact, if any, of mining activity on the snow chemistry. One site is located approximately 10 m from High Volume Station A1.4. The second site is located approximately two km north of High Volume Station A1.3. Two snow sampling stations are located in the South-West Pit area.

Snow samples are collected using a plastic cylinder. The cylinder is pushed through the snow cover and the trapped snow is placed into the clean plastic bags. This procedure is repeated five or six times to ensure that, when melted, there is a minimum of four liters of melt-water for analysis. As stated in the Feasibility Study (FS) *"Contaminants in snow may derive from three main sources; (1) impurities in the atmospheric precipitations; (2) admixtures collected from the surrounding atmosphere during the snow falls…; and (3) atmospheric pollutions on the snow and neighbouring facilities."*

Diagram 6-13: Total amount of snow precipitation in 1999-2011



Total Suspended Solids (TSS) and most other constituents in the snow samples were within the range of the results for the previous years.

6.5 HYDROLOGICAL MONITORING

6.5.1 KUMTOR RIVER MONITORING

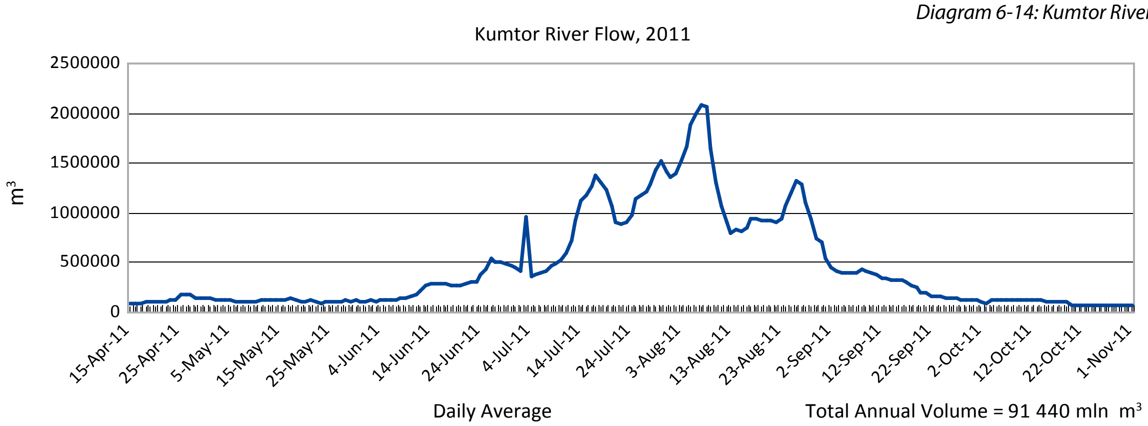
A hydrometric post was installed to monitor the Kumtor River water flow.

Diagram 6-14 presents the water flow measured from April through to the end of October. A peak flow of 24.02 m^3/s was recorded on August 7, 2011, which was 3.59 m^3/s less than 2010 data.

In 2011, the total flow in the Kumtor River measured at the flume, was calculated to be 91.4 M m^3/year. With the addition of the Upper Diversion (UDD), Lower Diversion Ditch, Lisyi Creek, Kichi Sary-Tor and Chon Sary-Tor streams the flow at the End of Mixing Zone, was calculated to be 112 M m^3/year.

Accurate flows measurement of the River Kumtor allows the maximum discharge of treated water from the Effluent Treatment Plant (ETP). If necessary, the ETP pumps capacity are adjusted to the Kumtor River output but usually the ETP discharge rate is insignificant comparing to the river flow.

Diagram 6-14: Kumtor River flow



6.5.2 PETROV LAKE MONITORING

A water level float recorder installed in 2000 provides the continuous records of water fluctuations in the Lake Petrov.

Diagram 6-15: Petrov Lake water level

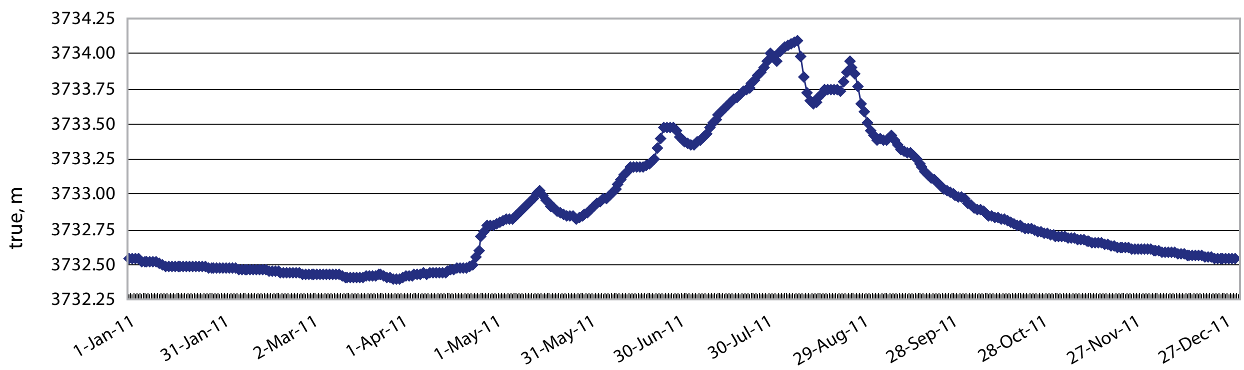


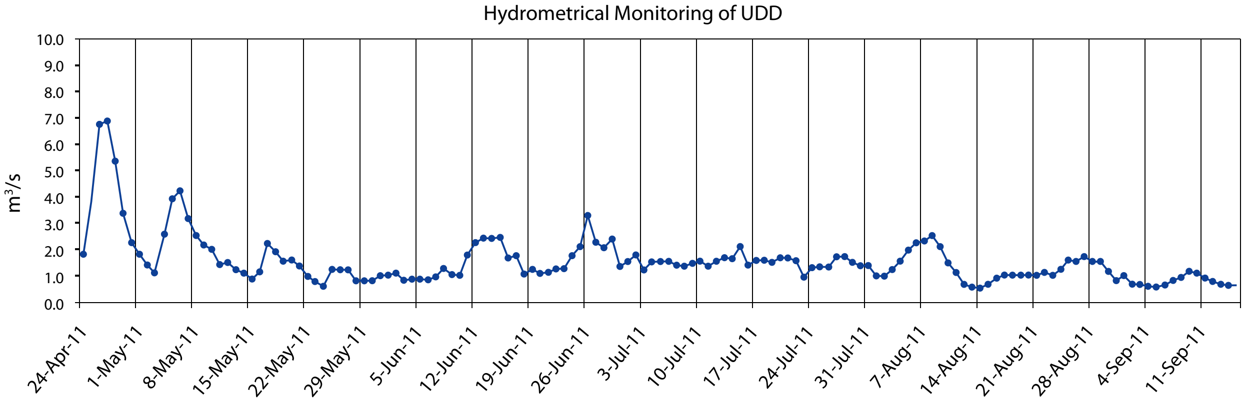
Diagram 6-15 illustrates the rise and fall of Petrov Lake water levels in 2011. As it is seen on the Diagram, the water level of the Petrov Lake was 3732.54 m at the beginning of the year and at the end of the year is was 3732.54m as well, i.e. it was at the same level. On August 9, the maximum water level (3734.09 m) was recorded.

6.5.3 UPPER AND LOWER DIVERSION DITCHES

The flow of the Upper Diversion Ditch was taken on a daily basis by using the floats fixed in the stream center along the maximum surface speed[1]. The maximum water flow of 9.0 m^3/s in the ditch was recorded on May 10, close to the beginning of the flow season (Diagram 6-16).

[1] "Practical Training on Hydrology, Hydrometry and Regulation of Flow" (edition of E.E.Ovcharova. M, Agropromizdat, 1988. – 224p)

Diagram 6-16: Hydrometrical Monitoring of Upper Diversion Ditch



6.6 RADIATION

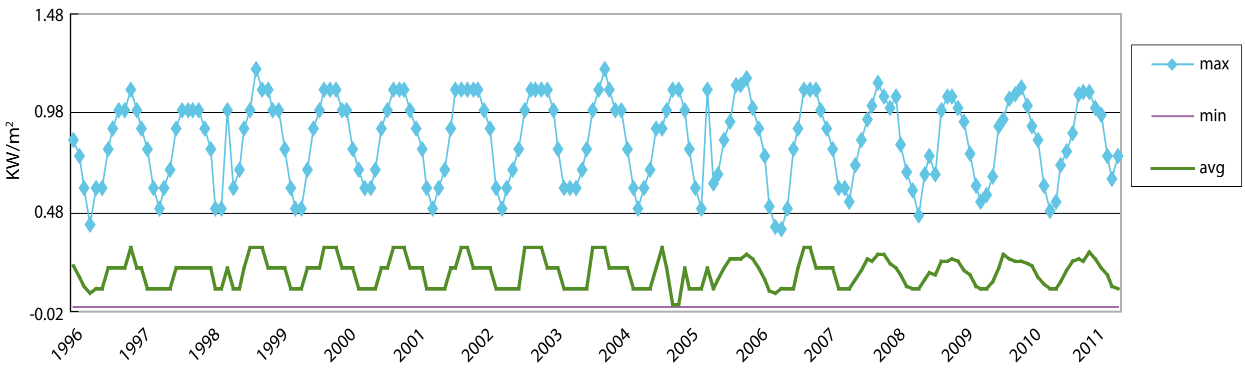
The radiation monitoring program has been implemented since 1996. Gamma radiation measurement of absorbed does in micro-sieverts per hour (µSv/hr) was performed on a weekly basis in 12 areas of the mine site and BMY. A hand radiation-measuring device is held approximately one meter above ground and once the readings stabilize, they are recorded

The average for the site is 0.16µSv/hr, which is unchanged since the monitoring program was implemented in 1996. Gamma radiation levels at Kumtor are approximately half of the average background value of the KR (0.255 µSv/hr or 25.5 microR/hr).

In 2010, the highest value recorded at Kumtor was in the Pit (0.22 µSv/hr or 22 microR/hr) and the lowest was recorded inside the underground mining area № 1 (0.10 µSv/hr or 10 microR/hr). In 2010 regardless of altitude, location and time of year, the gamma readings were low and consistent at individual stations.

At the KOC weather station, an irradiation sensor has been providing measurements of the solar intensity for the 15 years. Similar to the decade long constant temperature trend on site, the levels of solar radiation in 2011 averaged 0.3 KW/m^2 with maximum levels at 1.1 KW/m^2 as shown in Table 6-17.

Diagram 6-17: Historic Ambient olar Radiation Changes for 1996-2011



6.7 SOLID WASTE DISPOSAL

The mine wastes are divided into three types:

- Domestic waste, which consists of kitchen, camp and office waste;
- Industrial waste, which consists of all solids and liquids (oil products) generated from the maintenance shops and mill; and
- Hazardous waste, including the batteries acid and packing materials.

Domestic Waste - Domestic waste was buried in a special cell within the tailings basin boundary. With increasing recycling programs in place such as clean wood recovery for the local villages and paper recycling, there was less heating value in the domestic waste stream.

Industrial Waste - Industrial waste, consisting of the used tires, scrap steel, oil drums and waste oil is placed in designated areas within the tailings basin boundary which is designed to handle all industrial waste generated on site.

Pads and trenches have been constructed with earthen berms and liners, to handle the various types of waste oil.

A number of initiatives for recycling and reuse were both explored and implemented in 2005 and continued in 2011. In 2011, 3193 tons of scrap and 1695 tons of waste oil were removed from the mine by various organizations which have the required permits and licenses.

KOC continues investigation of the business market on recycling of waste tires.

Hazardous Waste - Cyanide crates, xanthate barrels, soda ash bags, other various packing materials from the mill and domestic wet waste are disposed in burning trenches, constructed within the tailings basin boundary.

In 2009, the Company has introduced a new waste collecting procedure. Metal garbage bins installed in the main facilities of the mine site were painted with different colours in compliance with waste types:

- Hazardous wastes;

- Metal scrap;

- Timber;

- Domestic wastes;

- Used tires.

6.8 OPERATION OF THE VERTICAL DRAINAGE SYSTEM AT KUMTOR MINE

Until 2000 the Administration building (AB) at Kumtor mine and the Mill (boiler house and generator house) were permanently under the phenomenon of subsidence due to flooding of the buildings' foundations by ground water. Frozen ground depositions under the base and the foundations were thawing out due to the under flooding that resulted into ongoing subsidence process.

Thus, it become necessary to maintain the groundwater level at a depth of 8.0 - 9.0 m from the ground surface to protect these facilities from the under flooding. The implementation of a vertical drainage system (VDS) of the ground water was considered as the most efficient method in the conditions of spreading of the permafrost depositions zone at Kumtor mine.

Hydrogeological and engineer-geological investigation data of the plots conducted earlier by "Golder Associates" and Joint Stock Company (JSC) "KyrgyzGIIZ" in 1995 and in 2000, Ltd "Enelbur" in 2001 were used to choose the type and structure for the best vertical drainage system.

A vertical drainage system of the ground water was installed and equipped in the following areas:

- Administration building site;
- Mill site;
- Camp plot.

6.8.1 ADMINISTRATION BUILDING

13 hydro-geological wells for vertical drainage system of ground water were drilled at the area of administration building (AB) during 2000-2001.

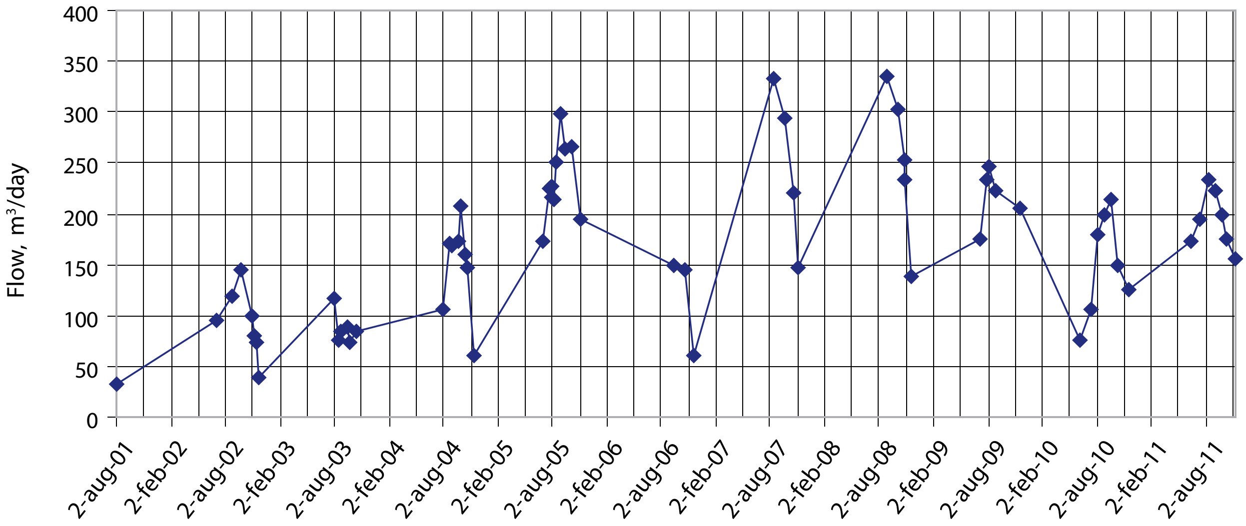
The wells hit the ground water. As per the distribution character the underground water is an underflow and has a direct hydraulic connection with superficial water of the Valley of Chon Sary Tor River. Water basin rocks consist of boulder-pebble with rare blocks (more than 10 m) and gravel-pebbles with sand-gravel aggregates. The rare compact loam layers and the clay loam lenses of confining layer are met among the water basin rocks. The underground water is weak confined water. The fixed water level in the wells varies from 0.55m to 1.10m.

Five hydro-geological wells of 20 m length were used to operate the vertical drainage system in the Admin building in 2011. They provided a diversion and discharge of ground water flood at this area. All wells were equipped with the submerged pump, model SP14A-7, with the capacity of 14 m^3/hour and head pressure of 35 m.

All wells were operating to reduce permanently the ground water level. During summer time four wells (W01-2, W01-3, W01-4, W01-5) were used to pump out ground water outside the Administration building. In winter, inside the building, the pumping out were performed at the well WH-00-D3. Its flow was at the rate of 3 – 3.7 m^3/day.

The monitoring data of AB wells show that the groundwater level is at the rate from 9.55 to 10.39 m.

Diagram 6-18: Total annual average groundwater flow



The Diagram 6-18 shows that the groundwater annual average flow was gradually increasing up to 2009. In 2009-2010 the water flow visibly reduced, but in 2011 a tendency of its increase was recorded. The maximum monthly average ground water flow was pumped out from August to September and the minimum flow was between November and February.

The max total average daily groundwater flow pumped out from the AB four external wells were 234 m^3/day (August), and minimal was 155 m^3/day (November) respectively.

25 thermistors (19 horizontal and 6 vertical) were installed to study temperature regime under the AB basement and foundation. The horizontal thermistors are evenly distributed under the Administration building and installed at the depth of 1.5 m. The vertical thermistors are installed at the representative locations at the depth from 3-15.5m, and 0-20m.

Until 2000 the temperature of the ground depositions under the building was between +0.5 °C - +4.5 °C and higher. This happened due to continuous underflooding with ground waters that resulted in defrosting of permafrost ground and therefore the building settlement occurred.

When the vertical drainage was performed the ground water level decreased and the ground under the AB foundation started gradually to freeze up and the settlement ceased. The AB building foundation is currently stable.

During 2010-2011 the permafrost ground average temperature under AB was registered at the rate from – 6.9 °C to – 1.6 °C at the depth from 3 m to 15.5 m.

In 2011, the wells ADM001, ADM002 and ADM003 were drilled on the depth of 30 - 54 m. All wells were equipped with the steel casing with diameter of 159 mm as well as perforated filters at most water abundant intervals. The underground water was at 22.3 – 44.6m depth. The GEOKON devices were installed for further monitoring of underground water level.

6.8.2 MILL

The vertical drainage was established at the Mill area to catch the ground water and decrease the water level at the area of the boiler house and the generator house that both are exposed to intensive settlements. Therefore, four hydro-geological wells M1-01, M2-01, M3-01, M4-01 with the depth of 20 – 25 m were drilled.

The wells locations were determined taking into account the possible impact radius (15-20 m) and the distance between the wells is 20-25 m.

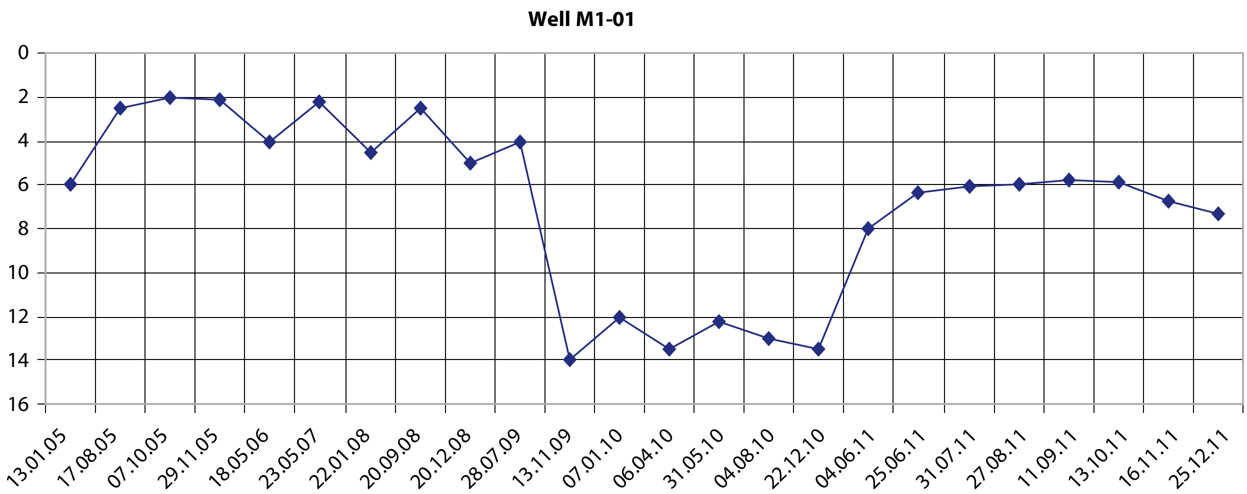
The wells M2-01, M3-01 and M4-01 are located along the right wall of the existing drainage ditch and the well M1-01 was drilled close to the South-East corner of the boiler-house.

All wells hit the groundwater. Naturally ground waters spread sporadically and have hydraulic link with cracking–vein waters of tectonic origin. Water-bearing rocks are represented by the gravel - rubble and gruss ground among the eluvial loamy soil and clays. Ground water has pressure regime due to presence of upper and lower confining layers that are represented by frozen grounds or weakly permeable loamy soils and clay slates.

Ground water level has got set and fluctuates at the rate from 2.00 m to 12.0 m from the ground. The water head is registered at the rate of 1.8 m to 5.5 m. After pumping the water level slowly increased up to 1.05 m – 5.75 m. This could be explained by weak permeability of the rock and water head instability (from 2.0 m to 10.0 m).

The water level in the well M1-01 has been monitored from 2005. Below, in the Diagram 6-21 is a graph of water level fluctuations in this well.

Diagram 6-19: Ground water level fluctuations at the area of the Mill boiler house



The depositions have not much water saturated areas and water does go deep either. Wells' flow rate was from 0.2 l/sec to 0.35 l/sec that corresponds to decreasing of water level from 6.5 to 15.0.

In 2011 three hydro-geological wells M1-01, M2-01 and M3-01 were used to run vertical system drainage at this area. The underflooding ground water was diverted and discharged from the area by these wells.

All of them operated to decrease the water level. The total ground water discharge was registered as 8.97 - 9.4 m^3/day in summer and 2.82- 2.88 m^3/day in winter, respectively. At the same time the dynamic levels in the wells were lower then 13 -14 m, i.e. ground water has been completely drained at this area.

6.8.3 HEAVY DUTY EQUIPMENT MAINTENANCE SHOP

The ground water was hit at the area of the New Top Shop during designing and construction period. Therefore, the base and foundation of the building were reinforced with piles.

Three hydro-geological wells, TS-1, TS-2, TS-3, with the depth of 20 - 25 m were drilled to investigate the hydro-geological and engineer-geological conditions of the ground. The wells were equipped with steel casing of 159 mm diameter and with filters in the most water abundant intervals. The wells are designed to install the submerged pumps and to drain out the possible underflooding ground water. The static levels are registered at the depth of 1.6 – 2.01 m.

In 2011 the ground water levels are decreased to the depth 13-14 m. The initial ground water level under the building foundation was at the depth of 1.6 – 2.1 m. The submerged pumps SP-14A-7 are used to pump out water. Both pumps are installed lower 16–17m.

The total ground water flow from the both wells was from 28.6 to - 33.2 m^3/day, and from 5.7 to 9.1 m^3/day in summer and winter, respectively. The well TS-1 located outside the building failed due to technical reasons.

Four hydrogeological wells (TSW001, TSW002, TSW003 и TSW004) were drilled at the construction area of a new washing station for Heavy Duty Machinery, to monitor the hydrogeological and engineer-geological status. The wells' depth was 17-25m, and the underground water was hit on 1.4-24.4m depth.

6.9 WATER QUALITY ASSURANCE / QUALITY CONTROL

Water quality control

It is essential to any environmental monitoring program that samples are collected, handled, analyzed, reported and interpreted in a consistent manner in order to minimize errors. Errors can occur due to inconsistent sampling procedures, improper preservation and poor laboratory techniques. The adherence to a Quality Assurance/Quality Control (QA/QC) program provides consistent collection and handling of data as well as proper analysis to ensure accurate results.

Alex Stewart Group (AS), located in Kara-Balta, is the contract laboratory for KOC and performs chemical analysis on all water samples from the Kumtor site. The onsite KOC laboratory is used however, for the daily analysis of the ETP discharge as results are required on a daily basis. The AS QA/QC program consists of conducting blind and duplicate sample analysis (approximately 10%) on samples obtained from Kumtor. Calibration of their equipment, review of their methodologies and acquisition of "state of the art" equipment continued in 2011.

In 2011 Saskatchewan Research Council and Lakefield Research Laboratories in Ontario, Canada, performed duplicate analysis for KOC. Lakefield Research specializes in cyanide chemistry and analysis.

In 2011 the laboratory of the Environment Department continued to perform test analysis for determination of AL, TSS, free chlorine and BOD_5.

Site QA/QC Program

Approximately 10% of the samples submitted by KOC for analysis was used for their QA/QC program. Examples of the program consisting of duplicate, blind and blank samples are described hereafter and illustrated in Table 6-6.

- Duplicate samples - Side by side samples are taken simultaneously with one sample being sent to AS (Kara-Balta) and the other sent to the SRC (Canada) and LR for general parameters and LR for cyanide. In 2011, 22 sets of duplicate samples per laboratory were submitted to SRC, AS and Lakefield. The results for sample stations T8.4 (ETP Discharge), W1.5.1 – control station and W1.8 (the nearest inhabited locality – KR CS) from the piezometers located at the tailings dam are provided for one sample campaign. The metal and major ion constituent results provide good correlation between the laboratories. While all the laboratories showed that the cyanide levels were below the regulated discharge limits, the results between the laboratories were slightly different. This has typically been a problem when the cyanide levels are low and close to the detection limits of the analytical method.
- Blind samples - Side by side samples were taken simultaneously with one sample labelled normally while the other is given a false name and both were sent to AS. For 2011, Table 6-6 illustrates consistency between all parameters using station in the results as in previous years.
- Blank samples - A sample of distilled water is collected at different times of the year, given a false name and submitted to AS. The results of two random sampling events are illustrated in Table 6-6.

As illustrated in Table 6-5, the consistency of results of the QA/QC program, gives KOC confidence that the results received from the contract laboratory are accurate even with such low levels of certain parameters and the constant shipping and preservation requirement.

Table 6-6: Quality assurance data

		Duplicate						Blind		Blank
		W1.5.1			W1.8			P5.2	P5.2A	Distill. water
		AS	SRC	LR	AS	SRC	LR	AS	AS	AS
Field data										
COND-F	ms/cm	0.386			0.221			0.138		0.076
pH-F	pH	8.01			8.02			7.7		7.9
Temp.	deg C	4.7			12.1			9.5		17.4
Major Constituents										
Ca	mg/l	51.7	49	54.7	40.3	38	71.1	17.7	17.3	
Cl	mg/l	12	5	5.6	4	3	2.6	3.7	3.7	
CO_3	mg/l	5	<1	<2	<1	<1	<2	<1	<1	<1
HCO_3	mg/l	76	80	60	115	117	136	30	30	3
K	mg/l	6.88	6	7.49	1.35	1.5	2.04	1.39	1.38	
Mg	mg/l	44.7	38	43.1	11.3	9.7	13.9	4.01	3.94	
Na	mg/l	33.2	28	33.3	4.92	4.6	5.25	2.17	2.13	
SO_4	mg/l	250	250	250	49	49	49	32	31	<1
T-HARD	mg/l	275	278	314	140	135	235	55	55	<1
T.ALK	mg/l	70.5	66	60	92.5	96	136	24.6	24.4	1.8
Metals										
Ag	mg/l	<0.003	<0.001	<0.0001	<0.003	<0.001	0.000			
Al	mg/l	0.74	0.5	0.822	3.51	5.2	2.51	0.035*	0.035*	<0.03
As	mg/l	<0.005	0.009	0.0012	<0.005	0.003	0.0022			
B	mg/l									
Ba	mg/l	0.023	0.029	0.0385	0.086	0.1	0.089	0.018	0.018	
Be	mg/l	<0.0002	<0.001	<0.001	<0.0002	<0.001	0.0001			
Cd	mg/l	<0.002	<0.001	<0.002	<0.002	<0.001	0.0001	<0.002	<0.002	
Co	mg/l	0.007	0.008	0.0077	<0.004	0.003	0.0024	<0.004	<0.004	
Cr	mg/l	<0.008	0.002	0.0016	<0.008	0.009	0.0045	<0.008	<0.008	
Cu	mg/l	<0.005	0.004	0.0045	0.005	0.007	0.0063			<0.005
F	mg/l		0.19			0.17		0.06	0.06	
Fe	mg/l	1	0.82	1.16	4.79	5.91	4.92	0.3**	0.3**	<0.003
Hg	mg/l	<0.0005	<0.0005	<0.0001	<0.0005	0.000	<0.0001	<0.0005	<0.005	
Mn	mg/l	0.366	0.45	0.485	0.146	0.16	0.162			
Mo	mg/l	0.019	0.018	0.0202	<0.004	0.001	0.0017			
Ni	mg/l	0.013	0.013	0.014	0.006	0.009	0.0065			<0.005
Pb	mg/l	<0.005	<0.002	0.0009	<0.005	0.005	0.0027	<0.005	<0.005	
Sb	mg/l	<0.02	0.0098	0.0086	<0.02	0.0006	0.0005			
Se	mg/l	<0.02	0.0018	0.002	<0.02	0.0009	<0.001			
V	mg/l	<0.005	<0.001	0.0012	0.006	0.01	0.005			
Zn	mg/l	<0.001	<0.005	0.004	0.051	0.027	0.057			<0.001
Nitro-group										
NH_3	mg/l	0.021	0.027	0.03	0.001	0.002	0.003			
NH_3-N	mg/l	1.42	1.8	2	<0.04	0.08	<0.1	<0.04	<0.04	0.005
NO_2-N	mg/l	0.036		0.42	0.003		<0.06	<0.001	0.004	<0.001
NO_3-N	mg/l	4	4.4	3.72	0.5	0.52	0.58	0.7	0.5	<0.1
$T.PO_4$	mg/l	0.08						<0.01	<0.01	
Suspended particles										
TDS	mg/l	464	459	533	200	172	197	81	75	<1
TSS	mg/l	30	16	3	196	157	190	<1	<1	<1
TURB-L	NTU	18	7.6	10.1	200	117	88	0.35	0.3	0.15
Trace constituents										
CN-T	mg/l	0.05	0.03	<0.01	0.007	<0.001	<0.01	<0.005	<0.005	
CN-F	mg/l	<0.005		<0.01	<0.005		<0.01			
CN-W	mg/l	0.017	<0.001	<0.01	0.005	<0.001	<0.01			

** - the Mine ecological laboratory conducted the analysis of Aluminum;*

*** - the Mine ecological laboratory conducted the analysis of Ferrum.*

SECTION 7

ENVIRONMENTAL STUDIES

7.1 Hydrobiological investigations of rivers and water bodies located at the area of Kumtor deposit

7.2 Investigations of environmental impact from Kumtor mine tailings dump

7.3 Kumtor Mine Closure Conceptual Plan (CCP)

7.1 HYDROBIOLOGICAL INVESTIGATIONS OF RIVERS AND WATER BODIES LOCATED AT THE AREA OF KUMTOR DEPOSIT

The hydrobiological investigations were carried out, as before, by the specialists of the KR NAS Biology and Soil Institute, L. A. Kustareva, C.B.S., leading researcher of the Laboratory of Ichthyology and Hydrobiology and M. V. Chernavskaya, postgraduate.

The investigations' target was the establishment of impact rate of abiotic factors on formation of planktonic and benthos communities in the water bodies of different types. The investigation objects were as follow:

1) sampling of hydrobionts from the River Kumtor and the other water bodies at the deposit area;
2) to get an image of water organisms status over a vegetative period (July-September).

In 2011, it was examined the River Kumtor, the Lake Djuukuchak with River Arabel-Suu flowing out the lake and the River Taragai (above a confluence with the River Kumtor), small water bodies like lakes, and the temporary puddles formed due to melted water and rains.

At each point, the bottom organisms were sampled with bentometer at the area of 0.28 m^2 and Jadine quantitative frame (a capture area was 1/4 m^2). It was captured 1 m^2 of bottom at each point. In 2011, the bentometer was changed on the other one with more catching efficiency which had a sieve #56. Zooplankton was sampled by a qualitative plankton sieve #77. Totally 68 samples of zooplankton and zoobenthos were sampled.

A cameral treatment of the sampled material was conducted in the Laboratory of Ichthyology and Hydrobiology. In each sample the organisms were classified on groups, were calculated for the further specific identification as per currently available standards' manuals. Further, a percentage ratio of separate groups and species for each point and water body was established.

In the River Kumtor the sampling was conducted at the monitoring points W1.1; W1.2; W1.3; W1.4; W1.5 and W1.6 at the area of confluence with the River Taragai. In the water courses and water bodies the stations were installed as per GPS data (table 1).

Table 7-1. Locations of zooplankton and zoobenthos sampling points

Name of water body		N	E	Zooplankton	Zoobenthos
River Arabel-Suu	p.1	41 879571	78 044081	–	+
	p.2	41 895341	78 046261	–	+
	p.3	41 891501	78 047831	–	+
	p.4	41 876	78 072	–	+
A lake on the right coast of the River Kumtor, below the p. W1.3		41 897481	73 165311	+	+
River Kumtor	p. W 1.2	41 581	78 081	–	+
	p. W 1.3	41 541	78 101	–	+
	p. W 1.4	41 531	78 101	–	+
	p. W 1.5.1			–	+
	p. W 1.6	41 771	77 971	–	+
River Tarahai	p.1	47 7731	77 9651	–	+
Lake Djuukuchak				+	+
Temporal water bodies				+	+

As before, a development of zoobenthos of the River Kumtor is insignificant (table 7-2).

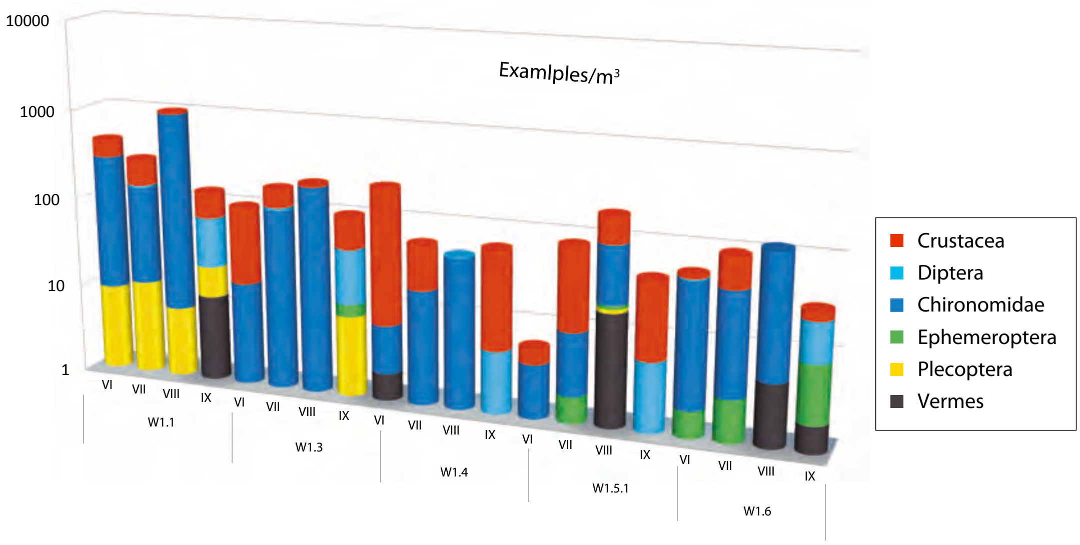
Table 7-2: Structure and quantitative zoobenthos development of the River Kumtor in August 2011 (example/m³)

Point	Month	Vermes	Plecoptera	Epheme-roptera	Chirono-midae	Diptera	Crustacea	Total
W 1.1	VI		9		271	1	160	441
	VII		11		124	8	137	280
	VIII		6		964		45	1015
	IX	9	11			51	67	138

Point	Month	Vermes	Plecoptera	Epheme-roptera	Chirono-midae	Diptera	Crustacea	Total
W 1.3	VI		1		13		87	101
	VII		1		101	8	67	177
	VIII		1		200		15	216
	IX		8	3		34	58	103
W 1.4	VI	2			5		225	232
	VII		1		18		41	60
	VIII		1		47	1		49
	IX					5	59	64
W 1.5.1	VI				4		2	6
	VII		1	1	8		74	84
	VIII	18	2	2	72	1	96	191
	IX			1		5	39	45
W 1.6	VI			2	47	2	5	56
	VII			3	40		53	96
	VIII	5			115			120
	IX	2		7		16	7	32

Diagram 7-1: Development of the River Kumtor zoobenthos

The structure and quantitative development of zoobenthos in the Kumtor river



Analyzing the table and the figure we see that the largest zoobenthos development is reached by Diptera from Chironomidae family, Orthocladiina subfamily, which is characterized for high areas of Mountain Rivers. The other met larva is larva Simullidae.

Larvae Erophila inhabited in noticeable quantity only a biotope of major immovable boulders and stones in the highest point. Practically full absence of larva Plecoptera and other groups of zoobenthos organisms located downstream the sampling points is related with their biotopes peculiarities, i.e. movable soil and large quantity of solids in the water.

The availability of large quantity of Calanoida and Cyclopoida in the bottom samples is related with their carrying out from the Lake Petrov by the River Kumtor and from the Lake Djuukuchak by the River Arabel-Suu (diversion ditch). The Crustacea carrying out by the rivers' flow present a "drift" element, which may contain the other invertebrates. Drifting of larvae of insects, Crustacea and other water invertebrates promotes their settling alongside the riverbed.

The availability of pupae Chironomids gives the flight evidence of their air phases which decreases the quantity of larvae in zoobenthos.

Investigation results

The water resources of the River Kumtor are formed in glacial-nival zone (Kovalev, 1996) on 3,500-4,000m above sea level. It is considered that the glacial-nival zone is unfit for the life (Shukurov, 1996). However, this zone can not be named lifeless, not many leaving organisms may just develop there due to extreme conditions of life.

In the rivers, at such altitude the main extreme factor is a major flow velocity and a large quantity of solids in the water (minerals suspensions).

The increased content of mineral particles (not more then 0.05 mm diameter) in the water negatively affects the river biocoenosis (Rusanov etc., 1981).

As some authors noted (Mamatkanov etc., 1996), water quality in the River Naryn is not practically changed under the anthropogenic development.

Two examples of fishes Diptychus sewerzovi (female and male) were captured at W4.1 (Arabel-Suu diversion ditch), upper a sedimentation pond, which witnesses to a favorable water quantity of the River Kumtor for their migration. In summer, the fishes rise on the river for spawning in the clean and warm tributaries flowing to the Kumtor.

7.2 INVESTIGATIONS OF ENVIRONMENTAL IMPACT FROM KUMTOR MINE TAILINGS DUMP

The goal of this investigation is the evaluation, assessment and analysis of the current state of environment and detection of mining impact (particularly from tailings) on soil, Flora and Fauna of adjoining area.

The investigations were conducted by the KR Academy of Science personnel. The team consisted of I. Rubsova, D.B.S, zoologist, A. Davletbakov, D.B.S, hydrobiologist, L. Kustareva, D.B.S, and zoologist, M. Chernavskaya, post-graduate.

In December 2011, they conducted the sampling of soil, water organisms, plants and the birds' organs.

The borders of examination include directly tailing dump (pond and tailing impoundment) and the areas related to the Tailings Management Facility (ETP, Industrial waste area, Lower Diversion Ditch (LDD)).

7.2.1 INVESTIGATION OF SOIL

Soil chemical compositions may be changed significantly; characteristics of substance polluting soil – natural or artificial – depend on type of soil and its geographical location.

Soils and precipitations may contain impurities that are part of air, water, humus and living organisms, soils adsorbed by colloidal particles, and minerals based on clay or humus.

The soils of Kumtor valley are typical alpine and arctic tundra. These soils were formed in the conditions of permafrost close bedding and severe climate, and as a result they have low-power and poor composition. The soils are characterized by calcareous soil and alkalinity.

It should be noted that permafrost is observed at small depth which is one of the soil formation factors. In a year, the freezing of soil layer reaches a considerable depth; thawing of the top horizons (0-20 and 20-40 cm.) is observed only for four months (May-September).

Soil Sampling was conducted to reveal the possible cyanide presence around the Kumtor Gold Mine in the environment during the operational stage of mining.

Soil sampling to detect cyanide was conducted during winter time (on December, 11-12th 2011) on following points:

1 – Tailing Dam;
2 – Treatment facilities;
3 – Explosive Magazine;
4 – Upper Fuel Farm;
5 – Industrial Dump;
6 – Pipeline;
7 – ЗИФ (фабрика);
8 – ГСМ (нижн.);
9 – административное здание (поселок геологов);
10 – карьер (восточная часть);
10.1 – карьер (западная часть);
11 – фоновая точка за территорией месторождения.

The soils were sampled by a shovel at all depth of the studied horizon (0-20 cm layer), in this case a mixed sample is received.

At 0-20 cm depth a root system is placed and nutrients (humus, nitrogen, phosphorus, potassium) and heavy metals are concentrated. The collected soils samples were sent for analyses to the independent laboratory Alex Stewart Group.

As per European Directives, the recommended cyanide concentration in the ground is varied from 1 mg/kg to 25-100 mg/kg depending on the purpose of lands usage.

It is determined that the main factors defining a migration and destruction of cyanides are acidity, alkalinity and oxidation-reduction characteristics of environment. The examined soils are differentiated by carbonate composition and alkalinity. The used NaCN-while getting to the soil enter into reaction with $CaCO_3$ and Na_2CO_x (soda) is generated.

$$NaCN + CaCO_3 = Na_2CO_3 + CN$$

Free cyanide (CN^-) is destroyed both in aerobic and anaerobic conditions.

It should be noted that the issue on cyanide behavior in the natural soils has been poorly studied.

It should be considered while evaluating a potential carrying over of cyanhydric acid that its stability does not increase 10 minutes (the data is provided by the KR Chui Ecological Laboratory). It should be considered while evaluating a potential carrying over by air of cyanhydric acid from the tailings area that its MAC in the atmospheric air of settlements is 0.2 mg/m^3, and for the air of operation zone is 0.3 mg/m^3; (the MAC data is for KR). Cyanide concentration at the monitoring station A1.3 (air monitoring) situated in the North-East zone of tailings is 0.008 – 0.045 mg/ m$^{3.}$ This is the data for 2007-2010.

The soils sampling were analyzed only for cyanide content (CNwad и CNtot) because the investigation goal was to determine the impact of tailings.

The received results are provided in the table 7-4.

Table 7-3: Cyanide concentration in the soils

Points ##	Objects description	Depth, cm	CN_{tot}, mg/kg	CN_{wad}, mg/kg
1	Tailings, near dam bottom	0-20	0,573	0,236
2	Effluent Treatment Plant (ETP)	0-20	0,190	0,110
3	Explosive Magazine	0-20	0,524	0,254
4	Upper Fuel Farm	0-20	0,524	0,202
5	Industrial Wastes Dump	0-20	0,072	0,068
6	East Pipeline	0-20	0,560	0,230
7	Mill	0-20	0,172	0,088
8	Lower Fuel Farm	0-20	0,404	0,122
9	Administrative building (geologist compound)	0-20	0,228	0,136
10	Pit	0-20	0,388	0,178
10.1	Pit	0-20	1,122	0,304
11	Background point 7 km lower the Kumtor River flow (end of mixing zone W1.5.1)	0-20	0,230	0,130

As it is seen from the table, the received results demonstrate that at the tailings dump area and generally at the mine the cyanide content in the soil is lower than that determined by the European legislation.

7.2.2 ZOOPLANKTON OF WATER BODIES

Zooplankton was sampled by plankton net made from grinding sieve #48 and having diameter of 30 cm. Zooplankton is sampled from the following water bodies at the area adjoining the tailing dump:

1. Lake #1, near tailing dump (its depth is 1.5 m, ice depth is 40 cm);
2. Lake #2, near a crossroads of tailing dam and industrial waste dump (its depth is 1 m, ice depth is 50 cm);

3. Pond #3 with treated effluents (depth is 3m, ice depth is 60 cm);
4. Lake #4 on the way to the explosive magazine, North zone (depth 3.5 m, ice depth is 70 cm).

The sampling is carried out in the ice holes by drawing the plankton net through the bottom to the surface. The table 7-5 presents that the plankton organisms are available at all water basins.

Table 7-4: Quantitative structure of zooplankton species in the water basins of the mine

Zooplankton organisms	Lake #1	Lake #2	Pond #3	Lake #4
Gammarus sp.	2	4	-	2
Hemidiaptomus ignatovi	28	73	-	23
Diaptomus glacialis	93	11	13	38
Harpacticidae	1	-	-	-
Daphnia pulex	4	27	-	-
Hygrotus impessopuntatus	-	1	-	-
Total examples/samples	**128**	**116**	**13**	**53**

As it is seen from the tables 7-5 winter zooplankton is poor both by numbers and quality. It is presented by taxons standard for such types of water bodies.

Table 7-5. Cyanide concentration in the examined water bodies

Water body	Lake #1	Lake #2	Pond #3	Lake #4
CN total	<0.005	<0.005	<0.005	<0.005
CN wad	<0.005	<0.005	<0.005	<0.005

Table 7-5 illustrates the absence of cyanide in the stagnant water bodies adjoining the tailings.

7.2.3 EXAMINATION OF BIRDS

The method of observing the birds is the most simple and effective method of monitoring to perform control over the changes in the Environment. This is because they react among first to the ongoing ecological changes – poisoning of the environment, climate changes, changes of flora composition, reduction of food etc. It is possible to evaluate parameters of the environment factors and forecast changes in the environment using indicative types.

54 kinds of birds live in Kumtor deposit and surrounding territories and the following of them are nonmigratory: long-legged buzzard (*Buteo rufinus*), golden eagle (*Aquila chrysaetos*), bearded vulture (*Gypaetus barbatus*), black vulture (*Aegypius monachus*), Himalayan griffon (*Gyps himalayensis*), common sandpiper (*Actitis hypoleucos*), blue hill pigeon (*Columba rupestris*), long-eared owl (*Asio otus*), little owl (*Ahtene noctua*), horned lark (*Eremophila alpestris*), common myna (*Acridotheres tristis*), white-rumped magpie (*Pica pica*), red-billed chough (*Pyrrhocorax pyrrhocorax*), Alpine chough (*Pyrrhocorax graculus*), corbie crow or raven (*Corvus corax*), black-bellied dipper (*Cinclus cinclus*), Asiatic dipper (*Cinclus pallasii*), brown accentor(*Prunella fulvescens*), missel (*Turdus viscivorus*), Brandt's rosy finch (*Leucosticte brandti*), snow finch (*Montifringilla nivalis*).

Those kinds of birds that are met at nesting period: roody shelduck (*Tadorna ferruginea*), sparrow hawk (*Accipiter nisus*), common kestrel (*Falco tinnunculus*), little ringed plover (*Charadrius dubius*), martinet (*Delichon urbica*), tree pipit (*Anthus trivialis*), rock pipit (*Anthus spinoletta*), gray wagtail (*Motacilla cinerea*), wagtail (*Motacilla personata*), wheatear (*Oenanthe oenanthe*), chat (*Oenanthe pleschanka*), common redstart (*Phoenicurus phoenicurus*), Giildenstadt's redstart (*Phoenicurus erythrogaster*).

Those kinds of birds that are met in migration period: Gray heron (*Ardea cinerea*), wild duck (*Anas platyrhynchos*), common teal (*Anas crecca*), gadwall (*Anas strepera*), pintail (*Anas acuta*) garganey (*Anas querquedula*), shoveler (*Anas clypeata*), red-crested pochard (*Netta rufina*), diving duck (*Aythya ferina*), tufted duck (*Aythya fuligula*), black kite (*Milvus migrans*), harrier (*Circus cyaneus*), Montagu's harrier (*Circus pygargus*), common buzzard (*Buteo buteo*), saker falcon (*Falco cherrug*), green sandpiper (*Tringa ochropus*), white wagtail (*Motacilla alba*), rosy pastor (*Sturnus roseus*), brown willow warbler (*Phylloscopus collybita*), greenish warbler (*Phylloscopus trochiloides*).

For the purpose of influence definition of industrial waste, particularly tailing damp to the fauna, following actions have been carried out at the KOC deposit area:

- Getting birds by shooting;
- Definition of a kind belonging;
- Dissecting, i.e. extraction of bodies (a stomach and a liver).

Seven species of raven (*C. corax*) have been found around the industrial dump (three species), in open pit area (one species), in tailings area (one species) and in adjoining to mining territory around W1.5.1. (one species). The Red-billed Chough (*P. pyrrhocorax*) two species in tailings area have been extracted. An Alpine Chough (*P. graculus*) it is extracted 1 species around the industrial dump. Black-headed Mountain Finch (*L. brandti*) it is extracted 1 species around the industrial dump.

The birds are of the settled species and inhabit in high mountains all-the-year-round.

At the process of testing of bodies, any pathological changes were not observed.

Daily data on registration of wildlife at the Mine (the information was provided by Kumtor Operating Company) have confirmed that there are no animal and bird fatality at Kumtor mine site area and surrounding territories.

The personnel of Academy of Science noticed that they haven't observed any bird fatality caused by Cyanide poisoning in tailing area or other territories of the deposit. Above mentioned data are also confirmed by researches conducted during previous periods.

The following stage of researches in spring-summer period of 2012 supposes the analysis of animals' bodies and an extension of species content including a chemical analysis. It is necessary to conduct researches in all seasons of year, especially during the migratory period of waterfowls.

7.2.4 HISTORY OF RESEARCH OF FLORA AND VEGETATIVE SURFACE COVER OF KUMTOR GOLD MINE

The flora and vegetation surface cover of Kumtor Gold mine haven't been described in the literature. During the ecological research of the area conducted before the mining works started, we had made a list of approximately 200 species that might be included all the specific structure of vascular plants in the area. The list hasn't been published. There is a species in the list that registered in the «Red book of the Kyrgyz Republic» - S involucrata (Kar. et Kir.) Sch. - Bip. – "Sossjureja obernutaya". There is also one endemic species - Taraxacum syrtorum Dzan that has been described from hollows of Chatyr Kul lake, further it's turned out more widespread, but, nevertheless, is endemic (anywhere else met) of Kyrgyzstan. Probably, it was conditionally endemic and further would be found in adjacent areas of other Central Asian republics and China. The area was repeatedly visited by floral scientists of today's Biology-Soil institute of Science Academy of the Kyrgyz Republic. However the majority of the collected materials are remained not completely researched.

Data on vegetation of Kumtor Gold mine vicinities can be found in A. G. Golovkovaya's works (1951).

Along with coauthors Golovkova has made a map of vegetation of Kyrgyzstan, including Kumtor Gold mine vicinities (Golovkova and others, 1987).

From December 9 till December 15, 2011, the expedition conducted the research of the current state of vegetative surface cover.

Major researches included areas related to Kumtor deposit and its adjoining territories.

The purpose of work was to reveal morphological deviations in a structure of plants that are probably the consequence of an adverse effect of the substances used in technological process.

Studying technique

A visual examination of some plants, mainly the dominants of vegetative communities and the plants in general was conducted at the defined areas close to the operational facilities.

On certain platforms near the following industrial objects:

- Tailings area,

- Effluent Treatment Plant
- Explosive magazine
- Industrial dump
- Pulpline
- Open pit
- Fuel farm
- Camp of geologists
- Adjoining territories.

They used similar to each other sites by its specific structure as control sites situated at the considerable distance (Point W1.5.1.) from Kumtor mine.

Subject of revealing:

- Chlorosis plants and other changes of color of plants
- Morphological changes (mutations), including:
- Brachysm of plants,
- Gigantism of plants,
- Presence of monstrosity,
- Presence of fasciation, as a plant in whole, as well as its separate bodies.
- Presence of the increased quantity of separate bodies, in particular in a flower (quantity of petals, dou-bleness), mutual transformation of the bodies into others that often serve as result of influence of sepa-rate chemical substances.

For revealing of differences in productivity of vegetative communities on the sites adjoining to Kumtor Gold mine sites and control sites, hay crops of elevated weight on 1 sq. m in 5 multiple frequency and recalculation of crude weight on hectare have been made.

The description of plants and vegetative communities at the chosen areas.

Photo 7-1. Tailings dump area

Photo 7-2. Upper Fuel Farm

Photo 7-3. Explosive magazine

Photo 7-4. Mill area

Photo 7-5. Well

Photo 7-6. Control point W1.5.1

The observations have shown that the color of communities and separate plants were usual, chlorios and other changes of color of plants were not observed.

Morphological changes (mutation) of plants including Brachysm, Gigantism, presence of Monsterism and fascination both plant and separate bodies, presence of increased quantity of separate bodies, in particular in a flower (quantity of petals, doubleness), mutual transformation of the bodies into others were not observed.

Essential deviations in morphology of separate plants, in comparison with control sites were not observed.

7-3 KUMTOR MINE CLOSURE CONCEPTUAL PLAN (CCP)

The Companies agree that the closure/decommissioning process at Kumtor will be a phased approach that allows for the development of an initial Reclamation Plan followed by the development of a Conceptual Closure Plan (CCP); a testing and monitoring period of several years to evaluate the most promising options advanced in the CCP; and finally the development of a Final Closure Plan (FCP) nearer the end of mine life that considers the results of the testing and monitoring as well as any changes to the environmental, regulatory and social environment that may have occurred over the life of the mine. Therefore, closure planning at Kumtor is an active and continuous process that is constantly evolving.

On the ground of KGC Restated Investment Agreement (2009) and according to the conscientious practice established in the gold mining industry the mine CCP will be revised every three years taking into account the EMAP.

KOC developed a reclamation plan to ensure that major components of the plan are technically, economically and socially feasible.

The underlying objectives of the closure plan are consistent with KOC's Environmental Management Action Plan and can be summarized as follows:

- Meet all regulatory requirements established for the Kumtor Gold Project;
- Minimize residual environmental impacts to aquatic and terrestrial resources;
- Ensure mine site features are geotechnically stable;
- Ensure the protection of public health and safety following closure of operations;
- Return the land to suitable post-mining end-land use.

Initial closure/decommissioning and rehabilitation criteria were set forth in the KOCFS and they have been used to establish a cost estimate by Kilborn/ENKA-Project S620 Revision 1 dated November 1994 (the "Reclamation Plan"), copies of which have previously been provided to each Agency Lender.

In 1999, KOC contracted Conor Pacific to update the closure strategies and cost estimates presented in the initial plan and developed the CCP titled Kumtor Gold Project Decommissioning Plan.

In 2004, a revised Conceptual Closure Plan (CCP) was developed by Lorax Environmental. The document was further reviewed by Centerra Gold Ltd. in 2004 and then translated and submitted to the Kyrgyz Authorities in 2005 for their information. The Lorax plan is more detailed and contemplates a different approach from the 1999 plan.

With the Mine Expansion during 2006 and 2007, as well as the extended Life of Mine plan until 2014, a new CCP commenced in the latter part of 2007. For this iteration of the CCP, Golder Associates from Montreal was chosen to develop the new plan. The plan will include an update to the assumptions shown in the 2004 Lorax Plan and a new salvage value will be provided for this new CCP to account for the new mine equipment and site infrastructure expansion. The new CCP from Golder Associates was completed and approved by the KGC Board of Directors and Centerra Gold Ltd. during the first six months of 2008.

The CCP 2007-2008 is more comprehensive than the original Reclamation Plan that was included in the Feasibility Study and approved by the Kyrgyz Republic. The CCP was developed after Kumtor operations commenced and is more comprehensive because it benefited from the monitoring and operational data that have been collected since commencement.

According to the commitments on revision of closure plan every three years and due to prolongation of operational term of the mine up to 2021 KOC negotiated in 2010 the agreement with Lorax Environmental consulting company with regard to revision and additions to 2007 CCP.

The revision works were terminated to the August 2011. CCP 2011 is the fourth stage of planning measures for Kumtor mine CCP.

This CCP was based on the available current information received as a result of the last investigations and monitoring data. The CCP observed the aspects of reclamation works, calculation of reclamation costs and closure. 2011 CCP does not consider the aspects of underground closure.

The closure plan proposed herein envisages a more diverse post-mining land use that utilizes the access and infrastructure that will remain at closure to support monitoring and maintenance at the facility as well as general environmental, meteorological, wildlife and glacier research and monitoring.

Particular emphasis is on maintaining positive impacts post closure to the Sarychat-Ertash Zapovednik (National Park) located in close proximity to the project area.

The waste rock dumps at the Kumtor Gold Project occupy portions of three drainages including the Lysyi, Chong Sary Tor and Kichi Sary Tor; these drainages discharge to the Kumtor River. Numerous acid rock drainage (ARD) characterization studies, including static and kinetic testing, have been performed on waste rock material generated at Kumtor. These studies have demonstrated that an overwhelming majority of the waste rock deposited at site has no ARD potential. Moreover, the excess of neutralizing waste rock suggests that limited and localized areas of acid generation will be neutralized within the dump.

Minimal closure activities are required for the waste dumps at Kumtor and dump regarding and contouring will be conducted throughout the life of mine operations. No additional reclamation of the dump areas is planned and climatic conditions do not support revegetation of the dump surfaces. Monitoring of the geotechnical stability of the waste dumps and glacier movement will however occur for a six-year post closure period.

Closure plans for the open pits (Central, Southwest and Sary Tor) are based on maintaining public safety and additional wall monitoring primarily for the Central pit. At the cessation of operations, the Central and Sary Tor pits will begin to fill with groundwater, precipitation and runoff water from upgradient glacial meltwaters.

The pits are expected to fill and eventually overflow and flow control structures will be constructed to channel and direct the overflow from the Kumtor and Southwest pit to the environment (Chong Sary Tor and Kichi Sary Tor respectively).

Closure planning for the tailings management facility (TMF) has received considerable attention and has focussed on water management and ensuring there is no risk of ARD from the TMF at closure.

The ARD characterization studies have concluded that there is little to no risk of potential ARD occurring in the TMF. Static and kinetic testing results have confirmed that the tailings at Kumtor contain an excess of neutralization potential that is sufficient to prevent the onset of ARD. Tailings porewater investigations completed in 2010 also provided conclusive evidence that ARD is not occurring within the impoundment interior.

A closure cost estimate has been developed for the conceptual closure plan.

The costs consider all charges of each component including open pit, waste dumps, tailings management facility (including water management systems) and dismantling of the mine infrastructure, short-term and long-term maintenance, inspection and monitoring of environment protection compliance.

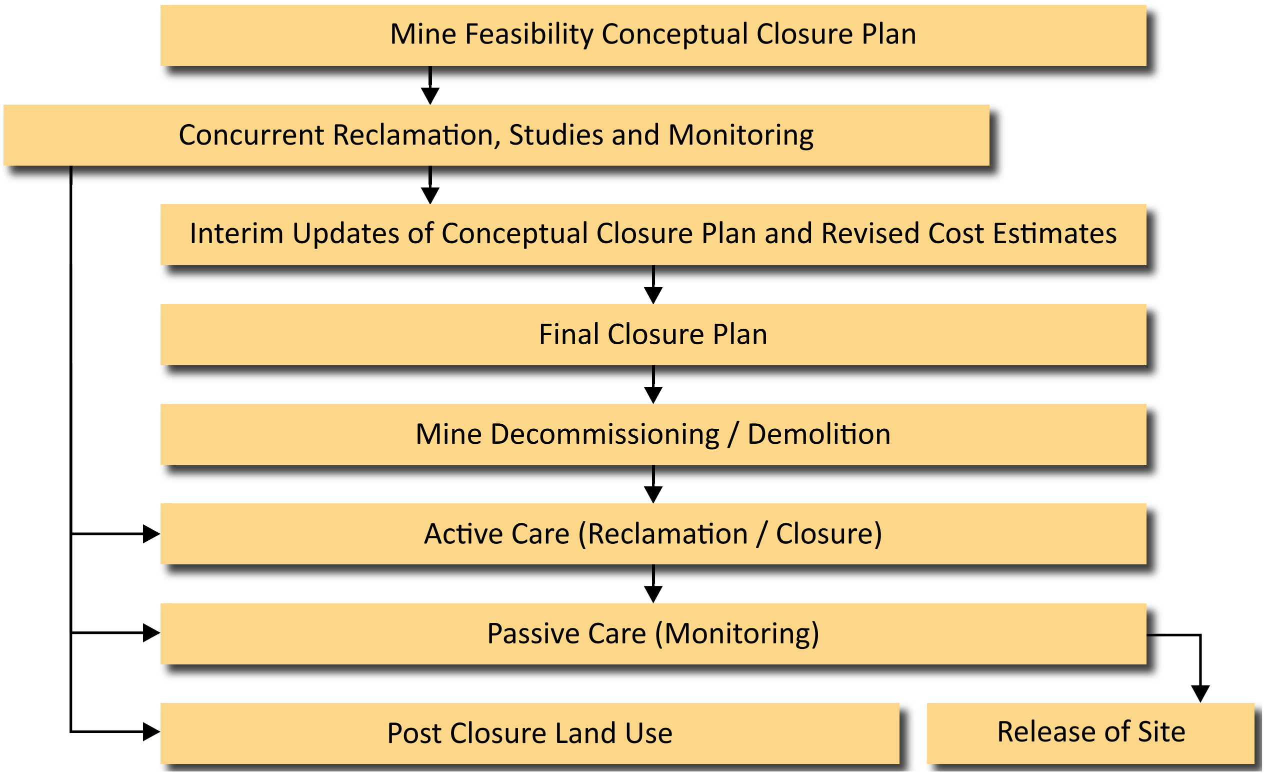
Total closure costs for the project are approximately $US 29 million. The majority of this cost is associated with closure of the TMF at approximately $US 20 million.

CCP has been translated on Russian and in December 2011 was provided to the KR Ministry of Natural Resources.

The CCP and subsequent updates will form the foundation of a FCP, which will be finalized within two years of cessation of operations. Development of the FCP will be an evolving process; continually evaluating the concepts realized in the CCP and integrating the results of ongoing monitoring and test work programs identifying key closure concepts.

The companies agree to complete the FCP within two years of the end of the mine life when all monitoring and test work has been completed, evaluated and integrated into the regulatory, environmental and economic conditions at closure.

Chart 7-1: Kumtor mine closure sequence



The FCP establishes a plan of action to be undertaken in the event that the mine were to be shut down after mining of the reserves available by open pit methods (Phase I under the KOCFS). However, the Section 3.2 of the Restated Investment Agreement (2009) provides for the potential underground mining of further reserves which would occur at the end of the open pit mine life. If the intention of the government of the Kyrgyz Republic is carried out and underground mine development occurs pursuant to the Master Agreement, then the life of the Kumtor mine will be extended and the reclamation plan would be put into effect after the underground reserves are exhausted.

The investigation results and CCP revisions will be updated in the Annual Environmental Report including the status of revegetation research, a review of the overall plan, and a discussion of any additional measures, which should be performed.

KGC has established a funded reclamation reserve ("Reserve") on the following terms:

Reclamation Costs

The net cost of closure/decommissioning and reclamation (total costs less salvage value) (Total Reclamation Cost) shall be re-estimated by the Companies each time there is a major change to the closure/decommissioning plan and such estimates shall be set forth in the Annual Environmental Report.

Reserve

The Reserve shall be constituted pursuant to a Security Trust Deed.

Reclamation Trust Fund

The Reserve is constituted pursuant to a Security Trust Deed of January 25, 1996 between KGC, Rothschild Trust Corporation Limited and Trust Fund Investor located in London (England). Currently, an issue of place Trust Fund in a finance-credit establishment located in Kyrgyzstan is discussed.

Funding

The amount to be deposited in the Reserve in any calendar year (the "Yearly Amount") shall be equal to the amount of the Total Reclamation Cost required to be amortized in such year calculated in accordance with Canadian Generally Accepted Accounting Principles. (Canadian GAAP currently requires amortization of such costs over the life of the mine, pro rata according to gold sales.)

The Yearly Amount to be funded in any calendar year shall be deposited to the Reserve promptly following the completion of the audit of the financial statements of KGC for such year, and in any case not later than 90 days following the end of each such year.

$1,705,915M USD was transferred to the fund balance in 2011.

The Trust Fund balance is $9,80,974 M USD

Investments

The required amount shall be deposited to the Reserve, and may be maintained, in cash (U.S. dollars), gold, Temporary Cash Investments, or letters of credit, performance bonds or other financial instruments providing assured future payment (in each case issued by institutions other obligations of which would constitute Temporary Cash Investments).

Post Closure Monitoring

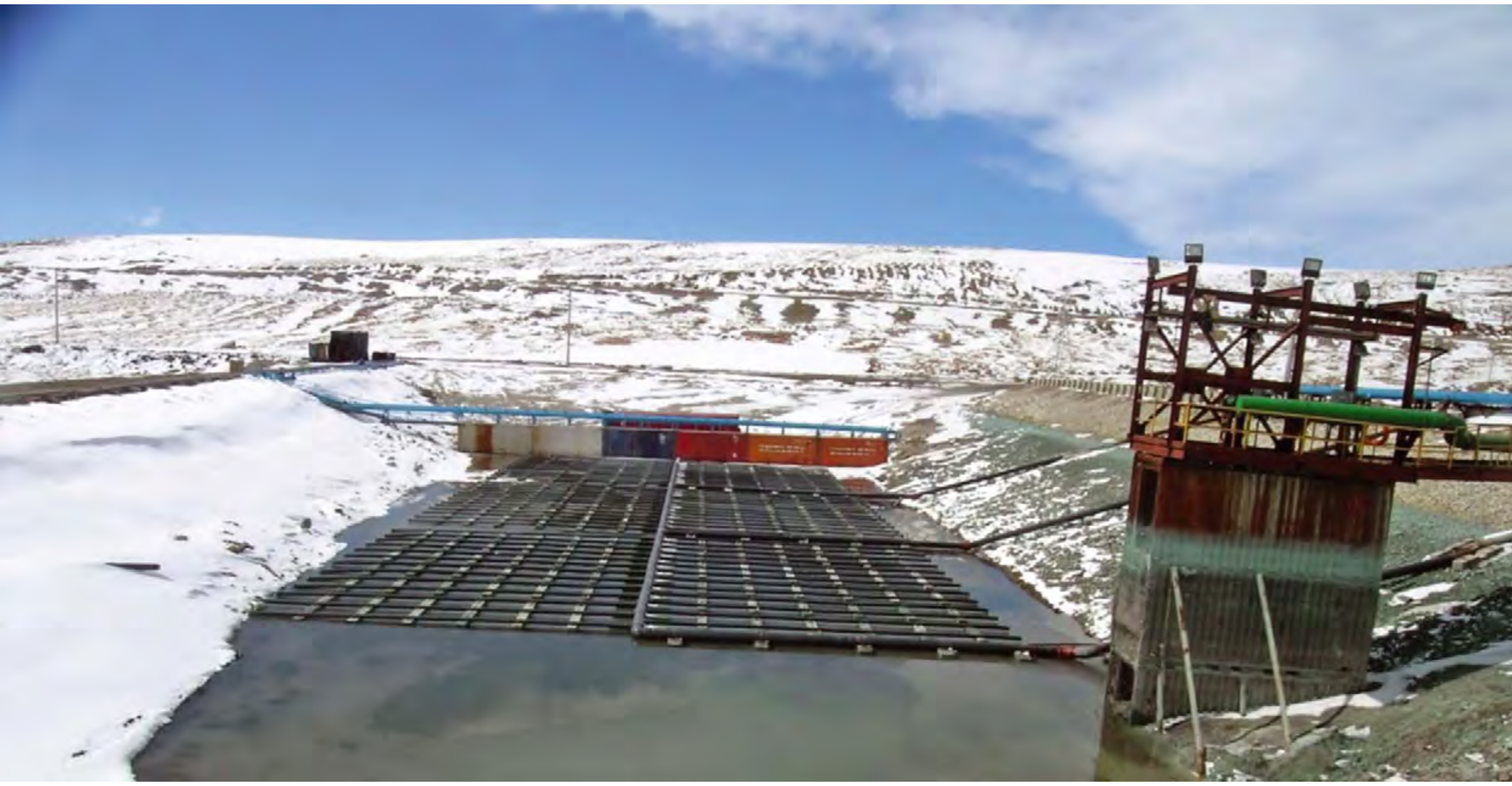
KGC shall ensure that immediately prior to any site abandonment, the site is in a stable condition with the water quality at the compliance point (end of mixing zone, Station 1.5.1) at a minimum meeting the surface water standards in Section 2.15. The site will be monitored for a minimum of three years following closure or the waters will be collected and treated until such time as these conditions can be met naturally (without treatment), and the Kyrgyz Republic approves of the abandonment.

While it is too early to devise a sampling program for the post-closure monitoring period, it is likely to include sampling at stations W1.3, W1.4, W1.5.1, W2.2, W3.1, W3.2 and W4.3.1 as described in the attached monitoring program (Attachments B and C).

If the treatment facility at the tailings pond is being utilized and effluent is being discharged, it will also likely include stations T8.1, and T8.4.

Floral and faunal investigations will be carried out in the event of a post-closure upset of some sort.

SECTION 8



TAILING DUMP, WATER BALANCE, TREATMENT FACILITIES

8.1 Tailings Dam Construction and Filling

8.2 Tailings Pond Dam Monitoring

8.3 Diversion Ditches

8.4 Water Treatment Systems

8.5 Petrov Lake Water Balance

8.1 EARTH WORKS AT TAILINGS DAM

At the end of 2011 there was 3.31 M m3 of water at the Tailings Pond and 53.79 M m3 of solid phase tailings were at the tailings impoundment; the total volume of tailings in the Tailings Basin was 57.10 M m3.

The dam crest is on elevation of 3664.0 m, and thus, its height is above the original ground surface of 34.0 m at the centerline.

At the end of 2011 the water level in the tailings pond was at an elevation of 3 657.84 m which was 4.66 meters lower than the allowable limit of 3662.5 meters.

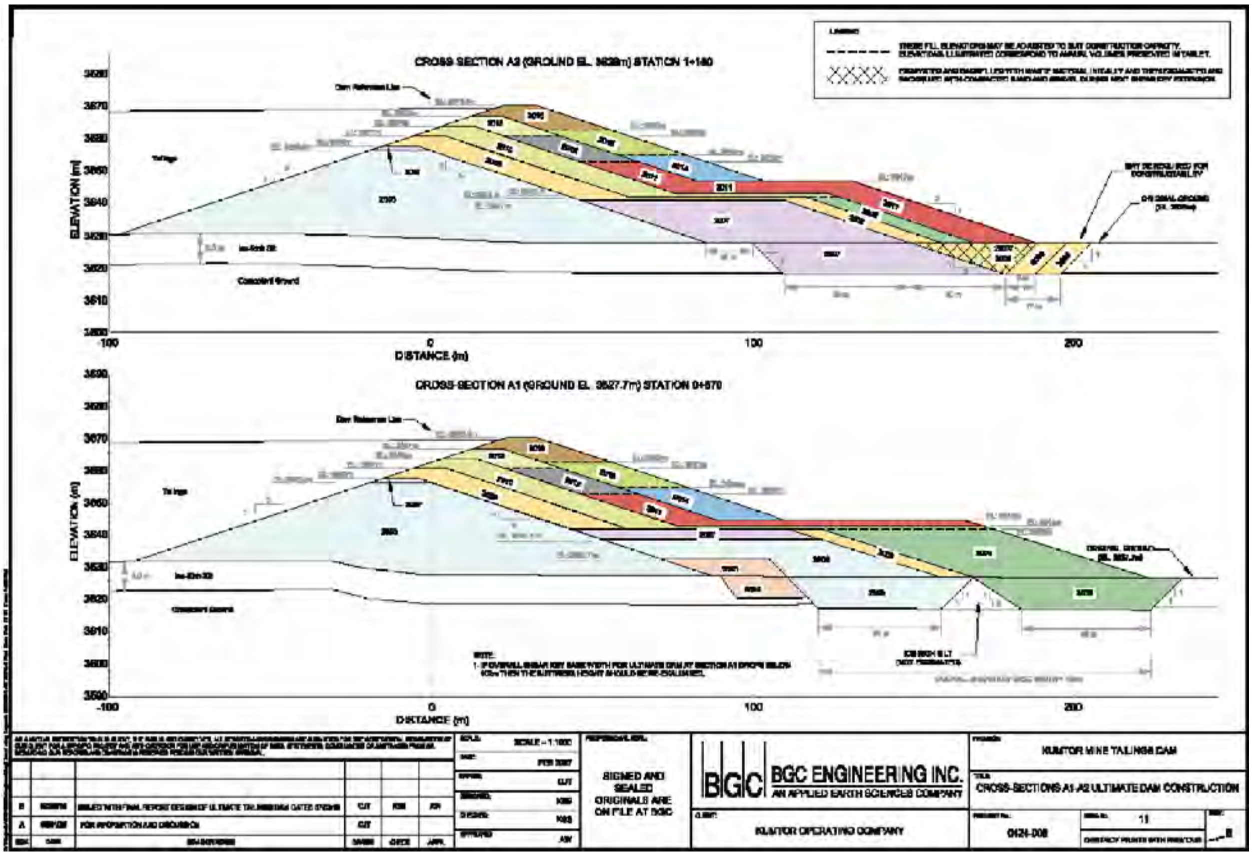
Figure 8-1 illustrates the dam height increase as a result of earth works in 2011 and provides the planned future raise of the dam due to continued filling by mill tailings, as the Mine Development Plan was increased and modified.

Construction works at tailing dam are going to include, as well, extension of shear key with a buttress and removal of frozen icy layer by the dam foundation. A soil creep by the dam foundation caused by icy clay layer was detected in April 1999 during the complex monitoring conducted with the help of relevant equipment.

Shear key and buttress designed by BGC Engineering and the Institute of Physics and Rock Mechanics of KR Academy of Science will provide the accepted safety coefficient of the dam and any issues due to the dam will not arise in a post closure period.

All planned works for 2011 including tailings dam building up, shear key and buttress construction were executed at the period from May 1 till October 11.

Figure 8-1: Tailings Dam Build up Design



8.2 TAILINGS DAM MONITORING

At the end of 2011, there were 43 inclinometers, 28 settling plates, 32 piezometers and 42 thermistors to conduct the regular monitoring of the Tailings Dam. In addition, four seepage monitoring points continued to be monitored on the downstream side of the dam base. It was indicated the movement caused by precipitations but continuous seepage was not observed.

Inclinometers. Inclinometers measure a horizontal displacement at various points of the dam body and under its base down to 15 m from the original ground. The following data were collected to the end of December:

Inclinometers located to the west of the 2006 buttress (alignments 0-0, A-A and B-B) registered the following displacement rates:

- on the dam crest – 0.06-0.08 mm/day;
- on the shear key – 0.0-0.01 mm/day;

Inclinometers located in the 2006 shear key (alignments 1-1, 2-2, 3-3, and 4-4) registered the following displacement rates:

- on the dam crest – 0.05-0.07 mm/day;
- on the shear key – 0.0-0.01 mm/day;
- at the buttress toe – 0.0 mm/day.

Inclinometers located to the east from the 2006 buttress (lines 5-5, 6-6, 7-7, 8-8, 9-9, 10-10, C-C and D-D) showed the following displacement rates:

- on the dam crest – 0.0-0.02 mm/day;
- over the shear key below the dam crest – 0.03 mm/day;
- on the shear key – 0.0-0.01 mm/day;
- at the buttress toe – 0.0 mm/day.

The data analysis (lowering of creep rates along the downstream) shows that the shear key operates as original «door limit» which stops the creep of the upper part of the dam sliding down over the permafrost which is saturated by ice and instable silty and clayey permafrost grounds which were not excavated during the previous construction works before 2006.

The shear key and buttress system as a "spring" must undergo a certain deformation before it can bear a load. The project planned measures will lead to the gradual decrease of displacement rates during the construction and operations. The monitoring data of the dam displacement confirm the aforesaid. Before the beginning of works on strengthening of tailings dam (from April 1999 up to the end of 2006) the dam horizontal displacement was about 280 mm or 36 mm in a year. From the end of 2006 (after the first construction phase of shear key and buttress) up to December 2011, the maximal horizontal displacement of the dam was about 118 mm or about 24 mm in a year, i.e. the displacement rate has decreased to 1.5 times. At such rate (decrease of displacement rate of 12 mm for 4.5 years) it can be supposed that it will be reduced up to 3 mm in a year or lower up to the year 2025.

Settling Plates. Settling plates identify the dam body base settlement. The Settling plate's data show that practically, there is no dam base settlement. During the survey the data is changing at the error limits.

Piezometers. The monitoring of water level and filtration in the dam was conducted by the use of 28 piezometers. The level of water/ice in piezometers is actually at the level of original surface or lower. The annual seasonal fluctuation of ground water level is about 1m as per piezometers.

Thermistors. For determination of the dam body temperature 42 vertical and inclined thermistors are used. The survey data of thermistors at the end of the year showed that those situated deeply in the dam body and at the base had the temperature about zero or in the limits of –1.8 to +0,9°C.

Seepage. Seepage from the tailings dam was identified in the initial design of the Kumtor Tailings Dam. This has occurred in one location of the dam where the old Arabel River previously ran through the TMF valley before the commencement of the Kumtor project. Seepage commenced in 1998 and had a tailings water component although cyanide levels were low and likely reduced through the groundwater flow path. Seepage monitoring stations DSW-1 and DSW-2, consisting of flow weirs were established along the old channel and along the Kumtor main road parallel to the dam. In 2002 KOC followed Golder Associates recommendation and established a standby seepage collection and return system in the unlikely event that the water quality would change.

The cumulative flow rates at DSW1 and DSW2 (the toe of the dam) have been consistently decreased from 2001 to 2006 as follows and there was no seepage since 2007:

- 2001 to 2002: decrease of approximately 12%;
- 2002 to 2003: decrease of approximately 45%; and

- 2003 to 2004: decrease of approximately 70%;
- 2004 to 2005: decrease of 47%
- 2005 to 2006: decrease of 86%
- 2006 - 2007 : absence of seepage
- 2007 - 2008 : absence of seepage
- 2008 -2009 : absence of seepage
- 2009-2010 : absence of seepage
- 2010-2011 : absence of seepage

The absence of seepage at the toe of the dam is explained by the reason that starting from 2000 KOC is carrying out shear key and buttress construction with the removal of the ice logged layers at the base of the dam by in-washing the fine-grained tailings fractions upstream of the dam, and also as a consequence of decreasing hydraulic gradient at the dam by distancing the pond shoreline from the dam.

Some water is accumulated at the runoff ditches and is collected near the auxiliary pump station at the toe of the dam in spring/summer time. This is caused by permafrost overlay defrosting and atmosphere precipitations (the most part of which fall at this period).

Table 8-1: Monitoring data at the station DS4

		May 11	May 20	June 3	June 10	July 8	July 28	Aug 5	Sep 18	Oct 12	Oct 19
Parameters											
pH		7.9	8.6	8.0	8.3	7.4	7.97	7.7	7.65	7.8	8.2
Metals											
Cu	mg/l	<0.005	<0.005	<0.005	0.007	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Fe	mg/l	0.36	0.46	0.28	0.27	0.206	0.22	0.33	0.166	0.17	0.33
Nutrients											
NH3-N	mg/l	<0.1	<0.1	<0.1	<0.1	0.06	0.08	0.08	<0.04	0.06	0.12
TSS	mg/l	14	17	2	8	3	2	2	6	1	15
Trace Constituents											
CN-T	mg/l	0.008	<0.005	0.011	0.012	0.022	<0.005	0.006	0.006	0.002	0.009

It can be seen from the data in the above table the concentration of Cu, Fe и CN, Zn, NH3-N is in general equal or below the limit of detection. TSS data are at very low rates.

8.3 DIVERSION DITCHES

The Upper Diversion Ditch (UDD) and the Lower Diversion Ditch (LDD) were in a satisfactory state throughout the year.

The monitoring is conducted with the help of piezometers situated along the UDD. The ice was in the piezometers PZ-UD#2 and PZ-UD#3, the water was in the other ones.

The monitoring is also conducted with the help of piezometers situated along the LDD. All piezometers (except PZ -LD#4) were frozen. A pipe culvert bridge located on the cross of LDD and a road to the UDD has been filling by ice every year in winter. At the beginning of melting period in spring the pipe has to be cleaned to avoid the overflow from the ditch. In February-March 2011, a new square culvert bridge of inside size of 2m x 2m was built. It has two times larger throughput comparing to the previous one.

8.4 DRILL WORKS AND INSTALLMENT OF NEW MONITORING DEVICES ON PETROV LAKE TAILINGS DAM AND MORAINE

On November 18–24, the drill works were performed on the dam to restore some monitoring devices which have been destroyed due to the effect of dam construction in 2011. The new gages were also added. 10 holes have been drilled, where 3 thermistors and 7 inclinometers were installed. They will be implemented to the dam monitoring system starting from January 1, 2012.

From September 28 to October 2, the drillers of KyrgyzGIIZ Ltd. drilled 19 wells, as a part of engineering-geological exploration program conducted at the area of future location of ETP (Effluent Treatment Plant). In the middle of December KyrgyzGIIZ provided to KOC with the report regarding the exploration results. This report was provided to the ECO Service SPF for examination and further usage as the part of ETP transferring project.

On November 24-27, 4 wells were drilled on the moraine of the Lake Petrov. 4 piezometers and 4 thermistors were installed there for monitoring.

On December 19-20, 3 wells were drilled on the moraine of the Lake Petrov, the surveyor's stations were installed there.

On December 23-25, 9 stations to monitor a potential surface displacement were installed on the moraine of the Lake Petrov.

8.5 WATER TREATMENT SYSTEM

In 2011, the Environmental Department continued to operate the Potable Water Treatment Plant (WTP), Sewage Treatment Plant (STP) and Effluent Treatment Plant (ETP). As part of KOC's Continuous Improvement Program (CIP), a significant amount of test work was done to improve the efficiency of the ETP and to reduce the treatment costs.

The WTP, STP and ETP complied with all standard requirements.

8.5.1 SEWAGE TREATMENT PLANT

The Sewage Treatment Plant (STP) operating at the mine site is the unique one due its altitude location (3,630m above sea level), harsh weather conditions and oxygen deficiency. There are no biological treatment plants operating in the similar conditions in the republic.

In 2011, the Sewage Plant operated successfully in terms of Biological Oxygen Demand (BOD) reduction, Total Suspended Solids reduction and Nitrification.

An average daily flow of sewages for treatment was 448 m^3/day.

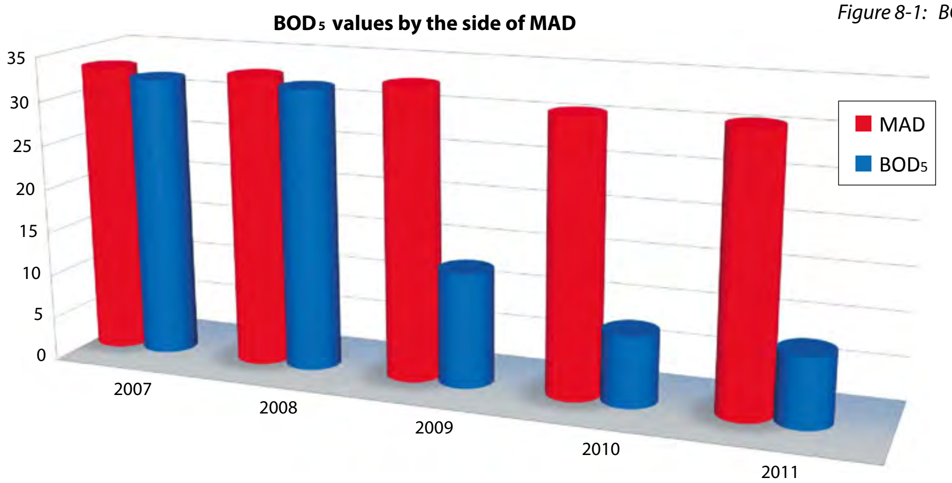
Discharge values of parameters were improved significantly, especially BOD_5, after installment of the additional KU-200.

Temperature, dissolved oxygen and MBAS impact the treatment quality of sewage.

The liquid effluent wastes generated during the winter months were stored in a holding pond and a discharge from this pond occurred only in the summer months after receiving a permit for discharge.

The quality of the discharged treated sewage complied with MAD (Maximum Allowable Discharge) permit standards approved in 2011. Figure 8-2 shows the BOD_5 data as per the MAD requirements according the years.

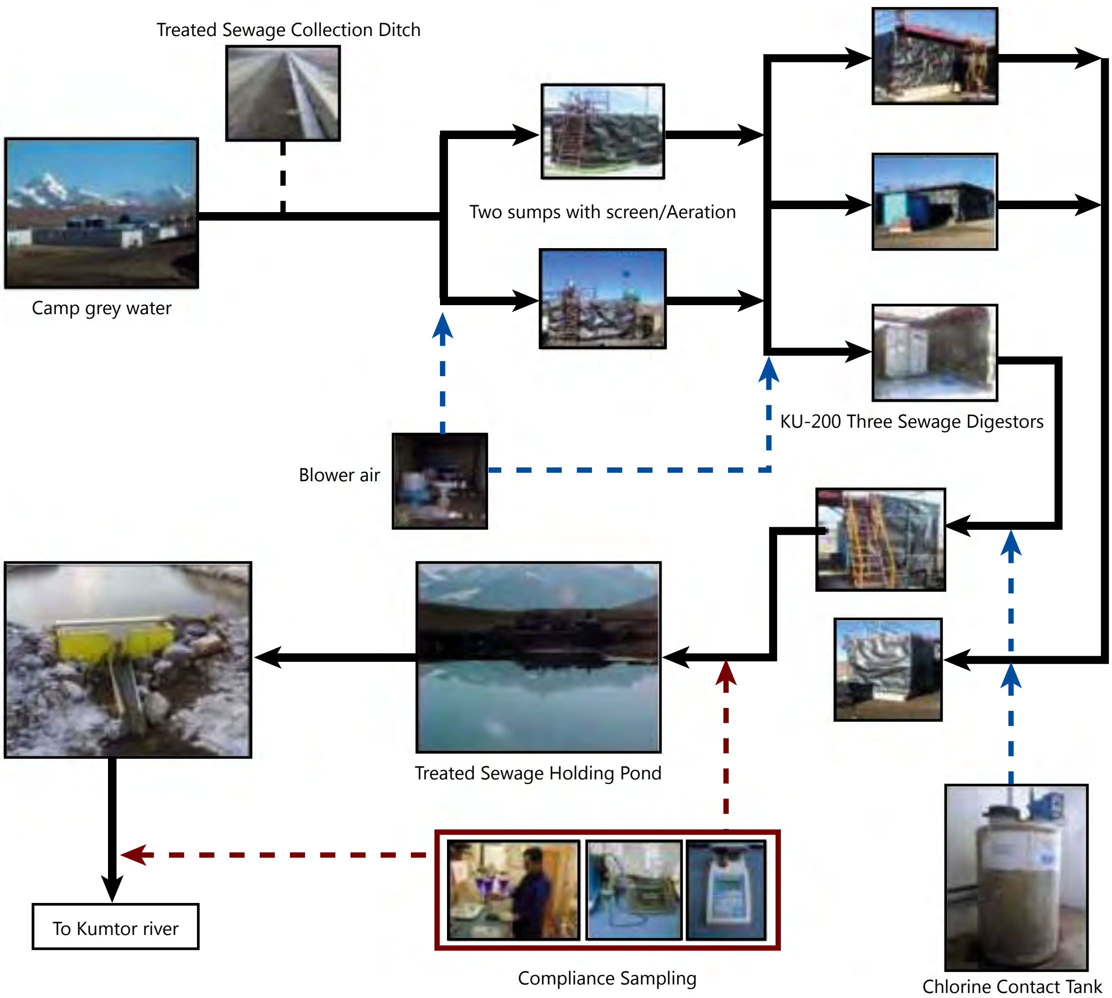
Figure 8-1: BOD_5 and MAD norms



Sewage Treatment Plant Flowsheet

A flowsheet demonstrating how sewage water is treated at the Kumtor Mine is shown in Figure 8-3. A detailed explanation of KOC's Sewage Plant is provided in Appendix A as part of the description of KOC's operations.

Figure 8-2: STP flowsheet



The treatment effectiveness as per BOD5 data is– 96.5 %

Table 8-2: STP data

Parameter	Input - RS1, мг/л	Output - S1.1 мг/л	MAD – 2011, mg/l
MBAS	11.1	0.4	2,09
Ammonium	11.2	5.5	10,89
BOD5	271.6	10.2	32,46
TSS	390.1	23.2	341,4
Nitrate	1.2	6.6	11,39
Nitrite	0.03	0.7	4,05
Sulphate	45.3	84.4	338,03
Chloride	33.5	39.8	350

8.5.3 POTABLE WATER TREATMENT PLANT (PWTP)

In 2011, the potable water was pumped from Petrov Lake using an insulated six-inch line. As previous, the raw water was treated through flocculation, filtration and chlorination.

In 2011, the plant treated 175,315 m3 or 6% more than in 2010. A simplified flow sheet of the lower site potable water treatment plant is shown in Figure 8-3. The Potable Water Quality for 2011 is described in the Section 6 as the sampling and analysis of site drinking water is a part of EMAP program.

In December 2011, the filter fillers (an activated carbon and quartz sand) of ARTAS-1 and ARTAS-2 were replaced with the help of manufacturer special.

Figure 8-3: Flowsheet of Water Treatment Plant at the Lower Site

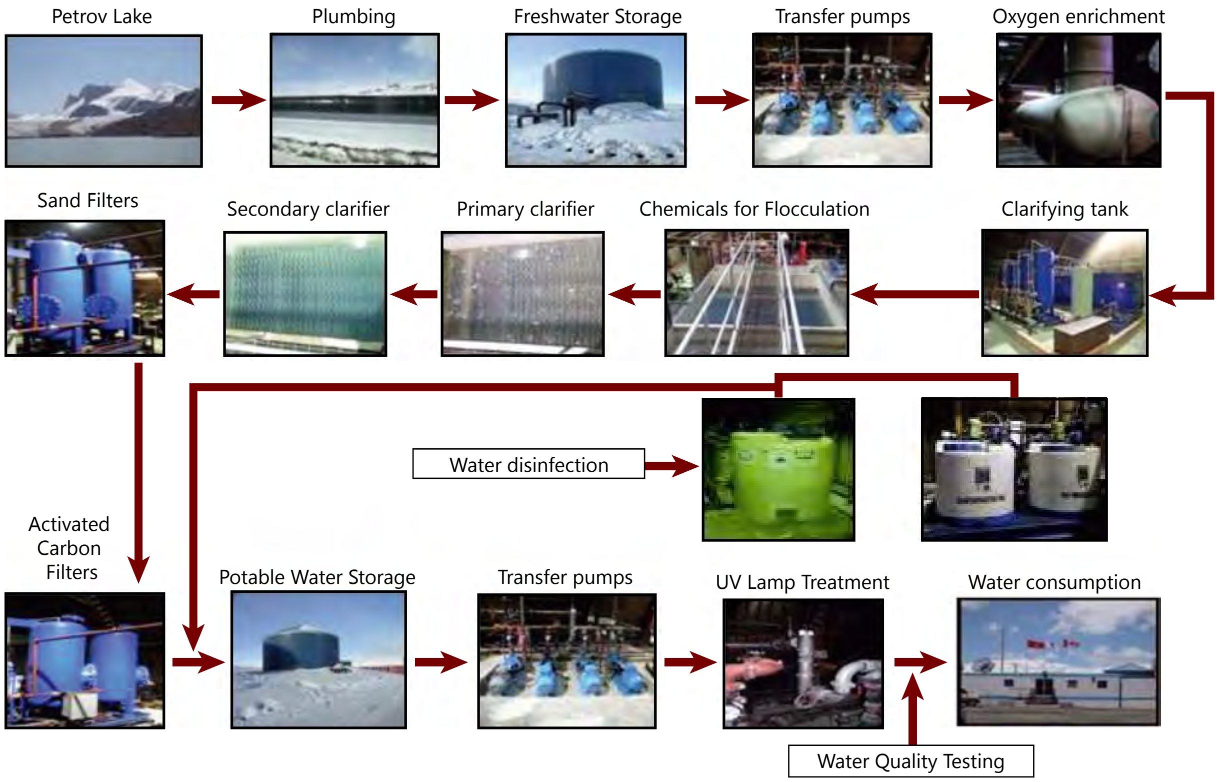
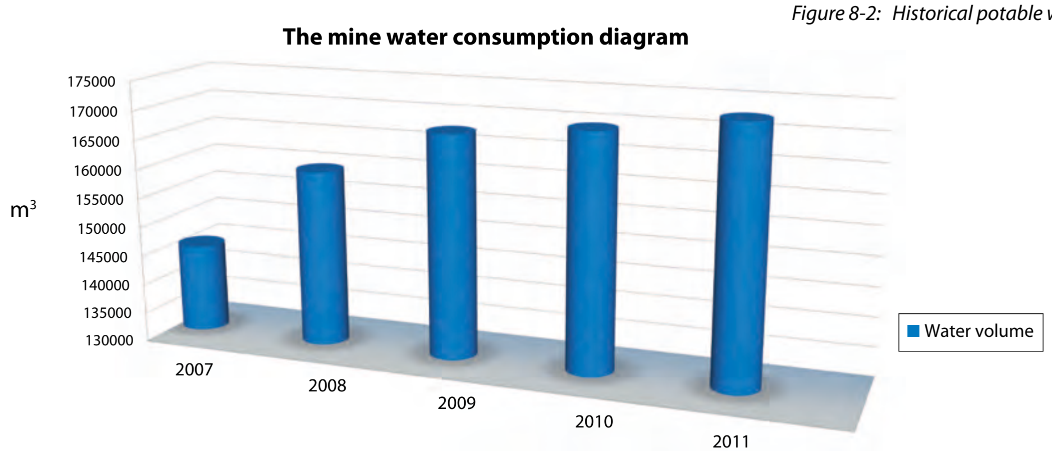


Figure 8-2 shows the usage of potable water at mine site starting from 2007.

Figure 8-2: Historical potable water usage



The annually increase in water consumption is attributed to the additional employees in the main KOC departments including the underground and contractors.

Potable water usage for upper site area was recorded as 18,900 m^3.

8.5.4 EFFLUENT TREATMENT PLANT

In 2011, 5.012 M м3 of effluents were treated. In general, the level of substances in the treated effluents discharged to the Kumtor River and at the EMZ complied with the set standards.

The electronic metering devices were set on the reagent's lines for a constant control and timely regulation of the reagents' dose supplied for the treatment.

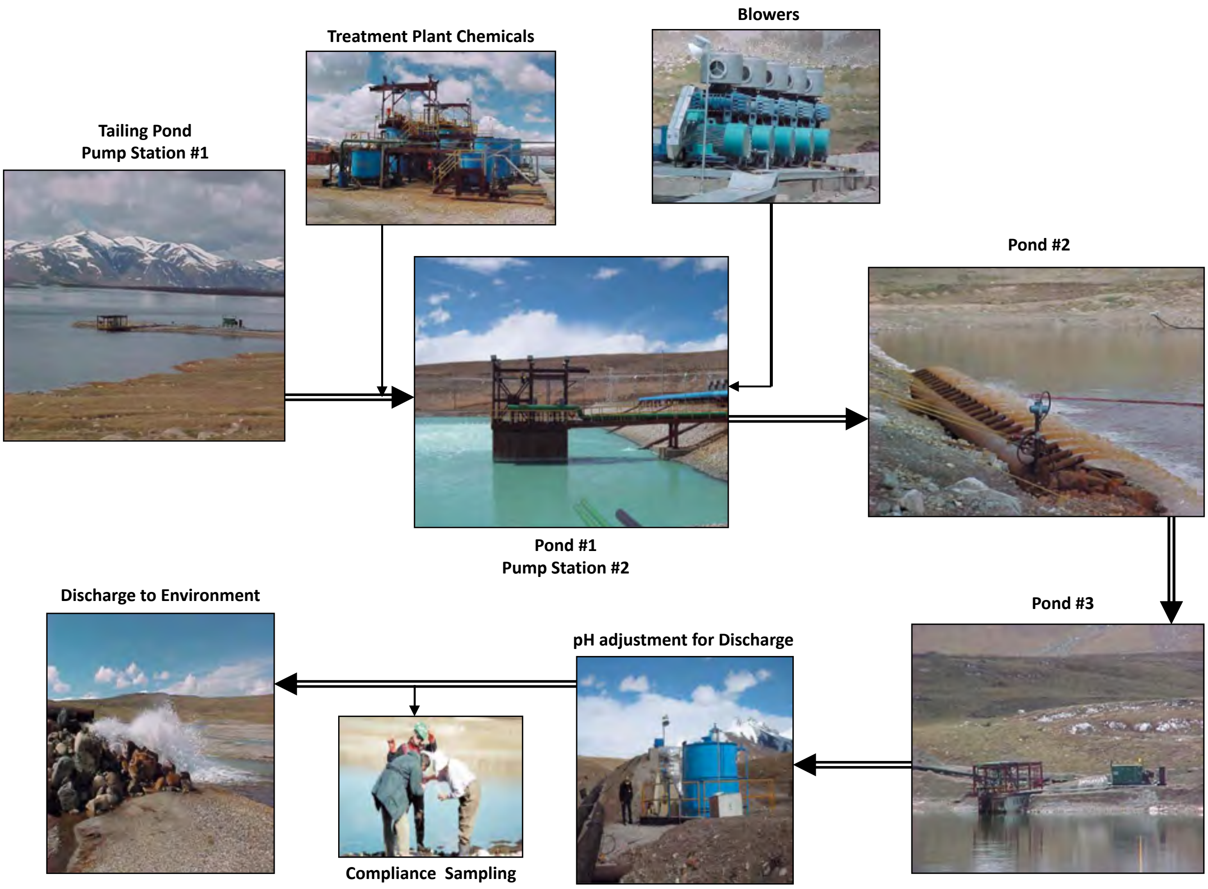
In 2011, a supply of caustic soda to the second pond was restarted for more effective precipitation of heavy metals and compliance with set MAD. A precipitation of heavy solids occurs faster if water pH is more than 9. Thus, the level of pH in the second pond was in the limits of 11 to improve the indices of the heavy metals in the discharges.

The indices of water chemical content in the tailings pond continued to show low levels of Iron cyanide complexes as before. In total, the chemistry data of the treated water was similar to the previous years.

Effluent Treatment Plant Flowsheet. The ETP at Kumtor is based on the patented INCO Ltd. SO2 Cyanide Destruction Process with a metals settling pond and pH adjustment on discharge. A simplified flowsheet is shown below in Figure 8-3.

A total of 4.9 M m^3 of treated water was discharged to the Kumtor River, which included the runoff and snowmelt that accumulated in the Pond # 3 during a snow melting season. In 2011, the discharge to the River Kumtor was less than the volume of treated water because in the course of preventive works conducted at the end of the season, the treated effluents were pumped to the tailings dump from the ponds #1 and #2.

Figure 8-3: Effluent Treatment Plant Flowsheet



In 2011, the monthly levels of substances in the treated effluents were lower than the MAD limits including the cyanides (table 8-3) and excluding sulphates and sodium. A high content of these substances are related with ETP production process because sodium metabisulphate is used for cyanide decontamination. At the control station the aforesaid parameters were in the MAD limits (table 8-3)

According to EMAP the monitoring of water quality at the control station (W1.5.1 – K3C) is conducted to confirm a compliance of Maximum Allowable Concentration (MAC) of substances set for domestic water use.

At the control station the most parameters were in compliance with MAC limits or lower (table 8-4). The indices of manganese, magnesium, iron and aluminum were higher the MAC limits which is generally typical for the natural levels of these substances in the natural water.

Table 8-3: Monthly average data of ETP water quality at the control station.

Parameter	T8.1	T8.4					
		May	June	July	August	September	October
Mg	6.86		8.8	3.91	4.82	5.88	5.375
Na	420.85		459.5	558	585	587.5	589.5
SO4	773.57		815	870	900	930	1095
Cu	22.01	0.076	0.111	0.087	0.098	0.113	0.199
Fe	1.61	0.748	0.272	0.304	0.541	0.170	0.255
Mn	0.01	0.099	0.047	0.012	0.017	0.014	0.032
Mo	0.33	0.138	0.184	0.243	0.304	0.268	0.257
Ni	0.59	0.006	0.009	0.005	0.005	0.006	0.008
Zn	0.21	0.007	0.008	0.005	0.004	0.001	0.001
NH3			0.3	0.34	0.43	0.42	0.40
TSS	2.67		8	20.9	2.6	1	1
CN-free	9.77				< 0.005	< 0.005	
CN-total	38.59	0.050	0.053	0.065	0.068	0.056	0.072
CN-wad	33.40	0.024	0.026	0.040	0.044	0.037	0.042

Table 8-4: Concentration of substances at the control station (W1.5.1)

Parameter	MAC	May	June	July	August	September	October
Mg	50	33.200	45.200	44.700	24.500	53.750	73.800
Na	200	6.560	39.200	33.200	14.200	59.850	63.200
SO4	500	239	229	182	135	297	535
Al	0.5	2.158	0.638	3.768	4.918	1.605	1.108
Cu	1	0.006	0.008	0.010	0.007	0.007	0.014
Fe	0.3	3.673	0.849	5.338	6.148	1.857	1.509
Mn	0.1	0.073	0.173	0.366	0.184	0.664	0.812
Mo	0.25	0.004	0.020	0.019	0.009	0.022	0.021
Ni	0.1	0.008	0.009	0.012	0.011	0.011	0.014
Zn	1	0.008	0.004	0.009	0.015	0.009	0.012
CN-free	0,035	0.005	0.005	0.005		0.005	0.005
CN-total	-	0.005	0.058	0.040	0.046	0.059	0.073
CN-wad	-	0.005	0.007	0.017		0.014	0.009

8.6 PETROV LAKE WATER BALANCE

In 2011, Petrov Lake water balance was carried out with the river flow information, water usage and discharge information to determine what percentage of the Mill total inflow was utilized.

In order to determine the effect of water use by Kumtor on Petrov Lake water balance, measuring was made at all outlets of the lake. This included gauges on the lake itself to measure elevation changes, flow meters on the water line that transports water to the Mill to measure water consumption, a flume in the Kumtor River, and precipitation and evaporation measurements as well.

Measured flow at the Kumtor River flume includes:

- discharge from the ETP;
- Lysyi Creek inflow;

- precipitation runoff;
- glacier melt water flow into Petrov Lake;
- spring or groundwater flow into Petrov Lake.

The total inflow to Petrov Lake was calculated based on the following equation:

$$V_{inflow} = V_{flume} - V_{ETP} - V_{Lysyi} + V_{mill} - P_{recipitation} + E_{vaporation} \pm V_{lake\ volume\ change}$$

Outflow Calculations

Kumtor River - Flow into the Kumtor River is the net flow out of Petrov Lake plus the discharges from the ETP and Lysyi Creek. In 2011, the Kumtor River flow was 91.44 M m^3 as measured at the Kumtor River flume from April to October (Section 6). That is 26.9 M m^3 less compared to the year 2010.

Effluent Treatment Plant - Flow discharged from the ETP, as measured with totalizing flow meters on the discharge pump #3, was 4.96 M m^3 (May to October).

Lysyi Creek - Lysyi Creek enters the Kumtor River at the point above the flume. This resulted in an estimated total flow of 11.9 M m^3 for the season. That is 3.9 M m^3 less compared to the year 2010.

Mill and Camp Usage - The volume of water used by the mill and camp was measured using a totalizing flow meter at the Petrov Lake pumping station. The total water used by all facilities of the mine in 2011 was 6.3 M m^3.

Net Precipitation - The evaporation rate from the lake was calculated using Meyer's equation for evaporation from the water surface. As per the data of KCGE (Kyrgyz Complex Geological Expedition) on 2009 the area of the lake Petrov was 403 h. The amount of calculated evaporation from May to October was 146.6 mm, or 0.591 Mm^3 from the Lake Petrov surface. With an annual precipitation of 428.8 mm, the water volume of the Lake increased to 0.429 m or the water volume of the lake increased to 1.728 M м^3.

Change in Storage - Over the flow season there was an increase in the water level of Petrov Lake of 1.55 m from the starting elevation of 3,732.54 m to 3,734.09 m. By the end of the flow season the water level decreased to 3,732.54 m. The increase and decrease of Petrov Lake water levels in 2011 are illustrated in the scheme 6-15.

Final Calculations - The total inflow to Petrov Lake in 2011 was calculated to be 79.75 Mm^3. The water used by Mill, camp and other consumers was 7.89% of the total inflow into Petrov Lake. The calculated stored volume of Petrov Lake is now considered to be 65.7 Mm^3.

Conclusions - The data shows that the amount of water KOC consumed in 2011 was 7.89% of the total inflow to the lake. Based on the above water balance calculation and the measured outflow and inflow volumes, it can be considered that the volume of water used from the Petrov Lake for Kumtor's operation was insignificant.

SECTION 9

GLACIERS, WASTE ROCK DUMPS, DEWATERING OF THE TILL, GLACIER COMPLEX AND ROCK OF THE CENTRAL PIT, SNOW AND AVALANCHE MONITORING

9.1 Glacier Monitoring

9.2 Waste Dump Monitoring

9.3 Acid Rock Drainage/Metal Leach (ARD/ML) Studies and Characterization

9.4 Dewatering of the till and glacier complex and rock of the Central Pit

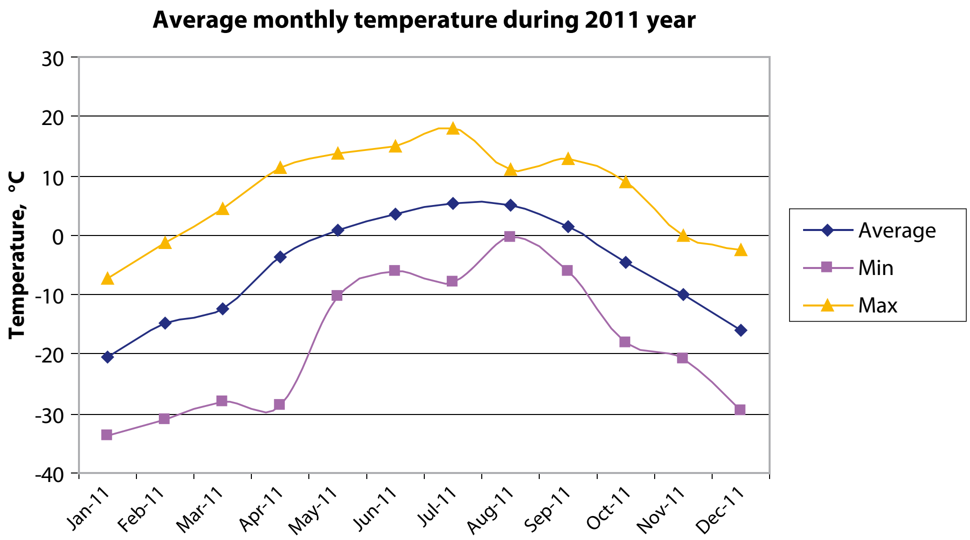
9.5 Snow and Avalanche Monitoring

9.1 GLACIER MONITORING

In 1995, a network of monitoring points was installed on the Davydov and Lysyi glaciers to monitor their movement. The Glacier-Monitoring Program is discussed in this section as in the previous annual reports. The monitoring points consisted of temporary survey rods positioned into the glacier and could be replaced or expanded in number as required.

This section presents the monthly data of glacier movement rate in tables and charts.

Diagram 9-1. Temperature data for 2011.



On the basis of the average annual glaciers movement rate and temperature chart comparison it can be concluded, that the glacier movement is activated by the temperature rise and decrease.

Table 9-1: Average monthly displacement rates for the glaciers

Glaciers	Average monthly displacement rates											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Lysyi	0.007	0.001	0.001	0.002	0.002	0.004	0.007	0.004	0.008	0.007	0.008	0.002
Sary-Tor	0.009	0.009	0.009	0.009	0.011	0.011	0.020				0.013	0.007
Davydov	0.020	0.047	0.042	0.027	0.022	0.032	0.043	0.053	0.048	0.035	0.039	0.032

The Lysyi Glacier

The table and graph suggest that the Lysyi Glacier has remained stable over the year. Maximal displacement rate made 0.008 m/day.

Sary-Tor Glacier

Maximal displacement rate of Sary-Tor Glacier made 0.02 m/day. From August to October the monitoring points at the glacier were missed but they were reestablished in November.

Davydov Glacier

Davydov Glacier has remained stable over the year as well. Maximal displacement rate made 0.047 m/day.

9.2 WASTE DUMPS MONITORING

Over the year waste dumps had higher movement rates when they were activated, and rates slowed down as dumps were closed. Also, growth of displacement rates compared rather good to temperature increase.

It should be noted that reported rates are average, whereas most monitoring points are installed within dynamic area at the face. Middle part of waste dumps usually has significantly smaller rates.

Average monthly rates per waste dumps are reported below in Table 9-2 and on Diagram 9-2.

Diagram 9-2: Average monthly displacement rates for the glaciers

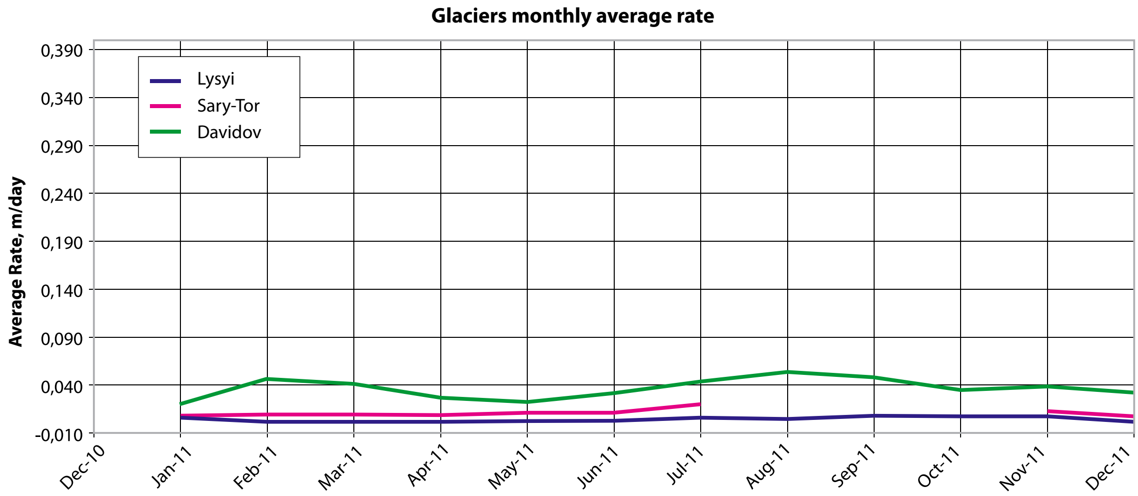


Table 9-2: Dumps average monthly rate

	Average monthly rate in 2011, m/day											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Waste dumps on the pit left flank												
WD #6(3958)		0.006	0.009	0.019	0.015	0.049	0.023	0.015	0.017	0.011	0.007	0.007
WD #6(4026)		0.022	0.025	0.032	0.063	0.111	0.049	0.076	0.067	0.079	0.105	0.374
WD #11(4226)	0.053	0.188	0.042	0.043	0.044	0.054	0.069	0.081	0.068	0.059	0.063	0.080
WD #23	0.011	0.007	0.008	0.009	0.011	0.012	0.012	0.020	0.012	0.011		0.011
WDp#24(3920)	0.286	0.186	0.185	0.247	0.312	0.339	0.317	0.293	0.320	0.332	0.303	
WD #30(3938)	0.147	0.106	0.090	0.143	0.139	0.126	0.080	0.053	0.093	0.095		0.174
WD #31(3882)	0.003	0.005	0.083	0.198		0.356	0.277	0.285	0.243	0.224	0.402	0.269
WD #32(3790)	0.115	0.092	0.213		0.189	0.762	0.170	0.143	0.133	0.152	0.157	0.137
WD #34(3962)		0.172	0.298	0.351	0.441	0.444	0.535	0.852	0.595	0.934	0.505	0.441
WD #35(3946)		0.072	0.044	0.050	0.060	0.087	0.015	0.014	0.004	0.008	0.001	0.005
Dumps near the Gold Plant												
WD #26	0.005	0.050	0.003	0.005	0.004	0.006	0.006	0.006	0.006	0.006	0.007	0.005
The SW Pit Waste Dumps												
WD #3(3958) SW	0.014	0.011	0.010		0.010	0.010	0.009	0.010	0.009	0.010	0.009	0.009
Waste dumps on the pit right flank												
WD #3(4118)	0.037	0.036	0.031	0.010	0.013	0.042	0.042	0.041	0.118	0.095	0.092	0.265
WD #24(4200)	0.004	0.003	0.003	0.003	0.004	0.004	0.004	0.004	0.005	0.006	0.003	0.004
WD #25	0.010	0.009	0.009	0.009	0.009	0.011	0.011	0.010	0.011	0.011	0.004	0.007

Waste dumps on the pit left flank

Dumps were stable throughout the year. Maximal annual rates were detected on the waste dumps as below:

1. #32(3790m) – 0.762 m/day (June)
2. #34(3962m) – 0.505-0.852 m/day (July-November).

The Southwest Pit waste dumps

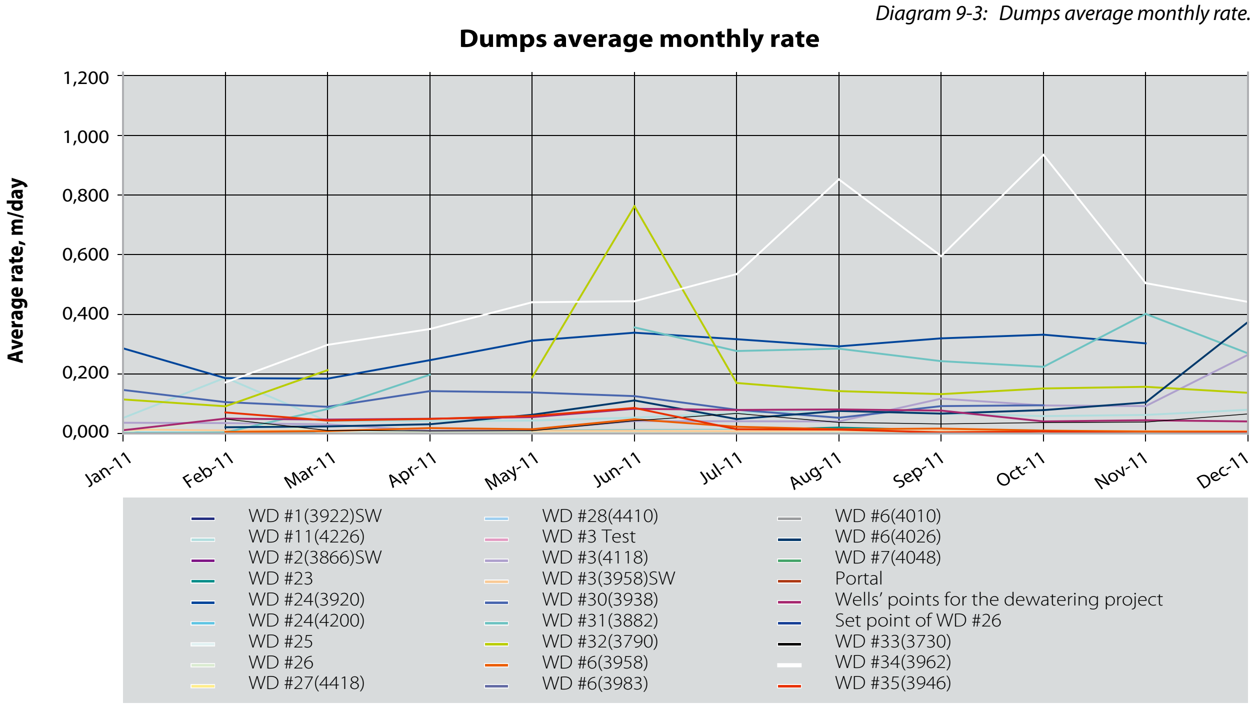
Dumps located in the Southwest pit were stable throughout the year. The highest average monthly rate made 0.014 m/day, minimal – 0.009 m/day.

Waste dumps on the pit right flank

Dumps were stable throughout the year, rate increase was related to opening up of dump #3. Rates did not exceed 0.265 m/day.

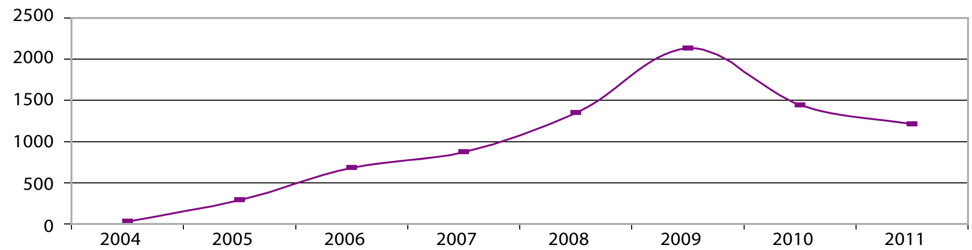
Once displacement rates on active dumps rose to critical, dumping was deferred and reassigned to other areas of a dump.

Diagram 9-3: Dumps average monthly rate.



1210 monitoring points were installed in total on the dumps, glaciers and Central Pit benches. The number of monitoring points installed since 2004 is shown on Diagram 9-3.

Diagram 9-4: Installation schedule of monitoring points



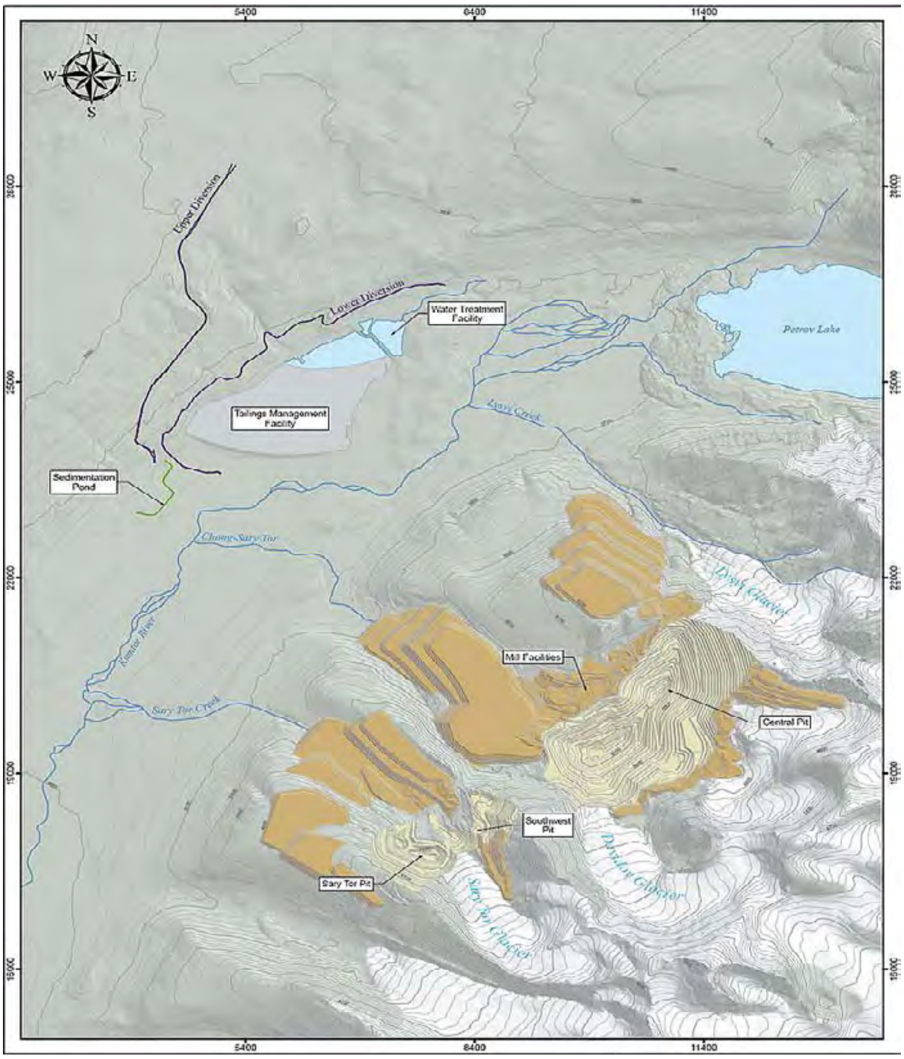
Historically, and owing to the limited space at site, the waste dump facilities associated with the Central pit were located on glaciers, with the majority of waste rock placed on the Davydov Glacier. This resulted in the gradual displacement of the glacier ice away from the pit, such that in some areas waste rock that was originally dumped on tops of the glacier, now rests for the most part on the original substratum, the basal moraine ("till") of the glacier. The waste dumps were originally intended to not only act as a buttress between the glacier and the pit, but also to divert the main flow path of Davydov Glacier away from the southern part of the Central Pit.

Stability of the waste dumps as well as the pit walls have become important geotechnical concerns over the excavation of the SB Zone. With increased expansion of the Central Pit and taking into consideration the geotechnical concerns the corrective changes were established in the process of waste dumping.

The excavation of the SB Zone occurs below the former location of the north arm of the Davidov Glacier in the south-western part of the Kumtor deposit. While all of the geotechnical mechanisms responsible for the pit wall deformations are not known, part of the problems were likely related to placement of waste rock on the ice as well as elevated pore pressures within the adjacent glacial till and bedrock.

To this end, KOC is no longer planning to dump waste rock atop the Davidov Glacier, which should help minimize movement rates. As can be seen in Diagram 9-1, the majority of waste rock from the Central Pit, is now placed further down the Chon-Sary Tor valley. This revised dumping practice is anticipated to limit waste dump instabilities and movement, certainly into the closure phase.

Chart 9- 1: Scheme of waste dumps placement



9.3 ACID ROCK DRAINAGE/METAL LEACH (ARD/ML)[1] STUDIES AND CHARACTERIZATION

Evaluation of potential acid rock drainage (ARD) from waste rock is an important part of environmental monitoring. Previous ARD/ML studies performed on Kumtor waste rock (Lorax 2004), including acid base accounting (ABA) and kinetic testing has indicated that a safe net potential ratio (NPR) for Kumtor waste rock to be 2.0. The NPR value is defined as the ratio of neutralization potential (NP) to the total acid potential (TAP):

NPR = NP/AP, where:

NP is measured directly from acid base accounting and AP is calculated from % Sulphur x 31.25.

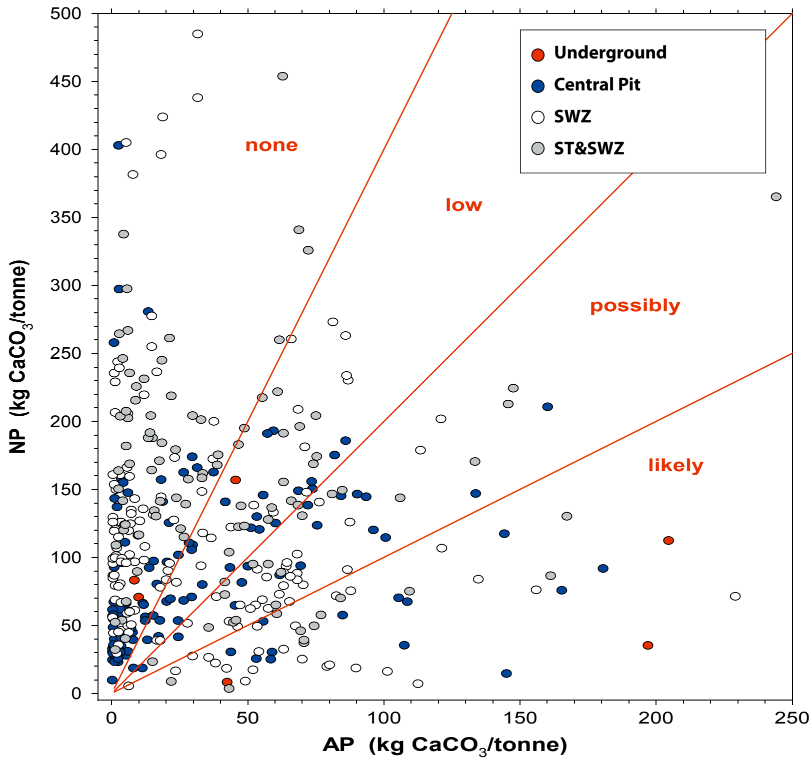
When all sulphur exists essentially as sulphide-sulphur, a simple total sulphur determination is sufficient to characterize the acid potential of the sample. A safe NPR indicates that ratio above which there is no predicted potential for acid drainage to occur at any point in time.

1 Kumtor Mine Closure Conceptual Plan. Lorax Environmental, 2010-2011

Based on the in pit drilling and sampling for the mine plan at that time, it was estimated that approximately 85% of the waste rock produced at Kumtor was considered to be nonacid generation and had NPR values of 2.0 or greater.

As part of the 2010 conceptual closure plan, additional samples of waste rock from all deposits were evaluated to determine if the original ARD/ML conclusions remained valid. To this end, samples from the Central Pit, the Southwest Zone (SWZ), the Sary-Tor and SWZ expansion and the underground (UG) were subjected to ABA analysis.

Diagram 9-5: Distribution of NP to AP for Waste Rock Samples from All Deposits



The ABA characteristics selected are the percentages of potential acid generating (PAG) and non-acid generating (NAG or non-PAG) materials among the waste rock samples. The net potential ratio (NPR) is used to quantify the net acid generating potential of a sample and is derived by dividing the neutralization potential (NP) by the acid potential (AP). As described previously, kinetic testing of waste rock material and low grade stockpile has indicated a site-specific safe NPR of 2.0, waste with values calculated at or above this are considered non-acid generating.

Although, ARD/ML is not a specific concern at Kumtor, oxidation of sulphides proceeds within the dumps and produces seepage waters with elevated sulphate concentrations.

Melt water diversion measures are taken to increase the sulphate concentrations. It minimizes the contact between the waste dumps and local surface water. If the waste rock is located "high and dry" a considerable infiltration of water through the waste rock will occur only during a short period of a year when the amount of precipitations increases the evaporation.

According to the 2011 ecological monitoring program the samples were taken from waste dumps including those that were formed from underground mining and tailings dump, the sampling was done on nine waste dumps and tailings impoundment. In 2011, 50 soil samples were analyzed. The results of acid base accounting (2011) show approximately 85% of the waste rock produced at Kumtor was considered to be non-acid generating and had NPR values of 2.0 or greater. 10% results were unspecified, i.e. had NPR values in the limits from 1.0 to 2.0.

Table 9-3. Acid Base Accounting Results (ABA test) 2011.

##	# sample	S total	NP	AP	NPR	Comments
1	Dump# 26	1.56	94.78	48.75	1.94	unspecified
2		1.33	112.86	41.56	2.72	non-acid generating
3		1.34	102.52	41.88	2.45	non-acid generating
4		1.05	80.95	32.81	2.47	non-acid generating
5		1.36	99.57	42.50	2.34	non-acid generating
6	Dump# 32	0.28	102.03	8.75	11.66	non-acid generating
7		0.29	174.78	9.06	19.29	non-acid generating
8		0.18	99.02	5.63	17.59	non-acid generating
9		0.50	167.55	15.63	10.72	non-acid generating
10		0.28	103.13	8.75	11.79	non-acid generating
11	Dump# 30	0.62	119.66	19.38	6.17	non-acid generating
12		0.63	117.49	19.69	5.97	non-acid generating
13		0.76	136.18	23.75	5.73	non-acid generating
14		0.79	136.89	24.69	5.54	non-acid generating
15		0.65	75.41	20.31	3.71	non-acid generating
16	Dump# 31	0.87	107.44	27.19	3.95	non-acid generating
17		0.91	105.26	28.44	3.70	non-acid generating
18		0.63	120.18	19.69	6.10	non-acid generating
19		0.82	86.58	25.63	3.38	non-acid generating
20		0.77	82.65	24.06	3.44	non-acid generating
21	Dump# 34	0.68	82.63	21.25	3.89	non-acid generating
22		0.49	87.83	15.31	5.74	non-acid generating
23		0.33	92.47	10.31	8.97	non-acid generating
24		0.36	66.94	11.25	5.95	non-acid generating
25		0.59	100.62	18.44	5.46	non-acid generating
26	Dump# 35	0.30	77.47	9.38	8.26	non-acid generating
27		1.04	114.97	32.50	3.54	non-acid generating
28		1.56	105.3	48.75	2.16	non-acid generating
29		0.07	63.2	2.19	28.86	non-acid generating
30		0.22	53.93	6.88	7.84	non-acid generating
31	Dump# 6	0.54	107.21	16.88	6.35	non-acid generating
32		0.41	105.10	12.81	8.20	non-acid generating
33		0.67	75.66	20.94	3.61	non-acid generating
34		0.56	94.64	17.50	5.41	non-acid generating
35		0.55	117.30	17.19	6.82	non-acid generating
36	TP-ABA # 1	2.52	122.96	78.75	1.56	unspecified
37		2.14	121.92	66.88	1.82	unspecified
38		2.62	133.34	81.88	1.63	unspecified
39		1.82	152.16	56.88	2.68	non-acid generating
40		2.53	156.95	79.06	1.99	unspecified

##	# sample	S total	NP	AP	NPR	Comments
41	UG1	0.17	33.83	5.31	6.37	non-acid generating
42		0.13	39.59	4.06	9.75	non-acid generating
43		0.59	69.63	18.44	3.78	non-acid generating
44		0.13	37.00	4.06	9.11	non-acid generating
45		0.17	54.37	5.31	10.24	non-acid generating
46	UG2	0.19	63.35	5.94	10.66	non-acid generating
47		0.23	69.54	7.19	9.67	non-acid generating
48		1.41	68.49	44.06	1.55	неопределенный
49		0.71	50.69	22.19	2.28	non-acid generating
50		3.52	50.10	110.00	0.46	acid generating

The waste dumps monitoring and further estimation of changes in waste dump procedure will be conducted throughout the year.

9.4 DEWATERING OF THE TILL AND GLACIER COMPLEX AND ROCK OF THE CENTRAL PIT

KOC implements a Project of dewatering of till-glacial complex and bedrock area of Kumtor Central Pit designed by Asiarudproiect CJSC as per the request of KOC.

The main goal of the Project is the hydrogeological works for dewatering of Kumtor watering area and decrease of Pit instability during the mining.

The waste rocks stored on the watering till and ice are rather waterproof and due to their weight create the pressure conditions for ground water in the till which cause the regime of confined filtration. It is indicated in the Project that piezometric water head in the waste dump reaches 70-80 m from the till surface. Filtration coefficient of the well was 4.32 m/day. In addition, the pit is waterlogged due to pinching out and discharge of ground water from waste rocks, moraine and bedrock. Melting glacier supplies the ground water of waste rocks, moraine and bedrock.

Thus, the ground water circulates actively on the depth of 5-10m in the roof of bedrocks which represents a crust of till; and in the waste dump bottom it circulates on the depth of 70-80m.

Currently operation of the pit to the depth causes a dulling of watering till and waste dump to the pit bottom which creates the instability of benches and complicates the mine operation.

The following hydrogeological works were performed in 2011 for pit dewatering (the wells were drilled and tested):

- Hydrogeological drainage wells in the moraine
- Vertical hydrogeological drainage wells in the waste rocks
- Vertical hydrogeological drainage wells in the bedrocks
- Piezometric wells for control of ground water level
- Horizontal hydrogeological drainage wells in the bedrocks.

Geologic-lithologic cuts, capacity and water content of waste rocks, moraine and bedrocks were examined with the help of vertical wells. The watering of these deposits is different and varies both per area and section and depends on ground flow level. The wells' charge varies in wide limits and consists of 0.3-15 l/sec. Filtration characteristics of water bearing rocks are different and depend on seasonal fluctuations. Water permeability of rocks is also different; it increases in summer and decreases in winter. A capacity of water bearing horizon is unrestrained as per area and section and varies from 20-30m to 70-90m.

In the vertical wells with ground water the water was pumped with depth pumps.

The horizontal wells were drilled on the benches for the drainage of bedrocks to increase the stability of walls. As per the distribution, the ground water has a sporadic character and hydraulic connection with crack-vein tectonic water.

As per the distribution, the ground water has a sporadic character and hydraulic connection with crack-vein tectonic water. There is no a defined regularity of ground water distribution in the rocks. Thus, the available materials about the examined geological-structural situation, rocks cleat and location of tectonic break-up areas were used while choosing the points for horizontal wells. The wells in the rocks were drilled with slope angle +50 - +100. Meanwhile, the rocks dewatering occurred through the wells by gravity. Water abundance of bedrocks is low and varies per area and cut too. The wells' debits fluctuate from 0.02 to 2 l/sec.

In the horizontal wells the ground water is collected in the sumps and further is pumped by the surface centrifugal pumps to the pipes outside the pit area.

The GEOKON piezometers were installed in the monitoring wells containing ground water to record the changes of ground water level over the time. The information was processed in the computer, was analyzed and the data base was formed. The monitoring results were used for the adjustment of the drilling points of wells.

In 2011, 182 hydro geological wells were drilled. The total drill footage was 17,639 rm. It was drilled:

- 170 vertical wells with total drill footage 16,058 rm;
- 12 horizontal wells with total drill footage 1,581 rm.

In 2011, the total average annual water pumping was 11,050,781.07m^3/year. It was pumped:

- 994,614.3 m^3 from the vertical hydro geological wells
- 4,665.6 m^3 from the horizontal hydro geological wells
- 829,526.2 m^3 from the North sump
- 8,997,301.82 m^3 from the South sump
- 229,338 m^3 from the glacial dump #6.

39 piezometers and 77 depth pumps were installed in 2011.

9.5 SNOW AND AVALANCHE MONITORING

In 2011, snow/avalanche-related operations including monitoring, ensuring avalanche safety, prevention measures implementation, engineering protection of facilities and communications, have been managed as per the instructional lines, rules, guideline documents, operating instructions and the other current and available materials as well as in accordance with the Production Plan. Snow/weather/avalanche-related information has been collected in amounts required for making local forecasts of avalanche hazardous periods and determining if appropriate preventive measures were in order. The observation materials collected from Tien-Shan-Kumtor Weather Station as well as from avalanche Monitoring Station at Barskaun Pass have been used.

Snow/weather/avalanche-related observations in the areas of NE, Sarytor, Boordu, right side of Petrov Glacier, and in the area of Portal #1 have been performed by expeditionary/field method and expert evaluation has been promptly provided in regards to snow cover distribution as well as the snow thickness and avalanche conditions.

40 avalanche monitoring bulletin were drawn up in 2011 which included the data on snow cover distribution, state of snow thickness, conclusion on avalanche conditions of Kumtor Access Road including the status of cyanide convoy passage throughout the road and the areas of exploration drilling. Three bulletins indicated the potential avalanches fall at exploration areas. As per the request of local authorities the road section on Suek pass was examined and the road cleaning from snowdrifts was provided.

According to the one of the main climatic avalanche activity data, i.e. accumulation of precipitations and snow, 2010–2011 winter periods was in the limits of many years' average rates. Distribution of precipitations within the seasons is typical when a condensation level goes down due to decrease of total temperature background and at 3,000m-3,200m above sea level the condensation level goes down.

In December and January, precipitated 47%-63% of many years' average norm. The monthly precipitations at this period do not reach the critical rates when the avalanche may occur. In February, the precipitations were three times over the norm, and in March, it was in the limit of norms. However, due to the shortage of precipitations in the previous period (weak and moderate snow falls) the major and catastrophic avalanches did not occur.

In March, a collapse of stable snow cover started and in April, snow was melting intensively. That and other factors resulted in a termination of avalanche hazard period at Kumtor operational areas. Besides, in the course of snow falls in April 17-19 and 28-29 the total precipitations have increased the critical value but there were not the avalanches.

The same situation with separate particularities of precipitation and snow accumulation, snow cover distribution and status of snow thickness was observed at the beginning of winter 2011-2012. The beginning of winter was characterized by an increased accumulation of precipitation. In October, it was 27.7 mm of snow, it was 231% of many years' average norms. In the course of October 7-9, 11.0 mm of snow has precipitated which caused 7 small volume avalanches at the area of Barskoon pass (5 avalanches), and at the exploration area of Sary-Tor (2 avalanches). Further, on October 20 and 29, after the weak snowfalls, two avalanches occurred at the area of Sary-Tor, which blocked the Access Road.

Except the snowfall of October 7-9 all the other ones were short-term and weak, and no one reached a critical mark when an avalanche may occur. The snow falls were not always accompanied with snowstorm transfer. However, after snowfalls and in some separate periods, due to the wind strengthening a considerable redistribution of snow cover, up to the appearance of the large wind gaps, and the large areas of bared ice on the surface of glaciers have occurred. In November, 14.8 mm of snow precipitated in the area, it was 185% of norm, and in December, there was only 3.2 mm. Thus, there were no avalanches in November and December.

Due to the insufficient accumulation of precipitations in the beginning and at the end of 2011 the avalanche activity was low at the end of winter 2010-2011 and in the beginning of winter 2011-2012.

A Project of Kumtor Access Road rerouting at the area of Barskoon pass was designed together with Engineering Department. Its realization will allow exclude the avalanche effect on the road not only in the three avalanche hazardous areas but to have a reserve area in case of emergency situations.

SECTION 10

COMMUNITY RELATIONS

10.1 Regional Liaison Committee

10.2 Regional Information Center

10.3 Isssy-Kul province development Fund

10.4 Sponsorships and Financial Aid

10.5 Visits to the Kumtor Mine Site and Region

In its activities, Kumtor Operating Company is guided by the principles of social responsibility. By strictly implementing the laws and rules of social life, respecting people, protecting the environment, the Company contributes to economic development and welfare of the region we operate in, as the Company's success is ultimately contingent on the amicability of the local population.

Public Relations determines the principles, basic guidelines and priorities in building relations between the Company and local communities, interaction with the Company-related social groups, works out PR's strategy with due attention given to the interests of the local communities, follows the sustainable development principles, contributes to the resolution of social problems in a regular dialogue with the local authorities and the general public.

10.1 REGIONAL LIAISON COMMITTEE

The Regional Liaison Committees (RLCs) in the Jety-Oguz and Ton districts were established as instrument for interacting with the region, considering opportunities for social and economic development in the region, keeping local communities informed about the Company's activities and for timely responding to requests coming from various social groups potentially influenced by the Kumtor project.

The RLCs representatives regularly meet with local community members to discuss challenges and problems faced by the region, consider local initiative support projects and track the process of their realization.

Regional Liaison Committee Structure, Jety-Oguz district

- Vice-President, Government and Public Relations, KOC
- Community Relations Manager, KOC
- Manager, Government Relations & Sustainable Development Projects, KOC
- Head of the Jety-Oguz district
- District Kenesh Chairman
- Heads of three ayil counties
- Public representatives.

Regional Liaison Committee Structure, Ton district

- Vice-President, Government and Public Relations, KOC
- Community Relations Manager, KOC
- Manager, Government Relations & Sustainable Development Projects, KOC
- Head of the Ton district
- Chairman and members of the District Kenesh
- Heads of ayil counties
- Representatives of the youth movement and NGOs.

10.1.1 OBJECTS AND MANDATE

The objective of the RLC is to build constructive relations between the Company and local communities situated within the closest proximity to the Company's operations.

The mandate of RLC also includes the following lines of activities:

- Maintain effective relations among Company Management, government officials, local self-government bodies and the population in the region.
- Maintain a dialogue with local communities to further enhance positive relationships.
- Consider sustainable development projects and programs contributing to the regional social and economic development within the budget as approved by KOC.
- Discuss population's needs and provide assistance in addressing them.
- Promote the Company's positive image.
- Create conditions facilitating the Company's continued operation in the region.
- Keep the local communities informed as to the Committee's and Company's activities in the region.

10.1.2 MEETINGS

In 2011, a number of meetings were held to discuss the funding of social and economic projects, KOC sponsorships reports, human resources matters, environmental problems and current issues.

10.2 REGIONAL INFORMATION CENTER

The Kumtor Operating Company Regional Information Center (RIC) was officially opened for Jety-Oguz and Ton communities in Barskoon, Jety-Oguz district, Issyk-Kul province in 2011. The RIC's purpose is to provide trustworthy information about KOC for the local residents. Available there will be reports and publications concerning the Issyk-Kul Development Fund. Also, KOC's hiring procedures, human-resources policy and vacancy information can be found at RIC. The Center officers are planning a series of training sessions for the local residents focusing on advanced farming methods as well as consultations regarding sustainable development projects. All services to be furnished by the Center will be free of charge.

Photo 10-1: During the opening of the Regional Information Center in Barskoon

10.3 ISSYK-KUL PROVINCE DEVELOPMENT FUND

Under the Investment Agreement signed by the Kyrgyz Government, Centerra Gold Inc., JSC "Kumtor Operating Company" and JSC "Kumtor Gold Company" dated as of June 6, 2009, 1% of the Company's gross income is contributed to the Issyk-Kul Province Development Fund (IKPDF) on a monthly basis.

In June 2010, the Cooperation Agreement between the Issyk-Kul Province Administration and KOC as well as a distribution mechanism of KGC's contributions to IKPDF were signed.

Under the accords reached, contributions to IKPDF, estimated to be 1% of the gross revenue, shall be distributed as follows:

- 50% shall be contributed to IKPDF's account to be further used by the Issyk-Kul Administration in the interests of the province's social and economic development. The Company shall not participate in the distribution of these contributions;
- the remaining 50% shall be contributed to IKPDF's special account designed for social and economic projects in Jety-Oguz and Ton districts as well as in the city of Balykchi.

In 2011, investment was made in 304 projects worth more than 636 million soms. Resources were contributed for the building and renovation of facilities in the spheres of education, health protection, culture and sport. Financial support was also granted to the self-government bodies for the restoration and expansion of the province infrastructure: rebuilding of the roads, water supply systems, land improvement, organization of public events, and purchase of farming equipment. Specifically due to the Fund's contributions in 2011 it became possible to overhaul 15 social facilities, build 9 schools, 6 gyms, 3 first aid/obstetrics stations and one kindergarten.

In 2011, Kumtor Operating Company contributed **US $10,790,080** to the Issyk-Kul Development Fund.

10.3.1 SUPERVISORY BOARD

To ensure transparent and fair expenditures, a Supervisory Board was established with a view to selecting social and economic projects submitted to Jety-Oguz and Ton districts as well as to the city of Balykchi.

After being approved by the parties concerned, the distribution mechanism for KGC's contributions to IKPDF was supported and approved by the Kyrgyz Finance Ministry.

The Supervisory Board was composed of two representatives of the Issyk-Kul Province Administration, one representative of administrations of Jety-Oguz and Ton districts as well as of the city of Balykchi and one representative of KGC/KOC.

On December 28, 2011, the Issyk-Kul Governor, members of district Keneshes, officers of capital construction department and representatives of civil society held a meeting of the Supervisory Board in Karakol to discuss the results of the Fund's activities in 2011 and approved the key project funding in 2012. Attending the meeting were KOC officers, public representatives and journalists. The journalists had visited a number of sites, under construction or completed, which were financed by the Fund: hospitals in Cholpon-Ata and Ananyevo, cultural centers and schools in Kurmenty as well as the site of the school in Oy-Tal, Tyup district. The Supervisory Board members discussed directions of development in 2012 based on the Regulations of the Issyk-Kul Development Fund approved by the Kyrgyz Government in 2011. The meeting agreed that support for sustainable development projects should be a top-priority in the efforts to improve the province economy.

Photo 10-2: At the Supervisory Board Meeting

10.4 SPONSORSHIPS AND FINANCIAL AID

Corporate Relations department traditionally provides charities for public associations, low-income and socially vulnerable groups, supports key social programs in the fields of education, health protection, culture, sports, etc., and provides support for sustainable development projects in the region. Implementation of social programs and charities contributes to KOC's constructive cooperation with government authorities, local self-government bodies and society at large.

Support for social projects and investment in the improvement of the quality of life in the region where the Company's facilities are located are top priorities of the Company's charities.

In 2011, sponsorships and financial aid were more than US **$1,186,000**.

In 2011, KOC contributed Soms **4,051,983** for the implementation of socio-economic projects previously approved by the heads of ayil counties and Keneshes. It was distributed according to the number of the population as follows:

- Tamga ayil county – 1,278,132 soms
- Barskoon ayil county – 1,817,001 soms
- Zhargylchak ayil county– 956,850 soms.

Addressing the shortage of fuel throughout the region in 2011, KOC provided 240 tonnes of diesel fuel for the farmers of two districts at a reduced price of 28 soms per liter. There came numerous requests of this kind from the farmers. The fuel required for the spring sowing campaign was transferred to the heads of two districts with all taxes paid by the Company itself. The fuel was distributed to the farmers following appropriate documentation procedures.

In addition, 12 forty-ton and 4 twenty-ton containers were distributed to the Jety-Oguz district administration in 2011 to meet the communities' needs; 2 twenty-ton containers to the school in Shor-Bulak, Ton district, to be remade into a canteen for students of junior grades; 1 forty-ton container to the Public Youth Movement "Yntymak-Tayanychi" in Karakol to be rebuilt into an administrative office, toilet and shower cabins for mini football players in Karakol; 2 forty-ton containers to Vostokelektro JSC to be rebuilt into a stand-by room at a substation; 4 forty-ton containers to the Issyk-Kul Province Office of Architectural Inspectorate to be rebuilt into an office and archives of architecture-related documents.

In 2011, KOC opened a Public Fund micro-credit agency "Ton Finance", in Bokonbaevo, Ton district. The MCA "Ton Finance" project provides public access to financial resources and stimulates small business throughout the region. Out of more than 100 requests submitted, its Supervisory Board selected 37, which were considered as the most substantiated. The projects selected will grant loans to boost production, construction, services and expansion of businesses. Credit terms vary from six months to three years. The interest rate is 10% to 12%, a record not only for region but also for the entire country. According to the latest estimates, the credit recovery is rather high, which makes it possible to open a new micro-credit line in 2012. The total budget was US **$300,000**.

Eurasia-Central Asia Fund helped to selected candidates, gave recommendations, and conducted training sessions for representatives of more efficient and commercial projects.

The Company has successful micro-crediting experience in the Jety-Oguz district. In 2011, KOC contributed US **$210,000** to the credit portfolio of the Jety-Oguz micro-credit agency based in Tamga and opened in 2006 under the regional sustainable economic development program.

Photo 10-3: The micro-credit agency in Ton

In 2011, one kindergarten was opened in Ton, Ton district, Issyk-Kul province. Its rebuilding was sponsored by KOC. The miner also helped to purchase equipment for the kindergarten, including appliances, toys and essential goods. A comfortable and fully equipped building was commissioned in September 2011. Also, nine social projects have been simultaneously underway in the Ton district, Issyk-Kul province, with the financial support of KOC. These are joint projects involving UNIFEM (UN-Women), local authorities and NGOs. The kindergarten in Ton is the ninth social project sponsored by KOC. The Issyk-Kul Development Fund sponsored by KOC also contributed to this project.

Throughout 2011, KOC continued to support the Jelden-Ata fruit-processing plant for which it provided Soms **7,300,0000** during the fruit-processing season to meet its administrative and production needs. End product, a fruit puree, according to analysis of the state standards agency and sanitary-and-epidemiologic inspection was recognized as high quality product. Currently the management of the plant is negotiating on delivery of the product to the local market.

Also, KOC provided aid to five schools and kindergarten Cholpon in Balykchi following the storm on December 19, 2011. The Company purchased 190 sheets of roofing slate for the facilities affected.

As part of the celebrations of the 80th anniversary of the Jety-Oguz district, Kumtor contributed Soms **500,000** for the purchase of sport prizes.

Kumtor Operating Company attaches great importance to the development of sports and culture in rural areas and promotes healthy living-styles among the youth. The Company contributes to the development of sport activities throughout the region by rebuilding sports grounds, gyms, supporting sports events and purchasing sports equipment. A national Graeco-Roman wrestling competition was held in the village of Saruu, Jety-Oguz district, in September 2011. It was a second tournament in Saruu dedicated to the memory of Rustam Shambetov, a sportsman killed on April 7, 2010, in Ala-Too Square, Bishkek. The competition initiative was supported by Kumtor Operating Company. As part of the tournament, friendly kok-boru and mini football matches, in addition to Graeco-Roman wrestling competition, were organized among neighborhood village teams. Also, a table tennis competition was included in the official program of 2011.

A national judo competition among juniors was held at Tosor, Jety-Oguz district, Issyk-Kul province, in June 2011. This was a second tournament of the kind, but this time the contestants included about 200 sportsmen of Kyrgyzstan and neighboring Kazakhstan.

In 2011, the Company provided financial aid to the Kyrgyz National Ice Hockey Federation by covering travel and accommodation expenses for participants in the International Congress of the World Hockey Federation held in Slovakia. Also a sponsorship of more than **896,000** soms was granted to the KR Graeco-Roman Wrestling Federation which was used to support coaching as part of preparations for the World Championship and Olympic Games. Aid was also granted by KOC to the Kyrgyz Federation of Professional Boxing in an amount of Soms **300,000** to cover travel and accommodation expenses of the national team participating in training camps along with the FSU boxers held in Kiev.

Photo 10-4: The national judo championship in Tosor

This year, KOC is planning to purchase sports equipment and building materials for sports clubs in Ozgorush and Uch-Terek to the amount of Soms **1,500,000**.

The Company supported the initiative to hold a mini football championship for the KR President's Cup as part of celebrations of International Day of Freedom of the Press and assigned Soms **92,000** for this purpose. Throughout the year, the Company repeatedly provided aid to the Balykchi Taekwondo Federation and supported the National Judo Federation in sending a Tosor coach to a study tour to Japan. A number of contests, football and volleyball matches were sponsored by KOC in 2011.

Photo 10-5: The KR President Cup mini football championship

While supporting the cultural heritage of the Kyrgyz people the Company willingly took part in a marathon to raise funds for the making and installation of monuments in Bishkek commemorating great Manas and Kyrgyz writer Chingiz Aitmatov. KOC contributed US **$100,000** for the project. Also, the Company provided financial aid for the Kasym Urpaktary Public Fund for the making of a monument to Kasym Urpaktary to the amount of Soms **330,000**. The sculpture will be installed in his native village, Chyrpykty, Tamcha ayil county.

In 2011, KOC allocated Soms **200,000** for the organization of Days of Culture in Issyk-Kul province. The funds raised during one of the concerts were used to provide help for Osh and Jalal-Abad residents.

Also, KOC sponsored a seventh festival "Salburun" held in Bokonbaevo, which included falconry, exhibition of sport horses and a show of handicrafts.

Photo 10-6: Hands-on training at vocational school #27 in Bishkek

Kumtor Operating Company has invariably supported health-protection projects. In 2011, it provided support for the Infant Resuscitation Department of a Bishkek clinic to complete renovation.

Also, **500,000**-som sponsorship was granted to the Danaza Public Fund for the preparation (translation and editing) of medical materials (dictionaries, magazines, etc.) for publication in three languages: Kyrgyz, Russian and English.

The Company continues to support the Barskoon-based Referral Center, to which it allocates Soms **900,000** annually.

Kumtor provides support for various educational institutions. Under the program "Regional Scholarship", the Company pays for the tuition of several Jety-Oguz and Ton graduates admitted to vocational school No. 27 in Bishkek. The program enables children from low-income families to acquire a profession. Within the framework of the program 15 students were admitted to the school in 2011.

Corporate Relations department continued support for Jety-Oguz rural schools. It provides them with class registers and stationery on an annual basis.

While contributing to education and culture, KOC donates books to libraries of Issyk-Kul province and other regions, considering their shortage of money hindering them to buy new literature necessary for students and schoolchildren. The donated books are mostly manuals, schoolbooks and fiction books.

In addition, KOC has rendered financial support to school and village libraries for subscription of newspapers and magazines. Annually the company supports the Jety-Oguz Centralized Library Network to subscribe newspapers for the village libraries.

Photo 10-7: At the primary school of the Krasnorechye orphanage

With the Company's support, the librarians of Issyk-Kul and Naryn provinces took part in the international conference "The Role Played by Libraries in Preserving Historical Heritage for the Development of Society of Learning" which was held in October 2011. Also, Kumtor sponsored the regional seminar "Information Technologies for Reading and Education" and a round-table discussion with the heads of Kitep-Ordo Centers "Support for Reading: Problems and Prospects", both organized by the Lenin Library of Issyk-Kul province.

In addition, the Company supported publication of collected works by Kyrgyz authors in 14 volumes from authors of the seventh century down to modern times.

Kumtor gives much attention to the environmental education of children, young people and adult population in communities, with local social and educational organizations and schools acting as its partners. For several years there have been working a children's environmental camp and an environmental festival for Jety-Oguz schoolchildren. Assistance was rendered to the NGO "Mairam-Yntymak" for the improvement of the coastal area in Sary-Kamysh by purchasing and planting trees.

Special care is given to war veterans as well as to disabled veterans and workers. This assistance is primarily designed to make them feel that society needs them. On the eve of Victory Day, the Company provided financial assistance for veteran organizations and individual veterans. Also, it has become a good tradition to organize meetings with war veterans residing in the Jety-Oguz district. For three past years, the Company has paid 500 soms in monthly life bonuses to each war veteran living in Barskoon, Tamga, Tosor, Kichi-Jargylchak and Chon-Jargylchak.

Photo 10-8: New Year celebrations in Jety-Oguz

In January 2011, KOC granted US **$10,000** in support of the orphanage in Krasnorechye during a charitable event organized by the Hyatt-Regency Hotel. As a result, the event raised US $40,000 which was used to renovate the roofing of and purchase essential goods for the primary school of the orphanage.

Throughout 2011, the Company held a series of charitable events and supported celebrations of International Women's Day, Victory Day, Children's Protection Day and New Year.

Also, KOC gave New Year presents to primary school students and kindergarten inmates in the Jety-Oguz district. Such events have become a good tradition which the Company is committed to continue in the future.

In 2011, KOC implemented a number of projects designed to contribute to the district's social and economic development, improve its social climate facilitating the Company's growth, regularly met with the local population to explain its activities, with an emphasis made on events demonstrating the Company's openness, accessibility, and readiness for cooperation which helped it win public support and enhance its positive perception.

10.5 VISITS TO THE KUMTOR MINE SITE AND THE REGION

Visits to the Kumtor mine site and the region by representatives of local communities, government bodies, international organizations, and NGOs enable them to see how the Company operates and works in the region. Company experts provide the visitors with details of various operations at Kumtor and their planned targets, while trying to give answers to the visitors' questions as fully as possible. The guests normally visit the key operations of the mine and are enabled to see living conditions at the mine site created for Kyrgyzstan citizens.

In 2011, the following visits were organized to the Kumtor mine site with CR participation:

- **February 15** – A group of Jety-Oguz and Ton district residents comprising community activists and representatives of the district youth movements.
- **April 22** – Participants of the seminar organized for the directors of Kyrgyzstan's vocational schools.
- **May 16-17** – two Norwegian professors, Richard Sinding-Larsen at the Norwegian University of Science and Technology (NTNU) and Kåre Kullerud at the University of Tromsø, visited the Kumtor gold mine accompanied by their colleagues from the Institute of Mining and Mine Technologies (IMMT) at the Kyrgyz Technical University. The Norwegian scientists arrived in Kyrgyzstan to assist preparations for an international project that implies the training of IMMT graduates in Norwegian universities.

- **June 16** – Participants in the EITI's Second International Conference "Following Validation: Looking into the Future of EITI". The delegation included representatives of Kyrgyzstan, Azerbaijan, Kazakhstan, Mongolia and Tajikistan.
- **June 23-24** – A parliamentary working group composed of members of the Zhogorku Kenesh Committee for Fuel, Energy and Subsoil Resources, representatives of ministries and government agencies, independent environmental, geology and glaciology experts as well as civil society activists. This visit was organized on the initiative of KOC Management.
- **August 8** – A group of district and village Keneshes, head of the Jety-Oguz district adminstration.
- **August 22** – A group of Peace Corps volunteers.
- **September 19** – A group of Jogorku Kenesh members, including Ravshan Jeenbekov, Dastan Bekeshov, Abdyjapar Bekmatov, Zamir Alymbekov, member of Bishkek City Kenesh Jusup Boshkoyev and the accompanying persons visited the Kumtor mine site. The visit was organized by Kumtor Operating Company Management at the request of various factions of the Kyrgyz Parliament who wished to visit the gold mine in order to see the real state of things at the mine.

Photo 10-9: Members of the parliamentary group, June 23-24, 2011

- **October 1-6** – A visit of Centerra Directors.
- **December 8** – A group of around 30 activists of Jety-Oguz, Balykchi, and Karakol civil society activists and government officials. The visit was organized by KOC Management in response to youth organizations' requests to visit the gold mine and see how it operates.
- Such visits to the Kumtor mine site have become a tradition. The Company is committed to continue its efforts towards making its activities as transparent as possible and enabling the local communities to see that production there is based on international experience and strictest environmental and occupational safety standards.

Photo 10-10: During a visit of Jety-Oguz civil society, December 8, 2011

MEDIA RELATIONS

11.1 Dissemination of information and cooperation with the media
11.2 Visits to the Kumtor mine site and the communities
11.3 Participation in public and charity events and other KOC's projects
11.4 Support for Media Organizations
11.5 Print and electronic media publications

Kumtor Operating Company strictly adheres in its activities to the principles of the Extractive Industries Transparency Initiative (EITI) which the Kyrgyz Republic has joined and also closely follows the strategic corporate line of sustainable development based on the principles of transparency which Centerra Gold Inc., as a public company, has proclaimed to promote access to information for any party concerned, including the broad public and media.

Photo 11-1. KOC President, Robert Vander, at a press conference

In the corporate management system, the functions of information dissemination are exercised via the Media Relations Department, which maintains close contacts with national, regional and international media organizations, providing them with information regarding the activities carried out by Kumtor Operating Company and Centerra Gold Inc. in the Kyrgyz Republic.

11.1 DISSEMINATION OF INFORMATION AND COOPERATION WITH THE MEDIA

Transparency and openness of the Company is one of the key principles underlying the activities of KOC. For purposes of creating an atmosphere of public trust in its activities and providing trustworthy information to all parties concerned (shareholders, partners, public), MR regularly publishes the Company's key financial data and other by:

- issuing new releases and official statements;
- organizing news conferences and meetings between Management of the Company and media workers;
- providing relevant information covering the Company's activities through media outlets and on its website **www.kumtor.kg**;
- arranging interviews for journalists;
- making corporate films and videos demonstrating KOC's activities and subsequently screened both nationally and regionally;
- distributing corporate reports through the media and during the events in which the Company takes part.

In 2011, more than 40 KOC's and Centerra's news releases were issued and distributed in the Kyrgyz Republic.

The Company regularly informed all parties concerned about the operating results, contributions to the national budget and the Issyk-Kul Development Fund as well as the other payments. Thus it was published by KOC:

- on January 11, 2011 - 2010 preliminary results and 2011 production outlook;
- on March 15, 2011 - 2010 operating results;
- on May 13, 2011 - 1st quarter, 2011, results;
- on August 17, 2011 - 2nd quarter, 2011 results;
- on November 24, 2011 - 3rd quarter, 2011 results.

Photo 11-2. Journalists at the mine site

In line with procedures adopted by the Company, quarterly reports on the Kumtor Gold Project's operating results and tax contributions to the Kyrgyz national budget are subject to obligatory publication, at the Company's cost, in the national, regional and district media outlets both in Kyrgyz and Russian. Thus, in 2011, the quarterly reports were published by the news agencies "24.kg" and "AKIpress", national newspapers "Vecherny Bishkek", "Slovo Kyrgyzstana", "Kyrgyz Tuusu", "Erkin Too", regional papers "Vesti Issyk-Kulya" and "Yssykkyol Kabarlary" and in the Jety-Oguz-based district paper "Jetyogyuz Janylygy". The news releases were also broadcast by various television channels and radio. These were issued as a material accessible in the Company offices and widely distributed during various public events and available to Company visitors.

In addition, on February 7, 2011, Centerra issued a news release on the updated reserves and resources, including Kumtor deposit.

The Company published various commentaries, explanations and refutations wherever biased or untrustworthy reports appeared in the media with regard to KOC activities. Specifically:

- on March 31, 2011, KOC commented on media reports related to the initiative of the Ministry of Natural Resources to impose economic sanctions on KOC to an amount of $22 million. The Management of Kyrgyzstan's largest investment project has lerned about it from media reports. No official notifications to that effect had come from the Ministry to KOC. The Company stated that KOC had always submitted mining reports and plans in time, including those in 2009-2010, and the Ministry never had any claims against the Company to this effect;
- on April 28, 2011, KOC circulated Centerra's statement containing commentaries on the meeting of Ata Meken faction in Jogorku Kenesh which considered the state of Kyrgyzstan's gold mining. The Company had to provide some elucidations as some of the MPs' pronouncements were out of synch with the real situation;
- on September 20, 2011, KOC circulated an official statement following an MP's and his escort's attempt to get into the territory of the mine site without any prior agreement with KOC Management;
- on November 4, 2011, KOC issued an official explanation regarding its operating plans to refute several MPs' pronouncements about the Company concealment of real volume of gold production which did not correspond to the facts;
- on November 25, 2011, KOC commented publicly the statement made by the Director of the Human Development Center "Tree of Life", K. Moldogaziyeva.

The Company made public statements with regard to various contingencies and road accidents:

- on May 24, 2011, KOC reported a road accident where a car collided with KOC's MACK truck;
- on November 28, 2011, KOC expressed concern regarding the illegal actions of picketers blocking an entrance to KOC's Marshalling Yard (BMY);
- on December 6, 2011, KOC informed that BMY operation has been restored.

KOC's Media Relations and the Kyrgyz Government's press service covered meetings between the Presidents of Centerra and KOC and KR Prime Minister and Vice Premier:

- on January 28, 2011, KOC issued a report about the working visit of Stephen Lang, President of Centerra, to Kyrgyzstan;
- on August 30, 2011, KOC reported about a meeting between the Kyrgyz Prime Minister, Almazbek Atambayev, and the President of Centerra Gold Inc., Stephen Lang. During the meeting, Stephen Lang informed the Prime Minister about the Company Directors' decision to contribute $10 million for construction of the new schools in Kyrgyzstan;
- on October 4, 2011, KOC reported about a meeting between Centerra's President Stephen Lang and KR First Vice Premier, Acting Prime Minister Omurbek Babanov.

Also, the Company informed:

- on October 3, 2011, Stephen Lang, President and CEO of Centerra, Kanat Sadykov KR Education and Science Minister, and Osmonbek Artykbayev, Chairman of Kyrgyzaltyn Board visited a school # 2, at Alamudun, Chu Province, constructed on the money sponsored by Centerra Gold Inc.;
- on October 7, 2011, the Centerra President and the members of the Board of Directors visited the Issyk-Kul Province to see a number of social and business projects implemented by KOC.

In 2011, the Company continued cooperation with the EITI Secretariat of the Kyrgyz Republic. On June 18, 2011, the Company reported its Management's participation in the 2^{nd} International Conference "Following Validation: Looking into the Future of EITI". As part of the Conference program, a number of its participants visited the Kumtor mine site.

On October 4, 2011, the Company publicly announced that it became a Supporting Company of the Extractive Industries Transparency Initiative. Kumtor Operating Company had supported EITI from its inception in the Kyrgyz Republic.

The Company reported regularly about the various visits to the mine site:

- on May 18, 2011, the Kumtor mine site was visited by a group of representatives of the Mining Engineering and Technologies Institute, the Kyrgyz Technological University, and two Norwegian professors of the Norwegian University of Science and Technology and University of Tromse;
- on June 27, 2011, the Kumtor mine site was visited by a parliamentary working group. KOC Management proposed to the members of the Working Group and the Jogorku Kenesh Committee of Fuel-and-Energy Complex and Mineral Resources to visit the gold mine. The parliamentary delegation consisted of four lawmakers – Raikan Tologonov (the Working Group head), Urmat Amanbayeva, Elmira Jumaliyeva, and Mirlan Bakirov. In addition the other members were included to the working group: representatives of ministries and government agencies, independent environmental, geology and glaciology experts as well as civil society activists;

Photo 11-3. President of "Centerra Gold Inc.", Stephen Lang, during a visit to the area of construction of a new building of high school number 2 in Alamudun village of Chui region

- on September 19, 2011, the members of Jogorku Kenesh visited the Kumtor mine. The visit was organized by Kumtor Operating Company Management on the request of various fractions of the Kyrgyz Parliament, they visited Kumtor to see the real situation at the mine;
- in October-November 2011, a 10-part film, "Height Winners", showing the mine operations, was televised nationally by OTRK, EITR, and Channel 5;
- on December 8, 2011, the Kumtor mine site was visited by 30 civil society activists and a group of Jety-Oguz and Balykchi residents, Issyk-Kul Province.

Traditionally, serious attention was paid in 2011 to the Company's activities in communities, KOC-sponsored events and its support for sustainable development projects:

- on April 19, 2011, KOC provided diesel fuel to the farmers of Ton and Jety-Oguz districts at a reduced price;
- on June 2, 2011, Media Relations reported on the opening of a children's playground at Balykchi, which was constructed with KOC's support;
- on June 13, 2011, MR reported about a II National Judo Tournament among juniors for the Cup of Janek Baatyr at Tosor organized with KOC's support;
- on June 30, 2011, MR reported about a meeting of the Regional Cooperation Committee at Ton, which discussed the opening of the KOC-sponsored micro-credit agency "Ton Finance";
- On June 1, 2011, MR reported on the opening of the micro-credit agency "Ton Finance" at Bokonbayevo, Ton District;
- on July 6, 2011, MR reported about the opening of a kindergarten at Ton, which was renovated at KOC's support;

Photo 11-4. KOC Regional Information Center in Barskoon village

- on September 18, 2011, MR reported on the testing of a new biopolymer agent for dust suppression on the access road to the Kumtor mine;
- on September 27, 2011, MR reported on the KOC-sponsored National Greco-Roman Tournament at Saruu, Jety-Oguz district;

- on December 30, 2011, MR reported on an extended meeting of the Supervisory Board of Issyk-Kul Development Fund, which discussed the 2011 results.

In 2011, a 10-part documentary, "Height Winners", was released with KOC's support. It focused on the Company's activities, its operations, working and living conditions created for KOC employees. In October-November 2011, it was televised by national channels.

In 2011, the corporate website **www.kumtor.kg** was developed and launched in Kyrgyz, Russian, and English languages. It provides information with regard to the Company's history, deposit development stages, operating and financial results, reserves and resources, environment reports, vacancies, hiring procedures, news releases and media publications featuring KOC. The website also provides the news previously televised and the documentary film "Height Winners".

11.2 VISITS TO THE KUMTOR MINE SITE AND THE COMMUNITIES

Organization of visits to the Kumtor mine remains an important component of MR activities with communities because such visits enable representatives of the general public, government authorities, diplomatic corps and international organizations familiarize with KOC operations, working conditions at the mine and ascertain the Company's compliance with strict safety standards as well as to see KOC's activities in the communities.

In 2011, MR and Community Relations organized over 20 visits to the mine site. Thus, the mine site was visited by three parliamentary groups, representatives of local communities in Jety-Oguz and Ton Districts, of Karakol and Balykchi, Issyk-Kul Province administration, experts of the KR National Registration Committee, representatives of the Mining Institute of Kyrgyzstan, and two Norwegian professors. The vocational and training school teachers, a group of participants in the EITI Conference, Peace Corps volunteers (USA), representatives of ZiJin and Altynken Ltd. Corporations, and Ambassadors of France and Germany in Kyrgyzstan also visited the mine to familiarize with KOC operations. In addition, MR has organized the visits for the filming teams of various television channels, including OTRK, EITR, Channel 5 for preparing news reports about the Company. Assistance was rendered to Russia Today and Mir television reporters in the preparation of thematic programs focusing on gold mining and economic development of Kyrgyzstan. The number of television pieces, video and photo reports were made following Reuters' visit to the mine site. An introductory trip was organized for representatives of Vecherny Bishkek Publishers and Philip Shishkin, Wall Street Journal's reporter.

Jointly with Community Relations, MR organized six trips to Issyk-Kul province where the Company implements a number of key social projects and holds charity events. Thus, media coverage was given to the opening of a renovated kindergarten at Ton, a village hospital at Ananyevo as well as various sport events held throughout the district with KOC's support.

A trip was also organized in 2011 for a group of representatives of KOC, province administration and leading media outlets to Issyk-Kul province to see construction sites sponsored by the Issyk-Kul Development Fund, including a hospital at Cholpon-Ata, a school at Oy-Taleh, a Cultural Center and a school at Kurmenty, etc.

Photo 11-5. Jogorku Kenesh Deputies on the mine site

As this practice shows, visits to the Kumtor mine site enable the Company to display the great scale of work being done on the deposit development, compliance with high standards of occupational and environmental safety and demonstrate the results of KOC's activities in the communities.

11.3 PARTICIPATION IN PUBLIC AND CHARITY EVENTS AND OTHER KOC'S PROJECTS

Direct meetings between Company Management and the members of Parliament, representatives of NGOs and other civil society groups remain an important part of dialogue with government structures, civil sector, general public and the media. Therefore, KOC Management took part in various public meetings, round-table discussions, and seminars with regard to the Company's activities. Apart from personal meetings, KOC representatives were participants in various international and national conferences and seminars.

Particular attention was given in 2011 to corporate social responsibility (CSR). In 2010, a national competition, Partnership-2010, was announced for the best media coverage of CSR in Kyrgyzstan with a view to attracting journalists' attention to this issue and decorate the best reporters and media organizations covering this problem. The competition was sponsored by KOC and CSR Business Network. A total of 101 reports were submitted by 26 journalists, representing 23 media outlets. These were stories, television and radio reports that had been published or aired in 2010 through January 2011 covering business contribution to the growth of the Kyrgyz Republic.

During the competition, serious attention was given to its transparency and the jury's professionalism and objectivity. The competition's jury comprised seven partner organizations, including the International Business Council, Central Asian Institute of Free Market, AmCham in Kyrgyzstan, Media Policy Institution, Eurasia Central Asia Fund, Internews Network and the Journalists Association.

A victory ceremony of the Republican competition Partnership 2010 was held on February 25, 2011, and was attended by Robert Wunder, KOC President,.

In 2011, KOC also supported a publication of the book "Corporate Social Responsibility: Complex Things in Simple Words". The presentation was held in Bishkek as part of the Corporate Social Responsibility Week (September 12-16, 2011), organized by CSR Business Network, Aga Khan Foundation, BAS of EBRD, AmCham, International Business Council, and OSCE. KOC President has also participated in the seminar "CSR for Business and Society".

In May 2011, KOC President attended the presentation of AmCham's project "Success Story: Career Advice".

Photo 11-6.: The book issued under the KOC financial support

In 2011, Company Management participated in the Central Asian Mining Congress held on June 20-22, 2011, in Almaty (Kazakhstan).

In September 2011, by the invitation of the KR Ministry of Natural Resources and the National Academy of Science, the Company took part in the national thematic exhibition, Mining-2011, where KOC provided information about advanced technologies and innovations adopted by the mine.

In November, the KOC Management took part in the celebrations of the 80th anniversary of Jety-Oguz District held at Kyzyl-Suu.

Throughout 2011, KOC organized charity events covered by the national media.

In June, KOC employees participated in a charity marathon organized for raising funds to support the oncological departments of children's hospitals in Bishkek and Osh. In addition, the Company handed over children's book in Kyrgyz and Russian.

In October 2011, Robert Wunder, KOC President, took part in the opening of the overhauled primary school of the special boarding school for handicapped and uncared for children at Krasnaya Rechka. Pamela Spratlen, the USA Ambassador Extraordinary and Plenipotentiary in the Kyrgyz Republic, the representatives of Hayatt Regency Bishkek and senior officials of Issyk-Ata administration attended this official ceremony as well. The funds for the renovation were collected by a number of companies and international organizations under their charity programs.

In November 2011, KOC employees and contractors joined the other charity marathon designed to raise funds for purchasing the children's respiratory apparatus to meet the needs of the Resuscitation Department of the National Research Institute of

Photo 11-7: KOC Vice President, Andrew Sazanov, and a Mayor of Balykchy, Mirbek Boobekov, at the opening of the playground in Balykchy

Heart Surgery and Transplantation of Organ. This action was initiated by the newspaper "Vecherny Bishkek", Internet Forum "Diesel" and the "Help the children-SKD" Public Charitable Foundation.

In December 2011, KOC provided the aid to the five schools and one kindergarten "Cholpon" in Balykchi, which were affected by the storm.

KOC organized the traditional events dedicated to Children Protection Day and New Year celebrations.

In 2011, KOC sponsored a subscription of children's newspaper Ay-Danek for the children institutions, libraries and schools in Naryn and Issyk-Kul provinces.

11.4 SUPPORT FOR MEDIA ORGANIZATIONS

In 2011, the Company continued its support for regional media organizations.

KOC contributed funds for the editorial boards of the newspapers "Vesti Issyk-Kulya" and "Yssykkol Kabarlary" for subscription of their newspapers by the schools, libraries, veteran organizations and pensioners of Issyk-Kul province.

The Company continued providing a support for the district newspaper "Jetyoguz janylygy".

In 2011, KOC continued its support program for regional media organizations. Under this program, the Company, in partnership with NGOs, organized the educational training sessions, thus helping a regional mass media raise a professional level of their journalists and editorial staff. With KOC's financial and organizational support, on the basis of the public association House of Journalist and in cooperation with national media outlets and NGOs, a training center, School of Journalism was opened in 2011. Its equipment enables it to hold the series of training sessions for media workers and students of the Journalism Department of Karakol National University.

11.5 PRINT AND ELECTRONIC MEDIA PUBLICATIONS

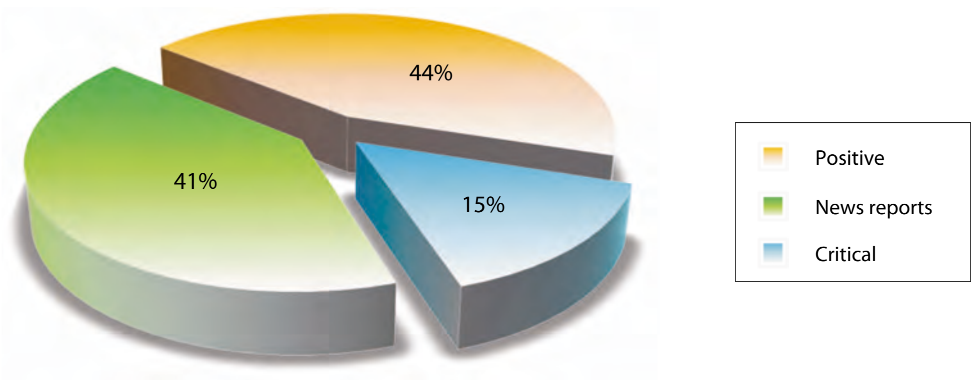
MR is monitoring and analyzing both international and Kyrgyz media publications regarding KOC.

In 2011, the Kyrgyz media, as before, gave much attention to the Company's activities. A total of 1,037 items were issued by the print and electronic media throughout the year that wholly or partly concerned KOC and Centerra.

Table 11-1: KOC-related media publications

	Total number of items	Including:		
		Positive	Neutral news reports	Critical
Newspapers and magazines	328	168	142	18
News Agencies' Reports	256	63	167	26
Television	76	48	17	11
Radio	64	23	31	10
Total	724	302	357	65

Diagram 11-1: KOC-related items published in 2011



SECTION 12

PLANS AND TARGETS

12.1 Company Perspectives

12.2 Environmental Targets for 2012

12.3 Safety Targets and Objectives

12.4 Mine Production Plan

12.5 Improvement is the key to sustainable development

12.1 COMPANY PERSPECTIVES

2012 Production plan is expected in the range of 390,000 to 410,000 ounces or 12.13 -12.75 tons of gold.

Change of production plan caused by the acceleration of movement of ice and rock in the south-eastern part of the pit, which requires removal of ice and rock from this part of the pit. Due to this, mining operations in the higher grade ore, SB zone, delayed for 2013-2015.

12.2 ENVIRONMENTAL TARGETS FOR 2012

KOC provides the wide environmental targets and objectives as part of the Environmental Management Action Plan that will be implemented at Kumtor mine. They are shown in Table 12-1.

Table 12-1: Environmental Performance Indicators for 2012 Targets

Environmental Performance Indicators	2012 Targets
Non Reportable Incidents (Type I Classification)	<10
Low Impact Spills (Type II Classification) and Reportable Spills (Type III, IV, V Classification)	0
Exceedances – Potable Water or Water Discharges	0

2012 Targets:

- Continue the investigations of river sediments and Fauna and hydrological investigations.
- Improve the Program of waste disposal and waste recycling.
- Continue the monitoring of the Lake Petrov hazard outburst according to the experts' recommendations.
- Continue the revegetation measures as part of Kumtor mine Closure Conceptual Plan, taking into consideration the recommendations of Consultants.
- Relocation of Effluent Treatment Plan to the new area.

12.3 SAFETY TARGETS AND OBJECTIVES

The indicators reflecting exactly the overall performance of the HSMS will be used in 2012. These lead indicators will be the targets of managers and supervisors staff.

KOC departmental safety performance during 2011 will be measured through specific departmental safety plans which have been introduced to support KOC's health and safety objectives.

Specific objectives for KOC 2012 will be:

Table 12-2: Lag indicators

KPI	Actual-2011	Target-2012
Lost Time Injures	2	0
Medical Aids (total number)	8	<15
RIF	0,31	<0,40

Leading Indicators:

- Maintenance of the high Safety standards;
- Lag Indicator review and Target Setting;
- Improvement of Program on exposure of risk source, timely assuming of preventive and remedial measures;
- Quality of Workplace Inspections and Toolbox Meetings should comply with the requirements of formalized checklists & Formalized Functional Program;

- Expand the "Safety Task Observation Program. General Safety Regulations on operation area";
- Each Department to set leading Safety and HSE indicators on the basis of previous years data;
- HIRAC Continuing – Strategic Risk Management & Management of Change;
- SAFEmap program continuing.

12.4 MINE PRODUCTION PLAN

Central Pit

Creep deformation on the SE Wall of the SW Pit Bottom has created a difficult mining environment. The creeping portion of the wall is heading towards the area of high-grade mineralization.

"The 2012 Central Pit Development Special Design" was produced to mitigate ramifications and increase pit production ensuring safe and stable behavior of the pit wall. In 2011, the unloading practices will be applied on the problematic wall, creeping material taken out, lower benches exposed, dropcuts into ore and consistent delivery established.

In 2012, the additional mine technique will be purchased including 25 CAT 789C haul trucks (payload 177 t), 4 drilling rigs, 4 Hitachi 3600 shovels.

Underground Development Plan for 2012

According to the Plan the Underground development will include ten main types of underground openings. The table 12-3 presents the parameters of openings and volume of mining development.

In 2012, the larger volume of exploration and geotechnical wells' drilling on stockwork drive is planed and the issue of further advance of stockwork drive will be settled on the basis of drilling results.

Table 12-3: The main types, parameters and volume of mining development in 2012

Type of opening	Finished section		Decline grade, %	Length, m
	Width, m	Height, m		
Decline 1B	5,2	5,9	-15	206,9
Remuck Bays, Equipment parking bays, and drill bays.	5,5	5,9	2,2	27
Safety bays	2	2,0	0	6
Total in 1B:				**239,9**
Decline 1S	5,2	5,9	0,62	60
Safety bays	2	2,0	0	2
Total:				**62**
Decline 2S	5,2	5,9	-15	627.5
Remuck Bays, Equipment parking bays, and drill bays.	5,5	5,9	2,2	127
Safety bays	2	2,0	0	20
Total:				**774,5**
Decline SB	5,2	5,9	-15	263
SB ventilation heading	5,2	5,9	-15	173,5
SB-Vent-Con			-15	119
SB1 ventilation raise			223	12,5
SB vent drive			-15	53
Remuck Bays, Equipment parking bays, and drill bays.	5,5	5,9	2,2	65,5

Type of opening	Finished section		Decline grade, %	Length, m
	Width, m	Height, m		
Safety bays	2	2,0	0	10
Total:				**697**

In 2012, the total length of underground mining development will be 1,772.9 rm. The mining will be performed in various types of geologically complex ground, which will require the various types of ground supports and driving modes.

Bays' openings

Remuck Bays will be located in 100m-120m intervals downwards the decline. They are used for:

- loading and storage of blasted rocks;
- exploration drilling;
- geotechnical drilling;
- equipment parking;
- safety bays.

The total length of bay driving in 2012 will be 219.5rm. They will be located on the both sides of declines' walls directed to the ore body. The planed rate of bay driving will be 2.6 m/day.

Safety bays for pedestrian

Safety bays will be located in each 25m downwards the decline where there are not the other safety places for the workers during the movement of self propelled equipment. Safety bays will be located in the right and left sides of decline. The total length of driving for safety bays in 2012 will be 38rm.

The Project of underground development is coming to the break through stage of declines 1 and 2 in the third quarter of 2012, and a crossing of the first ore at the SB zone is expected in the second quarter of 2013.

12.5 IMPROVEMENT IS THE KEY TO SUSTAINABLE DEVELOPMENT

"(...)Kumtor Gold Project is the first and the largest international mining project in Kyrgyzstan's post-Soviet history.

Kumtor Operating Company is the operator of this unprecedented project. Its clear objectives and strategies, efficient planning and a great sense of social responsibility have enabled it to lead both the Kyrgyz mining industry and economy for the past fifteen years.

Kumtor's high production achievements are the result of the cooperative and professional efforts of thousands of its employees. Advanced technologies, skilled expatriate staff and implementation of training programs for national labor have contributed to the Company's stable gold production".

Robert Wander, President "Kumtor Operating Company".

APPENDIX A

KUMTOR PROJECT DESCRIPTION

HISTORY

The Kumtor gold project derives its name from the Kumtor River. The mineral exploration was conducted from 1920 in an area beside the headwaters of this river system but a precious metal deposit was discovered in 1978. Prospecting, surveying, surface trenching, drilling and the development of the first underground adit were carried out from 1979 to 1983. Between 1984 and 1989 a second underground adit was developed and detailed exploration began. About 60 kilometers (km) of underground adit and crosscutting occurred, and approximately 77,000 meters of core drilling was completed.

At the completion of exploration, no reclamation activities were undertaken and the future site of the camp area and the open pit were littered with domestic and construction waste, abandoned housing, surface structures, and disturbed soils. However, with the independence of the KR and other republics of the former Soviet Union in 1991, Kumtor and other mining opportunities became available to Western companies.

Cameco Corporation (Cameco) was one of the first major mining companies to seriously examine such opportunities, and in December 1992, Kyrgyzaltyn, on behalf of the Government of the KR, and Cameco accepted an agreement on the joint development of Kumtor deposit. The Kumtor Gold Company (KGC) was a two-thirds the KR and one-third Cameco joint venture. KOC, a wholly owned subsidiary of Cameco, was created to operate the gold project on behalf of the joint venture.

In accordance with the Agreement regarding the joint development of Kumtor mine, the all gold, produced by the Kumtor mine as Dore alloy was transported for reprocessing at its refinery in the Kyrgyz Republic. In addition, the KGC tax regime was governed by this Agreement. A Construction and development began in 1994 and was completed in early 1997 at a cost of approximately $450 million (US). As an equity investment, Cameco provided the first 10% of development costs for the project. Additionally, Cameco provided an additional 23% as a loan to KGC. A consortium of international financial institutions advanced the remaining 66% of the cost in loans to the project. This included loans from the EBRD and IFC in the amount of $10 million each.

The detailed engineering was executed by Joint Venture Kilborn - Enka, general designer, with wide involvement of local design organizations. The facility's construction was carried out concurrently with engineering design by approval of the KR - Resolution, #895, as of December 28, 1994 on "Authorization for Kumtor Operating Company to Develop the Engineering Documentation Concurrently with the Construction of Kumtor Gold Project Facilities".

Kilborn-Enka was also the general contractor. Both local and foreign construction companies were involved in the project. From November 1996 to April 1997 commissioning and start-up was carried out at the Mill and other mine facilities. On December 31, 1996 the first gold of Kumtor deposit was poured. The beginning of industrial gold production is dated by May 1997.

KOC received the temporary approvals for commissioning and operations from 1996 to 1999. On March 31, 1999, the KR State Acceptance Commission granted the final approvals for operations of all facilities excluding the TMF. The State Acceptance Committee then granted final approval for TMF in December 1999.

The Kilborn Feasibility Study was based on an average gold price over $350/oz and as a result of the deflated precious metal price from 1998 to 2002, where the average gold price was below $300/oz, some of the short term benefits and proceeds to the Kyrgyz Government were not yet realized. The offer to restructure the Kumtor Project came about as the result of the Kyrgyz Government insisting on minimizing its financial risks and stabilizing its proceeds from the Kumtor Project. With Cameco's commitment to the project and the value placed on the relations with the Kyrgyz Republic, the process of restructuring the Kumtor Project commenced.

In order to accomplish the restructuring goal, Cameco took a number of steps towards the segregation of its gold assets and listed a newly formed gold company called Centerra Gold Inc. The first step in the formation of Centerra was the merger of Cameco and Australian Gold Resources (AGR) gold assets. This brought Boroo Gold (Mongolian gold mine) and REN (Nevada, USA – advanced exploration) into the newly formed gold company. After a number of agreements and a Kyrgyz government decree of December 2003, KGC became wholly owned by Centerra Gold Inc. In the agreements, Kyrgyzaltyn has received a 33% of common share interest in Centerra, which amounted to 18.8 million of ordinary shares.

As part of 2004 restructuring, EBRD and IFC who were original lenders at the start of the Kumtor project entered into agreements to exchange their outstanding loans to the Kumtor projects into shares. In addition, Centerra agreed to continue to follow applicable World Bank policies and allow the representatives of IFC and EBRD to visit the Kumtor Operations on annual basis.

As part of 2004 restructuring, Centerra, Cameco, Kyrgyzaltyn and the Kyrgyz Republic entered into an agreement pursuant to which, effective simultaneously with the completion of the Kumtor restructuring, the Kumtor Master Agreement (the "Master Agreement") entered into force in 1992 was replaced by an Investment Agreement (the "Investment Agreement") of December 2003, between Centerra (Canada), KGC and the Kyrgyz Republic. The new Investment Agreement and related agreements set out the terms and conditions applicable to the ongoing operation, development of the Kumtor mine, and the conditions of tax regime.

On April 24, 2009 Centerra negotiated a new Agreement with KR Government and Cameco on new conditions regarding Kumtor Project. This Agreement was ratified by the KR Parliament (KR Law #142 of April 30, 2009).

On June 6, 2009 a Restated Investment Agreement was secured between the KR Government, Centerra Gold Inc., Kumtor Gold Company CJSC, and Kumtor Operating Company CJSC.

In 2004, due to this restructuring, KGC paid to the KR Government USD22.4 million, Centerra issued 18, 232, 615 ordinary shares in favor of Kyrgyzaltyn, and Cameco transferred to Kyrgyzaltyn the ordinary shares of Centerra on the amount of USD25.3 million .

In December 2009, Cameco fully realized its share in Centerra and currently, Cameco is not the shareholder of Centerra.

LOCATION/CHARACTERISTICS

The Kumtor Project is one of only a handful of remote, high altitude mines operating in the world today. It is situated on the northwest slope of the Ak-Shyirak mountain range of the Tian-Shan Mountains in the north-east quarter of the KR (Figure A-1). The mine and its ancillary services lie at an altitude of 3,600 to 4,400 m above sea level. The project is located approximately 60 km south of Lake Issyk-Kul and 60 km northwest of China.

Its administrative-territorial location is Dzety-Oguz District, Issyk-Kul Region. The main access road to the deposit is the road along the River Arabel (95 km) from Kumtor to Barskoon village. The deposit area is characterized by what has been described as "severe climatic conditions" (an average yearly temperature of -8 degrees Celsius (°C), year round snow, active glaciers and several hundred meters of permafrost extending to the hundred meters depth).

The Kumtor River originates from Petrov Lake, which is located at the foot of Petrov Glacier and enters the Taragai-Naryn–Syr-Darya River system of the Aral Sea Basin.

Figure A-1: Map of Kyrgyzstan

Soil conditions as well as the wildlife and vegetation are typical for Tian-Shan high-altitude areas with two to three meter active layer of permafrost. One of the plant types, Ranunculus family (*Hedysarum kirgizorum*) and a number of wildlife species in the area of the Minesite including mountain sheep (*Ovis ammon karelini*), snow leopard (*Panthera uncla*), Siberian Ibex (*Capra sibirica aliana*), golden eagle (*Aquila chrysaetos*) and bearded vulture (*G ypaetus-barbatus*), are included in the Red Data Book of Kyrgyzstan.

GEOLOGY

The deposit is located in the southern side of the largest Tien Shan fault (Nikolayev Line) separating Caledonides (from the north) and Hercynides (from the south). Smaller northeast disturbances are widely developed in the hanging (southern) wall of this regional fault: diachronous differently-facial effusive-carbonate-terrigenous thicknesses of Riphean, Vendian and Paleozoic age form narrow elongated blocks superimposed over each other. The deposit is confined to one of these faults (Kumtor fault). The oldest rocks of the deposit are metamorphosed greenish-grey arkosic conglomerates-gravelites of the Kashkasu suite R3, spread in the eastern part of the area, and metamorphosed basalts and slates of the Jargalach suite R3, nipped in tectonic blocks in the western part of the area, but not occurring in the Central Pit area.

The Kumtor deposit represents a zone of corrugation, boudinage, brecciation and crushing of the Jetymtau suit Vendian rocks. It was repeatedly renewed during early- and late-orogenic stages of the area development and as a result of it the thick ore-controlling folded-discontinuous structure of the deposit was formed – the Kumtor zone of contortion to 400m thickness, traced in the northeast direction over tens of kilometers.

In the Central area this structure on the cross section is sharply split into four parts. The hanging wall of the Kumtor fault (Zone-0) represents a mélange zone with scarce fragments of mineralized oxidized zones. The Kumtor fault zone represents a highly mylonitized and carbonized phyllite with frequently occurred boudins of ore metasomatites which is named at the mine site as Zone-I.

Less disturbed but intensively altered phyllites in a band of 100-300m width, forming the Main mineralized zone of the deposit (Zone-II) occur in the hanging (southern) wall of the Kumtor thrust. Its upper boundary is the Southern fault. Ore zones are pone to structurally directed metasomatic alterations of different degrees; content of the useful component in ore correlates with presence of sulphide mineralization. The main ore mineral is pyrite. Gold-bearing pyrite is developed in form of thin veinlets and impregnations in metasomatites and metasomatically altered rocks. Essential part of gold is confined to pyrite, remaining gold occurs in quartz, carbonate, and feldspar.

Zone-III occurs in the hanging wall of the Southern fault, where a flat-dipping ore body and stockwork mineralization near the Southern fault is fixed.

Mineralization of the Central area is traced down dip to 3250m. Mining of ore bodies to 3618m elevation is planned by open pit method. Below the mining of the ore bodies is possible only from the underground. For that since 2010 the preparatory operations have been carried out: ramps from two Declines and a number of exploration drilling bays are built. During the beginning period of the preparatory operations the advanced geotechnical drilling, which facilitates study of host rocks, is carried out from the drilling bays. The results of this drilling are considered at construction of the ramps. Then, from the same drilling bays the exploration drilling is performed for further tracing of ore bodies, their parameters and economic conditions in accordance with the underground mining requirements.

DESCRIPTION OF OPERATIONS

The Kumtor mine is an open pit operation and includes ice removal (when cutting back benches), conventional drilling, blasting and hauling. The primary mine equipment in use consists of 80 and 130 tonne trucks, 12 and 16 m^3 shovels, 12 m^3 loading units, and blast hole drilling rigs. Depending on the area worked, waste is hauled and dumped at one of the glacier waste rock dump areas. Ore is typically hauled directly to the crusher or to an ore storage area for future blending and processing. A mine dispatch station is located on the top of the lookout above the Mill from which the mine fleet movement is optimized with the help of a Global Positioning System (GPS).

An automated geo-technical monitoring is part of KOC's pit operations. Two automatic survey stations comprise the Leica Monitoring System and are situated on the southern and western sides of the pit to measure displacements of the northern and eastern walls. The stations are connected via a Local Area Network (LAN) and both feed the survey measurements to a computer located at the station on the western side of the pit. The computer controls the system and runs a program that monitors the measurements, which set benchmarks for dangerous situations. When one of these benchmarks is realized, an alarm will be activated. The alarm consists of a siren and flashing light on the western side of the pit and also directly to the mine dispatch station which is manned 24 hours a day. Information from this computer is sent to the engineering office and to the camp, which allows a control over the pit wall condition on an around the clock basis. Monitoring is carried out on a frequency of every hour to every eight hours depending on the area of the pit.

Deep inclinometers have also been installed in drill holes on the 4,370m, 4,298m and 4,082m benches in the pit. The instrumentation in these holes is connected via a telemetry system to a computer in the dispatch station. The system constantly measures for displacements in the holes. When limits of displacement are reached in the holes, an alarm system is activated on the computer in the dispatch station.

The ore is reclaimed from the outside stockpile using apron feeders located within a tunnel under the stockpile and fed to the grinding circuit. The ore is then wet ground to 80% passing 100 mesh using a Semi-Autogenous Grinding (SAG) mill in a closed circuit with a pebble crusher, followed by a ball mill in a closed circuit with hydro-cyclones.

In 2005, as a result of continuous modernization of operations, an ultrafine grinding mill or ISA-Mill was installed to grind the concentrate prior to cyanide leaching down to a particle size of less than a 38 µm screen size. The ISA-Mill is an important process in the sustainability of the future KOC operations to maintain higher recoveries as the grade of the ore changes at different stages of on-going pit development.

The milling process uses pyrite flotation and carbon-in-leach (CIL) technology where both the reground pyrite concentrate and the flotation tails are leached in separate circuits. High rate thickeners reclaim as much water as possible from the flotation concentrate, flotation tails feed, reground flotation concentrate CIL feed and final tails.

The mill is controlled by a Foxboro I/A Control System. This system allows the operation of all milling processes from the operator control room. Since the mill was commissioned, progressive changes have been made to the mill process to achieve process improvements, enhanced recovery, and reduce reagent consumption. In 2002, process refinements included the addition of a cyanide control system and the conversion of the first concentrate leach tank to a pre-aeration tank at the beginning of the leach tank circuit. In addition, the Mill continues to recycle spent carbon fines, a process developed in 2000.

The Kumtor Tailings Management Facility (TMF) consists of tailings pipeline, tailings dam, Effluent Treatment Plant (ETP), and two diversion ditches.

The tailings pipelines at the Kumtor Gold Project are approximately 7,000 m in length and have an approximate vertical drop of 400 m. It consists of a single 450 mm diameter High-Density Polyethylene (HDPE) pipe with a wall thickness ranging from 20 mm to 40 mm.

The operation of the second line provides a reduction of Mill downtime due to pipe wear and leak detection, and the ability to conduct preventive maintenance work on one pipeline while utilizing the second line. The tailings line pressure, velocity, pipe wear and correct orifice station arrangement and size were optimized. A compacted earth pipe bed was designed and constructed to lay both the existing pipeline and the new pipeline onto the tailings line security road. This bedding base is capable of containing runoff flow from precipitation events and any potential leakage of tailings from the line.

A berm with a minimum height of 0.75 m was placed between the tailings line berm and the main water line for added protection. The tailings line security road and outer berm as well as the waterline protection berm are designed to function as the pipeline secondary containment system. Access to the secondary containment area on the security road is limited to security patrols and maintenance. In critical areas where a line rupture could potentially result in a release to a watercourse, concrete trays and larger road berms have been used to protect the tailings lines. The flexibility with having a spare line allows KOC to lift the empty line perform to complete non-destructive testing with the ultra-sonic thickness gauge. The line was officially commissioned in 2002 following a hydrostatic pressure test and approval by proper regulatory authorities.

The tailings from the Kumtor Mill are composed approximately of equal parts of water and solids and contain small amounts of chemicals from the flotation and leaching circuits, including frothing agent, collectors and Sodium Cyanide (CN) complexes. The tailings are transported from the Mill to the tailings dam by gravity via a closed pipeline.

The tailings are contained in a single tailings basin created through the construction of a tailings dam across the former Ara-Bel Suu lower discharge valley. The dam is an engineered structure designed and constructed with a permanently frozen inner core. A synthetic liner was placed on the upstream side of the dam to assist in initiating the frozen core during the early stages of construction and operation and for seepage control.

The Tailings Dam is approximately 3,000 m in length and 34 m (2011) in height and constructed from alluvial material. The dam has a minimum 10 m crest width and 3:1 upstream and downstream slopes. An additional three-meter lift is constructed in stages and should be completed every second year. These activities are in accordance with Tailings Dam Operating Plan and Golder Associates Tailings Dam design.

Although the first bar of gold was poured in December 1996, KOC did not discharge any treated tailings effluent until June 1999. During this two-and-a-half-year period, all effluent was stored in the tailings basin area. During the winter of 1998-1999, the ETP was built to treat 1,400 m3/hr of tailings effluent. In 2001 and 2002, upgrades were made to the ETP that increased the tailings effluent treatment capacity to 1,700 m^3/hr improved efficiencies and decreased the unit cost of operation. The purpose of the ETP is to destroy cyanide in the effluent, to precipitate out metals and to ensure that all water quality objectives are met before the treated effluent is released to the Kumtor River. Effluent is pumped from the tailings pond using a maximum of six pumps. There are three separate ponds that are used in the treatment process. The last pond of the process, Pond 3, provides more than three weeks storage and contains the treated effluent prior to discharge to the Kumtor River. Ensuring that contaminant levels are not above the Maximum Allowable Discharge (MAD) values or Canadian MMERs, KOC samples four locations along the treatment process before the water is discharged to the Kumtor River. These locations are as follows:

- Tailings pond before treatment
- CN destruction Pond 1-Outflow
- Metal precipitation Pond 2-Outflow
- Polishing Pond 3-Outflow.

KOC uses modular trailer units which are connected together to form the main camp. Both KOC employees and contractors are housed in the camp and population levels can rise above 1500 depending on the season.

Water supply and sewage treatment are important components of the camp operation and a part of the environmental monitoring.

All raw water used for potable purposes was pumped from a Glacier fed lake, Petrov Lake, via a six-inch line. The raw water was treated through flocculation, filtration and chlorination. To facilitate flocculation in the WTP, raw water is aerated upon entry to the plant. A polyelectrolyte is added to reduce repulsion between colloidal particles and alum is added for flocculation and coagulation. The water then passes through a parallel-plate settling chamber. After settling, the water is filtered through a sand filter to remove any remaining sediment that passed the settling tank. Water is then filtered through activated carbon for removal of taste, odour and color. There are duplicate sand and activated carbon filters to allow for backwashing. A dose of chlorine is then added for disinfection and the water flows into a storage tank where adequate contact time is provided for the chlorine disinfection process. As the water is drawn from the storage tank to the camp it is exposed to a ultra-violet light for disinfection. Chlorine (twice daily) and fecal coli form tests are performed to ensure water quality.

In 2007 and in 2010, the additional КУ-200 utilities (6m^3/h capability) were set in operation due to the annual increase of KOC and contractors employees' quantity and the increase of water consumption accordingly. The total capability of WTP is 27m^3/h.

In 2009, the new treatment facilities for potable water which have analogy with installed in the WTP (the capability is 3m^3/h) were installed for the Mill needs.

In the STP, raw sewage from camp is gravity fed through a 2.5 m^3 in-line settling tank where coarse material and grit are removed. The sewage is then pumped to a 36 m^3 aerated sewage sump where an automated level control system equalizes the flow. The sump has a grit removal screen, aeration network to condition the raw sewage and effective hopper on the bottom to allow the unit to be easily cleaned with the vacuum truck. The aerated sewage flows in the same volumes to two Russian Digestors KU-200, the active silt is used for the process of biological sewage treatment.

It was decided in the beginning of 2006 to set in operation the second КУ-200 utility due to the expansion of production and the increase of employees' quantity accordingly, and in September 2010, the third one was set.

The KU-200 is a common Russian Digestor able to treat 200 to 250 m^3/day of sewage. The digestor systems consists of three sections; an aeration or activated sludge chamber to decompose the sewage, a settling chamber to settle aerobic biomass and return it to the aeration chamber, and a mineralization chamber where dead biomass is stabilized before being drained to storage pads. The sewage first enters the aeration chamber where it was distributed evenly using a launder. The overflow of the aerobic chamber flowed into the settling chamber where rapid settling occurs. The discharge of the settling tank represents the treated water and it left the KU-200 via a network of three overflow launders. Biomass (activated sludge solids) is distributed back to the aerobic or mineralization process using an airlift system from the main compressor. A pump and return line in the mineralization tank returns activated sludge back to the sewage sump to better condition the raw sewage feed. The overflow of clarified water from both KU-200 are then combined and flow to a 7.1 m^3 chlorine contact tank (renewed in 2009) where the water is disinfected by Sodium Hypochlorite. The chlorinated effluent then flows into a 90,000 m^3 holding pond where it is stored during the winter and discharged in the summer.

LEADER OF KYRGYZ INDUSTRY

Since 1997, our Company has been contributing significantly to the development of the Kyrgyz national economy. Leadership in the national mining sector is due to the selfless efforts being made by our skilled employees, innovations, strict adherence to the environmental and occupational safety standards, aggressive exploration and sizeable investment in operations.

As a socially-oriented company, we are fully aware of our responsibility both to the shareholders and society. By supporting regional sustainable development projects, the Company does not only reaffirm its status as the largest and most successful investment project in Kyrgyzstan, but is also distinctly capable of attaining a higher stage of development.

ECONOMIC TRENDS

For the year 2011, gold sales volume was 599.494 ounces or 18.646 kg, representing 5% increase from 2010.

In 2011 the Revenue was $ 941.1 million in 2011 due to the higher gold price.

The average realized price was $1570 per ounce in 2010 representing 27% increase compared to 2010.

The Kumtor mine produces unrefined Doré bars, which are purchased at the mine site by Kyrgyzaltyn JSC for further processing at its refinery in Kara Balta refinery factory pursuant to a Gold and Silver Sales Agreement signed by KOC, Kyrgyzaltyn and the Government of the Kyrgyz Republic. Kyrgyzaltyn JSC is the sole distributor of the refined gold and silver in the Kyrgyz Republic and abroad.

Table A-1: Kumtor Gold Project's Operating and financial trends

	12 months, as of 31 December		
	2011	2010	Change
Gold produced - ounces	**583156**	567 802	3%
Gold produced - kg	**18138,2**	17 660,6	3%
Gold sold - ounces	**599494**	568 390	5%
Gold sold - kg	**18646,4**	17678,9	5%
Average realized gold price – $/oz	**1570**	1239	27%
Revenue from gold sales to Kyrgyzaltyn - $ millions	**941,1**	704,3	34%
Total production cost (with depletion and amortization) - $millions	**392,1**	291,1	35%
Revenue-based tax + Issyk-Kul Development Fund - $millions	**142,1**	102,5	39%
Capital expenditures - $millions	**180,7**	186,5	(3%)
Exploration expenditures - $millions	**12,7**	11,5	10%
Tonnes mined - 000s	**150605**	116466	29%
Tonnes ore mined - 000s	**6020**	5765	4%
Tonnes milled - 000s	**5815**	5594	4%
Average mill head grade - g/t	**3,79**	4,02	(6%)
Recovery - %	**80,8**	79,5	2%

Cost of sales at Kumtor was $555 per ounce in 2011 representing 16% cost increase over 2010.

PAYMENTS TO THE KYRGYZ NATIONAL BUDGET AND MANDATORY CONTRIBUTIONS

In 2011, contributions to the national budget in taxes, deductions to the Social Fund and other mandatory payments have totaled in more than **$173.76 million**. According to the official National Bank exchange rate as of December 31, 2011, this amounts to more than **8.77 billion soms**.

Table A-2: Kumtor Gold Project's Contributions in Taxes and Mandatory Payments for 12 months of 2011

As of December 31, 2011	USD thousands
Revenue-based tax	131271,0
Issyk-Kul Development Fund	10790,1
Pollution tax	310,0
Income tax	5022,2
Social Insurance Fund	24268,8
Customs	1080,7
Income tax for non-residents	950,3
Other taxes and mandatory payments	69,5
Total	**173762,7**
US$ official exchange rate to the Kyrgyz Soms as of December 31, 2011	46,4847
Equivalent of payments effected in million Kyrgyz Soms	**8077,308**

Note: *Under the Agreement on New Terms of April 24, 2009, the revenue-based tax and contributions to the Issyk-Kul Development Fund are estimated based on actual cash revenues from sales during the specified period.*

ANNUAL DIVIDEND

According to previous disclosures, in May 2011, Centerra's Gold Inc. paid dividends to shareholders registered in Toronto Stock Exchange Market.

Based on Kyrgyzaltyn's interest (33%) as the Centerra's largest shareholder, it has received net dividends of **$30.167 million**.

OTHER PAYMENT

In September 2011 at the Kyrgyz Governments request «Kumtor» made payments in the amount of **$10 million** for construction and reconstruction of schools.

PAYMENTS EFFECTED WITHIN THE KYRGYZ REPUBLIC

In 2011, payments effected within the Kyrgyz Republic (including taxes, contract payments to local suppliers, infrastructure payments, charities, etc.) totaled more than **$383 million**. During the period between 1994 and 2010, Kumtor Gold Project's payments within the Kyrgyz Republic have totaled **$1 billion and 852 million**. (Table A-4).

THE COMPANY'S IMPACT ON THE MACROECONOMIC CHARACTERISTIC OF THE KYRGYZ REPUBLIC

According to the KR National Statistics Commitee's preliminary reports:

- Kumtor's share in GDP in 2011 was 11.7%;
- Kumtor's share in the total industrial output is 26.1%;
- Gold's share in the national exports in 2011 was 51.1%

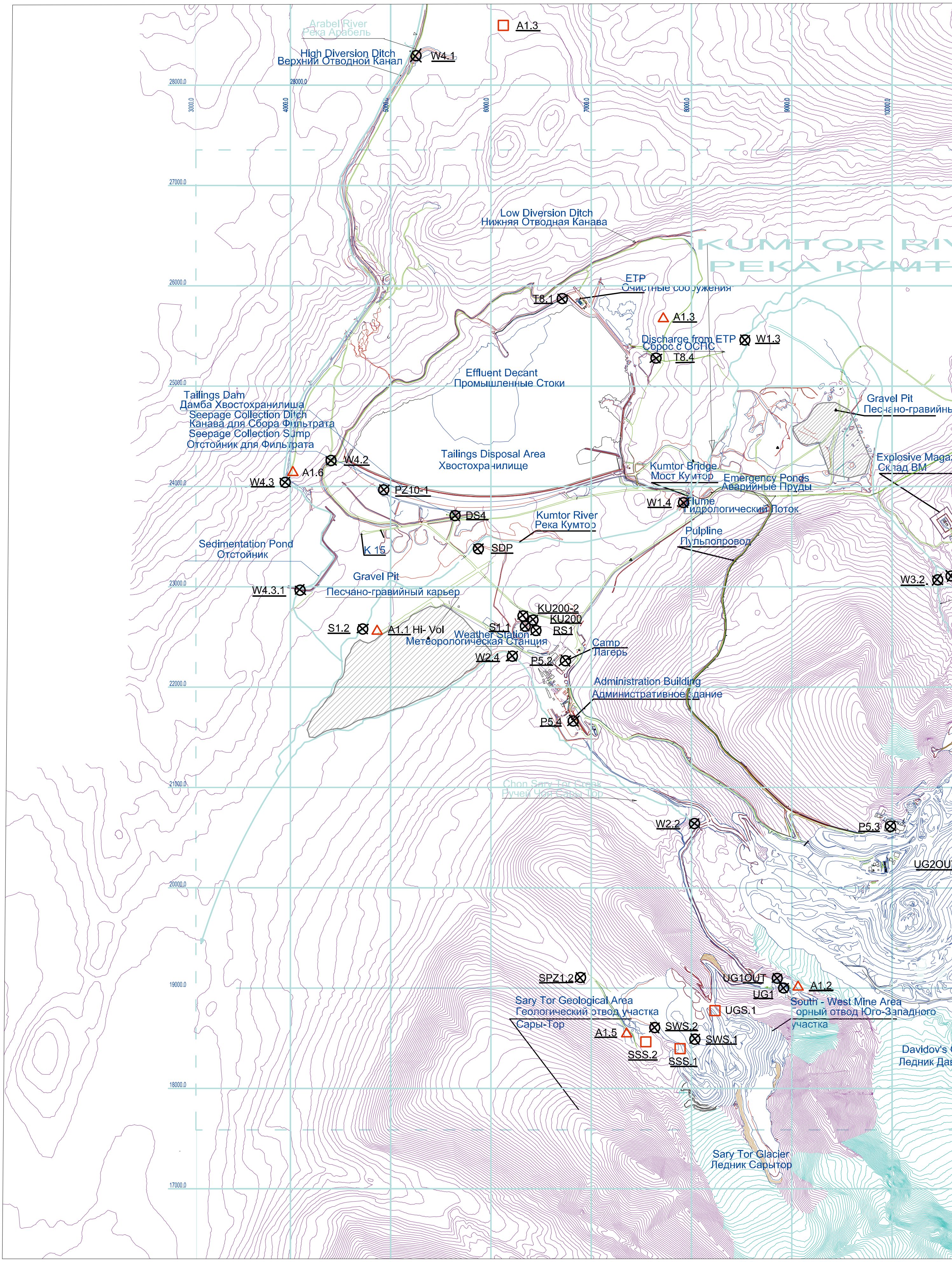
Table A-3: Kumtor Gold Project's payment structure within the Kyrgyz Republic

mln. US Dollars	2011	1994-2011
Taxes, customs & other mandatory payments	138,394	524,259
Social Insurance Fund	24,269	72,476
Issyk-Kul Development Fund	10,790	23,036
Licenses & permits	0,280	2,019

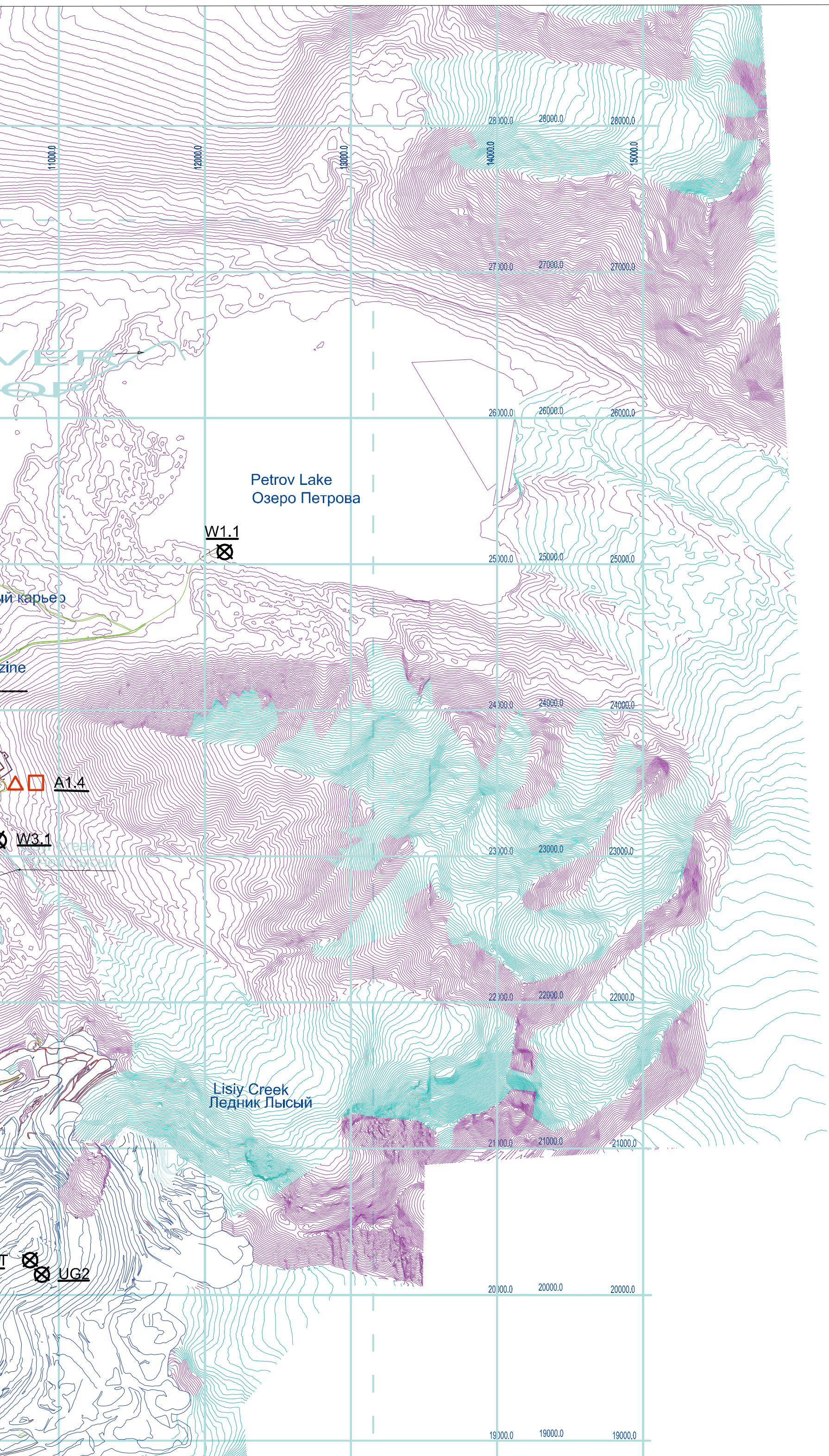
mln. US Dollars		2011	1994-2011
Pollution tax and payments to the Environment Protection Agency		0,310	3,439
Payments to Kyrgyzaltyn		0,607	11,421
Refinery		2,947	34,197
Revenue from the sale of Centerra shares		-	86,000
Dividends		30,167	44,413
Purchases in the Kyrgyz Republic:	- supplies & services	79,953	482,836
	- food	4,949	41,193
Kyrgyz-infrastructure-related payments:	- electricity	12,429	108,399
	- roads outside the mine site	1,559	33,802
	- Tamga-Kumtor power-transmission line	—	41,612
KOC employees' net wage		64,793	312,076
Sanatoria treatment		0,120	0,608
Education, scholarships & training		0,109	3,765
Sponsorships & charities		1,211	9,866
Assistance in construction and reconstruction of schools		10,000	10,000
Region's Sustainable Development Program		0,286	2,205
Payments to communities		-	4,400
Total		**383,172**	**1 852,023**

APPENDIX B

ENVIRONMENTAL MONITORING PROGRAM



Arabel River
Река Арабель
A1.3
High Diversion Ditch
Верхний Отводной Канал
W4.1
28000.0
3000.0
4000.0
5000.0
6000.0
7000.0
8000.0
9000.0
10000.0
27000.0
Low Diversion Ditch
Нижняя Отводная Канава
KUMTOR RIV
РЕКА КУМТ
26000.0
ETP
Очистные сооружения
T8.1
A1.3
Discharge from ETP
Сброс с ОСПС
W1.3
T8.4
Effluent Decant
Промышленные Стоки
25000.0
Tailings Dam
Дамба Хвостохранилища
Seepage Collection Ditch
Канава для Сбора Фильтрата
Seepage Collection Sump
Отстойник для Фильтрата
Gravel Pit
Песчано-гравийны
Tailings Disposal Area
Хвостохранилище
W4.2
Explosive Magaz
Склад ВМ
A1.6
W4.3
24000.0
Kumtor Bridge
Мост Кумтор
Emergency Ponds
Аварийные Пруды
PZ10-1
W1.4
Flume
Гидрологический Поток
DS4
Kumtor River
Река Кумтор
Pulpline
Пульпопровод
Sedimentation Pond
Отстойник
K 15
SDP
Gravel Pit
Песчано-гравийный карьер
W3.2
23000.0
W4.3.1
KU200-2
KU200
S1.2
A1.1 Hi- Vol
S1.1
RS1
Weather Station
Метеорологическая Станция
Camp
Лагерь
W2.4
P5.2
22000.0
Administration Building
Административное здание
P5.4
21000.0
Chon Sary Tor Creek
Ручей Чон Сары Тор
W2.2
P5.3
UG2OUT
20000.0
19000.0
SPZ1.2
UG1OUT
UG1
A1.2
Sary Tor Geological Area
Геологический отвод участка
Сары-Тор
UGS.1
South - West Mine Area
Горный отвод Юго-Западного
участка
A1.5
SWS.2
SWS.1
SSS.2
SSS.1
Davidov's G
Ледник Дав
18000.0
Sary Tor Glacier
Ледник Сарытор
17000.0



Условные обозначения
Legends

- Станции отбора проб воды / Water sampling station
- Пробоотборник воздуха большого объема / High volium air samplers
- Станции отбора проб снега / Snow sampling stations
- Автодороги общего пользования / Public roads
- Пульпопровод / Pulpline
- Реки / Rivers

Расстояние (в км) от точки отбора Т8.4 до:
The distance (in km) from T8.4 sampling point to:

by downstream по водотоку	by right line по прямой
to W1.5.1 = 12.36	до W1.5.1 = 10.97
to W1.6 = 24.36	до W1.6 = 21.97
to W1.7 = 42.36	до W 1.7 = 37.93
to W1.8 = 231.82	до W1.8 = 182.24

Менеджер Manager	
Гл.инженер Chief Eng.	
Составил Drawn by	

КУМТОР ОПЕРЕЙТИНГ КОМПАНИ
Kumtor Gold Company

Месторождение Кумтор
Kumtor Project

Чертеж №1 Plot #1

Станции экомониторинга рудника Кумтор
Stations of environmental monitoring Kumtor mine site

Масштаб Scale	Лист Sheet	Листов Sheets
	1	1

КОК/KOC

APPENDIX C

WATER QUALITY DATA MONTHLY AVERAGE

SAMPLE POINT: W1.1		jan-11	feb-11	mar-11	apr-11	may-11	jun-11	jul-11	aug-11	sep-11	oct-11	nov-11	dec-11
-----Field data------													
TEMP	deg C	4,1	4,4	6	1,2	2,45	8,8		3,1	1,9	6,7	2,2	6,5
COND-F	ms/cm	0,084	1,28	0,103	0,201	0,2055	0,09		1,162	0,891	0,84	0,78	0,841
PH-F	pH unit	7,6	8,47	8,1	7,78	8,05	7,6333		7,8	7,9	8,46	8,2	8,1
-----Major Constituents------													
CA	mg/L								18,75	17			
CL	mg/L								1,95	0,5			
CO3	mg/L	1	1	1	1	1	1			1	1	1	1
HCO3	mg/L	44	45	46	42	41	38			41	46	42	46
K	mg/L								2,255	5,99			
MG	mg/L								3,905	5,21			
NA	mg/L								1,96	4,85			
SO4	mg/L	20	20	20	19	20,5	14			22	17	16	18
T-HARD	mg/L	55	55	85	55	49	46,5			45	47	49	55
T.ALK	mg/L	36	37	37,8	34,6	33,7	31,05			33,7	37,8	34,2	37,8
-----Metals------													
AG	mg/L								0,003	0,003			0,003
AL	mg/L	0,42	0,45	0,53	0,27	0,305	0,3467			1,985	2,24	0,68	0,49
AS	mg/L								0,005	0,005			0,005
B	mg/L												
BA	mg/L								0,11	0,078			0,025
BE	mg/L								0,0002	0,0002			0,0002
BI	mg/L												
CD	mg/L								0,002	0,002			0,002
CO	mg/L								0,004	0,004			0,004
CR	mg/L								0,008	0,008			0,008
CU	mg/L	0,005	0,005	0,005	0,005	0,005	0,005			0,005	0,005	0,005	0,005
F	mg/L								0,158				
FE	mg/L	0,405	0,48	0,39	0,386	0,2885	0,444			2,215	2,14	0,603	0,521
HG	mg/L								0,0005				
MN	mg/L								0,0985	0,063			0,015
MO	mg/L			0,005					0,004	0,004			0,004
NI	mg/L	0,005	0,011		0,005	0,0095	0,005			0,005	0,005	0,005	0,005
PB	mg/L								0,005	0,005			0,005
SB	mg/L								0,02	0,02			0,02
SE	mg/L								0,02	0,02			0,02
SI	mg/L												
V	mg/L								0,0075	0,006			0,006
ZN	mg/L	0,002	0,003	0,004	0,003	0,0045	0,003			0,0105	0,014	0,004	0,003
-----Nutrients------													
NH3	mg/L												
NH3-N	mg/L	0,04	0,62	0,04	0,12	0,07	0,0667			0,05	0,04	0,04	0,04
NO2-N	mg/L	0,001	0,003	0,001	0,001	0,0015	0,0033			0,007	0,004	0,001	0,001
NO3-N	mg/L	0,4	0,8	0,4	0,2	0,25	0,5333			0,1	0,3	0,3	0,3
T.PO4	mg/L								0,07	0,03			
TKN	mg/L												
-----Solids------													
TURB-L	NTU								135				
TDS	mg/L	82,5	82	77,4	73	65,75	65,5	76,75	150,5	64,6	68,3	75	76
TSS	mg/L	25,75	23,5	18,6	14,5	17	21,25	55,5	43,5	129	120,3	44,75	27,5
-----Trace Constituents------													
CN-F	mg/L									0,005			
CN-T	mg/L						0,005		0,005	0,005			
CN-WAD	mg/L									0,005			

SAMPLE POINT : W1.3		jan-11	feb-11	mar-11	apr-11	may-11	jun-11	jul-11	aug-11	sep-11	oct-11	nov-11	dec-11
-----Field data------													
TEMP	deg C				1,9	7,5	2,9	13,5	6,05	11,9	0,6		
COND-F	ms/cm				0,482	0,087	0,13	0,189	0,189	1,92	0,96		
PH-F	pH unit				8,4	8,4	8,4	8,1	8,3	8,14	8,4		
-----Major Constituents------													
CA	mg/L							31,1		25,5			
CL	mg/L							26		1,9			
CO3	mg/L							3		4			
HCO3	mg/L							110		46			
K	mg/L							89,4		6,86			
MG	mg/L							4,12		8,71			
NA	mg/L							566		5,93			
SO4	mg/L				235	64	42		18,5	494	640		
T-HARD	mg/L							100		75			
T.ALK	mg/L							95		43,8			
-----Metals------													
AG	mg/L							0,003		0,003			
AL	mg/L				0,06	0,34	0,39		3,525	1,255	1,32		
AS	mg/L									0,005			
B	mg/L												
BA	mg/L							0,02		0,071			
BE	mg/L									0,0002			
BI	mg/L												
CD	mg/L							0,002		0,002			
CO	mg/L							0,024		0,004			
CR	mg/L							0,008		0,008			
CU	mg/L				0,005	0,005	0,005		0,005	0,005	0,005		
F	mg/L												
FE	mg/L				0,078	0,368	0,5335		4,685	1,476	1,27		
HG	mg/L							0,0005					
MN	mg/L							0,017		0,055			
MO	mg/L							0,27		0,004			
NI	mg/L				0,005	0,005	0,005		0,0055	0,005	0,005		
PB	mg/L							0,005		0,005			
SB	mg/L									0,02			
SE	mg/L									0,02			
SI	mg/L												
V	mg/L							0,006		0,006			
ZN	mg/L				0,002	0,002	0,0025		0,0155	0,0065	0,008		
-----Nutrients------													
NH3	mg/L												
NH3-N	mg/L				0,04	0,04	0,04		0,04	9,02	0,04		
NO2-N	mg/L				0,001	0,001	0,001		0,003	0,243	0,003		
NO3-N	mg/L				0,9	0,5	0,4		0,2	11,05	17		
T.PO4	mg/L									0,03			
TKN	mg/L												
-----Solids------													
TURB-L	NTU							2,9					
TDS	mg/L				428	159	295	1580	70,5	69	896		
TSS	mg/L				13	33	46	2	159,5	132	85		
-----Trace Constituents------													
CN-F	mg/L									0,005			
CN-T	mg/L				0,005	0,005	0,005		0,005	0,0725	0,15		
CN-WAD	mg/L									0,005			

SAMPLE POINT : W1.4		jan-11	feb-11	mar-11	apr-11	may-11	jun-11	jul-11	aug-11	sep-11	oct-11	nov-11	dec-11
-----Field data------													
TEMP	deg C				0,9	8,1	3,4	10,1	8,6	9,1	0,2		
COND-F	ms/cm				0,637	0,196	0,12	0,182	0,18	2,5	0,22		
PH-F	pH unit				8,2	8,1	8,6	7,9	8,4	8,5	8,3		
-----Major Constituents------													
CA	mg/L									30,8			
CL	mg/L									7,6			
CO3	mg/L									1			
HCO3	mg/L									66			
K	mg/L									10,7			
MG	mg/L									8,76			
NA	mg/L									52,5			
SO4	mg/L				495	80	205	77	36	112	124		
T-HARD	mg/L									110			
T.ALK	mg/L									54,5			
-----Metals------													
AG	mg/L									0,003			
AL	mg/L				0,1	0,13	0,51	2,29	3,19	2,29	1,12		
AS	mg/L									0,005			
B	mg/L												
BA	mg/L									0,056			
BE	mg/L									0,0002			
BI	mg/L												
CD	mg/L									0,002			
CO	mg/L									0,008			
CR	mg/L									0,008			
CU	mg/L				0,005	0,005	0,018	0,006	0,005	0,0095	0,005		
F	mg/L												
FE	mg/L				0,142	0,126	0,839	2,33	4,25	2,975	0,98		
HG	mg/L								0,0005				
MN	mg/L									0,048			
MO	mg/L									0,033			
NI	mg/L				0,005	0,005	0,005	0,005	0,009	0,005	0,005		
PB	mg/L									0,005			
SB	mg/L									0,02			
SE	mg/L									0,02			
SI	mg/L												
V	mg/L									0,006			
ZN	mg/L				0,003	0,002	0,005	0,001	0,015	0,013	0,005		
-----Nutrients------													
NH3	mg/L												
NH3-N	mg/L				0,2	0,12	3,2	0,68	0,32	1,8	1,56		
NO2-N	mg/L				0,001	0,001	0,062	0,056	0,018	0,129	0,12		
NO3-N	mg/L				1,4	0,4	2,8	1,4	0,5	1,95	1,5		
T.PO4	mg/L									0,03			
TKN	mg/L												
-----Solids------													
TURB-L	NTU												
TDS	mg/L				734	178	383	385	101	156	257		
TSS	mg/L				27	31	55	119,5	210	141	71		
-----Trace Constituents------													
CN-F	mg/L									0,005			
CN-T	mg/L				0,005	0,005	0,024	0,048	0,005	0,022	0,08		
CN-WAD	mg/L									0,006			

SAMPLE POINT: W1.5.1		jan-11	feb-11	mar-11	apr-11	may-11	jun-11	jul-11	aug-11	sep-11	oct-11	nov-11	dec-11
-----Field data------													
TEMP	deg C				0,625	5,1	4,52	7,375	6,1	3,5333	1,2667	0,55	
COND-F	ms/cm				0,6918	0,3288	0,3372	0,3103	0,2282	0,4363	0,7557	0,6545	
PH-F	pH unit				8,1	8,28	7,852	8,1325	8,1	8,13	7,9333	7,95	
-----Major Constituents------													
CA	mg/L				82,2	69,6	63,85	51,7	43,8	90,7	122		
CL	mg/L				13	27	12,1	12	3,2	13,55	10,45		
CO3	mg/L				1	1	1	5	1	1	1		
HCO3	mg/L				110	115	94,5	76	62	96	125		
K	mg/L				5,07	2,36	7,345	6,88	4,23	11,72	15,415		
MG	mg/L				39,7	33,2	45,2	44,7	24,5	53,75	73,8		
NA	mg/L				7,43	6,56	39,2	33,2	14,2	59,85	63,2		
SO4	mg/L				668,333	238,667	228,75	181,5	134,5	296,667	535	417,5	
T-HARD	mg/L				350	262,5	287,5	275	170	425	537,5		
T.ALK	mg/L				91,5	95	78,25	70,5	51	78,25	103		
-----Metals------													
AG	mg/L					0,003	0,003	0,003		0,003	0,003		
AL	mg/L				0,3873	2,1583	0,6375	3,7675	4,9175	1,6052	1,1083	0,4385	
AS	mg/L					0,005	0,005	0,005		0,005	0,005		
B	mg/L												
BA	mg/L				0,052	0,03	0,039	0,023	0,091	0,078	0,0465		
BE	mg/L					0,0002	0,0002	0,0002		0,0002	0,0002		
BI	mg/L												
CD	mg/L				0,002	0,002	0,002	0,002	0,002	0,002	0,002		
CO	mg/L				0,004	0,004	0,0045	0,007	0,004	0,016	0,0205		
CR	mg/L				0,008	0,008	0,008	0,008	0,008	0,0065	0,008		
CU	mg/L				0,005	0,006	0,0075	0,0095	0,0073	0,0067	0,0137	0,005	
F	mg/L												
FE	mg/L				0,6383	3,6733	0,8493	5,3375	6,1475	1,8568	1,5093	0,437	
HG	mg/L				0,0005	0,0005	0,0005	0,0005	0,0005	0,0005	0,0005		
MN	mg/L				0,086	0,0725	0,1725	0,366	0,184	0,664	0,812		
MO	mg/L				0,007	0,004	0,009	0,0123	0,0105	0,011	0,014	0,015	
NI	mg/L				0,0073	0,008	0,013	0,0243	0,0135	0,0363	0,0847	0,0265	
PB	mg/L				0,005	0,005	0,005	0,005	0,005	0,005	0,005		
SB	mg/L					0,02	0,02	0,02		0,02	0,02		
SE	mg/L					0,02	0,02	0,02		0,02	0,02		
SI	mg/L												
V	mg/L					0,006	0,006	0,005		0,006	0,02		
ZN	mg/L				0,006	0,0077	0,0043	0,0093	0,0145	0,0087	0,0117	0,1975	
-----Nutrients------													
NH3	mg/L												
NH3-N	mg/L				5,5267	0,9467	1,495	0,855	0,765	1,88	3,2	2,26	
NO2-N	mg/L				0,003	0,002	0,0135	0,016	0,0228	0,0467	0,016	0,001	
NO3-N	mg/L				36,7667	5,9667	3,95	2,875	2,7	6,2	16	20,5	
T.PO4	mg/L					0,02	0,1	0,08		0,09	0,07		
TKN	mg/L												
-----Solids------													
TURB-L	NTU				8,9667	22,5	12,725	40	99,25	32,5	13,5	7	
TDS	mg/L				1393,33	489,667	449,25	652	288,75	497,5	1040,5	839	
TSS	mg/L				11,6667	58,3333	19	46,25	93,75	39	1	7,5	
-----Trace Constituents------													
CN-F	mg/L					0,005	0,005	0,005		0,005	0,005		
CN-T	mg/L				0,005	0,005	0,0583	0,04	0,0455	0,0593	0,0733	0,005	
CN-WAD	mg/L					0,005	0,007	0,017		0,014	0,009		

SAMPLE POINT: W1.6		jan-11	feb-11	mar-11	apr-11	may-11	jun-11	jul-11	aug-11	sep-11	oct-11	nov-11	dec-11
-----Field data------													
TEMP	deg C				0,5	6,9	6,6	12,4	5,6	3,5	2,6		
COND-F	ms/cm				0,441	0,215	0,32	0,477	0,214	0,334	0,607		
PH-F	pH unit				7,9	8,06	7,7	8,1	7,68	8,13	7,73		
-----Major Constituents------													
CA	mg/L						64,3		47,1	81			
CL	mg/L						13		4,2	12			
CO3	mg/L						1		1	1			
HCO3	mg/L						100		70	105			
K	mg/L						4,97		3,9	7,54			
MG	mg/L						40,3		24,1	41,9			
NA	mg/L						26,4		13	26,2			
SO4	mg/L				310	75		235			480		
T-HARD	mg/L						275		170	350			
T.ALK	mg/L						82		58	88			
-----Metals------													
AG	mg/L												
AL	mg/L				0,26						0,07		
AS	mg/L												
B	mg/L												
BA	mg/L												
BE	mg/L												
BI	mg/L												
CD	mg/L												
CO	mg/L												
CR	mg/L												
CU	mg/L				0,005		0,005		0,005	0,005			
F	mg/L												
FE	mg/L				0,477		1,07		4,49	0,397			
HG	mg/L												
MN	mg/L												
MO	mg/L												
NI	mg/L						0,009		0,009	0,026			
PB	mg/L												
SB	mg/L												
SE	mg/L												
SI	mg/L												
V	mg/L												
ZN	mg/L						0,007		0,015	0,003			
-----Nutrients------													
NH3	mg/L												
NH3-N	mg/L						1,04		0,54	1,96			
NO2-N	mg/L												
NO3-N	mg/L												
T.PO4	mg/L												
TKN	mg/L												
-----Solids------													
TURB-L	NTU						22		110	10			
TDS	mg/L				430	220	421	110	480	542	267		
TSS	mg/L				43	91	16	39	88	14	20		
-----Trace Constituents------													
CN-F	mg/L												
CN-T	mg/L						0,032		0,07	0,06			
CN-WAD	mg/L												

SAMPLE POINT: W1.7		jan-11	feb-11	mar-11	apr-11	may-11	jun-11	jul-11	aug-11	sep-11	oct-11	nov-11	dec-11
-----Field data------													
TEMP	deg C				0,5	7,9	7,5	11,3	4,9	4,7	1,9		
COND-F	ms/cm				0,301	0,28	0,25	0,336	0,1708	0,345	0,49		
PH-F	pH unit				7,78	7,9	7,8	7,9	7,74	8,16	7,6		
-----Major Constituents------													
CA	mg/L						42,1		43,3	68,7			
CL	mg/L						8,9		5,6	10			
CO3	mg/L						1		1	1			
HCO3	mg/L						84		76	115			
K	mg/L						6,17		2,37	4,93			
MG	mg/L						15		16,5	29,3			
NA	mg/L						37		8,34	17,7			
SO4	mg/L				120	38		104			290		
T-HARD	mg/L						140		130	275			
T.ALK	mg/L						68		63	93,5			
-----Metals------													
AG	mg/L												
AL	mg/L				0,47		0,53		2,49	0,36			
AS	mg/L												
B	mg/L												
BA	mg/L												
BE	mg/L												
BI	mg/L												
CD	mg/L												
CO	mg/L												
CR	mg/L												
CU	mg/L				0,005								
F	mg/L												
FE	mg/L				0,569								
HG	mg/L						0,0005		0,0005	0,0005			
MN	mg/L												
MO	mg/L												
NI	mg/L						0,005		0,006	0,017			
PB	mg/L						0,005		0,005	0,005			
SB	mg/L												
SE	mg/L												
SI	mg/L												
V	mg/L												
ZN	mg/L												
-----Nutrients------													
NH3	mg/L												
NH3-N	mg/L						0,4		0,4	1,14			
NO2-N	mg/L						0,005		0,009	0,02			
NO3-N	mg/L						1,5		1,3	5,2			
T.PO4	mg/L												
TKN	mg/L												
-----Solids------													
TURB-L	NTU						8,5		70	10			
TDS	mg/L				390	173	267	102	225	399	301		
TSS	mg/L				31	95	7	35	51	5	23		
-----Trace Constituents------													
CN-F	mg/L												
CN-T	mg/L						0,1		0,11	0,048			
CN-WAD	mg/L												

SAMPLE POINT: W1.8		jan-11	feb-11	mar-11	apr-11	may-11	jun-11	jul-11	aug-11	sep-11	oct-11	nov-11	dec-11
-----Field data------													
TEMP	deg C	0,2	1,1	2,6	6,1	8,1	11,6	12,1	10	10	4,1	1,5	0,3
COND-F	ms/cm	0,197	0,211	0,206	0,177	0,19	0,201	0,221	0,205	0,205	0,25	0,201	0,23
PH-F	pH unit	7,7	8,21	8,4	7,97	8,1	8,1	8,02	8,2	8,02	8,1	7,9	8,4
-----Major Constituents------													
CA	mg/L	53,2	52	51,4	38,1	50,1	47,9	40,3	53	54	51,8	56	57,5
CL	mg/L	6,6	6,5	7,2	6,5	9	5,2	4	3,9	5,6	9,4	5,6	6,4
CO3	mg/L	1	1	3	1	1	1	1	1	1	1	1	1
HCO3	mg/L	160	155	140	105	135	125	115	125	140	155	150	160
K	mg/L	1,53	1,45	2	2	1,47	1,34	1,35	2,09	2,36	1,68	1,35	1,79
MG	mg/L	16,2	15,6	16,6	10,4	14,7	13,8	11,3	14,7	16	16,1	15,3	16,9
NA	mg/L	8,95	9,11	9,95	5,13	6,88	6,19	4,92	7,88	8,96	9,54	7,74	9,42
SO4	mg/L	66	67	61	37	50	49	49	52	73	73	63	66
T-HARD	mg/L	180	190	220	130	160	150	140	150	180	190	190	200
T.ALK	mg/L	129	128	120	88	112	102	92,5	103	117	126	123	133
-----Metals------													
AG	mg/L						0,003	0,003	0,003	0,003	0,003		
AL	mg/L	0,08	0,11	0,16	2,8	0,63	0,26	3,51	1,09	0,18	0,1	0,09	0,06
AS	mg/L						0,005	0,005	0,005	0,005	0,005		
B	mg/L												
BA	mg/L						0,44	0,086	0,062	0,048	0,049		
BE	mg/L						0,0002	0,0002	0,0002	0,0002	0,0002		
BI	mg/L												
CD	mg/L						0,002	0,002	0,002	0,002	0,002		
CO	mg/L						0,004	0,004	0,004	0,004	0,004		
CR	mg/L						0,008	0,008	0,008	0,008	0,008		
CU	mg/L	0,005	0,005	0,005	0,007	0,005	0,005	0,005	0,005	0,005	0,005	0,005	0,005
F	mg/L												
FE	mg/L	0,107	0,163	0,221	4,42	0,817	0,342	4,79	1,84	0,231	0,13	0,097	0,048
HG	mg/L	0,0005	0,0005	0,0005	0,0005	0,0005	0,0005	0,0005	0,0005	0,0005	0,0005	0,0005	0,0005
MN	mg/L	0,006	0,011	0,011	0,255	0,037	0,015	0,146	0,072	0,018	0,019	0,011	0,009
MO	mg/L						0,004	0,004	0,004	0,004	0,004		
NI	mg/L	0,005	0,005	0,005	0,007	0,005	0,005	0,006	0,005	0,005	0,005	0,005	0,005
PB	mg/L						0,005	0,005	0,005	0,005	0,005		
SB	mg/L						0,02	0,02	0,02	0,02	0,02		
SE	mg/L						0,02	0,02	0,02	0,02	0,02		
SI	mg/L												
V	mg/L						0,006	0,006	0,006	0,006	0,006		
ZN	mg/L	0,109	0,064	0,176	0,401	0,326	0,06	0,051	0,733	0,445	0,061	0,059	0,268
-----Nutrients------													
NH3	mg/L												
NH3-N	mg/L	0,04	0,42	0,04	0,1	0,1	0,04	0,04	0,12	0,04	0,06	0,26	0,04
NO2-N	mg/L	0,002	0,001	0,001	0,003	0,001	0,003	0,003	0,001	0,001	0,001	0,001	0,002
NO3-N	mg/L	0,8	1,7	0,8	0,3	0,6	0,5	0,5	0,6	1	1	0,7	0,8
T.PO4	mg/L												
TKN	mg/L												
-----Solids------													
TURB-L	NTU						12	200	73	2,3	2,2		
TDS	mg/L	248	220	273	152	190	180	200	187	231	228		
TSS	mg/L	10	11	18	420	31	2	196	94	5	2	5	6
-----Trace Constituents------													
CN-F	mg/L						0,005	0,005	0,005	0,005	0,005		
CN-T	mg/L	0,005	0,005	0,005	0,005	0,005	0,02	0,007	0,005	0,005	0,022	0,005	0,005
CN-WAD	mg/L						0,005	0,005	0,005	0,005	0,006		

SAMPLE POINT: W2.2		jan-11	feb-11	mar-11	apr-11	may-11	jun-11	jul-11	aug-11	sep-11	oct-11	nov-11	dec-11
-----Field data------													
TEMP	deg C	0,875	1,05	1,46									
COND-F	ms/cm	1,6885	1,9175	1,5144									
PH-F	pH unit	7,675	7,8475	8,026									
-----Major Constituents------													
CA	mg/L	458,5	533	378									
CL	mg/L	18	41,25	17,2									
CO3	mg/L												
HCO3	mg/L	370	630	280									
K	mg/L	27,9	33,7667	26,92									
MG	mg/L	317,5	412,6667	249,8									
NA	mg/L												
SO4	mg/L	1622,5	2510	1316									
T-HARD	mg/L												
T.ALK	mg/L												
-----Metals------													
AG	mg/L												
AL	mg/L	0,2925	0,2025	0,492									
AS	mg/L												
B	mg/L												
BA	mg/L												
BE	mg/L												
BI	mg/L												
CD	mg/L												
CO	mg/L												
CR	mg/L												
CU	mg/L	0,005	0,005	0,005									
F	mg/L												
FE	mg/L	0,4165	0,459	0,7904									
HG	mg/L												
MN	mg/L	0,3078	0,1695	0,3074									
MO	mg/L												
NI	mg/L												
PB	mg/L												
SB	mg/L												
SE	mg/L												
SI	mg/L												
V	mg/L												
ZN	mg/L	0,0053	0,012	0,0066									
-----Nutrients------													
NH3	mg/L												
NH3-N	mg/L	6,9	11,15	4,64									
NO2-N	mg/L	0,001	0,001	0,001									
NO3-N	mg/L	87,5	140	67									
T.PO4	mg/L												
TKN	mg/L												
-----Solids------													
TURB-L	NTU												
TDS	mg/L	1587	2590	1862									
TSS	mg/L	53	29	43									
-----Trace Constituents------													
CN-F	mg/L												
CN-T	mg/L												
CN-WAD	mg/L												

SAMPLE POINT: W2.4		jan-11	feb-11	mar-11	apr-11	may-11	jun-11	jul-11	aug-11	sep-11	oct-11	nov-11	dec-11
-----Field data------													
TEMP	deg C	0,575	1,075	1,46	3,24	5,175	5,32	8,575	8,625	4,92	4,7667	0,86	0,65
COND-F	ms/cm	0,9645	1,4923	1,372	1,0178	1,3002	1,1824	0,8615	0,6755	0,7408	1,3223	1,384	0,8045
PH-F	pH unit	7,5375	7,8325	8,122	7,52	8,05	7,9	7,955	7,675	8,048	7,9333	7,806	7,45
-----Major Constituents------													
CA	mg/L	605	415,6667	393,2	228,25	296,75	291,2	245,6667	236	229	288,5	336,25	402,5
CL	mg/L	41	14,5	18	10,775	16,75	14	8,3667	6,025	6,58	10,3	11,45	13
CO3	mg/L							12					
HCO3	mg/L	667,5	320	308	165,75	195	222	210	177	175	201,25	285	355
K	mg/L	59,225	28,1667	29,98	15,3525	14,875	14,36	12,9333	12,925	13,88	17,55	25,4	30,65
MG	mg/L	626	264,6667	271,2	163,5	253,25	287,8	223,3333	176,75	171,2	207	211,25	247,5
NA	mg/L												
SO4	mg/L	2820	2005	1450	860	1262,5	1236	1040	802,5	910	1112,5	1162,5	1285
T-HARD	mg/L							0					
T.ALK	mg/L							191					
-----Metals------													
AG	mg/L												
AL	mg/L	0,1225	0,085	0,198	1,5575	1,7125	1,552	1,75	2,5125	1,29	0,485	0,175	0,75
AS	mg/L												
B	mg/L												
BA	mg/L							0,043					
BE	mg/L												
BI	mg/L												
CD	mg/L												
CO	mg/L												
CR	mg/L												
CU	mg/L	0,005	0,005	0,005	0,0065	0,005	1,004	0,005	0,005	0,0134	0,0183	0,005	0,005
F	mg/L												
FE	mg/L	0,1928	0,1275	0,352	2,9675	2,2185	2,186	2,46	3,3175	3,2088	2,3478	0,3193	1,065
HG	mg/L							0,0005					
MN	mg/L	0,4835	0,3298	0,3484	0,4583	0,633	1,7728	1,3067	1,14	2,3424	2,6675	0,6268	0,7925
MO	mg/L							0,04					
NI	mg/L						0,1335	0,096	0,0563				
PB	mg/L							0,005					
SB	mg/L							0,02					
SE	mg/L												
SI	mg/L												
V	mg/L												
ZN	mg/L	0,006	0,006	0,0066	0,0103	0,008	0,0085	0,006	0,0085	0,0198	0,0293	0,0093	0,009
-----Nutrients------													
NH3	mg/L												
NH3-N	mg/L	13,675	6	6,3	10,125	6,6	4,7	3,7	3,025	3,96	5,65	7,4	9,55
NO2-N	mg/L	0,001	0,001	0,001	0,0018	0,0308	0,001	0,001	0,003	0,0018	0,001	0,001	0,001
NO3-N	mg/L	193,75	69,25	80,2	53,25	45,5	35,6	28,3333	22	28	41	72,25	86,5
T.PO4	mg/L												
TKN	mg/L												
-----Solids------													
TURB-L	NTU							26					
TDS	mg/L	1644	1566	1592	1223	1538	1511	2120	927	1240	1244	2290	1999
TSS	mg/L	68,3	25,3	33	283,5	66	322	40	317	152	87	34	20
-----Trace Constituents------													
CN-F	mg/L												
CN-T	mg/L							0,005					
CN-WAD	mg/L												

SAMPLE POINT: W3.1		jan-11	feb-11	mar-11	apr-11	may-11	jun-11	jul-11	aug-11	sep-11	oct-11	nov-11	dec-11
-----Field data------													
TEMP	deg C	4	6,8	0,9	0,4	3,2	7,6	7,5		5,15	0,5	0,95	
COND-F	ms/cm	0,41	4,36	0,183	0,862	0,576	0,258	0,175		0,43	0,624	0,806	
PH-F	pH unit	7,8	8,06	8,1	7,74	7,9	7,9	8,8		8,26	8,08	8,35	
-----Major Constituents------													
CA	mg/L							40,6					
CL	mg/L							2,9					
CO3	mg/L							1					
HCO3	mg/L							52					
K	mg/L							1,43					
MG	mg/L							18,2					
NA	mg/L							0,87					
SO4	mg/L	5320	5190	2060	930	475	230			342,5	530	1120	
T-HARD	mg/L							130					
T.ALK	mg/L							43,2					
-----Metals------													
AG	mg/L									0,003			
AL	mg/L	0,06	0,06	0,03		0,81	1,46			1,6133	0,21	0,26	
AS	mg/L									0,005			
B	mg/L												
BA	mg/L							0,054		0,038			
BE	mg/L									0,0002			
BI	mg/L												
CD	mg/L									0,002			
CO	mg/L									0,004			
CR	mg/L									0,008			
CU	mg/L	0,005	0,005	0,005		0,005	0,006			0,0077	0,005	0,005	
F	mg/L												
FE	mg/L	0,035	0,211	0,055		1,09	2,84			3,4233	0,239	0,588	
HG	mg/L							0,0005				0,0005	
MN	mg/L							0,142		0,123			
MO	mg/L							0,004		0,004			
NI	mg/L							0,009		0,01			
PB	mg/L							0,005		0,005			
SB	mg/L							0,02		0,02			
SE	mg/L									0,02			
SI	mg/L												
V	mg/L									0,006			
ZN	mg/L							0,01		0,006			
-----Nutrients------													
NH3	mg/L												
NH3-N	mg/L	0,34	2	0,32	0,1	0,12	0,06			0,04	0,04	0,08	
NO2-N	mg/L	0,001	0,001	0,001	0,001	0,001	0,003			0,0045	0,001	0,001	
NO3-N	mg/L	5,6	8,4	0,6	1,6	1,2	0,6			0,8	1,1	1,7	
T.PO4	mg/L												
TKN	mg/L												
-----Solids------													
TURB-L	NTU							240					
TDS	mg/L	6500		2946	1107	665	371	172		341,5	788	1379	
TSS	mg/L	15		10	68	129	150	422		135	44	64	
-----Trace Constituents------													
CN-F	mg/L												
CN-T	mg/L							0,005					
CN-WAD	mg/L												

SAMPLE POINT: W3.2		jan-11	feb-11	mar-11	apr-11	may-11	jun-11	jul-11	aug-11	sep-11	oct-11	nov-11	dec-11
-----Field data------													
TEMP	deg C				0,5	5,5	7,4	13,5	9	1,3	3,7		
COND-F	ms/cm				0,92	0,233	0,443	0,314	0,461	0,319	0,348		
PH-F	pH unit				7,81	8,1	8	8,7	7,5	8,1	8		
-----Major Constituents------													
CA	mg/L							67,6					
CL	mg/L							4,1					
CO3	mg/L							1					
HCO3	mg/L							110					
K	mg/L							1,74					
MG	mg/L							41,3					
NA	mg/L							3,29					
SO4	mg/L				33	49	200		310	106	104		
T-HARD	mg/L							275					
T.ALK	mg/L							90,5					
-----Metals------													
AG	mg/L												
AL	mg/L					0,03	1,08		1,21	0,07	0,05		
AS	mg/L												
B	mg/L												
BA	mg/L							0,165					
BE	mg/L												
BI	mg/L												
CD	mg/L												
CO	mg/L												
CR	mg/L												
CU	mg/L					0,005	0,005		0,005	0,005	0,005		
F	mg/L												
FE	mg/L					0,014	1,2		0,785	0,077	0,044		
HG	mg/L							0,0005					
MN	mg/L							0,062					
MO	mg/L							0,006					
NI	mg/L							0,005	0,005				
PB	mg/L							0,005					
SB	mg/L							0,02					
SE	mg/L												
SI	mg/L												
V	mg/L												
ZN	mg/L							0,004					
-----Nutrients------													
NH3	mg/L												
NH3-N	mg/L				0,12	0,06	0,04		0,04	0,04	0,04		
NO2-N	mg/L				0,001	0,001	0,001		0,001	0,001	0,001		
NO3-N	mg/L				0,2	1	1		2,7	1,3	1,3		
T.PO4	mg/L												
TKN	mg/L												
-----Solids------													
TURB-L	NTU							50					
TDS	mg/L				690	281	376	332	635	490	416		
TSS	mg/L				168	18	53	64	51	85	43		
-----Trace Constituents------													
CN-F	mg/L												
CN-T	mg/L							0,005					
CN-WAD	mg/L												

SAMPLE POINT : W4.1		jan-11	feb-11	mar-11	apr-11	may-11	jun-11	jul-11	aug-11	sep-11	oct-11	nov-11	dec-11
-----Field data------													
TEMP	deg C					4,7	9	11,6	14,5	3	4,8		
COND-F	ms/cm					0,139	0,908	0,114	0,044	0,82	0,149		
PH-F	pH unit					8,5	8	8,37	8,4	7,84	8,27		
-----Major Constituents------													
CA	mg/L						40,9		16,6	26,3			
CL	mg/L						25		4,1	10			
CO3	mg/L						1		7	1			
HCO3	mg/L						90		35	64			
K	mg/L						0,92		0,4	0,8			
MG	mg/L						7,17		1,92	3,32			
NA	mg/L						4,08		1,21	2,31			
SO4	mg/L						9		5	12			
T-HARD	mg/L						100		43	70			
T.ALK	mg/L						74		41,4	53,5			
-----Metals------													
AG	mg/L												
AL	mg/L						0,05		0,14	0,07			
AS	mg/L												
B	mg/L												
BA	mg/L						0,014		0,005	0,009			
BE	mg/L						0,0002		0,0002	0,0002			
BI	mg/L												
CD	mg/L						0,002		0,002	0,002			
CO	mg/L												
CR	mg/L												
CU	mg/L						0,005		0,005	0,005			
F	mg/L												
FE	mg/L						0,195		0,249	0,15			
HG	mg/L						0,0005		0,0005	0,0005			
MN	mg/L												
MO	mg/L												
NI	mg/L						0,005		0,005	0,005			
PB	mg/L						0,005		0,005	0,005			
SB	mg/L												
SE	mg/L												
SI	mg/L												
V	mg/L												
ZN	mg/L						0,002		0,001	0,001			
-----Nutrients------													
NH3	mg/L												
NH3-N	mg/L						0,08		0,04	0,04			
NO2-N	mg/L						0,002		0,001	0,001			
NO3-N	mg/L						0,1		0,1	0,2			
T.PO4	mg/L												
TKN	mg/L												
-----Solids------													
TURB-L	NTU						1		2,5	0,85			
TDS	mg/L				120	116	138	79	50	91	169		
TSS	mg/L				20	18	3	18	1	1	11		
-----Trace Constituents------													
CN-F	mg/L												
CN-T	mg/L												
CN-WAD	mg/L												

SAMPLE POINT : W4.2		jan-11	feb-11	mar-11	apr-11	may-11	jun-11	jul-11	aug-11	sep-11	oct-11	nov-11	dec-11
-----Field data------													
TEMP	deg C				0,7	4,7	7,4	12,1	11,7	2,9	5,9		
COND-F	ms/cm				0,155	0,23	0,92	0,2	0,155	0,141	0,16		
PH-F	pH unit				7,9	8,5	7,92	8,13	8,1	7,81	8,27		
-----Major Constituents------													
CA	mg/L						57,6		43	35,3			
CL	mg/L						22		7,1	9,8			
CO3	mg/L						3		1	1			
HCO3	mg/L						135		109	105			
K	mg/L						2,46		2,25	2,13			
MG	mg/L						13,8		9,25	7,41			
NA	mg/L						6,74		4,47	3,93			
SO4	mg/L						34		16	16			
T-HARD	mg/L						170		110	110			
T.ALK	mg/L						114		89	84,5			
-----Metals------													
AG	mg/L												
AL	mg/L						3,52		0,49	0,5			
AS	mg/L												
B	mg/L												
BA	mg/L						0,068		0,029	0,029			
BE	mg/L						0,0002		0,0002	0,0002			
BI	mg/L												
CD	mg/L						0,002		0,002	0,002			
CO	mg/L												
CR	mg/L												
CU	mg/L						0,006		0,006	0,005			
F	mg/L												
FE	mg/L						5,3		0,796	1,32			
HG	mg/L						0,0005		0,0005	0,0005			
MN	mg/L												
MO	mg/L												
NI	mg/L						0,005		0,005	0,005			
PB	mg/L						0,005		0,005	0,005			
SB	mg/L												
SE	mg/L												
SI	mg/L												
V	mg/L												
ZN	mg/L						0,017		0,009	0,005			
-----Nutrients------													
NH3	mg/L												
NH3-N	mg/L						0,1		0,06	0,04			
NO2-N	mg/L						0,003		0,002	0,003			
NO3-N	mg/L						0,2		0,1	0,2			
T.PO4	mg/L												
TKN	mg/L												
-----Solids------													
TURB-L	NTU						100		5,5	9			
TDS	mg/L				176	255	198	147	130	104	135		
TSS	mg/L				128	162	160	43	29	21	11		
-----Trace Constituents------													
CN-F	mg/L												
CN-T	mg/L												
CN-WAD	mg/L												

SAMPLE POINT : W4.3		jan-11	feb-11	mar-11	apr-11	may-11	jun-11	jul-11	aug-11	sep-11	oct-11	nov-11	dec-11
-----Field data------													
TEMP	deg C					4,6	7,14	10,575	13,1	7,2	5,5		
COND-F	ms/cm					0,1302	0,1409	0,1077	0,078	0,0689	0,145		
PH-F	pH unit					8,3333	7,88	8,155	8,3	8,0333	8,4		
-----Major Constituents------													
CA	mg/L						28,4		22,5		31,4		
CL	mg/L						8,9		2,2		14		
CO3	mg/L						1		1		1		
HCO3	mg/L						72		52		21		
K	mg/L						0,76		0,57		0,87		
MG	mg/L						3,46		2,53		4,31		
NA	mg/L						2,12		1,49		2,73		
SO4	mg/L						7		5		13		
T-HARD	mg/L						70		42		85		
T.ALK	mg/L						58,5		42		17		
-----Metals------													
AG	mg/L												
AL	mg/L						0,05		0,16		0,03		
AS	mg/L										0,005		
B	mg/L												
BA	mg/L												
BE	mg/L												
BI	mg/L												
CD	mg/L												
CO	mg/L												
CR	mg/L												
CU	mg/L						0,005		0,005		0,005		
F	mg/L												
FE	mg/L						0,131		0,277		0,019		
HG	mg/L												
MN	mg/L												
MO	mg/L												
NI	mg/L						0,005		0,005		0,005		
PB	mg/L												
SB	mg/L												
SE	mg/L												
SI	mg/L												
V	mg/L												
ZN	mg/L						0,003		0,003		0,001		
-----Nutrients------													
NH3	mg/L												
NH3-N	mg/L						0,04		0,04		0,04		
NO2-N	mg/L						0,001		0,005		0,001		
NO3-N	mg/L						0,2		0,1		0,2		
T.PO4	mg/L												
TKN	mg/L												
-----Solids------													
TURB-L	NTU						2,7		2		0,25		
TDS	mg/L				350	184,5	80	89,5	50	294	115		
TSS	mg/L				71	24	1	25,25	3	103,75	1		
-----Trace Constituents------													
CN-F	mg/L												
CN-T	mg/L												
CN-WAD	mg/L												

SAMPLE POINT : W4.3.1		jan-11	feb-11	mar-11	apr-11	may-11	jun-11	jul-11	aug-11	sep-11	oct-11	nov-11	dec-11
-----Field data------													
TEMP	deg C						7,4	12,1			7,1		
COND-F	ms/cm						0,095	0,0794			0,138		
PH-F	pH unit						7,5	8,12			8,3		
-----Major Constituents------													
CA	mg/L						31,9	27,3			34,2		
CL	mg/L						8,5	4,3			16		
CO3	mg/L						1	1			1		
HCO3	mg/L						70	62			14		
K	mg/L						0,87	0,7			1,16		
MG	mg/L						4,15	3,16			5,16		
NA	mg/L						2,2	1,91			3,39		
SO4	mg/L						7	6			14		
T-HARD	mg/L						70	55			100		
T.ALK	mg/L						57,5	50,5			11		
-----Metals------													
AG	mg/L												
AL	mg/L						0,06	0,09			0,07		
AS	mg/L										0,005		
B	mg/L												
BA	mg/L												
BE	mg/L												
BI	mg/L												
CD	mg/L												
CO	mg/L												
CR	mg/L												
CU	mg/L						0,005	0,005			0,005		
F	mg/L												
FE	mg/L						0,089	0,143			0,085		
HG	mg/L						0,0005	0,0005			0,0005		
MN	mg/L												
MO	mg/L												
NI	mg/L						0,005	0,005			0,005		
PB	mg/L												
SB	mg/L												
SE	mg/L												
SI	mg/L												
V	mg/L												
ZN	mg/L						0,003	0,002			0,002		
-----Nutrients------													
NH3	mg/L												
NH3-N	mg/L						0,04	0,06			0,04		
NO2-N	mg/L						0,004	0,001			0,001		
NO3-N	mg/L						0,2	0,1			0,2		
T.PO4	mg/L												
TKN	mg/L												
-----Solids------													
TURB-L	NTU						0,7	1,5			1,7		
TDS	mg/L				89	176	83	69	68	74	127		
TSS	mg/L				17	20	1	3	13	5	1		
-----Trace Constituents------													
CN-F	mg/L												
CN-T	mg/L												
CN-WAD	mg/L												

SAMPLE POINT : W6.1		jan-11	feb-11	mar-11	apr-11	may-11	jun-11	jul-11	aug-11	sep-11	oct-11	nov-11	dec-11
-----Field data------													
TEMP	deg C				6,5	3,2	3,1	6,3	4,6	5,3	3,1		
COND-F	ms/cm				0,256	0,145	0,115	0,121	0,532	1,44	0,158		
PH-F	pH unit				7,8	8,5	8,2	8,07	7,8	8,2	8,1		
-----Major Constituents------													
CA	mg/L						39,2		31,6	45,6			
CL	mg/L						7,3		3,6	6,7			
CO3	mg/L						1		1	1			
HCO3	mg/L						96		70	105			
K	mg/L						0,82		0,88	1,26			
MG	mg/L						5,55		4,03	8,45			
NA	mg/L						2,71		1,55	4,24			
SO4	mg/L						21		17	60			
T-HARD	mg/L						110		70	140			
T.ALK	mg/L						78		57,5	84,5			
-----Metals------													
AG	mg/L												
AL	mg/L						0,14		2	0,23			
AS	mg/L												
B	mg/L												
BA	mg/L						0,015		0,019	0,021			
BE	mg/L						0,0002		0,0002	0,0002			
BI	mg/L												
CD	mg/L						0,002		0,002	0,002			
CO	mg/L												
CR	mg/L												
CU	mg/L						0,005		0,005	0,005			
F	mg/L												
FE	mg/L						0,187		2,38	0,352			
HG	mg/L						0,0005		0,0005	0,0005			
MN	mg/L												
MO	mg/L												
NI	mg/L						0,005		0,005	0,005			
PB	mg/L						0,005		0,005	0,005			
SB	mg/L												
SE	mg/L												
SI	mg/L												
V	mg/L												
ZN	mg/L						0,012		0,007	0,006			
-----Nutrients------													
NH3	mg/L												
NH3-N	mg/L						0,06		0,04	0,04			
NO2-N	mg/L						0,003		0,002	0,002			
NO3-N	mg/L						0,1		0,1	0,6			
T.PO4	mg/L												
TKN	mg/L												
-----Solids------													
TURB-L	NTU						2		26	4,6			
TDS	mg/L				225	163	126	108	112	180	94		
TSS	mg/L				38	13	1	17	15	1	20		
-----Trace Constituents------													
CN-F	mg/L												
CN-T	mg/L						0,005		0,005	0,04			
CN-WAD	mg/L												

SAMPLE POINT : SDP		jan-11	feb-11	mar-11	apr-11	may-11	jun-11	jul-11	aug-11	sep-11	oct-11	nov-11	dec-11
-----Field data------													
TEMP	deg C						8,1	7,86	9,375	2,55	2,85		
COND-F	ms/cm						0,325	1,12	0,709	0,3167	0,42		
PH-F	pH unit						7,3	7,76	7,3925	7,7625	7,9		
-----Major Constituents------													
CA	mg/L												
CL	mg/L							310		82	66		
CO3	mg/L												
HCO3	mg/L												
K	mg/L												
MG	mg/L												
NA	mg/L												
SO4	mg/L							123		88	115		
T-HARD	mg/L												
T.ALK	mg/L												
-----Metals------													
AG	mg/L												
AL	mg/L								0,08	0,04	0,03		
AS	mg/L												
B	mg/L												
BA	mg/L												
BE	mg/L												
BI	mg/L												
CD	mg/L												
CO	mg/L												
CR	mg/L												
CU	mg/L								0,009	0,005	0,005		
F	mg/L												
FE	mg/L								0,138	0,107	0,155		
HG	mg/L												
MN	mg/L												
MO	mg/L												
NI	mg/L								0,005	0,005	0,005		
PB	mg/L												
SB	mg/L												
SE	mg/L												
SI	mg/L												
V	mg/L												
ZN	mg/L								0,033	0,008	0,008		
-----Nutrients------													
NH3	mg/L												
NH3-N	mg/L						0,56	1,816	5,3667	3,8667	6,3		
NO2-N	mg/L						0,001	0,0086	0,0073	0,0083	0,005		
NO3-N	mg/L						0,1	5,44	4,7667	5,6	4,4667		
T.PO4	mg/L						0,68	1,388	3,3333	2,7333	1,9		
TKN	mg/L												
-----Solids------													
TURB-L	NTU								17				
TDS	mg/L								280				
TSS	mg/L								15				
-----Trace Constituents------													
CN-F	mg/L												
CN-T	mg/L												
CN-WAD	mg/L												

SAMPLE POINT : KU200-3		jan-11	feb-11	mar-11	apr-11	may-11	jun-11	jul-11	aug-11	sep-11	oct-11	nov-11	dec-11
-----Field data------													
TEMP	deg C	16,6	18	18,625	20,5	20	21	21,2	21,6667	20,75	20,6	19,5	19
COND-F	ms/cm												
PH-F	pH unit	7,22	7,15	7,25	7,25	7,35	7,4	7,3	7,3333	7,425	7,46	7,45	7,2667
-----Major Constituents------													
CA	mg/L												
CL	mg/L	40	29,975	29,5	36,4	39,75	37,75	56,2	32,5	33,5	45,4	47,3333	46
CO3	mg/L												
HCO3	mg/L												
K	mg/L												
MG	mg/L												
NA	mg/L												
SO4	mg/L	82,8	69,5	69,25	77,6	78,5	76,5	79	76,25	83,25	105,4	104	103,4
T-HARD	mg/L												
T.ALK	mg/L												
-----Metals------													
AG	mg/L												
AL	mg/L												
AS	mg/L												
B	mg/L												
BA	mg/L												
BE	mg/L												
BI	mg/L												
CD	mg/L												
CO	mg/L												
CR	mg/L												
CU	mg/L												
F	mg/L												
FE	mg/L												
HG	mg/L												
MN	mg/L												
MO	mg/L												
NI	mg/L												
PB	mg/L												
SB	mg/L												
SE	mg/L												
SI	mg/L												
V	mg/L												
ZN	mg/L												
-----Nutrients------													
NH3	mg/L												
NH3-N	mg/L	3,58	4,3	0,84	1,004	1,915	1,915	2,688	8,1	6,45	8,912	3,8667	20,92
NO2-N	mg/L	0,944	2,33	1,22	0,904	0,0268	0,1495	1,4182	0,22	0,0158	0,8964	1,4067	0,311
NO3-N	mg/L	17,54	13,625	11,7	21,6	27,5	24,75	17,88	17,475	18,45	12,6	18,2667	12,4
T.PO4	mg/L	4,68	4,55	4,55	4,64	4,9	4,675	4,96	5,2	5,875	3,02	3,2	5,04
TKN	mg/L												
-----Solids------													
TURB-L	NTU												
TDS	mg/L	378,4	307	298,25	381,2	384,25	339,6667						
TSS	mg/L	9,4	16,75	21,5	9	14	8						
-----Trace Constituents------													
CN-F	mg/L												
CN-T	mg/L												
CN-WAD	mg/L												

SAMPLE POINT : KU200		jan-11	feb-11	mar-11	apr-11	may-11	jun-11	jul-11	aug-11	sep-11	oct-11	nov-11	dec-11
-----Field data------													
TEMP	deg C	16,8	18	19,125	19,75	20	21	21,25	21,3333	20,75	21,1	19,75	19
COND-F	ms/cm												
PH-F	pH unit	7,26	7,325	7,425	7,425	7,475	7,4	7,275	7,4667	7,45	7,42	7,625	7,3
-----Major Constituents------													
CA	mg/L												
CL	mg/L	39	35,25	35,25	33,8	38,5	38,3333	35	29,25	30,75	44,8	44,3333	44,6
CO3	mg/L												
HCO3	mg/L												
K	mg/L												
MG	mg/L												
NA	mg/L												
SO4	mg/L	80,6	79,25	76,25	75	77,5	77,6667	80,25	72,75	79,75	102,4	102,6667	103,6
T-HARD	mg/L												
T.ALK	mg/L												
-----Metals------													
AG	mg/L												
AL	mg/L												
AS	mg/L												
B	mg/L												
BA	mg/L												
BE	mg/L												
BI	mg/L												
CD	mg/L												
CO	mg/L												
CR	mg/L												
CU	mg/L												
F	mg/L												
FE	mg/L												
HG	mg/L												
MN	mg/L												
MO	mg/L												
NI	mg/L												
PB	mg/L												
SB	mg/L												
SE	mg/L												
SI	mg/L												
V	mg/L												
ZN	mg/L												
-----Nutrients------													
NH3	mg/L												
NH3-N	mg/L	7,744	2,42	4,665	2,152	2,65	3,42	2,41	6,65	7,63	8,804	6,0667	10,436
NO2-N	mg/L	0,1746	0,7165	0,261	0,5514	0,7933	0,6	0,129	0,5325	0,1558	0,1832	0,2133	0,5488
NO3-N	mg/L	2,64	6,075	2,175	10,02	17,3	10,4	15,6	11,825	7,6	1,88	1,5667	8,76
T.PO4	mg/L	4,02	4,575	3,3	3,46	3,175	5,0667	5,2	4,55	4,525	1,82	1,5467	3,92
TKN	mg/L												
-----Solids------													
TURB-L	NTU												
TDS	mg/L	299,6	314,25	282,75	318,6	350,25	371,5						
TSS	mg/L	16,8	157,25	7,25	8	6,25	19,5						
-----Trace Constituents------													
CN-F	mg/L												
CN-T	mg/L												
CN-WAD	mg/L												

SAMPLE POINT : KU200-2		jan-11	feb-11	mar-11	apr-11	may-11	jun-11	jul-11	aug-11	sep-11	oct-11	nov-11	dec-11
-----Field data------													
TEMP	deg C	17,75	17,75	19,125	19,75	20	21	21	21,3333	20,75	20,8	19,5	19,3333
COND-F	ms/cm												
PH-F	pH unit	7,25	7,375	7,325	7,425	7,425	7,475	7,3	7,4333	7,45	7,42	7,525	7,3333
-----Major Constituents------													
CA	mg/L												
CL	mg/L	37,5	33,25	34,25	33,6	38,75	36,5	33,4	30,25	32	44,2	44,6667	41,2
CO3	mg/L												
HCO3	mg/L												
K	mg/L												
MG	mg/L												
NA	mg/L												
SO4	mg/L	77,5	76,25	74,25	72	76,25	75,25	78	73	76,75	100	100,6667	97,4
T-HARD	mg/L												
T.ALK	mg/L												
-----Metals------													
AG	mg/L												
AL	mg/L												
AS	mg/L												
B	mg/L												
BA	mg/L												
BE	mg/L												
BI	mg/L												
CD	mg/L												
CO	mg/L												
CR	mg/L												
CU	mg/L												
F	mg/L												
FE	mg/L												
HG	mg/L												
MN	mg/L												
MO	mg/L												
NI	mg/L												
PB	mg/L												
SB	mg/L												
SE	mg/L												
SI	mg/L												
V	mg/L												
ZN	mg/L												
-----Nutrients------													
NH3	mg/L												
NH3-N	mg/L	4,42	9,525	2,78	5,98	3,885	8,175	4,392	9,375	11,125	13,26	7,5	16,74
NO2-N	mg/L	0,6475	0,6218	0,6945	0,6244	0,476	0,8	0,1302	0,51	0,1443	0,2062	0,9733	0,0998
NO3-N	mg/L	2,675	1,8	2,225	3,22	2,325	4,95	7,5	3,575	7,3	1,12	8,1667	0,96
T.PO4	mg/L	3,2	3,35	3,4	2,84	2,55	4,425	3,92	4,575	4,775	2	1,8333	2,98
TKN	mg/L												
-----Solids------													
TURB-L	NTU												
TDS	mg/L	305,75	296,75	283	311	268,75	277,6667						
TSS	mg/L	12	6	8,5	8,2	5,5	20,6667						
-----Trace Constituents------													
CN-F	mg/L												
CN-T	mg/L												
CN-WAD	mg/L												

SAMPLE POINT : S1.1		jan-11	feb-11	mar-11	apr-11	may-11	jun-11	jul-11	aug-11	sep-11	oct-11	nov-11	dec-11
-----Field data------													
TEMP	deg C	14,8	16,25	16,5	17,75	18	19				18	16,5	16,3333
COND-F	ms/cm												
PH-F	pH unit	7,08	7,175	7,0525	7,225	7,25	7,2333				7,6	7,25	7,1333
-----Major Constituents------													
CA	mg/L												
CL	mg/L	38,8	36,5	35,5	34	39,25	37,6667				45	43	46
CO3	mg/L												
HCO3	mg/L												
K	mg/L												
MG	mg/L												
NA	mg/L												
SO4	mg/L	76	80,25	74,75	75	77	76				100	97	105,2
T-HARD	mg/L												
T.ALK	mg/L												
-----Metals------													
AG	mg/L												
AL	mg/L												
AS	mg/L												
B	mg/L												
BA	mg/L												
BE	mg/L												
BI	mg/L												
CD	mg/L												
CO	mg/L												
CR	mg/L												
CU	mg/L												
F	mg/L												
FE	mg/L												
HG	mg/L												
MN	mg/L												
MO	mg/L												
NI	mg/L												
PB	mg/L												
SB	mg/L												
SE	mg/L												
SI	mg/L												
V	mg/L												
ZN	mg/L												
-----Nutrients------													
NH3	mg/L												
NH3-N	mg/L	5,58	6,95	3,87	2,56	3,115	6,3333				6,6	8,3333	12,06
NO2-N	mg/L	0,408	1,114	0,508	0,6788	0,7525	0,7				2,1	0,4867	0,358
NO3-N	mg/L	2,54	5,625	2,3	9,46	9,425	6,4667				4,5	4,1333	10,48
T.PO4	mg/L	3,78	3,7	3,3	3,26	3,4	4,3667				2,2	1,7333	3,84
TKN	mg/L												
-----Solids------													
TURB-L	NTU												
TDS	mg/L	293,8	314,5	289,25	319	305,5	289,3333						
TSS	mg/L	28,6	12,25	5,75	11,6	6,5	15						
-----Trace Constituents------													
CN-F	mg/L												
CN-T	mg/L												
CN-WAD	mg/L												

SAMPLE POINT : S1.2		jan-11	feb-11	mar-11	apr-11	may-11	jun-11	jul-11	aug-11	sep-11	oct-11	nov-11	dec-11
-----Field data------													
TEMP	deg C						10,2		4,9	3,9	2,9		
COND-F	ms/cm						1,03			0,41	0,488		
PH-F	pH unit						7,5		6,79	7,85	8,1		
-----Major Constituents------													
CA	mg/L												
CL	mg/L						13	10	3,6	7,9	9,4		
CO3	mg/L												
HCO3	mg/L												
K	mg/L												
MG	mg/L												
NA	mg/L												
SO4	mg/L						120	116	61	140	270		
T-HARD	mg/L												
T.ALK	mg/L												
-----Metals------													
AG	mg/L												
AL	mg/L						0,5	0,54	3,71	1,71	0,81		
AS	mg/L												
B	mg/L												
BA	mg/L												
BE	mg/L												
BI	mg/L												
CD	mg/L												
CO	mg/L												
CR	mg/L												
CU	mg/L						0,007	0,005	0,008	0,009	0,018		
F	mg/L												
FE	mg/L						0,623	0,706	5,06	2,09	1,04		
HG	mg/L												
MN	mg/L												
MO	mg/L												
NI	mg/L						0,005	0,005	0,005	0,005	0,005		
PB	mg/L												
SB	mg/L												
SE	mg/L												
SI	mg/L												
V	mg/L												
ZN	mg/L						0,003	0,002	0,017	0,01	0,005		
-----Nutrients------													
NH3	mg/L												
NH3-N	mg/L						1,66	1,52	0,84	1,98	3,6		
NO2-N	mg/L						0,074	0,068	0,062	0,15	0,16		
NO3-N	mg/L						2,3	2,1	1,3	2,2	3,3		
T.PO4	mg/L						0,3	0,08	0,14	0,19	4		
TKN	mg/L												
-----Solids------													
TURB-L	NTU						0,95	16					
TDS	mg/L						541	236		186			
TSS	mg/L						12	14		65			
-----Trace Constituents------													
CN-F	mg/L												
CN-T	mg/L												
CN-WAD	mg/L												

SAMPLE POINT : P5.2		jan-11	feb-11	mar-11	apr-11	may-11	jun-11	jul-11	aug-11	sep-11	oct-11	nov-11	dec-11
-----Field data------													
TEMP	deg C	9,675	9,125	10,8	10,62	11,05	9,6	11,25	9,8	10,125	12,65	12,975	10,68
COND-F	ms/cm	0,1555	0,1095	0,1578	0,1267	0,3156	0,1478	0,2665	0,1325	0,1327	0,1347	0,1	0,1202
PH-F	pH unit	7,7225	7,45	7,7275	7,468	7,8725	7,68	7,55	7,7175	7,7575	7,85	7,8	7,844
-----Major Constituents------													
CA	mg/L	20,7			17,5			17,7	17,5			13,8	
CL	mg/L	1,2			2,3			3,7	1,2			1	
CO3	mg/L	1			1			1	1			1	
HCO3	mg/L	33			32			30	25			31	
K	mg/L	1,56			1,39			1,39	1,54			1,09	
MG	mg/L	3,64			3,43			4,01	3,35			2,53	
NA	mg/L	2,24			2,08			2,17	1,89			1,55	
SO4	mg/L	30			25			32	27			27	
T-HARD	mg/L	55			47			55	49			49	
T.ALK	mg/L	27			26			24,6	45			25,6	
-----Metals------													
AG	mg/L												
AL	mg/L	0,1133	0,085	0,085	0,085	0,1075	0,18	0,1225	0,126	0,1025	0,1075	0,2167	0,152
AS	mg/L												
B	mg/L												
BA	mg/L	0,019			0,018			0,018	0,027			0,024	
BE	mg/L												
BI	mg/L												
CD	mg/L	0,002			0,002			0,002	0,002			0,002	
CO	mg/L	0,004			0,004			0,004	0,004			0,004	
CR	mg/L	0,008			0,008			0,008	0,008			0,008	
CU	mg/L	0,0167	0,005	0,0135	0,0075	0,0195	0,0273	0,0398	0,0256	0,0253	0,0273	0,0053	0,0118
F	mg/L	0,095			0,087			0,06	0,05			0,061	
FE	mg/L	0,0327	0,0363	0,0365	0,0338	0,0233	0,0363	0,0598	0,1198	0,0858	0,0867	0,088	0,0624
HG	mg/L	0,0005			0,0005			0,0005	0,0005			0,0005	
MN	mg/L												
MO	mg/L												
NI	mg/L												
PB	mg/L	0,005			0,005			0,005	0,005			0,005	
SB	mg/L												
SE	mg/L												
SI	mg/L												
V	mg/L												
ZN	mg/L												
-----Nutrients------													
NH3	mg/L												
NH3-N	mg/L	0,04			0,04			0,04	0,06			0,04	
NO2-N	mg/L	0,001			0,001			0,004	0,001			0,002	
NO3-N	mg/L	0,1			0,5			0,7	0,2			0,3	
T.PO4	mg/L	0,01			0,01			0,01	0,03			0,01	
TKN	mg/L												
-----Solids------													
TURB-L	NTU	0,95	0,8125	1,1375	1,38	0,5625	0,75	0,35	3			2	
TDS	mg/L	68	77,25	68	74,6	69,25	67,75	81	61			77	
TSS	mg/L	2	1	2,5	2,2	1	1	1	1			1	
-----Trace Constituents------													
CN-F	mg/L												
CN-T	mg/L	0,005			0,005			0,005	0,005			0,005	
CN-WAD	mg/L												

SAMPLE POINT : P5.3		jan-11	feb-11	mar-11	apr-11	may-11	jun-11	jul-11	aug-11	sep-11	oct-11	nov-11	dec-11
-----Field data------													
TEMP	deg C	7,6	9,2	10,7	12,35	11,475	11,48	12,4333	9,9	10,16	11,64	12,575	11,04
COND-F	ms/cm	0,131	0,0973	0,1568	0,1037	0,147	0,3188	2,6727	0,128	0,1214	0,1365	0,0908	0,1092
PH-F	pH unit	7,575	7,45	7,6875	7,2225	7,975	7,568	21,0867	7,78	7,764	7,836	7,675	7,86
-----Major Constituents------													
CA	mg/L					18,6		19,8			16,5	17,3	
CL	mg/L					4,8		3,3			1,1	1,4	
CO3	mg/L					1		1			1	1	
HCO3	mg/L					26		24			23	31	
K	mg/L					1,54		1,6			1,25	1,42	
MG	mg/L					3,51		3,88			3,05	3,25	
NA	mg/L					2,65		2,1			1,87	2,35	
SO4	mg/L					30		38			32	30	
T-HARD	mg/L					47		55			47	50	
T.ALK	mg/L					21,4		20			18,8	25,8	
-----Metals------													
AG	mg/L										0,003		
AL	mg/L	0,16	0,12	0,29	0,088	0,1067	0,1125	0,4225	0,0833	0,072	0,13	0,07	0,164
AS	mg/L										0,005		
B	mg/L												
BA	mg/L					0,018		0,021			0,023	0,018	
BE	mg/L										0,0002		
BI	mg/L												
CD	mg/L					0,002		0,002			0,002	0,002	
CO	mg/L					0,004		0,004			0,004	0,004	
CR	mg/L					0,008		0,008			0,008	0,008	
CU	mg/L	0,014	0,0098	0,015	0,027	0,009	0,0143	0,038	0,034	0,0252	0,022	0,012	0,0162
F	mg/L					0,08		0,033			0,042	0,07	
FE	mg/L	0,0878	0,0258	0,0418	0,0242	0,0263	0,041	0,3338	0,0787	0,069	0,0774	0,04	0,0544
HG	mg/L					0,0005		0,0005			0,0005		
MN	mg/L										0,005		
MO	mg/L										0,004		
NI	mg/L										0,005		
PB	mg/L					0,005		0,005			0,005	0,005	
SB	mg/L										0,02		
SE	mg/L										0,02		
SI	mg/L												
V	mg/L										0,006		
ZN	mg/L										0,017		
-----Nutrients------													
NH3	mg/L												
NH3-N	mg/L					0,04		0,04			0,04	0,04	
NO2-N	mg/L					0,001		0,003			0,001	0,001	
NO3-N	mg/L					0,4		0,3			0,3	0,3	
T.PO4	mg/L					0,01		0,01			0,01	0,01	
TKN	mg/L												
-----Solids------													
TURB-L	NTU	2,9	1	1,7	0,91	0,6167	0,475	0,45			2,3	1,3	
TDS	mg/L	77	80	69,75	74,4	67	67,5	78			77	79	
TSS	mg/L	2,5	1	2,75	2,4	1	1	1			1	0,1	
-----Trace Constituents------													
CN-F	mg/L												
CN-T	mg/L	0,005	0,005	0,005	0,005	0,005	0,005	0,005	0,005	0,005	0,005	0,005	0,005
CN-WAD	mg/L												

SAMPLE POINT : P5.4		jan-11	feb-11	mar-11	apr-11	may-11	jun-11	jul-11	aug-11	sep-11	oct-11	nov-11	dec-11
-----Field data------													
TEMP	deg C	8,775	8,875	9,675	9,54	10,7	10,76	11,6333	9,9333	9,88	10	7,625	10,05
COND-F	ms/cm	0,123	0,0935	0,164	0,0949	0,102	0,268	0,1777	0,1461	0,1306	0,112	0,071	0,1439
PH-F	pH unit	7,5025	7,5625	7,6125	7,428	8,05	7,676	7,71	7,7467	7,732	7,8375	7,85	7,9525
-----Major Constituents------													
CA	mg/L						15,1	18,1					
CL	mg/L						2,2	2,2					
CO3	mg/L						1	1					
HCO3	mg/L						21	29					
K	mg/L						1,21	1,29					
MG	mg/L						2,93	3,7					
NA	mg/L						1,71	1,87					
SO4	mg/L						29	36					
T-HARD	mg/L						44	55					
T.ALK	mg/L						17,4	23,6					
-----Metals------													
AG	mg/L												
AL	mg/L	0,095	0,07	0,0725	0,102	0,11	0,2067	0,1125	0,09	0,104	0,0825	0,1733	0,162
AS	mg/L												
B	mg/L												
BA	mg/L						0,015	0,019					
BE	mg/L												
BI	mg/L												
CD	mg/L						0,002	0,002					
CO	mg/L						0,004	0,004					
CR	mg/L						0,008	0,008					
CU	mg/L	0,005	0,0053	0,005	0,0132	0,0058	0,018	0,0475	0,0123	0,0228	0,0285	0,0077	0,0052
F	mg/L						0,052	0,048					
FE	mg/L	0,0965	0,048	0,0513	0,0448	0,044	0,057	0,1063	0,103	0,1092	0,0743	0,0957	0,0888
HG	mg/L						0,0005	0,0005					
MN	mg/L												
MO	mg/L												
NI	mg/L												
PB	mg/L						0,005	0,005					
SB	mg/L												
SE	mg/L												
SI	mg/L												
V	mg/L												
ZN	mg/L												
-----Nutrients------													
NH3	mg/L												
NH3-N	mg/L						0,04	0,04					
NO2-N	mg/L						0,002	0,001					
NO3-N	mg/L						0,3	0,3					
T.PO4	mg/L						0,01	0,01					
TKN	mg/L												
-----Solids------													
TURB-L	NTU	1,15	0,7875	1,1375	1,44	0,6	0,95	0,55					
TDS	mg/L	77,25	98	67,75	77	79,75	68,3333	98					
TSS	mg/L	1,25	1	2,25	3	1	1	1					
-----Trace Constituents------													
CN-F	mg/L												
CN-T	mg/L						0,005	0,005					
CN-WAD	mg/L												

SAMPLE POINT : RS1		jan-11	feb-11	mar-11	apr-11	may-11	jun-11	jul-11	aug-11	sep-11	oct-11	nov-11	dec-11
-----Field data------													
TEMP	deg C	19,6	20,75	21,5	21,75	21,75	22,75	23	24,3333	23	23,1	21,5	21,5
COND-F	ms/cm												
PH-F	pH unit	8,16	8,025	7,7125	7,85	8,3	8,25	8,16	8,2333	8,425	7,73	8,125	7,95
-----Major Constituents------													
CA	mg/L												
CL	mg/L	29,4	31	34,25	29	24	32,25	39,6	34,5	24,425	30,2	43,6667	46
CO3	mg/L												
HCO3	mg/L												
K	mg/L												
MG	mg/L												
NA	mg/L												
SO4	mg/L	68,4	42,25	60,25	43,4	49,5	50,25	41,2	55,75	41,5	27,2	71	89
T-HARD	mg/L												
T.ALK	mg/L												
-----Metals------													
AG	mg/L												
AL	mg/L												
AS	mg/L												
B	mg/L												
BA	mg/L												
BE	mg/L												
BI	mg/L												
CD	mg/L												
CO	mg/L												
CR	mg/L												
CU	mg/L												
F	mg/L												
FE	mg/L												
HG	mg/L												
MN	mg/L												
MO	mg/L												
NI	mg/L												
PB	mg/L												
SB	mg/L												
SE	mg/L												
SI	mg/L												
V	mg/L												
ZN	mg/L												
-----Nutrients------													
NH3	mg/L												
NH3-N	mg/L	7,86	5,3	11,6	13,96	11,275	15	11,92	15,375	15	15,66	9,6	17,04
NO2-N	mg/L	0,0032	0,0038	0,0028	0,0098	0,0085	0,0038	0,26	0,0053	0,0055	0,0104	0,0073	0,0098
NO3-N	mg/L	0,12	0,225	0,125	0,3	0,1	0,1	0,1	0,1	0,1	0,14	0,2	0,1
T.PO4	mg/L	8,2	6,525	11,125	9,74	9,5	8,5	10	8,5	10,25	6,3	6,3333	7,06
TKN	mg/L												
-----Solids------													
TURB-L	NTU												
TDS	mg/L	402,6	437,5	439	432,4	365,25	418,6667						
TSS	mg/L	314	357,5	1085,75	972,2	1210,5	944,6667						
-----Trace Constituents------													
CN-F	mg/L												
CN-T	mg/L												
CN-WAD	mg/L												

SAMPLE POINT : T8.1		jan-11	feb-11	mar-11	apr-11	may-11	jun-11	jul-11	aug-11	sep-11	oct-11	nov-11	dec-11
-----Field data------													
TEMP	deg C	0,2	5	3,4	3,975	5,48	5,85	12,35	8,82	8,05	4,475	0,75	0,3
COND-F	ms/cm		1,654		0,992	1,463			1,961	1,665	1,6772	1,6275	1,65
PH-F	pH unit	8,9	8,9	9,45	9,125	9,292	9,715	9,205	8,932	8,6467	8,925	8,775	8,56
-----Major Constituents------													
CA	mg/L	83,6	74,6	99,8	49,5	55,2	50,6	69,9		90,4	126	105	140
CL	mg/L	37	37	50,5	24	28	27	27	28	150	32	29	29
CO3	mg/L	20	21	38,5	20	40	20	28	17	15	18	44	54
HCO3	mg/L	92	88	90,5	49	60	70	110	110	94,5	115	62	45
K	mg/L	119	115	158	72,7	97,7	96	102		112,85	100	99,1	109
MG	mg/L	9,08	8,45	12,645	6,83	5,35	5,1	5,07		5,24	5,46	4,22	3,91
NA	mg/L	511	386	661	341	374	382	385		438	434	4,11	456
SO4	mg/L	810	810	1090	530	560	550	580	620	735	820	920	980
T-HARD	mg/L	230	250	325	170	170	150	800	275	267,5	325	350	400
T.ALK	mg/L	109	106	138,5	73	116	91	140	119	103	122	125	127
-----Metals------													
AG	mg/L					0,077				0,059	0,063		
AL	mg/L	0,135	0,15	0,135	0,29	0,42	0,26	0,209	0,18	0,1648	0,23	0,07	0,14
AS	mg/L					0,005				0,005	0,005		
B	mg/L												
BA	mg/L	0,07	0,064	0,062	0,04	0,0465	0,036	0,037	0,029	0,0275	0,027	0,019	0,02
BE	mg/L					0,0002				0,0002	0,0002		
BI	mg/L												
CD	mg/L					0,002				0,002	0,002		
CO	mg/L	0,07	0,066	0,0915	0,052	0,0545	0,06	0,06	0,059	0,059	0,064	0,067	0,058
CR	mg/L	0,008	0,008	0,008	0,008	0,008	0,008	0,008	0,008	0,008	0,008	0,008	0,008
CU	mg/L				15,5933	22,65	21,7333	22,9	23,025	22,789	23,2	24,8	
F	mg/L												
FE	mg/L				3,0733	3,4025	1,064	0,805	1,245	1,3695	0,6645	0,748	
HG	mg/L	0,0005	0,0005	0,0005	0,0005	0,0005	0,0005	0,0005	0,0005	0,0005		0,0005	0,0005
MN	mg/L	0,001	0,001	0,001	0,024	0,0105	0,005	0,01	0,009	0,0065	0,031	0,02	0,011
MO	mg/L	0,397	0,378	0,4735	0,25	0,273	0,294	0,307	0,302	0,2978	0,321	0,355	0,321
NI	mg/L				0,4183	0,5793	0,603	0,613	0,6103	0,6293	0,6395	0,681	
PB	mg/L					0,018				0,009	0,009		
SB	mg/L					0,21				0,16	0,155		
SE	mg/L					0,02				0,02	0,03		
SI	mg/L												
V	mg/L					0,006				0,006	0,014		
ZN	mg/L				0,2977	0,4163	0,4023	0,2335	0,021	0,0135	0,1118	0,25	
-----Nutrients------													
NH3	mg/L												
NH3-N	mg/L	15	16,5	24	10,1333	13,3333	10,8333	10,15	12,125	12,8333	16,5	33	19
NO2-N	mg/L	0,048	0,38	0,027	0,0037	0,0027	0,002	0,1432	0,3228	0,2633	0,3078	0,38	0,48
NO3-N	mg/L	30	30	42	42,4	28,3333	26,3333	25,5	25,25	24,6667	24,75	26,5	29
T.PO4	mg/L									1,3	1,2		
TKN	mg/L												
-----Solids------													
TURB-L	NTU	1,4	0,6	2,1	95	14	4,5	3,3	3,6	5,6		2,7	0,3
TDS	mg/L	1940	1950	2630	1370	1280	1470	1490	1300	1670		2060	2170
TSS	mg/L	3	1	1,5	9	5	1	4	3	1		1	1
-----Trace Constituents------													
CN-F	mg/L	14,5	15	20,25	12,6667	17,375	5,7667	9,575	4,175	5,3333	6	4,6	13,5
CN-T	mg/L	54	58	87	35	50	35	29,25	26,5	24,3333	31,75	35	46
CN-WAD	mg/L	39	48	69	30	43,5	33,6667	21,95	25,75	22,3333	29,25	33	38

SAMPLE POINT : T8.4		jan-11	feb-11	mar-11	apr-11	may-11	jun-11	jul-11	aug-11	sep-11	oct-11	nov-11	dec-11
-----Field data------													
TEMP	deg C					8,1	6,075	11,78	8,64	7,425	5,925		
COND-F	ms/cm					1,16			2,1425	1,85	2,045		
PH-F	pH unit					8,9	7,9	7,892	8,038	8,0025	8,0875		
-----Major Constituents------													
CA	mg/L						46,7	30,3	30,6	49,4	68,7		
CL	mg/L						26,5	26	26	122,5	30		
CO3	mg/L						6	1	20	2,5	33,5		
HCO3	mg/L						160	105	130	89	76		
K	mg/L						65	88,9	101	109,9	99,1		
MG	mg/L						8,8	3,91	4,82	5,88	5,375		
NA	mg/L						459,5	558	585	587,5	589,5		
SO4	mg/L						815	870	900	930	1095		
T-HARD	mg/L						155	100	160	140	205		
T.ALK	mg/L						141,5	85,5	140	75,75	116		
-----Metals------													
AG	mg/L					0,003	0,003		0,003	0,003	0,003		
AL	mg/L					0,45	0,155	0,17	0,19	0,0712	0,085		
AS	mg/L					0,005	0,005		0,005	0,005	0,005		
B	mg/L												
BA	mg/L					0,039	0,0305	0,018	0,018	0,014	0,0165		
BE	mg/L					0,0002	0,0002		0,0002	0,0002	0,0002		
BI	mg/L												
CD	mg/L					0,002	0,002		0,002	0,002	0,002		
CO	mg/L					0,012	0,019	0,022	0,042	0,043	0,0475		
CR	mg/L					0,008	0,008	0,008	0,008	0,008	0,008		
CU	mg/L					0,076	0,1107	0,0867	0,0984	0,1125	0,199		
F	mg/L												
FE	mg/L					0,748	0,2723	0,3035	0,541	0,17	0,2547		
HG	mg/L						0,0005	0,0005	0,0005	0,0005	0,0005		
MN	mg/L					0,099	0,0465	0,012	0,017	0,0135	0,032		
MO	mg/L					0,138	0,184	0,243	0,304	0,2675	0,257		
NI	mg/L					0,006	0,009	0,005	0,005	0,006	0,0077		
PB	mg/L					0,005	0,005		0,005	0,005	0,005		
SB	mg/L					0,07	0,1		0,138	0,1	0,101		
SE	mg/L					0,02	2		0,02	0,02	0,029		
SI	mg/L												
V	mg/L					0,006	0,006		0,006	0,006	0,011		
ZN	mg/L					0,007	0,0083	0,005	0,0036	0,0013	0,0013		
-----Nutrients------													
NH3	mg/L						0,3	0,3405	0,4324	0,4243	0,3977		
NH3-N	mg/L						20,5	19,75	19,8	23,6667	24,6667		
NO2-N	mg/L						0,2027	0,3453	0,378	0,3387	0,4547		
NO3-N	mg/L						17	22	23,8	22,6667	21,3333		
T.PO4	mg/L									0,28	0,88		
TKN	mg/L												
-----Solids------													
TURB-L	NTU						4,5333	11,65	2,28	0,7	0,975		
TDS	mg/L						1626,6667	1810	1776	1930	1945		
TSS	mg/L						8	20,9	2,6	1	1		
-----Trace Constituents------													
CN-F	mg/L					0	0		0,005	0,005			
CN-T	mg/L					0,05	0,0527	0,065	0,0676	0,056	0,0717		
CN-WAD	mg/L					0,024	0,026	0,0395	0,044	0,0373	0,042		

SAMPLE POINT : SSS.1		jan-11	feb-11	mar-11	apr-11	may-11	jun-11	jul-11	aug-11	sep-11	oct-11	nov-11	dec-11
-----Field data------													
TEMP	deg C	4,8	6,9	4,8	2,3						1,1	6,4	3,5
COND-F	ms/cm	0,019	0,52	0,042	0,24						0,081	0,246	0,085
PH-F	pH unit	8,6	8,85	8,4	8,67						8,4	7,93	8,23
-----Major Constituents------													
CA	mg/L	5,56	8,04	5,63	3,79						1,59	6,47	4,05
CL	mg/L	0,5	0,5	0,7	1,2						0,5	0,5	0,5
CO3	mg/L												
HCO3	mg/L	21	12	16	11						15	19	13
K	mg/L	0,93	0,17	0,6	0,18						0,5	0,37	0,42
MG	mg/L	0,75	1,68	0,94	0,51						0,28	0,63	0,57
NA	mg/L												
SO4	mg/L	3	16	3	2						1	3	4
T-HARD	mg/L												
T.ALK	mg/L												
-----Metals------													
AG	mg/L												
AL	mg/L												
AS	mg/L												
B	mg/L												
BA	mg/L												
BE	mg/L												
BI	mg/L												
CD	mg/L												
CO	mg/L												
CR	mg/L												
CU	mg/L												
F	mg/L												
FE	mg/L	3,11	3,59	5,84	1,84						0,259	0,375	1,56
HG	mg/L												
MN	mg/L												
MO	mg/L												
NI	mg/L												
PB	mg/L												
SB	mg/L												
SE	mg/L												
SI	mg/L	1,02	1,23	4,28	1,01						0,21	0,23	0,84
V	mg/L												
ZN	mg/L												
-----Nutrients------													
NH3	mg/L												
NH3-N	mg/L	0,28	0,16	0,2	0,26						0,16	0,22	0,24
NO2-N	mg/L	0,001	0,002	0,001	0,001						0,001	0,001	0,001
NO3-N	mg/L	0,2	0,8	0,3	0,1						0,1	0,1	0,3
T.PO4	mg/L												
TKN	mg/L												
-----Solids------													
TURB-L	NTU												
TDS	mg/L												
TSS	mg/L	261	85	158	160						28	121	148
-----Trace Constituents------													
CN-F	mg/L												
CN-T	mg/L												
CN-WAD	mg/L												

SAMPLE POINT : SSS.2		jan-11	feb-11	mar-11	apr-11	may-11	jun-11	jul-11	aug-11	sep-11	oct-11	nov-11	dec-11
-----Field data------													
TEMP	deg C	4	6,6	3,5	6,7						1,4	3,4	3,2
COND-F	ms/cm	0,041	0,661	0,038	0,511						0,0114	0,531	0,08
PH-F	pH unit	7,9	8,96	8,7	8,52						8,3	7,69	8,25
-----Major Constituents------													
CA	mg/L	3,85	5,84	3,64	6,19						1,17	3,69	3,61
CL	mg/L	0,6	0,5	0,5	1,5						0,5	0,5	0,5
CO3	mg/L												
HCO3	mg/L	15	14	12	17						9	12	11
K	mg/L	0,35	0,23	0,26	0,61						0,11	0,13	0,23
MG	mg/L	0,83	1,82	0,5	0,71						0,2	0,54	1,69
NA	mg/L												
SO4	mg/L	4	9	2	2						1	2	8
T-HARD	mg/L												
T.ALK	mg/L												
-----Metals------													
AG	mg/L												
AL	mg/L												
AS	mg/L												
B	mg/L												
BA	mg/L												
BE	mg/L												
BI	mg/L												
CD	mg/L												
CO	mg/L												
CR	mg/L												
CU	mg/L												
F	mg/L												
FE	mg/L	2,23	1,93	2,01	1,14						0,321	0,127	0,83
HG	mg/L												
MN	mg/L												
MO	mg/L												
NI	mg/L												
PB	mg/L												
SB	mg/L												
SE	mg/L												
SI	mg/L	1,21	0,62	2,33	0,69						0,41	0,06	0,46
V	mg/L												
ZN	mg/L												
-----Nutrients------													
NH3	mg/L												
NH3-N	mg/L	0,3	0,24	0,18	0,38						0,26	0,2	0,16
NO2-N	mg/L	0,003	0,001	0,001	0,001						0,001	0,001	0,001
NO3-N	mg/L	0,3	0,7	0,2	0,1						0,1	0,1	0,3
T.PO4	mg/L												
TKN	mg/L												
-----Solids------													
TURB-L	NTU												
TDS	mg/L												
TSS	mg/L	219	126	100	83						26	69	102
-----Trace Constituents------													
CN-F	mg/L												
CN-T	mg/L												
CN-WAD	mg/L												

SAMPLE POINT : SWS.1		jan-11	feb-11	mar-11	apr-11	may-11	jun-11	jul-11	aug-11	sep-11	oct-11	nov-11	dec-11
-----**Field data**------													
TEMP	deg C				0,7	4,1	4,8	7,9	4,35	3,2	1,5		
COND-F	ms/cm				0,39	0,335	0,514	2,12	0,6895	0,894	1,483		
PH-F	pH unit				7,99	8	7,6	7,7	7,8	7,7	8		
-----**Major Constituents**------													
CA	mg/L												
CL	mg/L				10	11	7,9	7,6	4,1		6,7		
CO3	mg/L												
HCO3	mg/L												
K	mg/L												
MG	mg/L												
NA	mg/L												
SO4	mg/L				3570	3860	2860	2030	1015		1980		
T-HARD	mg/L												
T.ALK	mg/L												
-----**Metals**------													
AG	mg/L									0,003			
AL	mg/L				0,25	1,56	0,78	0,15	0,185	1,1	0,06		
AS	mg/L				0,005	0,005	0,005	0,005	0,005	0,005	0,005		
B	mg/L												
BA	mg/L									0,074			
BE	mg/L									0,0002			
BI	mg/L												
CD	mg/L									0,002			
CO	mg/L									0,004			
CR	mg/L									0,008			
CU	mg/L				0,005	0,005	0,005	0,005	0,005	0,005	0,005		
F	mg/L												
FE	mg/L				0,358	3,34	8,92	0,664	2,65	3,43	1,35		
HG	mg/L												
MN	mg/L									0,119			
MO	mg/L									0,004			
NI	mg/L				0,386	0,467	0,461	0,27	0,2185	0,005	0,169		
PB	mg/L									0,005			
SB	mg/L									0,02			
SE	mg/L									0,02			
SI	mg/L												
V	mg/L									0,006			
ZN	mg/L									0,005			
-----**Nutrients**------													
NH3	mg/L												
NH3-N	mg/L				0,28	0,34	0,32	0,06	0,17		0,26		
NO2-N	mg/L				0,001	0,001	0,001	0,003	0,0015		0,001		
NO3-N	mg/L				5,7	4,9	2,8	2,2	0,95		2,4		
T.PO4	mg/L												
TKN	mg/L												
-----**Solids**------													
TURB-L	NTU				15	40	39	4,5	17,5		9,1		
TDS	mg/L				5660	5850	4430	3440	1650		2220		
TSS	mg/L				18	90	48	13	17		1		
-----**Trace Constituents**------													
CN-F	mg/L												
CN-T	mg/L												
CN-WAD	mg/L												

SAMPLE POINT : SWS.2		jan-11	feb-11	mar-11	apr-11	may-11	jun-11	jul-11	aug-11	sep-11	oct-11	nov-11	dec-11
-----**Field data**------													
TEMP	deg C				2,025	2,525	3,375	5		5,72	1,4	0,3	
COND-F	ms/cm				0,271	1,02	1,1338	1,597	1,184	1,4538	1,4943	0,317	
PH-F	pH unit				7,79	8,025	8,0025	8,04	7,8	7,898	7,675	7,2	
-----**Major Constituents**------													
CA	mg/L				470,25	339	349,5	325,4	366,6667	326,4	429,25	359	
CL	mg/L				78,5	29	21,75	18,2	23,6667	26,2	42,25	54	
CO3	mg/L				1	1	1	1	3	1	1	1	
HCO3	mg/L				357,5	250	260	234	286,6667	304	395	490	
K	mg/L				19,15	11,42	9,76	10,558	12,1	10,566	13,175	13,5	
MG	mg/L				753,75	422,25	399,25	341,8	488	497,8	795,75	757	
NA	mg/L				23,65	11,86	10,465	10,268	14,5	12,902	19,475	21,7	
SO4	mg/L				3432,5	1915	1892,5	1678	2143,3333	2288	3380	4280	
T-HARD	mg/L												
T.ALK	mg/L												
-----**Metals**------													
AG	mg/L												
AL	mg/L				0,2625	0,035	0,03	0,03	0,03	0,03	0,03	0,03	
AS	mg/L												
B	mg/L												
BA	mg/L				0,018	0,0133	0,012	0,0136	0,0113	0,0138	0,0118	0,012	
BE	mg/L												
BI	mg/L												
CD	mg/L												
CO	mg/L												
CR	mg/L												
CU	mg/L				0,005	0,005	0,005	0,005	0,005	0,005	0,005	0,005	
F	mg/L												
FE	mg/L				0,1628	0,0093	0,0115	0,0098	0,0107	0,01	0,028	0,009	
HG	mg/L												
MN	mg/L				0,254	0,1855	0,1563	0,137	0,1837	0,1632	0,1958	0,164	
MO	mg/L				0,0283	0,013	0,0143	0,02	0,0157	0,0104	0,0188	0,031	
NI	mg/L				0,047	0,025	0,0225	0,0193	0,0223	0,0198	0,0308	0,037	
PB	mg/L				0,005	0,005	0,005	0,005	0,005	0,005	0,005	0,005	
SB	mg/L												
SE	mg/L				0,025	0,0225	0,025	0,02	0,02	0,024	0,0325	0,04	
SI	mg/L												
V	mg/L												
ZN	mg/L				0,0053	0,0048	0,005	0,0023	0,004	0,004	0,0058	0,009	
-----**Nutrients**------													
NH3	mg/L												
NH3-N	mg/L				1,055	0,37	0,235	0,28	0,1467	0,152	0,56	1,3	
NO2-N	mg/L				0,2755	0,001	0,0018	0,0018	0,0023	0,002	0,0048	0,001	
NO3-N	mg/L				18,25	12	12	7,96	9,5667	9,66	15,25	20	
T.PO4	mg/L												
TKN	mg/L												
-----**Solids**------													
TURB-L	NTU												
TDS	mg/L				5642,5	3085	2810	2646	3860	3578	5450	5650	
TSS	mg/L				79,75	140,25	72,5	55,6	83,3333	62,6	21,25	9	
-----**Trace Constituents**------													
CN-F	mg/L												
CN-T	mg/L												
CN-WAD	mg/L												

SAMPLE POINT : UG1		jan-11	feb-11	mar-11	apr-11	may-11	jun-11	jul-11	aug-11	sep-11	oct-11	nov-11	dec-11
-----Field data------													
TEMP	deg C	6,5	7,1	8,75	9,3	12,85	10,8	17	13,25	9,45	14,45	2,9	9,25
COND-F	ms/cm	0,48	1,0775	1,483	1,2583	0,756	0,171	1,13	0,4556	0,8255	0,675	0,73	0,4827
PH-F	pH unit	11,4	12,1	12,335	11,8333	11,15	11	11,7	10,1	9,38	11,05	9,1	8,165
-----Major Constituents------													
CA	mg/L	59,3	152	208	191,6667	91,65	87,6	57,25	68,05	124,45	80,85	84	38,6
CL	mg/L	15	7,9333	5,1	9,2	5,75	6,8	6,9	7,75	14,35	5,3	5,65	5,25
CO3	mg/L												
HCO3	mg/L	1	1	1	1	1	1	1	1	1	1	1	47,5
K	mg/L	9,86	24,9333	46,6	34,9333	19,2	18,85	30,95	21,6	27,1	22,4	19,4	10,475
MG	mg/L	13,6	0,0833	0,265	0,48	4,945	0,135	3,23	4,44	8,82	0,075	13,425	8,71
NA	mg/L												
SO4	mg/L	162	209,6667	362,5	187,3333	131	103,5	93,5	164	142	53	147	119
T-HARD	mg/L												
T.ALK	mg/L												
-----Metals------													
AG	mg/L												
AL	mg/L	1,68	0,2067	0,69	2	0,4	0,485	0,81	0,905	0,56	1,87	0,75	3,98
AS	mg/L												
B	mg/L												
BA	mg/L												
BE	mg/L												
BI	mg/L												
CD	mg/L												
CO	mg/L												
CR	mg/L												
CU	mg/L	0,005	0,005	0,005	0,005	0,005	0,005	0,007	0,005	0,0125	0,005	0,0105	0,0145
F	mg/L												
FE	mg/L	3,18	0,1263	0,788	2,6637	0,4925	1,6245	0,323	1,08	0,7785	1,481	1,1035	13,3755
HG	mg/L	0,0005	0,0005	0,0005	0,0005	0,0005	0,0005	0,0005	0,0005	0,0005	0,0005	0,0005	0,0005
MN	mg/L	0,102	0,004	0,01	0,0507	0,0175	0,0255	0,0095	0,0145	0,0125	0,023	0,0235	0,24
MO	mg/L												
NI	mg/L												
PB	mg/L												
SB	mg/L												
SE	mg/L												
SI	mg/L												
V	mg/L												
ZN	mg/L	0,011	0,002	0,0035	0,025	0,0125	0,0055	0,0035	0,0035	0,004	0,0045	0,004	0,032
-----Nutrients------													
NH3	mg/L												
NH3-N	mg/L	9,4	1,2	5,5	1,8867	5	2,27	3,75	1,28	38,3	6,7	36,25	4,95
NO2-N	mg/L	0,26	0,0893	0,215	0,1367	0,127	0,0515	0,0705	0,048	0,2455	0,44	0,55	0,1175
NO3-N	mg/L	18	2,1667	8,6	2,9667	6,9	1,7	6,95	1,05	51,65	11	51	7,1
T.PO4	mg/L												
TKN	mg/L												
-----Solids------													
TURB-L	NTU	90	27,3333	40	110,6667	23	62	70,5	45	36,5	62,5	255	142
TDS	mg/L	426	631	800	657,3333	414,5	388,5	301	299	576,5	329	574,5	341
TSS	mg/L	168	63,6667	128	213	75,5	181	121,5	57,5	79	99,5	327,5	556,5
-----Trace Constituents------													
CN-F	mg/L												
CN-T	mg/L												
CN-WAD	mg/L												

SAMPLE POINT : UG1OUT		jan-11	feb-11	mar-11	apr-11	may-11	jun-11	jul-11	aug-11	sep-11	oct-11	nov-11	dec-11
-----Field data------													
TEMP	deg C		9,5	7,8	8,7	10,3	11	14,5	11,1	11,45	13,85	10,5	7,55
COND-F	ms/cm		1,625	1,463	0,8897	0,371	0,4115	1,09	0,4785	1,1665	0,5955	0,372	1,1335
PH-F	pH unit		12,57	12,4	11,29	10,35	11	11,4	9,2	8,985	10,465	9,7	11,45
-----Major Constituents------													
CA	mg/L		269	241,5	162,2	66,4	123	119,45	134,1	213	77,75	4,17	148,85
CL	mg/L		7,3	6,45	15,5667	9,4	11,25	6,95	10,25	9,9	4,6	3,7	8,5
CO3	mg/L												
HCO3	mg/L		1	1	1	1	1	1	36,5	80,5	1	1	1
K	mg/L		36,7	34	25,8667	11,9	15,4	24,25	13,7	15,25	17,65	1,91	22,15
MG	mg/L		0,05	0,09	0,5133	10,32	19,455	3,265	81,15	178,85	0,1	1,92	2,62
NA	mg/L												
SO4	mg/L		250	300	261,3333	184,5	299,5	274	502,5	932,5	91,5	98	194,5
T-HARD	mg/L												
T.ALK	mg/L												
-----Metals------													
AG	mg/L												
AL	mg/L		0,23	0,62	0,3167	0,3	0,13	0,095	0,28	0,6	3,09	0,71	0,39
AS	mg/L												
B	mg/L												
BA	mg/L												
BE	mg/L												
BI	mg/L												
CD	mg/L												
CO	mg/L												
CR	mg/L												
CU	mg/L		0,005	0,005	0,0057	0,005	0,005	0,005	0,005	0,005	0,005	0,005	0,005
F	mg/L												
FE	mg/L		0,182	0,5085	0,4053	0,521	0,227	0,145	0,413	0,73	3,425	1,52	0,6085
HG	mg/L		0,0005	0,0005	0,0005	0,0005	0,0005	0,0005	0,0005	0,0005	0,0005	0,0005	0,0005
MN	mg/L		0,003	0,0055	0,0067	0,0155	0,012	0,0045	0,0525	0,1065	0,064	0,062	0,011
MO	mg/L												
NI	mg/L												
PB	mg/L												
SB	mg/L												
SE	mg/L												
SI	mg/L												
V	mg/L												
ZN	mg/L		0,002	0,0035	0,0033	0,0085	0,004	0,002	0,003	0,0035	0,0105	0,03	0,004
-----Nutrients------													
NH3	mg/L												
NH3-N	mg/L		1,08	6,3	2,12	2,43	2,01	2,22	2,09	3,14	3,36	1,82	14,3
NO2-N	mg/L		0,12	0,295	0,111	0,055	0,0175	0,0305	0,223	0,0955	0,191	0,006	0,345
NO3-N	mg/L		1,9	11,5	3,9333	3,35	1,55	2,15	2,8	6,9	4,45	0,6	28
T.PO4	mg/L												
TKN	mg/L												
-----Solids------													
TURB-L	NTU		5	7,55	33	24	19	22,5	11,35	37,5	51,45	170	9,95
TDS	mg/L		789	836,5	623,3333	349,5	588	565,5	813	1497,5	295	446	687,5
TSS	mg/L		41	107	88,6667	54,5	47	35	17,5	50,5	93,5	232	45
-----Trace Constituents------													
CN-F	mg/L												
CN-T	mg/L												
CN-WAD	mg/L												

SAMPLE POINT : UG2		jan-11	feb-11	mar-11	apr-11	may-11	jun-11	jul-11	aug-11	sep-11	oct-11	nov-11	dec-11
-----Field data------													
TEMP	deg C	2,5	8,4	7,8	11,7667	14,3	10,5	15,1	17,5	9,95	14,15	6,35	9,45
COND-F	ms/cm	0,103	1,5115	1,705	1,4283	0,6055	0,122	1,2	2,1415	1,4	0,5705	0,656	1,36
PH-F	pH unit	8,3	10,715	11,3667	10,9333	10,65	10,9	10,6	9,8	10,155	10	9,9	10,4
-----Major Constituents------													
CA	mg/L	325	313,5	248,5	272,6667	257,5	345,5	563	424	352,5	642,5	274	299,1
CL	mg/L	11	9,15	28,65	16	11,65	12,5	15,5	9,95	10,4	9,7	7,9	10,5
CO3	mg/L												
HCO3	mg/L	120	1	1	97	1	49,5	31,5	1	60,5	45,5	31,5	98
K	mg/L	33,6	33	44,75	33,1667	38,35	27,4	46,15	62,5	39,4	45,15	23,95	16,945
MG	mg/L	177	110,1	21,5	206	54,9	529	175,5	60,025	266,525	270,3	282	64,9
NA	mg/L												
SO4	mg/L	1380	1090	760	1376,6667	785	2605	2140	1060	1585	2155	1565	1340
T-HARD	mg/L												
T.ALK	mg/L												
-----Metals------													
AG	mg/L												
AL	mg/L	1,99	0,035	0,645	6,3533	0,455	1,06	0,35	0,415	3,225	0,635	0,515	1,095
AS	mg/L												
B	mg/L												
BA	mg/L												
BE	mg/L												
BI	mg/L												
CD	mg/L												
CO	mg/L												
CR	mg/L												
CU	mg/L	0,005	0,005	0,005	0,0167	0,007	0,005	0,0065	0,005	0,009	0,005	0,005	0,005
F	mg/L												
FE	mg/L	3,73	0,0355	0,8045	11,7333	0,624	1,422	0,366	0,4765	6,328	0,663	0,833	2,105
HG	mg/L	0,0005	0,0005	0,0005	0,0005	0,0005	0,0005	0,0005	0,0005	0,0005	0,0005	0,0005	0,0005
MN	mg/L	0,313	0,022	0,0145	0,662	0,0445	7,0915	1,1145	0,014	2,3575	1,077	0,1215	1,0195
MO	mg/L												
NI	mg/L												
PB	mg/L												
SB	mg/L												
SE	mg/L												
SI	mg/L												
V	mg/L												
ZN	mg/L	0,129	0,0035	0,0045	0,066	0,039	0,011	0,0035	0,002	0,0255	0,006	0,015	0,0435
-----Nutrients------													
NH3	mg/L												
NH3-N	mg/L	2,6	2,3	7,1	3,2667	3,3	2,16	11,2	2,8	1,61	24,3	14,97	15,7
NO2-N	mg/L	0,042	0,41	0,61	0,7667	0,71	0,1805	0,02	0,28	0,0555	0,416	0,28	0,6525
NO3-N	mg/L	4,6	3,4	13,2	10,5	5,55	2,8	14,05	5,5	2,5	50,5	24,5	24,85
T.PO4	mg/L												
TKN	mg/L												
-----Solids------													
TURB-L	NTU	190	16,6	122,5	398,3333	27	42,5	18,5	11,1	182,5	55	80	117,65
TDS	mg/L	2240	1670	1415	2563,3333	1210	3915	3370	1860	2645	3720	2475	2280
TSS	mg/L	326	51,5	70	846	144	3470,5	116	69,5	657,5	73,5	258,5	217
-----Trace Constituents------													
CN-F	mg/L												
CN-T	mg/L												
CN-WAD	mg/L												

SAMPLE POINT : UG2OUT		jan-11	feb-11	mar-11	apr-11	may-11	jun-11	jul-11	aug-11	sep-11	oct-11	nov-11	dec-11
-----Field data------													
TEMP	deg C	6	8,5	9,1333	10,5	14,1	12,6333	12,4	14,6	10,1	14,3	7,2	8,5
COND-F	ms/cm	0,133	1,9075	1,453	1,5175	0,7045	0,2937	1,244	0,155	1,4755	0,2225	1,4675	1,048
PH-F	pH unit	9,15	10,335	10,3667	9,55	9,4	9,0333	9,15	8,87	8,38	9	9,7	10,3
-----Major Constituents------													
CA	mg/L	333	494,5	334,55	277,3333	253,5	330,5	262	318,7	229,5	306	132,5	77,1
CL	mg/L	11	12,3	26,5	12,6	16	15,5	14,9	11	12	9,7	8,6	9,55
CO3	mg/L												
HCO3	mg/L	125	28,5	6,5	19,3333	150	75,5	115,5	24,5	94,5	79	53	104,5
K	mg/L	34,8	45,45	35,75	43,2667	22,95	23,1	21,1	23,4	16,95	20,7	11,2	5,68
MG	mg/L	189	200,625	30,7	105,0367	309,5	395,5	346,5	289,55	170,05	323,5	114	86,3
NA	mg/L												
SO4	mg/L	1390	1885	1025	1143,3333	1975	2925	1335	2520	1850	1825	1330	1255
T-HARD	mg/L												
T.ALK	mg/L												
-----Metals------													
AG	mg/L												
AL	mg/L	5,39	0,245	1,835	3,35	18,25	0,655	0,585	2,765	4,885	4,71	0,075	1,41
AS	mg/L												
B	mg/L												
BA	mg/L												
BE	mg/L												
BI	mg/L												
CD	mg/L												
CO	mg/L												
CR	mg/L												
CU	mg/L	0,006	0,005	0,005	0,005	0,017	0,005	0,006	0,005	0,005	0,0295	0,005	0,005
F	mg/L												
FE	mg/L	11,2	0,277	4,1425	5,604	34,2	1,5255	2,3425	0,414	9,967	7,563	0,123	2,915
HG	mg/L	0,0005	0,0005	0,0005	0,0005	0,0005	0,0005	0,0005	0,0005	0,0005	0,0005	0,0005	0,0005
MN	mg/L	0,799	0,051	0,116	0,2383	7,22	1,845	6,35	2,19	4,58	3,905	1,3255	0,8545
MO	mg/L												
NI	mg/L												
PB	mg/L												
SB	mg/L												
SE	mg/L												
SI	mg/L												
V	mg/L												
ZN	mg/L	0,04	0,005	0,013	0,022	0,133	0,015	0,0235	0,004	0,028	0,0535	0,007	0,0265
-----Nutrients------													
NH3	mg/L												
NH3-N	mg/L	3	9,6	6,3	6,6	7,7	9,1	5,6	3,15	2,05	6,7	14,2	4,85
NO2-N	mg/L	0,024	0,6	0,375	0,68	0,525	0,0365	0,0265	0,1705	0,024	0,009	0,217	0,0195
NO3-N	mg/L	5,7	5	8,85	14,3	9,45	2,4	2,25	3,5	3,6	13,25	20,5	3,9
T.PO4	mg/L												
TKN	mg/L												
-----Solids------													
TURB-L	NTU	270	25	102,5	112,6667	770	86	72,5	25	190	220	81,8	77,5
TDS	mg/L	2370	2815	1670	2401,3333	3035	4440	3745	3820	2880	2875	2150	2415
TSS	mg/L	569	28,5	156	181,6667	1035	217,5	120	28,5	237,5	237	129	314,5
-----Trace Constituents------													
CN-F	mg/L												
CN-T	mg/L												
CN-WAD	mg/L												

APPENDIX D

WATER QUALITY DATA ANNUAL AVERAGE OF LAST 5 YEARS

SAMPLE POINT : W1.1		**2007**	**2008**	**2009**	**2010**	**2011**
-----Field data------						
TEMP	deg C	4,2077	5,2167	4,5077	4,5	4,7
COND-F	ms/cm	0,3124	0,2411	0,5212	0,312	0,535
PH-F	pH unit	8,15	8,1017	8,1615	8,1	7,9473
-----Major Constituents------						
CA	mg/L	13,85	20,1	20	20,2	18,1667
CL	mg/L	2,05	0,5	0,7	2	1,4667
CO3	mg/L	1	1	1	1	1
HCO3	mg/L	38,6	38,5455	42,9091	82,0909	42,3846
K	mg/L	1,58	5,01	1,42	5,52	3,5
MG	mg/L	2,76	5,35	3,85	6,57	4,34
NA	mg/L	1,8	4,03	1,19	3,98	2,9233
SO4	mg/L	19,1	16,7273	20,9091	22	18,6923
T-HARD	mg/L	52	50,3636	54,8182	54,4545	52,4615
T.ALK	mg/L	31,7	31,6727	63,6727	35,8364	34,7769
-----Metals------						
AG	mg/L	0,003	0,003	0,003	0,003	0,003
AL	mg/L	0,8491	0,7636	0,3482	0,6555	0,7643
AS	mg/L	0,005	0,005	0,005	0,005	0,005
B	mg/L					
BA	mg/L	0,041	0,127	0,047	0,111	0,0808
BE	mg/L	0,0002	0,0002	0,0002	0,0002	0,0002
BI	mg/L					
CD	mg/L	0,002	0,002	0,002	0,002	0,002
CO	mg/L	0,004	0,005	0,004	0,004	0,004
CR	mg/L	0,008	0,012	0,008	0,008	0,008
CU	mg/L	0,0054	0,0052	0,005	0,005	0,005
F	mg/L	0,2455	0,355	0,464	0,272	0,158
FE	mg/L	0,8849	1,0979	0,4373	0,7807	0,8046
HG	mg/L	0,0005	0,0005	0,0005	0,0005	0,0005
MN	mg/L	0,023	0,142	0,048	0,098	0,0688
MO	mg/L	0,004	0,004	0,004	0,004	0,0042
NI	mg/L	0,0068	0,0078	0,0062	0,0055	0,0062
PB	mg/L	0,005	0,005	0,005	0,009	0,005
SB	mg/L	0,02	0,02	0,02	0,02	0,02
SE	mg/L	0,02	0,02	0,02	0,02	0,02
SI	mg/L					
V	mg/L	0,006	0,006	0,006	0,008	0,0068
ZN	mg/L	0,0041	0,0043	0,0017	0,0042	0,0051
-----Nutrients------						
NH3	mg/L					
NH3-N	mg/L					0,0986
NO2-N	mg/L	0,058	0,0909	0,0509	0,0927	0,0028
NO3-N	mg/L	0,0018	0,0055	0,0027	0,0013	0,3571
T.PO4	mg/L	0,39	0,4091	0,3364	0,3909	0,0567
TKN	mg/L	0,01	0,88	0,03	0,08	
-----Solids------						
TURB-L	NTU	95,4	190	50	150	135
TDS	mg/L	76	151,5	72	98	112
TSS	mg/L	42	67	29	36	52
-----Trace Constituents------						
CN-F	mg/L					0,005
CN-T	mg/L	0,005	0,005	0,005	0,005	0,005
CN-WAD	mg/L					0,005

SAMPLE POINT : W1.3		**2007**	**2008**	**2009**	**2010**	**2011**
-----Field data------						
TEMP	deg C	3,6625	5,275	2,3833	7,3	6,3
COND-F	ms/cm	0,2963	0,5325	0,5122	0,420	0,5183
PH-F	pH unit	8,2263	8,2613	8,435	8,1	8,305
-----Major Constituents------						
CA	mg/L	17,5	23,2	25,6	32,3	28,3
CL	mg/L	2,2	0,85	3,6	6,4	13,95
CO3	mg/L	1	1	1	1	3,5
HCO3	mg/L	45	41,5	56	82,5	78
K	mg/L	1,72	2,85	1,7	1,7	48,13
MG	mg/L	4,52	4,08	4,85	6,29	6,415
NA	mg/L	2,72	2,42	2,35	3,015	285,965
SO4	mg/L	31,8571	273,2857	35,1667	208	250,75
T-HARD	mg/L	65	55	90	100	87,5
T.ALK	mg/L	37,2	34,2	45,8	68,35	69,4
-----Metals------						
AG	mg/L	0,003	0,003	0,003	0,003	0,003
AL	mg/L	0,9654	0,3917	0,39	0,9514	1,34
AS	mg/L					0,005
B	mg/L					
BA	mg/L	0,048	0,607	0,026	0,041	0,0455
BE	mg/L					0,0002
BI	mg/L					
CD	mg/L	0,002	0,002	0,002	0,002	0,002
CO	mg/L	0,007	0,006	0,004	0,004	0,014
CR	mg/L	0,008	0,008	0,008	0,008	0,008
CU	mg/L	0,0051	0,0052	0,005	0,0078	0,005
F	mg/L					
FE	mg/L	1,034	0,5996	0,4885	1,2939	1,6783
HG	mg/L	0,0005	0,0005	0,0005	0,0005	0,0005
MN	mg/L	0,038	0,09	0,009	0,059	0,036
MO	mg/L	0,006	0,004	0,004	0,004	0,137
NI	mg/L	0,0047	0,0092	0,005	0,0071	0,0051
PB	mg/L	0,005	0,005	0,005	0,005	0,005
SB	mg/L					0,02
SE	mg/L					0,02
SI	mg/L		1,91			
V	mg/L	0,008	0,006	0,028	0,006	0,006
ZN	mg/L	0,0043	0,0027	0,0035	0,0053	0,0068
-----Nutrients------						
NH3	mg/L					
NH3-N	mg/L	0,0514	0,4257	0,05	2,0514	2,285
NO2-N	mg/L	0,0024	0,0146	0,0013	0,0273	0,0623
NO3-N	mg/L	0,3286	1,6571	0,45	2,1714	5,1625
T.PO4	mg/L					0,03
TKN	mg/L					
-----Solids------						
TURB-L	NTU	62,5	100	8,4	30	2,9
TDS	mg/L	123	145	105	159	932
TSS	mg/L	26	81,5	18	64	50
-----Trace Constituents------						
CN-F	mg/L					0,005
CN-T	mg/L	0,005	0,0118	0,0055	0,016	0,0361
CN-WAD	mg/L					0,005

SAMPLE POINT : W1.4		2007	2008	2009	2010	2011
-----Field data------						
TEMP	deg C	3,9	4,0286	3,8667	6,4	5,7714
COND-F	ms/cm	0,363	0,4524	0,2877	0,262	0,5764
PH-F	pH unit	8,1113	7,9971	8,1617	8,2	8,2857
-----Major Constituents------						
CA	mg/L	26,7	21,3	30,7	27,6	30,8
CL	mg/L	3,1	2,4	9,5	3,3	7,6
CO3	mg/L	1	1	1	1	1
HCO3	mg/L	44	40	58	52	66
K	mg/L	2,34	4,47	6,84	4,95	10,7
MG	mg/L	8,52	5,1	8,38	7,86	8,76
NA	mg/L	25,4	13,5	29,3	11,6	52,5
SO4	mg/L	152,2857	80,3333	142,6667	185,8571	155,125
T-HARD	mg/L	95	75	100	85	110
T.ALK	mg/L	36,4	32,8	46,8	42,2	54,5
-----Metals------						
AG	mg/L	0,003	0,003	0,003	0,003	0,003
AL	mg/L	0,5201	0,485	0,415	0,8514	1,49
AS	mg/L					0,005
B	mg/L					
BA	mg/L	0,066	0,107	0,04	0,194	0,056
BE	mg/L					0,0002
BI	mg/L					
CD	mg/L					0,002
CO	mg/L					0,008
CR	mg/L					0,008
CU	mg/L	0,0146	0,0072	0,0102	0,0153	0,0079
F	mg/L					
FE	mg/L	0,6484	0,7348	0,7525	1,3021	1,8271
HG	mg/L	0,0005	0,0005	0,0005	0,0005	0,0005
MN	mg/L	0,062	0,119	0,038	0,194	0,048
MO	mg/L	0,015	0,009	0,028	0,004	0,033
NI	mg/L	0,0071	0,005	0,0053	0,0053	0,0055
PB	mg/L	0,005	0,005	0,005	0,009	0,005
SB	mg/L					0,02
SE	mg/L					0,02
SI	mg/L					
V	mg/L					0,006
ZN	mg/L	0,0021	0,0028	0,0028	0,0046	0,0071
-----Nutrients------						
NH3	mg/L				0,0167	
NH3-N	mg/L	1,8829	0,5633	1,1733	1,3829	1,21
NO2-N	mg/L	0,0261	0,0183	0,0222	0,0164	0,0645
NO3-N	mg/L	1,1714	0,95	1,5833	1,4857	1,4875
T.PO4	mg/L					0,03
TKN	mg/L					
-----Solids------						
TURB-L	NTU	121	160	40	290	
TDS	mg/L	273	185	273	217	323
TSS	mg/L	29	115,5	27	272	97
-----Trace Constituents------						
CN-F	mg/L					0,005
CN-T	mg/L	0,008	0,016	0,0085	0,0206	0,0264
CN-WAD	mg/L					0,006

SAMPLE POINT : W1.5.1		2007	2008	2009	2010	2011
-----Field data------						
TEMP	deg C	2,8188	3,3567	3,6969	3,4	4,0333
COND-F	ms/cm	0,5638	0,7037	0,7939	0,339	0,4345
PH-F	pH unit	8,1972	8,2227	8,1484	8,0	8,0633
-----Major Constituents------						
CA	mg/L	44,4	45,28	72,2429	61,6889	79,0909
CL	mg/L	11,6429	11,2	14,2	10,7889	14,0364
CO3	mg/L	1	1	1	1	1,3636
HCO3	mg/L	69,7143	67,2	107,143	94,7778	100,818
K	mg/L	7,7429	4,344	14,7014	5,96	8,1691
MG	mg/L	22,8429	22,44	59,1857	43,4667	47,3455
NA	mg/L	39,5786	14,582	19,0671	21,1878	35,6773
SO4	mg/L	196,8	198,917	273,37	239,731	316,539
T-HARD	mg/L	218,571	185,6	350	307,778	347,273
T.ALK	mg/L	56,9	55,4	87,8571	77,8889	83,8182
-----Metals------						
AG	mg/L			0,002	0,004	0,003
AL	mg/L	1,7684	2,3246	0,546	2,8141	2,0748
AS	mg/L		0,005	0,004	0,005	0,005
B	mg/L					
BA	mg/L	0,0486	0,1366	0,0399	0,0507	0,0503
BE	mg/L			0,0006	0,0002	0,0002
BI	mg/L					
CD	mg/L	0,002	0,002	0,002	0,002	0,002
CO	mg/L	0,007	0,006	0,0061	0,0051	0,0095
CR	mg/L	0,0087	0,0086	0,008	0,0081	0,0077
CU	mg/L	0,0084	0,0076	0,0067	0,0087	0,0077
F	mg/L			0,16		
FE	mg/L	2,0538	3,4688	1,018	3,9281	2,8171
HG	mg/L	0,0005	0,0005	0,0005	0,0005	0,0005
MN	mg/L	0,1049	0,149	0,3473	0,212	0,3707
MO	mg/L	0,0525	0,0178	0,0229	0,0187	0,0152
NI	mg/L	0,018	0,0186	0,0177	0,0146	0,0107
PB	mg/L	0,005	0,005	0,005	0,0054	0,005
SB	mg/L			0,0104	0,02	0,02
SE	mg/L		0,02	0,0105	0,02	0,02
SI	mg/L		15,6			
V	mg/L			0,0035	0,006	0,0086
ZN	mg/L	0,0192	0,0099	0,0053	0,0086	0,0234
-----Nutrients------						
NH3	mg/L				0,0163	
NH3-N	mg/L	1,3128	0,88	1,4519	1,0354	1,9862
NO2-N	mg/L	0,019	0,0213	0,0167	0,0126	0,0159
NO3-N	mg/L	2,608	3,9958	3,7269	4,0077	10,5346
T.PO4	mg/L			0,01	1,5133	0,072
TKN	mg/L					
-----Solids------						
TURB-L	NTU	34,86	48,76	9,4963	49,1692	33,6792
TDS	mg/L	399,68	410,88	526,259	459,539	665,125
TSS	mg/L	33,12	50,28	11,5926	88,2692	39,2083
-----Trace Constituents------						
CN-F	mg/L		0,005	0,005	0,005	0,005
CN-T	mg/L	0,0092	0,0113	0,0169	0,0177	0,039
CN-WAD	mg/L		0,005	0,013	0,006	0,0104

SAMPLE POINT : W1.6		2007	2008	2009	2010	2011
-----Field data------						
TEMP	deg C	5,25	7,1857	4,5571	4,5	5,4429
COND-F	ms/cm	2,3917	0,6678	1,1101	0,289	0,3726
PH-F	pH unit	8,3725	8,2571	8,0857	8,0	7,9
-----Major Constituents------						
CA	mg/L	41,9	53,5667	57,2	55,9667	64,1333
CL	mg/L	9,3	12,1	15,3	13,2333	9,7333
CO3	mg/L	1	1	1	1	1
HCO3	mg/L	72,6667	92,3333	106,6667	94	91,6667
K	mg/L	4,83	3,3833	5,7833	3,92	5,47
MG	mg/L	21,1	26,8667	36,3333	28,9333	35,4333
NA	mg/L	19,87	9,2433	25,1033	15,2	21,8667
SO4	mg/L	177,4	162,25	214	176	275
T-HARD	mg/L	385	236,6667	271,6667	220	265
T.ALK	mg/L	59,5	75,3333	87,8333	76,8333	76
-----Metals------						
AG	mg/L					
AL	mg/L					0,165
AS	mg/L					
B	mg/L					
BA	mg/L					
BE	mg/L					
BI	mg/L					
CD	mg/L					
CO	mg/L					
CR	mg/L					
CU	mg/L	0,0073	0,005	0,0053	0,0053	0,005
F	mg/L					
FE	mg/L	1,2373	1,0843	0,393	2,0187	1,6085
HG	mg/L					
MN	mg/L					
MO	mg/L					
NI	mg/L	0,0073	0,0103	0,017	0,0103	0,0147
PB	mg/L					
SB	mg/L					
SE	mg/L					
SI	mg/L					
V	mg/L					
ZN	mg/L	0,0053	0,0047	0,0027	0,0063	0,0083
-----Nutrients------						
NH3	mg/L					
NH3-N	mg/L	0,8667	0,6333	1,2333	0,6067	1,18
NO2-N	mg/L					
NO3-N	mg/L					
T.PO4	mg/L					
TKN	mg/L					
-----Solids------						
TURB-L	NTU	44	39	7,6	73	47,3333
TDS	mg/L	277,6667	316	427	281	379
TSS	mg/L	36	99,25	21	76	45,8
-----Trace Constituents------						
CN-F	mg/L					
CN-T	mg/L	0,009	0,0057	0,0277	0,0217	0,054
CN-WAD	mg/L					

SAMPLE POINT : W1.7		2007	2008	2009	2010	2011
-----Field data------						
TEMP	deg C	5,5875	6,8286	4,9143	5,5	5,5286
COND-F	ms/cm	0,6707	0,576	1,3244	0,458	0,3104
PH-F	pH unit	8,2513	8,2214	8,2614	8,1	7,84
-----Major Constituents------						
CA	mg/L	39,1667	50,9	49,6667	54,5	51,3667
CL	mg/L	8,2667	13,1	14,5667	13,0667	8,1667
CO3	mg/L	1	1	1	1	1
HCO3	mg/L	79	102,6667	105,3333	92,3333	91,6667
K	mg/L	2,84	2,1933	2,6467	4,1867	4,49
MG	mg/L	16,38	17,5667	18,8667	29,7333	20,2667
NA	mg/L	11,2667	6,9433	11,6267	15,6567	21,0133
SO4	mg/L	93,4	102,5	131,25	113,5	138
T-HARD	mg/L	148,3333	190	195	195	181,6667
T.ALK	mg/L	64,8333	83,5	86,1667	76,5	74,8333
-----Metals------						
AG	mg/L					
AL	mg/L	1,17	0,386	0,35	1,63	0,9625
AS	mg/L					
B	mg/L					
BA	mg/L					
BE	mg/L					
BI	mg/L					
CD	mg/L					
CO	mg/L					
CR	mg/L					
CU	mg/L					0,005
F	mg/L					
FE	mg/L					0,569
HG	mg/L	0,0005	0,0005	0,0005	0,0005	0,0005
MN	mg/L					
MO	mg/L					
NI	mg/L	0,006	0,006	0,007	0,0103	0,0093
PB	mg/L	0,005	0,005	0,005	0,005	0,005
SB	mg/L					
SE	mg/L					
SI	mg/L					
V	mg/L					
ZN	mg/L					
-----Nutrients------						
NH3	mg/L					
NH3-N	mg/L	0,4733	0,2867	0,4733	0,4667	0,6467
NO2-N	mg/L	0,01	0,007	0,0103	0,008	0,0113
NO3-N	mg/L	1,1	1,2	1,2	1,5333	2,6667
T.PO4	mg/L					
TKN	mg/L					
-----Solids------						
TURB-L	NTU	43	21,6667	7	51	29,5
TDS	mg/L	884,3333	213	290	607	273
TSS	mg/L	38,6667	72,5	20	55	34
-----Trace Constituents------						
CN-F	mg/L					
CN-T	mg/L	0,0067	0,005	0,0063	0,0217	0,086
CN-WAD	mg/L					

SAMPLE POINT : W1.8		**2007**	**2008**	**2009**	**2010**	**2011**
-----**Field data**------						
TEMP	deg C	4,55	5,5833	4,1667	5,9	5,6417
COND-F	ms/cm	0,5796	0,5081	0,514	0,255	0,2078
PH-F	pH unit	8,1592	8,1733	8,36	8,1	8,0933
-----**Major Constituents**------						
CA	mg/L	41,005	49,86	56,2455	51,55	50,4417
CL	mg/L	5,7167	5,1182	5,5818	6,9583	6,325
CO3	mg/L	1	1	1,3636	1	1,1667
HCO3	mg/L	125,8333	133,1818	137,2727	142,5	138,75
K	mg/L	1,4072	1,335	1,28	1,8133	1,7008
MG	mg/L	13,3542	14,569	14,4073	14,42	14,8
NA	mg/L	7,3414	7,072	6,8491	7,485	7,8892
SO4	mg/L	52,8333	62,9091	55,4545	59,0833	58,8333
T-HARD	mg/L	166,6667	171,8182	153,6364	167,5	173,3333
T.ALK	mg/L	103,25	109,6364	113,5	116,5833	114,4583
-----**Metals**------						
AG	mg/L			0,003	0,003	0,003
AL	mg/L	0,4055	0,199	0,25	0,3567	0,7558
AS	mg/L			0,0045	0,005	0,005
B	mg/L					
BA	mg/L		0,081	0,044	0,0495	0,137
BE	mg/L			0,0002	0,0002	0,0002
BI	mg/L					
CD	mg/L		0,002	0,002	0,002	0,002
CO	mg/L		0,004	0,004	0,004	0,004
CR	mg/L		0,008	0,008	0,008	0,008
CU	mg/L	0,0125	0,0059	0,0051	0,005	0,0052
F	mg/L					
FE	mg/L	0,783	0,4481	0,4607	0,5608	1,1005
HG	mg/L	0,0005	0,0005	0,0005	0,0005	0,0005
MN	mg/L	0,0214	0,0157	0,0263	0,0421	0,0508
MO	mg/L		0,004	0,004	0,009	0,004
NI	mg/L	0,013	0,0056	0,0052	0,005	0,0053
PB	mg/L		0,005	0,005	0,005	0,005
SB	mg/L			0,02	0,02	0,02
SE	mg/L			0,02	0,02	0,02
SI	mg/L					
V	mg/L			0,006	0,006	0,006
ZN	mg/L	0,1293	0,1691	0,2888	0,2136	0,2294
-----**Nutrients**------						
NH3	mg/L				0,0026	
NH3-N	mg/L	0,0301	0,0636	0,0673	0,1217	0,1083
NO2-N	mg/L	0,0015	0,0097	0,0015	0,0015	0,0017
NO3-N	mg/L	0,8333	0,8364	0,7727	0,8583	0,775
T.PO4	mg/L					
TKN	mg/L					
-----**Solids**------						
TURB-L	NTU	38,5	270	22,5	76,25	57,9
TDS	mg/L	183	174	213	210	210
TSS	mg/L	24	121	51	70	63
-----**Trace Constituents**------						
CN-F	mg/L	0,01		0,005	0,005	0,005
CN-T	mg/L	0,0063	0,0063	0,005	0,005	0,0078
CN-WAD	mg/L	0,01		0,005	0,005	0,0052

SAMPLE POINT : W2.2		**2007**	**2008**	**2009**	**2010**	**2011**
-----**Field data**------						
TEMP	deg C	1,6429	2,4889	3,0809	2,4	1,1538
COND-F	ms/cm	1,2598	1,3992	2,2626	1,305	1,692
PH-F	pH unit	8,2129	8,0222	8,057	7,9	7,8631
-----**Major Constituents**------						
CA	mg/L	151	152	272,2289	289,2549	443,5833
CL	mg/L	9,7	4,5	16,5447	15,0471	24,8462
CO3	mg/L	1	1	1	1	
HCO3	mg/L	155	130	250,3947	274,6471	415,3846
K	mg/L	10,3	7,38	14,1139	17,2212	28,9583
MG	mg/L	152	87,4	419,1703	278,998	313,0833
NA	mg/L	12,7	12	21,9	30,8925	
SO4	mg/L	677,8571	1102,5	1842,5556	1370	1777,6923
T-HARD	mg/L	1050	675	2775	950	
T.ALK	mg/L	130	106	208	87	
-----**Metals**------						
AG	mg/L					
AL	mg/L	0,1729	0,17	0,1874	0,8074	0,3415
AS	mg/L		0,005			
B	mg/L					
BA	mg/L	0,033	0,043	0,022	0,084	
BE	mg/L					
BI	mg/L					
CD	mg/L					
CO	mg/L		0,006			
CR	mg/L					
CU	mg/L	0,0061	0,0056	0,0051	0,0059	0,005
F	mg/L					
FE	mg/L	1,0419	1,2691	0,7166	1,2569	0,5734
HG	mg/L					
MN	mg/L	2,67	0,132	2,9771	0,9081	0,2651
MO	mg/L	0,086	7,92	0,055	0,015	
NI	mg/L	0,236	0,02	0,387	0,02	
PB	mg/L	0,005	0,005	0,005	0,005	
SB	mg/L	0,02	0,02	0,02	0,02	
SE	mg/L		0,02			
SI	mg/L		2,11			
V	mg/L					
ZN	mg/L	0,013	0,005	0,0109	0,0061	0,0078
-----**Nutrients**------						
NH3	mg/L					
NH3-N	mg/L	0,9271	7,445	5,9378	3,9984	7,3385
NO2-N	mg/L	0,0486	0,2246	0,0011	0,0012	0,001
NO3-N	mg/L	9,8714	39,25	34,2711	42,0745	95,7692
T.PO4	mg/L					
TKN	mg/L					
-----**Solids**------						
TURB-L	NTU	250	95	5,6	300	
TDS	mg/L	1054	825,5	2796	1399	1961
TSS	mg/L	102	140	40	274	62
-----**Trace Constituents**------						
CN-F	mg/L					
CN-T	mg/L					
CN-WAD	mg/L					

SAMPLE POINT : W2.4		2007	2008	2009	2010	2011
-----Field data------						
TEMP	deg C	3,1125	3,0625	3,7391	2,6	3,814
COND-F	ms/cm	1,3037	1,5348	1,9623	1,180	1,1047
PH-F	pH unit	8,2462	8,1125	8,016	7,9	7,8376
-----Major Constituents------						
CA	mg/L	142	151	254,4237	295,6471	325,9362
CL	mg/L	17	4,3	14,6895	16,3196	14,3167
CO3	mg/L	1	1	1	1	12
HCO3	mg/L	165	125	228,7895	266,0392	268,9792
K	mg/L	10,9	7,41	11,9089	15,0759	22,4896
MG	mg/L	152	87	311,8457	266,0157	258,7447
NA	mg/L	13,4	12	11,4333	17,8425	
SO4	mg/L	745	897,1429	1568,4091	1314,6078	1328,5417
T-HARD	mg/L	1050	650	1075	1025	0
T.ALK	mg/L	135	101	131	92	191
-----Metals------						
AG	mg/L					
AL	mg/L	0,2329	0,0971	0,2195	0,8696	1,0115
AS	mg/L		0,005			
B	mg/L					
BA	mg/L	0,056	0,044	0,028	0,086	0,043
BE	mg/L					
BI	mg/L					
CD	mg/L					
CO	mg/L		0,008			
CR	mg/L					
CU	mg/L	0,0064	0,0059	0,0051	0,0051	0,1112
F	mg/L					
FE	mg/L	1,1259	0,9514	0,7094	1,1075	1,7543
HG	mg/L	0,0005	0,0005	0,0005	0,0005	0,0005
MN	mg/L	2,81	0,142	1,8188	0,7734	1,0937
MO	mg/L	0,088	7,46	0,0385	0,015	0,04
NI	mg/L	0,234	0,019	0,051	0,017	0,0911
PB	mg/L	0,005	0,005	0,005	0,005	0,005
SB	mg/L	0,02	0,02	0,02	0,02	0,02
SE	mg/L		0,02			
SI	mg/L		2,16			
V	mg/L					
ZN	mg/L	0,012	0,005	0,0078	0,0056	0,0109
-----Nutrients------						
NH3	mg/L					
NH3-N	mg/L	0,7925	4,7275	3,7114	3,8298	6,5604
NO2-N	mg/L	0,0401	0,0326	0,001	0,0013	0,0038
NO3-N	mg/L	11,75	22,35	30,1659	41,1588	61,7708
T.PO4	mg/L					
TKN	mg/L					
-----Solids------						
TURB-L	NTU	201	48	18	220	26
TDS	mg/L	804	975,5	1545	1490	1793
TSS	mg/L	90	102,15	40	243	94
-----Trace Constituents------						
CN-F	mg/L					
CN-T	mg/L	0,013	0,009	0,005	0,005	0,005
CN-WAD	mg/L					

SAMPLE POINT : W3.1		2007	2008	2009	2010	2011
-----Field data------						
TEMP	deg C	2,6091	2,8833	6,8	2,8	3,5917
COND-F	ms/cm	2,2462	3,588	1,2927	0,948	0,8267
PH-F	pH unit	8,0036	8,0383	8,0091	8,2	8,1333
-----Major Constituents------						
CA	mg/L	300	160	100	80,8	40,6
CL	mg/L	18	3,1	3,8	3	2,9
CO3	mg/L	1	1	1	1	1
HCO3	mg/L	510	145	150	96	52
K	mg/L	17,3	3,35	2,19	2,83	1,43
MG	mg/L	539	83,8	65,7	62,4	18,2
NA	mg/L	14,8	3,52	3,46	1,96	0,87
SO4	mg/L	1230,5	997,2727	764,2	992,8333	1654
T-HARD	mg/L	3325	600	550	400	130
T.ALK	mg/L	420	118	121	78	43,2
-----Metals------						
AG	mg/L					0,003
AL	mg/L	0,0733	0,0636	0,069	0,815	0,773
AS	mg/L					0,005
B	mg/L					
BA	mg/L	0,1325	0,047	0,056	0,037	0,046
BE	mg/L					0,0002
BI	mg/L					
CD	mg/L					0,002
CO	mg/L					0,004
CR	mg/L					0,008
CU	mg/L	0,007	0,0054	0,005	0,0054	0,0059
F	mg/L					
FE	mg/L	0,2519	0,3294	0,1089	0,9904	1,5328
HG	mg/L	0,0005	0,0005	0,0005	0,0005	0,0005
MN	mg/L	0,532	0,111	0,154	0,11	0,1325
MO	mg/L	0,026	0,011	0,004	0,004	0,004
NI	mg/L	0,079	0,016	0,008	0,01	0,0097
PB	mg/L	0,005	0,005	0,005	0,005	0,005
SB	mg/L	0,02	0,02	0,02	0,02	0,02
SE	mg/L					0,02
SI	mg/L					
V	mg/L					0,006
ZN	mg/L	0,003	0,003	0,006	0,004	0,007
-----Nutrients------						
NH3	mg/L					
NH3-N	mg/L	0,32	0,21	0,11	0,2	0,314
NO2-N	mg/L	0,0013	0,0095	0,0019	0,001	0,0019
NO3-N	mg/L	4,3182	2,5667	2,02	1,9583	2,24
T.PO4	mg/L					
TKN	mg/L					
-----Solids------						
TURB-L	NTU	43,35	35	85	65	240
TDS	mg/L	2420	856,5	858	845	798
TSS	mg/L	22	35,5	53	129	261
-----Trace Constituents------						
CN-F	mg/L					
CN-T	mg/L	0,005	0,005	0,007	0,005	0,005
CN-WAD	mg/L					

SAMPLE POINT : W3.2		2007	2008	2009	2010	2011
-----Field data------						
TEMP	deg C	2,9	4,4143	6,8	5,0	5,8429
COND-F	ms/cm	0,5393	1,047	1,157	0,431	0,434
PH-F	pH unit	8,324	8,1929	8,165	8,2	8,03
-----Major Constituents------						
CA	mg/L	59,8	52	69,2	75,4	67,6
CL	mg/L	9,2	1,4	7,3	5,6	4,1
CO3	mg/L	1	1	4	2	1
HCO3	mg/L	160	54	140	140	110
K	mg/L	1,44	1,44	1,29	1,79	1,74
MG	mg/L	39,4	28,1	42,4	40,9	41,3
NA	mg/L	7,28	1,34	5,18	4,41	3,29
SO4	mg/L	147,8	104,6667	114,4	284,8333	133,6667
T-HARD	mg/L	350	210	325	325	275
T.ALK	mg/L	130	43,6	122	119	90,5
-----Metals------						
AG	mg/L					
AL	mg/L	0,285	0,07	0,038	0,78	0,488
AS	mg/L					
B	mg/L					
BA	mg/L	0,063	0,05	0,089	0,076	0,165
BE	mg/L					
BI	mg/L					
CD	mg/L					
CO	mg/L					
CR	mg/L					
CU	mg/L	0,0058	0,005	0,005	0,0052	0,005
F	mg/L					
FE	mg/L	0,147	0,1058	0,1092	0,6273	0,424
HG	mg/L	0,0005	0,0005	0,0005	0,0005	0,0005
MN	mg/L	0,01	0,126	0,015	0,016	0,062
MO	mg/L	0,01	0,004	0,006	0,004	0,006
NI	mg/L	0,005	0,011	0,005	0,005	0,005
PB	mg/L	0,005	0,005	0,005	0,005	0,005
SB	mg/L	0,02	0,02	0,02	0,02	0,02
SE	mg/L					
SI	mg/L					
V	mg/L					
ZN	mg/L	0,001	0,006	0,001	0,001	0,004
-----Nutrients------						
NH3	mg/L					
NH3-N	mg/L	0,06	0,0857	0,0567	0,1467	0,0567
NO2-N	mg/L	0,0013	0,0011	0,001	0,001	0,001
NO3-N	mg/L	1,6	1,2286	1,35	1,3333	1,25
T.PO4	mg/L					
TKN	mg/L					
-----Solids------						
TURB-L	NTU	93	55	3,3	10	50
TDS	mg/L	365	465,5	496	463	410
TSS	mg/L	30	127,5	49	65	71
-----Trace Constituents------						
CN-F	mg/L					
CN-T	mg/L	0,006	0,005	0,005	0,007	0,005
CN-WAD	mg/L					

SAMPLE POINT : W4.1		2007	2008	2009	2010	2011
-----Field data------						
TEMP	deg C	7,2667	9,0333	5,08	9,6	8,75
COND-F	ms/cm	0,1115	0,181	0,2348	0,294	0,432
PH-F	pH unit	8,8667	8,2	8,202	8,2	8,12
-----Major Constituents------						
CA	mg/L	21,8	29,2667	33,7	26,3	27,9333
CL	mg/L	7,9667	10,8333	11,9667	11,6333	13,0333
CO3	mg/L	2,6667	1	2,6667	2,6667	3
HCO3	mg/L	51,3333	58,6667	70,6667	61,6667	63
K	mg/L	0,6533	8,8533	0,4933	0,6833	0,7067
MG	mg/L	3,67	3,0667	4,09	3,5967	4,1367
NA	mg/L	2,69	1,9733	2,3433	2,18	2,5333
SO4	mg/L	5,6667	6,3333	7,3333	7,6667	8,6667
T-HARD	mg/L	63,3333	71,6667	83,3333	68,6667	71
T.ALK	mg/L	45,0333	47,9333	61,1667	54,1667	56,3
-----Metals------						
AG	mg/L					
AL	mg/L	0,1367	0,14	0,0767	0,1267	0,0867
AS	mg/L					
B	mg/L					
BA	mg/L	0,0073	0,009	0,0093	0,0097	0,0093
BE	mg/L	0,0002	0,0002	0,0002	0,0002	0,0002
BI	mg/L					
CD	mg/L	0,002	0,002	0,002	0,002	0,002
CO	mg/L					
CR	mg/L					
CU	mg/L	0,005	0,005	0,005	0,005	0,005
F	mg/L					
FE	mg/L	0,228	0,2133	0,141	0,209	0,198
HG	mg/L	0,0005	0,0005	0,0005	0,0005	0,0005
MN	mg/L					
MO	mg/L					
NI	mg/L	0,0057	0,005	0,005	0,005	0,005
PB	mg/L	0,005	0,005	0,005	0,005	0,005
SB	mg/L					
SE	mg/L					
SI	mg/L					
V	mg/L					
ZN	mg/L	0,0017	0,001	0,0013	0,001	0,0013
-----Nutrients------						
NH3	mg/L					
NH3-N	mg/L	0,04	0,04	0,0733	0,08	0,0533
NO2-N	mg/L	0,001	0,0013	0,001	0,001	0,0013
NO3-N	mg/L	0,2333	0,2	0,1	0,1	0,1333
T.PO4	mg/L					
TKN	mg/L					
-----Solids------						
TURB-L	NTU	23,2	2,3333	1,3167	3	1,45
TDS	mg/L	78	87,91	104	93	120
TSS	mg/L	11,6	10,75	15	12	9
-----Trace Constituents------						
CN-F	mg/L					
CN-T	mg/L					
CN-WAD	mg/L					

SAMPLE POINT : W4.2		2007	2008	2009	2010	2011
-----Field data------						
TEMP	deg C	7,55	8,2667	5,15	9,5	7,3
COND-F	ms/cm	0,2	0,355	0,224	0,276	0,148
PH-F	pH unit	8,4	8,1667	8,31	7,9	7,955
-----Major Constituents------						
CA	mg/L	49,8667	47,7667	61,2667	56,1333	45,3
CL	mg/L	30	16,8333	33	25,4	12,9667
CO3	mg/L	1	1	3,3333	1	1,6667
HCO3	mg/L	117,3333	107	123,3333	121,6667	116,3333
K	mg/L	1,8	14,0233	1,71	2,2133	2,28
MG	mg/L	12,8	10,9133	11,83	10,3967	10,1533
NA	mg/L	8,09	5,4533	6,8367	5,45	5,0467
SO4	mg/L	35,6667	30	32,3333	29,6667	22
T-HARD	mg/L	176,6667	143,3333	176,6667	156,6667	130
T.ALK	mg/L	95,6667	87,3333	107	98,8333	95,8333
-----Metals------						
AG	mg/L					
AL	mg/L	0,8367	0,43	0,7067	0,6167	1,5033
AS	mg/L					
B	mg/L					
BA	mg/L	0,0363	0,029	0,0387	0,038	0,042
BE	mg/L	0,0002	0,0002	0,0002	0,0002	0,0002
BI	mg/L					
CD	mg/L	0,002	0,002	0,002	0,002	0,002
CO	mg/L					
CR	mg/L					
CU	mg/L	0,0067	0,005	0,005	0,005	0,0057
F	mg/L					
FE	mg/L	1,1503	0,706	1,1463	1,0183	2,472
HG	mg/L	0,0005	0,0005	0,0005	0,0005	0,0005
MN	mg/L					
MO	mg/L					
NI	mg/L	0,006	0,005	0,005	0,005	0,005
PB	mg/L	0,005	0,005	0,005	0,005	0,005
SB	mg/L					
SE	mg/L					
SI	mg/L					
V	mg/L					
ZN	mg/L	0,005	0,002	0,0057	0,003	0,0103
-----Nutrients------						
NH3	mg/L					
NH3-N	mg/L	0,04	0,04	0,04	0,1067	0,0667
NO2-N	mg/L	0,0013	0,0013	0,001	0,001	0,0027
NO3-N	mg/L	0,3	0,2333	0,1333	0,3	0,1667
T.PO4	mg/L					
TKN	mg/L					
-----Solids------						
TURB-L	NTU	95	15,4	16	15	38,1667
TDS	mg/L	296	173,5	219	182	178
TSS	mg/L	60,5	55	46	76	72
-----Trace Constituents------						
CN-F	mg/L					
CN-T	mg/L					
CN-WAD	mg/L					

SAMPLE POINT : W4.3		2007	2008	2009	2010	2011
-----Field data------						
TEMP	deg C	4,5	6,0667	1,98	7,7	9,3
COND-F	ms/cm	0,1855	0,173	0,3852	0,217	0,1115
PH-F	pH unit	8,25	8,0667	8,266	8,0	8,35
-----Major Constituents------						
CA	mg/L	28,0667	32,7333	28,1667	29,0333	27,4333
CL	mg/L	11,3333	8,4333	12,8333	14,0333	8,3667
CO3	mg/L	1	1	2,6667	1	1
HCO3	mg/L	72,6667	63	74,6667	73,3333	48,3333
K	mg/L	0,8067	0,7267	0,53	0,58	0,7333
MG	mg/L	4,6	4,0833	3,8333	3,9667	3,4333
NA	mg/L	3,3933	2,2733	2,37	2,3433	2,1133
SO4	mg/L	10,6667	7	10,6667	9,6667	8,3333
T-HARD	mg/L	88,3333	75,6667	90	83,3333	65,6667
T.ALK	mg/L	59,5	52,1667	64,3333	59,6667	39,1667
-----Metals------						
AG	mg/L					
AL	mg/L	0,03	0,0633	0,0333	0,1167	0,08
AS	mg/L					0,005
B	mg/L					
BA	mg/L	0,02				
BE	mg/L	0,0002				
BI	mg/L					
CD	mg/L	0,002				
CO	mg/L					
CR	mg/L					
CU	mg/L	0,005	0,005	0,005	0,005	0,005
F	mg/L					
FE	mg/L	0,048	0,1547	0,1123	0,197	0,1423
HG	mg/L					
MN	mg/L					
MO	mg/L					
NI	mg/L	0,0085	0,005	0,005	0,005	0,005
PB	mg/L	0,005				
SB	mg/L					
SE	mg/L					
SI	mg/L					
V	mg/L					
ZN	mg/L	0,002	0,001	0,0013	0,0017	0,0023
-----Nutrients------						
NH3	mg/L					
NH3-N	mg/L	0,0733	0,04	0,0533	0,12	0,04
NO2-N	mg/L	0,001	0,0023	0,001	0,0013	0,0023
NO3-N	mg/L	0,1333	0,1667	0,2	0,1333	0,1667
T.PO4	mg/L					
TKN	mg/L					
-----Solids------						
TURB-L	NTU	15,5	2	0,65	2	1,65
TDS	mg/L	100,6667	94,665	117	107	115
TSS	mg/L	13	9,78	11	10	17
-----Trace Constituents------						
CN-F	mg/L					
CN-T	mg/L					
CN-WAD	mg/L					

SAMPLE POINT : W4.3.1		2007	2008	2009	2010	2011
-----Field data------						
TEMP	deg C	6,2333	6,2667	3,2833	6,8	8,8667
COND-F	ms/cm	0,174	0,137	0,2617	0,431	0,1041
PH-F	pH unit	8,2333	8,1	7,8033	7,9	7,9733
-----Major Constituents------						
CA	mg/L	25,9	32,7667	36,9667	37,7333	31,1333
CL	mg/L	7,5	8,7	21,5333	21,9333	9,6
CO3	mg/L	1	1	2,6667	1	1
HCO3	mg/L	68,6667	67,3333	84	86,6667	48,6667
K	mg/L	0,7533	0,89	0,6867	0,76	0,91
MG	mg/L	4,9467	4,4167	5,5033	5,5467	4,1567
NA	mg/L	2,94	2,48	3,5367	3,3667	2,5
SO4	mg/L	7,3333	7,6667	11,3333	12,6667	9
T-HARD	mg/L	79	81,6667	113,3333	103,6667	75
T.ALK	mg/L	56,4	54,8667	72,1667	70,3333	39,6667
-----Metals------						
AG	mg/L					
AL	mg/L	0,0633	0,03	0,05	0,0567	0,0733
AS	mg/L					0,005
B	mg/L					
BA	mg/L					
BE	mg/L					
BI	mg/L					
CD	mg/L					
CO	mg/L					
CR	mg/L					
CU	mg/L	0,005	0,005	0,005	0,005	0,005
F	mg/L					
FE	mg/L	0,103	0,05	0,1183	0,0683	0,1057
HG	mg/L	0,0005	0,0005	0,0005	0,0005	0,0005
MN	mg/L					
MO	mg/L					
NI	mg/L	0,005	0,005	0,005	0,005	0,005
PB	mg/L					
SB	mg/L					
SE	mg/L					
SI	mg/L					
V	mg/L					
ZN	mg/L	0,0017	0,001	0,001	0,0013	0,0023
-----Nutrients------						
NH3	mg/L					
NH3-N	mg/L	0,0533	0,06	0,0667	0,0667	0,0467
NO2-N	mg/L	0,001	0,0017	0,001	0,001	0,002
NO3-N	mg/L	0,1333	0,6333	0,1333	0,1	0,1667
T.PO4	mg/L					
TKN	mg/L					
-----Solids------						
TURB-L	NTU	33	0,9333	1,05	2	1,3
TDS	mg/L	92,533	96,18	124	124	99
TSS	mg/L	19,28	9,37	5	10	7
-----Trace Constituents------						
CN-F	mg/L					
CN-T	mg/L					
CN-WAD	mg/L					

SAMPLE POINT : W6.1		2007	2008	2009	2010	2011
-----Field data------						
TEMP	deg C	4,9	7,9667	7,7833	5,8	4,48
COND-F	ms/cm	0,879	0,234	0,2445	0,387	0,4732
PH-F	pH unit	8,19	8	8,285	7,8	8,074
-----Major Constituents------						
CA	mg/L	36,9667	45,3	43,7333	37,3667	38,8
CL	mg/L	9,2667	8,3333	8	6,8	5,8667
CO3	mg/L	1	1	1	1	1
HCO3	mg/L	85,3333	92	95,3333	83,6667	90,3333
K	mg/L	0,8267	0,85	0,78	1,32	0,9867
MG	mg/L	6,4333	6,42	6,22	5,2967	6,01
NA	mg/L	3,1267	2,82	2,9133	2,51	2,8333
SO4	mg/L	26	42,6667	28,6667	23,6667	32,6667
T-HARD	mg/L	115	133,3333	115	95	106,6667
T.ALK	mg/L	69,6667	75,5	78,5	68,3333	73,3333
-----Metals------						
AG	mg/L					
AL	mg/L	0,4967	0,4233	0,3767	1,09	0,79
AS	mg/L					
B	mg/L					
BA	mg/L	0,0187	0,0183	0,018	0,0197	0,0183
BE	mg/L	0,0002	0,0002	0,0002	0,0002	0,0002
BI	mg/L					
CD	mg/L	0,002	0,002	0,002	0,002	0,002
CO	mg/L					
CR	mg/L					
CU	mg/L	0,0053	0,005	0,0057	0,005	0,005
F	mg/L					
FE	mg/L	0,8323	0,852	0,448	1,5743	0,973
HG	mg/L	0,0005	0,0005	0,0005	0,0005	0,0005
MN	mg/L					
MO	mg/L					
NI	mg/L	0,005	0,0053	0,005	0,005	0,005
PB	mg/L	0,005	0,005	0,005	0,006	0,005
SB	mg/L					
SE	mg/L					
SI	mg/L					
V	mg/L					
ZN	mg/L	0,0033	0,002	0,0023	0,0043	0,0083
-----Nutrients------						
NH3	mg/L					
NH3-N	mg/L	0,0867	0,2533	0,04	0,1	0,0467
NO2-N	mg/L	0,001	0,0017	0,0013	0,0013	0,0023
NO3-N	mg/L	0,4	0,2667	0,1333	0,1667	0,2667
T.PO4	mg/L					
TKN	mg/L					
-----Solids------						
TURB-L	NTU	12,3667	12,3667	7,9667	25	10,8667
TDS	mg/L	140,8	173,79	146	195	144
TSS	mg/L	15,08	21,5	11	23	14
-----Trace Constituents------						
CN-F	mg/L					
CN-T	mg/L	0,0057	0,005	0,0063	0,005	0,0167
CN-WAD	mg/L					

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SAMPLE POINT : A1.3		2007	2008	2009	2010	2011
-----Field data------						
TEMP	deg C	5,4	6	5,4571	4,2	4,9
COND-F	ms/cm	0,182	0,02	0,2994	0,904	0,4819
PH-F	pH unit	8,1383	8,5188	8,5543	8,5	8,44
-----Major Constituents------						
CA	mg/L	3,695	2,6575	2,6763	4,4	5,15
CL	mg/L	0,9667	0,85	0,525	3,2625	1,3286
CO3	mg/L					
HCO3	mg/L	10,8333	7,625	6,875	10,5	24,5714
K	mg/L	0,6783	0,1613	0,2668	0,4414	0,3143
MG	mg/L	0,3068	0,1863	0,2476	0,4254	0,4271
NA	mg/L	0,7353				
SO4	mg/L	2	2,25	1,75	1,875	3,2143
T-HARD	mg/L					
T.ALK	mg/L					
-----Metals------						
AG	mg/L					
AL	mg/L					
AS	mg/L					
B	mg/L					
BA	mg/L					
BE	mg/L					
BI	mg/L					
CD	mg/L					
CO	mg/L					
CR	mg/L					
CU	mg/L	0,005				
F	mg/L					
FE	mg/L	0,7005	0,1183	0,317	0,6821	0,94
HG	mg/L					
MN	mg/L					
MO	mg/L					
NI	mg/L					
PB	mg/L					
SB	mg/L					
SE	mg/L					
SI	mg/L	0,856	0,0899	0,1375	0,3863	0,8471
V	mg/L					
ZN	mg/L					
-----Nutrients------						
NH3	mg/L					
NH3-N	mg/L	0,22	0,13	0,205	0,2025	0,1543
NO2-N	mg/L	0,002	0,0051	0,001	0,001	0,001
NO3-N	mg/L	0,2833	0,45	0,225	0,2875	0,2286
T.PO4	mg/L					
TKN	mg/L					
-----Solids------						
TURB-L	NTU					
TDS	mg/L					
TSS	mg/L	57	47	50	71	46
-----Trace Constituents------						
CN-F	mg/L					
CN-T	mg/L					
CN-WAD	mg/L					

SAMPLE POINT : A1.4		2007	2008	2009	2010	2011
-----Field data------						
TEMP	deg C	5,1	5,7125	4,2143	4,7	4,35
COND-F	ms/cm	0,1222	0,0847	0,5221	0,487	0,2853
PH-F	pH unit	7,9733	8,48	8,3771	8,4	8,5313
-----Major Constituents------						
CA	mg/L	5,7683	5,5412	3,6725	4,4387	6,03
CL	mg/L	1,6167	0,9875	0,9125	1,6875	1
CO3	mg/L					
HCO3	mg/L	14,5	13,375	10,625	11	27,8571
K	mg/L	0,3993	0,3313	0,3564	0,6313	0,5514
MG	mg/L	0,9633	0,5638	0,3245	0,4779	0,5414
NA	mg/L	0,6427				
SO4	mg/L	7,3333	5,375	2,875	1,5	2,0857
T-HARD	mg/L					
T.ALK	mg/L					
-----Metals------						
AG	mg/L					
AL	mg/L					
AS	mg/L					
B	mg/L					
BA	mg/L					
BE	mg/L					
BI	mg/L					
CD	mg/L					
CO	mg/L					
CR	mg/L					
CU	mg/L	0,007				
F	mg/L					
FE	mg/L	3,1382	1,8633	0,5716	1,2521	1,689
HG	mg/L					
MN	mg/L					
MO	mg/L					
NI	mg/L					
PB	mg/L					
SB	mg/L					
SE	mg/L					
SI	mg/L	2,748	0,8289	0,1563	0,795	1,4443
V	mg/L					
ZN	mg/L					
-----Nutrients------						
NH3	mg/L					
NH3-N	mg/L	0,33	0,1975	0,22	0,275	0,2829
NO2-N	mg/L	0,0027	0,0068	0,0025	0,0014	0,003
NO3-N	mg/L	0,45	0,3	0,1875	0,2625	0,2286
T.PO4	mg/L					
TKN	mg/L					
-----Solids------						
TURB-L	NTU					
TDS	mg/L					
TSS	mg/L	106	190	125	81	132,2857
-----Trace Constituents------						
CN-F	mg/L					
CN-T	mg/L					
CN-WAD	mg/L					

SAMPLE POINT : CKB1		2007	2008	2009	2010	2011
-----Field data------						
TEMP	deg C	10,6833	10,4364	11,71	11,8	9,7
COND-F	ms/cm	0,9181	0,8276	0,6217	0,468	0,3465
PH-F	pH unit	7,8	7,8709	7,741	7,8	7,55
-----Major Constituents------						
CA	mg/L	67,6475	75,2	84,88	76,2458	74,45
CL	mg/L	45,6667	43	37,9091	35,75	35
CO3	mg/L	1	1	1	1	1
HCO3	mg/L	156,6667	168,3333	168,1818	171,6667	175
K	mg/L	1,0374	1,1255	0,989	1,1617	1,17
MG	mg/L	14,9217	15,925	14,95	15,05	14,6
NA	mg/L	47,9575	51,35	41,21	41,4167	38,75
SO4	mg/L	110	111,5	101,5455	113,5833	118
T-HARD	mg/L	264,1667	244,5833	241,3636	239,1667	152,5
T.ALK	mg/L	128,3333	138,3333	137,6364	140,6667	143
-----Metals------						
AG	mg/L	0,003	0,003	0,003	0,003	
AL	mg/L	0,03	0,03	0,03	0,03	
AS	mg/L	0,005	0,005	0,005	0,005	
B	mg/L					
BA	mg/L	0,003	0,039	0,044	0,089	
BE	mg/L					
BI	mg/L					
CD	mg/L					
CO	mg/L					
CR	mg/L	0,015	0,008	0,008	0,008	
CU	mg/L	0,0189	0,0063	0,0453	0,0054	0,005
F	mg/L					
FE	mg/L	0,0063	0,054	0,012	0,004	
HG	mg/L	0,0005	0,0005	0,0005	0,0005	
MN	mg/L	0,002	0,003	0,003	0,005	
MO	mg/L	0,021	0,004	0,004	0,004	
NI	mg/L	0,005	0,0053	0,0051	0,0051	0,005
PB	mg/L	0,005	0,005	0,005	0,005	
SB	mg/L	0,02	0,02		0,02	
SE	mg/L			0,02		
SI	mg/L					
V	mg/L					
ZN	mg/L	0,1405	0,2073	0,3936	0,3125	0,1115
-----Nutrients------						
NH3	mg/L					
NH3-N	mg/L	0,0467	0,0417	0,0509	0,05	0,04
NO2-N	mg/L	0,0013	0,0086	0,0016	0,001	0,001
NO3-N	mg/L	6,9667	6,45	5,5	4,3167	4,75
T.PO4	mg/L					
TKN	mg/L					
-----Solids------						
TURB-L	NTU	0,15	0,4	0,35	0,4	
TDS	mg/L	415	434	391	385	316
TSS	mg/L	2,7917	2,4167	2,2	7	2
-----Trace Constituents------						
CN-F	mg/L					
CN-T	mg/L	0,0065	0,0056	0,0057	0,005	0,005
CN-WAD	mg/L					

SAMPLE POINT : CKB6A		2007	2008	2009	2010	2011
-----Field data------						
TEMP	deg C	11,4333	10,9083	11,34	11,8	9,05
COND-F	ms/cm	0,9206	0,8475	0,5995	0,534	0,4105
PH-F	pH unit	7,8308	7,7675	89,18	7,7	7,45
-----Major Constituents------						
CA	mg/L	57,8475	63,9917	67,79	63,575	63
CL	mg/L	26,0833	27,6667	31,1818	49,25	55,5
CO3	mg/L	1	1	1	1	1
HCO3	mg/L	185	187,9167	190	185,4167	182,5
K	mg/L	1,1392	1,0867	1,212	1,3925	1,315
MG	mg/L	13,3175	13,5083	12,498	13,4833	13,5
NA	mg/L	57,1417	57,5333	56,47	61,6167	61,65
SO4	mg/L	92,8333	90,1667	88,4545	88,75	88,5
T-HARD	mg/L	227,9167	214,1667	251,8182	202,5	134,5
T.ALK	mg/L	152	153,5833	155,8182	152,1667	150,5
-----Metals------						
AG	mg/L	0,003	0,003	0,003	0,003	
AL	mg/L	0,05	0,1	0,07	0,06	
AS	mg/L	0,005	0,005	0,005	0,005	
B	mg/L					
BA	mg/L	0,04	0,047	0,034	0,053	
BE	mg/L					
BI	mg/L					
CD	mg/L					
CO	mg/L					
CR	mg/L	0,008	0,008	0,008	0,008	
CU	mg/L	0,0262	0,0108	0,0085	0,0056	0,0085
F	mg/L					
FE	mg/L	0,1007	0,353	0,057	0,089	
HG	mg/L	0,0005	0,0005	0,0005	0,0005	
MN	mg/L	0,008	0,013	0,004	0,008	
MO	mg/L	0,004	0,004	0,004	0,004	
NI	mg/L	0,005	0,005	0,005	0,0091	0,005
PB	mg/L	0,005	0,005	0,005	0,005	
SB	mg/L	0,04	0,02		0,02	
SE	mg/L			0,02		
SI	mg/L					
V	mg/L	0,006				
ZN	mg/L	0,1429	0,2032	0,345	0,3966	0,1365
-----Nutrients------						
NH3	mg/L					
NH3-N	mg/L	0,0583	0,0567	0,0527	0,0483	0,04
NO2-N	mg/L	0,0013	0,0098	0,0023	0,001	0,001
NO3-N	mg/L	4,9833	5,5417	5,1273	4,9083	4,7
T.PO4	mg/L					
TKN	mg/L					
-----Solids------						
TURB-L	NTU	4,8	4,2	0,55	0,4	
TDS	mg/L	376	367	358	387	308
TSS	mg/L	5	4	12	7	2
-----Trace Constituents------						
CN-F	mg/L					
CN-T	mg/L	0,0069	0,0056	0,0053	0,005	0,005
CN-WAD	mg/L					

SAMPLE POINT : CKB2		2007	2008	2009	2010	2011
-----Field data------						All facilities have been moved on new BMY.
TEMP	deg C	14,8	11	15,8	13	
COND-F	ms/cm			0,467	0,34	
PH-F	pH unit	8,2	8,2	7,72	7,6	
-----Major Constituents------						
CA	mg/L	45,6	54,6	51,1	61,3	
CL	mg/L	17	18	19	21	
CO3	mg/L	1	1	1	1	
HCO3	mg/L	170	165	170	175	
K	mg/L	1,09	0,92	0,72	1,06	
MG	mg/L	13,9	10,9	10,2	11,7	
NA	mg/L	67,7	35,5	48,1	29,1	
SO4	mg/L	74	64	59	54	
T-HARD	mg/L	150	200	170	180	
T.ALK	mg/L	140	134	140	142	
-----Metals------						
AG	mg/L	0,003	0,003	0,003	0,003	
AL	mg/L	0,03	0,03	0,05	0,06	
AS	mg/L	0,005	0,005	0,005	0,005	
B	mg/L					
BA	mg/L	0,037	0,041	0,037	0,053	
BE	mg/L					
BI	mg/L					
CD	mg/L					
CO	mg/L					
CR	mg/L	0,008	0,008	0,008	0,008	
CU	mg/L					
F	mg/L					
FE	mg/L	0,015	0,048	0,052	0,015	
HG	mg/L	0,0005	0,0005	0,0005	0,0005	
MN	mg/L	0,001	0,003	0,003	0,005	
MO	mg/L	0,004	0,004	0,004	0,004	
NI	mg/L					
PB	mg/L	0,005	0,005	0,005	0,005	
SB	mg/L	0,03	0,02		0,02	
SE	mg/L			0,02		
SI	mg/L					
V	mg/L					
ZN	mg/L					
-----Nutrients------						
NH3	mg/L					
NH3-N	mg/L	0,04	0,04	0,04	0,04	
NO2-N	mg/L	0,001	0,012	0,001	0,001	
NO3-N	mg/L	3,8	4	4,4	4,3	
T.PO4	mg/L					
TKN	mg/L					
-----Solids------						
TURB-L	NTU	0,2	0,35	1	0,75	
TDS	mg/L	315		266		
TSS	mg/L	1	2	3		
-----Trace Constituents------						
CN-F	mg/L					
CN-T	mg/L			0,006	0,005	
CN-WAD	mg/L					

SAMPLE POINT : CKB3		2007	2008	2009	2010	2011
-----Field data------						All facilities have been moved on new BMY.
TEMP	deg C	14,5	12	16,3	14,1	
COND-F	ms/cm			0,522	0,39	
PH-F	pH unit	8,2	8,1	7,71	7,6	
-----Major Constituents------						
CA	mg/L	60,6	66,2	67,7	67,3	
CL	mg/L	22	24	24	27	
CO3	mg/L	1	1	1	1	
HCO3	mg/L	135	145	155	155	
K	mg/L	0,84	0,87	0,69	1,08	
MG	mg/L	18,8	14,5	14,3	14,1	
NA	mg/L	30,8	18,9	21,5	20,3	
SO4	mg/L	76	69	33	63	
T-HARD	mg/L	210	250	210	200	
T.ALK	mg/L	113	120	127	128	
-----Metals------						
AG	mg/L	0,003	0,003	0,003	0,003	
AL	mg/L	0,03	0,03	0,06	0,05	
AS	mg/L	0,005	0,005	0,005	0,005	
B	mg/L					
BA	mg/L	0,036	0,046	0,042	0,05	
BE	mg/L					
BI	mg/L					
CD	mg/L					
CO	mg/L					
CR	mg/L	0,008	0,008	0,008	0,008	
CU	mg/L					
F	mg/L					
FE	mg/L	0,02	0,167	0,077	0,005	
HG	mg/L	0,0005	0,0005	0,0005	0,0005	
MN	mg/L	0,001	0,004	0,004	0,005	
MO	mg/L	0,004	0,004	0,004	0,004	
NI	mg/L					
PB	mg/L	0,005	0,005	0,005	0,005	
SB	mg/L	0,03	0,02		0,02	
SE	mg/L			0,02		
SI	mg/L					
V	mg/L					
ZN	mg/L					
-----Nutrients------						
NH3	mg/L					
NH3-N	mg/L	0,04	0,04	0,04	0,04	
NO2-N	mg/L	0,001	0,001	0,001	0,001	
NO3-N	mg/L	4,1	4,6	4,5	4,7	
T.PO4	mg/L					
TKN	mg/L					
-----Solids------						
TURB-L	NTU	0,25	0,5	0,7	0,85	
TDS	mg/L	301		298		
TSS	mg/L	1	2	2		
-----Trace Constituents------						
CN-F	mg/L					
CN-T	mg/L			0,005	0,005	
CN-WAD	mg/L					

SAMPLE POINT : CKB4		2007	2008	2009	2010	2011
-----Field data------						
TEMP	deg C	15,8	11	16,8	14,3	All facilities have been moved on new BMY.
COND-F	ms/cm			0,556	0,38	
PH-F	pH unit	7,5	8,1	7,56	7,5	
-----Major Constituents------						
CA	mg/L	68,3	63	66,8	62,8	
CL	mg/L	23	24	23	22	
CO3	mg/L	1	1	1	1	
HCO3	mg/L	175	175	180	185	
K	mg/L	0,91	1,06	0,76	1,11	
MG	mg/L	22	16	14,5	13,7	
NA	mg/L	46,6	30,5	34,6	33	
SO4	mg/L	76	76	70	70	
T-HARD	mg/L	230	220	230	200	
T.ALK	mg/L	142	143	148	153	
-----Metals------						
AG	mg/L	0,003	0,003	0,003	0,003	
AL	mg/L	0,03	0,03	0,05	0,06	
AS	mg/L	0,005	0,005	0,005	0,005	
B	mg/L					
BA	mg/L	0,077	0,077	0,067	0,076	
BE	mg/L					
BI	mg/L					
CD	mg/L					
CO	mg/L					
CR	mg/L	0,008	0,008	0,008	0,008	
CU	mg/L					
F	mg/L					
FE	mg/L	0,018	0,277	0,266	0,004	
HG	mg/L	0,0005	0,0005	0,0005	0,0005	
MN	mg/L	0,005	0,005	0,006	0,005	
MO	mg/L	0,004	0,004	0,004	0,004	
NI	mg/L					
PB	mg/L	0,005	0,005	0,005	0,005	
SB	mg/L	0,02	0,02		0,02	
SE	mg/L			0,02		
SI	mg/L					
V	mg/L					
ZN	mg/L					
-----Nutrients------						
NH3	mg/L					
NH3-N	mg/L	0,04	0,04	0,04	0,04	
NO2-N	mg/L	0,001	0,001	0,001	0,001	
NO3-N	mg/L	3,2	5	4,1	3,2	
T.PO4	mg/L					
TKN	mg/L					
-----Solids------						
TURB-L	NTU	0,15	2,8	0,9	0,5	
TDS	mg/L	335		325		
TSS	mg/L	1	7	5		
-----Trace Constituents------						
CN-F	mg/L					
CN-T	mg/L			0,01	0,005	
CN-WAD	mg/L					

SAMPLE POINT : CKB5		2007	2008	2009	2010	2011
-----Field data------						
TEMP	deg C	15,3	14	17,7	13,5	All facilities have been moved on new BMY.
COND-F	ms/cm			0,535	0,38	
PH-F	pH unit	8,1	8,2	7,37	7,4	
-----Major Constituents------						
CA	mg/L	64	61	67,8	66,1	
CL	mg/L	15	19	4	22	
CO3	mg/L	1	1	1	1	
HCO3	mg/L	185	185	190	200	
K	mg/L	0,93	1,03	0,75	1,17	
MG	mg/L	19,4	15,2	13,9	13,7	
NA	mg/L	39,3	27,7	30,6	30	
SO4	mg/L	61	55	49	56	
T-HARD	mg/L	210	240	230	200	
T.ALK	mg/L	151	152	157	162	
-----Metals------						
AG	mg/L	0,003	0,003	0,003	0,003	
AL	mg/L	1	0,03	0,07	0,05	
AS	mg/L	0,005	0,005	0,005	0,005	
B	mg/L					
BA	mg/L	0,07	0,066	0,059	0,07	
BE	mg/L					
BI	mg/L					
CD	mg/L					
CO	mg/L					
CR	mg/L	0,008	0,008	0,008	0,008	
CU	mg/L					
F	mg/L					
FE	mg/L	0,687	0,147	0,054	0,004	
HG	mg/L	0,0005	0,0005	0,0005	0,0005	
MN	mg/L	0,015	0,004	0,004	0,005	
MO	mg/L	0,004	0,004	0,004	0,004	
NI	mg/L					
PB	mg/L	0,005	0,005	0,005	0,005	
SB	mg/L	0,02	0,02		0,02	
SE	mg/L			0,02		
SI	mg/L					
V	mg/L					
ZN	mg/L					
-----Nutrients------						
NH3	mg/L					
NH3-N	mg/L	0,04	0,04	0,04	0,04	
NO2-N	mg/L	0,001	0,001	0,001	0,001	
NO3-N	mg/L	4,9	5,7	6,1	5	
T.PO4	mg/L					
TKN	mg/L					
-----Solids------						
TURB-L	NTU	4,2	1,2	1,4	0,45	
TDS	mg/L	321		315		
TSS	mg/L	6	1	7		
-----Trace Constituents------						
CN-F	mg/L					
CN-T	mg/L			0,005	0,005	
CN-WAD	mg/L					

SAMPLE POINT : CKB7		2007	2008	2009	2010	2011
-----Field data------						All facilities have been moved on new BMY.
TEMP	deg C	14,3	13	16,9	13,8	
COND-F	ms/cm			0,647	0,24	
PH-F	pH unit	8,1	7,9	7,5	7,4	
-----Major Constituents------						
CA	mg/L	83,2	86,4	78,4	73,8	
CL	mg/L	45	46	38	35	
CO3	mg/L	1	1	1	1	
HCO3	mg/L	155	165	170	180	
K	mg/L	1,16	1,21	0,93	1,24	
MG	mg/L	24,3	17,3	15,9	14,8	
NA	mg/L	66,9	44,6	49,9	47,5	
SO4	mg/L	130	128	116	108	
T-HARD	mg/L	275	275	275	220	
T.ALK	mg/L	129	134	138	146	
-----Metals------						
AG	mg/L	0,003	0,003	0,003	0,003	
AL	mg/L	0,06	0,03	0,1	0,05	
AS	mg/L	0,005	0,005	0,005	0,005	
B	mg/L					
BA	mg/L	0,027	0,033	0,029	0,038	
BE	mg/L					
BI	mg/L					
CD	mg/L					
CO	mg/L					
CR	mg/L	0,008	0,008	0,008	0,01	
CU	mg/L					
F	mg/L					
FE	mg/L	0,146	0,584	0,106	0,361	
HG	mg/L	0,0005	0,0005	0,0005	0,0005	
MN	mg/L	0,005	0,013	0,015	0,01	
MO	mg/L	0,004	0,004	0,004	0,004	
NI	mg/L					
PB	mg/L	0,005	0,005	0,005	0,005	
SB	mg/L	0,04	0,02		0,02	
SE	mg/L			0,02		
SI	mg/L					
V	mg/L					
ZN	mg/L					
-----Nutrients------						
NH3	mg/L					
NH3-N	mg/L	0,04	0,04	0,1	0,04	
NO2-N	mg/L	0,001	0,001	0,001	0,001	
NO3-N	mg/L	7,2	6,8	6,9	7,4	
T.PO4	mg/L					
TKN	mg/L					
-----Solids------						
TURB-L	NTU	3,6	1,5	3,7	0,4	
TDS	mg/L	446		418		
TSS	mg/L	2	6	8		
-----Trace Constituents------						
CN-F	mg/L					
CN-T	mg/L			0,005	0,005	
CN-WAD	mg/L					

SAMPLE POINT : CKB11		2007	2008	2009	2010	2011
-----Field data------						
TEMP	deg C	13,1917	12,2583	11,5111	12,7	11,1
COND-F	ms/cm	0,6299	0,682	0,4844	0,396	0,297
PH-F	pH unit	7,9008	7,77	7,9144	7,7	7,55
-----Major Constituents------						
CA	mg/L	55,4075	58,9333	65,822	61,8917	61,5
CL	mg/L	30,0833	29,9167	29,9091	32,5833	31
CO3	mg/L	1	1	1	1	1
HCO3	mg/L	110,9167	109,5833	120,5455	125	130
K	mg/L	0,8182	0,7708	0,995	0,9175	0,91
MG	mg/L	12,5325	12,65	12,51	12,8008	12,6
NA	mg/L	17,5108	16,0667	16,57	16,5583	16,65
SO4	mg/L	63,75	59,9167	64,0909	59,8333	58,5
T-HARD	mg/L	215,4167	195,8333	196,3636	191,6667	124
T.ALK	mg/L	91,0833	90,2083	98,5909	102,625	108
-----Metals------						
AG	mg/L	0,003	0,003	0,003	0,003	
AL	mg/L	0,03	0,03	0,06	0,04	
AS	mg/L	0,005	0,005	0,005	0,005	
B	mg/L					
BA	mg/L	0,067	0,067	0,062	0,072	
BE	mg/L					
BI	mg/L					
CD	mg/L					
CO	mg/L					
CR	mg/L	0,008	0,008	0,008	0,008	
CU	mg/L	0,005	0,0056	0,005	0,005	0,005
F	mg/L					
FE	mg/L	0,195	0,092	0,044	0,004	
HG	mg/L	0,0005	0,0005	0,0005	0,0005	
MN	mg/L	0,004	0,005	0,004	0,006	
MO	mg/L	0,004	0,004	0,004	0,004	
NI	mg/L	0,005	0,005	0,005	0,005	0,005
PB	mg/L	0,005	0,005	0,005	0,005	
SB	mg/L	0,03	0,02		0,02	
SE	mg/L			0,02		
SI	mg/L					
V	mg/L					
ZN	mg/L	0,1281	0,2066	0,3583	0,3087	0,169
-----Nutrients------						
NH3	mg/L					
NH3-N	mg/L	0,09	0,0567	0,06	0,05	0,04
NO2-N	mg/L	0,0037	0,0088	0,0015	0,0011	0,001
NO3-N	mg/L	4,4833	4,4417	4,8182	5,1333	4,95
T.PO4	mg/L					
TKN	mg/L					
-----Solids------						
TURB-L	NTU	0,4	2,1	0,4	0,5	
TDS	mg/L	266	249,5455	251	286	230
TSS	mg/L	1,5	1,75	1,0909	2	1
-----Trace Constituents------						
CN-F	mg/L					
CN-T	mg/L	0,0061	0,006	0,0054	0,005	0,005
CN-WAD	mg/L					

SAMPLE POINT : SSS.1		2007	2008	2009	2010	2011
-----Field data------						
TEMP	deg C	3,7667	6,4857	4,7333	3,3	4,3833
COND-F	ms/cm	0,0962	0,0676	0,1352	0,230	0,1913
PH-F	pH unit	8,5017	8,4243	8,3583	8,41	8,475
-----Major Constituents------						
CA	mg/L	5,5917	3,6433	2,7917	2,61	5,0186
CL	mg/L	1,25	0,6817	0,5	1,1167	0,6286
CO3	mg/L					
HCO3	mg/L	10,5333	10	8,8333	7,5	15,2857
K	mg/L	0,5087	0,5733	0,2283	0,3433	0,4529
MG	mg/L	1,6883	0,595	0,32	0,45	0,7657
NA	mg/L	0,246	0,77			
SO4	mg/L	13	7,1667	1,6667	2,5	4,5714
T-HARD	mg/L					
T.ALK	mg/L					
-----Metals------						
AG	mg/L					
AL	mg/L					
AS	mg/L					
B	mg/L					
BA	mg/L					
BE	mg/L					
BI	mg/L					
CD	mg/L					
CO	mg/L					
CR	mg/L					
CU	mg/L					
F	mg/L					
FE	mg/L	2,2675	0,8578	0,3813	0,6067	2,3677
HG	mg/L					
MN	mg/L					
MO	mg/L					
NI	mg/L					
PB	mg/L					
SB	mg/L					
SE	mg/L				0,06	
SI	mg/L	0,826	0,2133	0,1167	0,366	1,26
V	mg/L					
ZN	mg/L					
-----Nutrients------						
NH3	mg/L					
NH3-N	mg/L	0,2767	0,1333	0,18	0,2467	0,2171
NO2-N	mg/L	0,0017	0,0067	0,0032	0,0013	0,0011
NO3-N	mg/L	0,3333	0,25	0,25	0,2167	0,2714
T.PO4	mg/L					
TKN	mg/L					
-----Solids------						
TURB-L	NTU					
TDS	mg/L					
TSS	mg/L	100	55	44	49	137
-----Trace Constituents------						
CN-F	mg/L					
CN-T	mg/L					
CN-WAD	mg/L					

SAMPLE POINT : SSS.2		2007	2008	2009	2010	2011
-----Field data------						
TEMP	deg C	3,9833	6,6143	3,2667	4,0	4,2667
COND-F	ms/cm	0,2328	0,0578	0,3668	0,203	0,2989
PH-F	pH unit	8,4033	8,3586	8,4367	8,6	8,345
-----Major Constituents------						
CA	mg/L	5,39	4,5733	3,165	3,135	3,9986
CL	mg/L	1,7667	0,65	0,5	1,0833	0,6571
CO3	mg/L					
HCO3	mg/L	11,2667	12,1667	10	9,6667	12,8571
K	mg/L	0,5433	0,4667	0,29	0,245	0,2743
MG	mg/L	1,4017	0,785	0,365	0,8833	0,8986
NA	mg/L	0,222	1,11			
SO4	mg/L	12,6667	8,3333	1,3333	4,1667	4
T-HARD	mg/L					
T.ALK	mg/L					
-----Metals------						
AG	mg/L					
AL	mg/L					
AS	mg/L					
B	mg/L					
BA	mg/L					
BE	mg/L					
BI	mg/L					
CD	mg/L					
CO	mg/L					
CR	mg/L					
CU	mg/L					
F	mg/L					
FE	mg/L	2,3588	1,1552	1,4398	0,6133	1,2269
HG	mg/L					
MN	mg/L					
MO	mg/L					
NI	mg/L					
PB	mg/L					
SB	mg/L					
SE	mg/L				0,06	
SI	mg/L	0,3363	0,3367	0,4367	0,424	0,8257
V	mg/L					
ZN	mg/L					
-----Nutrients------						
NH3	mg/L					
NH3-N	mg/L	0,2433	0,16	0,26	0,3733	0,2457
NO2-N	mg/L	0,0017	0,0052	0,0033	0,0012	0,0013
NO3-N	mg/L	0,25	0,25	0,2	0,1833	0,2571
T.PO4	mg/L					
TKN	mg/L					
-----Solids------						
TURB-L	NTU					
TDS	mg/L					
TSS	mg/L	131	103	95	44,5	104
-----Trace Constituents------						
CN-F	mg/L					
CN-T	mg/L					
CN-WAD	mg/L					

SAMPLE POINT : SWS.1		2007	2008	2009	2010	2011
-----Field data------						
TEMP	deg C	4,6429	4,2875	4,68	4,5	3,9571
COND-F	ms/cm	0,805	1,0286	2,624	1,4522	0,8887
PH-F	pH unit	8,0857	7,725	7,868	7,8	7,8414
-----Major Constituents------						
CA	mg/L		429			
CL	mg/L	4,6	3,6875	5,9	6,72	7,3429
CO3	mg/L					
HCO3	mg/L					
K	mg/L		5,38			
MG	mg/L		457			
NA	mg/L		5,05			
SO4	mg/L	322,2857	864,75	2246	1892	2332,8571
T-HARD	mg/L					
T.ALK	mg/L					
-----Metals------						
AG	mg/L					0,003
AL	mg/L	0,1514	2,9288	0,058	0,59	0,5337
AS	mg/L	0,005	0,005	0,005	0,005	0,005
B	mg/L					
BA	mg/L					0,074
BE	mg/L					0,0002
BI	mg/L					
CD	mg/L					0,002
CO	mg/L					0,004
CR	mg/L					0,008
CU	mg/L	0,0093	0,0611	0,0058	0,005	0,005
F	mg/L					
FE	mg/L	1,7591	14,8242	3,4436	11,62	2,9202
HG	mg/L					
MN	mg/L					0,119
MO	mg/L					0,004
NI	mg/L	0,041	0,2686	0,3488	0,3408	0,2744
PB	mg/L					0,005
SB	mg/L					0,02
SE	mg/L					0,02
SI	mg/L					
V	mg/L					0,006
ZN	mg/L		0,021			0,005
-----Nutrients------						
NH3	mg/L					
NH3-N	mg/L	0,1057	0,185	0,296	0,316	0,2286
NO2-N	mg/L	0,0013	0,0015	0,001	0,0094	0,0014
NO3-N	mg/L	0,6857	0,825	3,72	2,7	2,8429
T.PO4	mg/L					
TKN	mg/L					
-----Solids------						
TURB-L	NTU	14,0143	41,1625	20,43	75	20
TDS	mg/L	582,7143	1403,125	3262	2820	3557
TSS	mg/L	22	35,375	15,6	81	29
-----Trace Constituents------						
CN-F	mg/L					
CN-T	mg/L					
CN-WAD	mg/L					

SAMPLE POINT : SWS.2		2007	2008	2009	2010	2011
-----Field data------						
TEMP	deg C	4,9429	4,65	4,76	5,7	4
COND-F	ms/cm	0,83	0,8828	2,2196	1,156	0,9617
PH-F	pH unit	8,0143	7,7875	7,718	7,7	7,7
-----Major Constituents------						
CA	mg/L					
CL	mg/L	5,0714	4,4	8,7	7,68	8,2857
CO3	mg/L					
HCO3	mg/L					
K	mg/L					
MG	mg/L					
NA	mg/L					
SO4	mg/L	378,5714	887,125	1584	1652	1958,5714
T-HARD	mg/L					
T.ALK	mg/L					
-----Metals------						
AG	mg/L					
AL	mg/L	0,14	2,4638	0,036	0,5436	0,19
AS	mg/L	0,005	0,005	0,005	0,005	0,005
B	mg/L					
BA	mg/L					
BE	mg/L					
BI	mg/L					
CD	mg/L					
CO	mg/L					
CR	mg/L					
CU	mg/L	0,0083	0,0529	0,005	0,005	0,005
F	mg/L					
FE	mg/L	1,4101	12,2779	6,54	8,64	1,6931
HG	mg/L					
MN	mg/L					
MO	mg/L					
NI	mg/L	0,0464	0,2531	0,2736	0,2638	0,25
PB	mg/L					
SB	mg/L					
SE	mg/L					
SI	mg/L					
V	mg/L					
ZN	mg/L				0	
-----Nutrients------						
NH3	mg/L					
NH3-N	mg/L	0,14	0,145	0,696	0,28	0,2629
NO2-N	mg/L	0,0011	0,002	0,001	0,0048	0,0017
NO3-N	mg/L	0,5571	1,3625	3,56	2,72	2,6429
T.PO4	mg/L					
TKN	mg/L					
-----Solids------						
TURB-L	NTU	17,5286	41,1875	39,11	48,6	15
TDS	mg/L	672,5714	1453,125	2486	2546	3154
TSS	mg/L	23,4286	38,875	16,6	46,4	24
-----Trace Constituents------						
CN-F	mg/L					
CN-T	mg/L					
CN-WAD	mg/L					

SAMPLE POINT : T8.1		2007	2008	2009	2010	2011
-----Field data------						
TEMP	deg C	5,6725	5,9075	4,5971	6,9	6,1643
COND-F	ms/cm	3,3389	3,509	1,5311	1,7133	1,6479
PH-F	pH unit	8,5859	8,64	8,8371	8,8	9,1197
-----Major Constituents------						
CA	mg/L	202,5	146,775	96,2545	99,1231	87,2923
CL	mg/L	111,4545	87	87	35,5077	49,9286
CO3	mg/L	13,5455	34,6667	7,3636	15,4615	27,7857
HCO3	mg/L	146,3636	100,6667	139,5455	98,3077	83,6429
K	mg/L	99,0818	127,7833	88,2091	96,5923	111,7077
MG	mg/L	20,9	15,27	9,73	31,1723	6,8646
NA	mg/L	326,8182	425,5833	328,6091	384,9231	420,8546
SO4	mg/L	936,7273	874,5833	667,6364	733,8462	773,5714
T-HARD	mg/L	743,1818	451,25	305,9091	283,0769	307,5
T.ALK	mg/L	142,6818	154,25	126,2545	106,2308	115,0714
-----Metals------						
AG	mg/L					0,0663
AL	mg/L	0,1917	0,283	0,1192	0,242	0,2069
AS	mg/L					0,005
B	mg/L					
BA	mg/L	0,0771	0,0917	0,0375	0,0378	0,0409
BE	mg/L					0,0002
BI	mg/L					
CD	mg/L					0,002
CO	mg/L	0,0798	0,0772	0,0601	0,0558	0,0644
CR	mg/L	0,0128	0,008	0,008	0,008	0,008
CU	mg/L	24,7813	18,7933	18,6458	18,5057	22,0095
F	mg/L					
FE	mg/L	2,4455	3,3534	1,0533	1,3907	1,6053
HG	mg/L	0,0006	0,0005	0,0005	0,0005	0,0005
MN	mg/L	0,0741	0,0428	0,0311	0,0642	0,0099
MO	mg/L	0,6746	0,4771	0,4095	0,4239	0,3342
NI	mg/L	0,872	0,71	0,5924	0,6899	0,5923
PB	mg/L					0,012
SB	mg/L					0,175
SE	mg/L					0,0233
SI	mg/L					
V	mg/L					0,0087
ZN	mg/L	0,2432	0,5314	0,1474	0,4844	0,2123
-----Nutrients------						
NH3	mg/L					
NH3-N	mg/L	16,3151	5,5471	12,4906	13,7414	14,871
NO2-N	mg/L	0,0027	0,0058	0,0178	0,1148	0,1817
NO3-N	mg/L	13,3732	19,1875	17,5406	21,5517	28,8129
T.PO4	mg/L					1,25
TKN	mg/L					
-----Solids------						
TURB-L	NTU	5,9455	11,3417	2,5682	5	11,2667
TDS	mg/L	2153,6364	2126,6667	1572,3636	1829	1830
TSS	mg/L	9,0909	29,0833	3,7273	5	2,6667
-----Trace Constituents------						
CN-F	mg/L	11,295	13,5485	8,4063	13,2379	9,7656
CN-T	mg/L	37,2674	51,5152	25,5938	32,8276	38,5938
CN-WAD	mg/L	32,5854	40,2182	23,4594	29,8448	33,4

SAMPLE POINT : T8.4		2007	2008	2009	2010	2011
-----Field data------						
TEMP	deg C	9,61	10,3059	6,7294	9,6	8,1696
COND-F	ms/cm	2,269	3,013	1,8432	1,5432	1,955
PH-F	pH unit	8,133	7,6412	8,1835	7,9	8,0222
-----Major Constituents------						
CA	mg/L	168,6833	174	70,4833	57,4	48,8125
CL	mg/L	113,8333	109,25	93,5	22,7143	51,25
CO3	mg/L	1	2	2,8333	5,5714	13,125
HCO3	mg/L	96,1667	92,5	145	139,1429	110,625
K	mg/L	88,9667	87,575	66,7	66,4714	92,2375
MG	mg/L	15,3	11,6625	9,165	7,98	6,105
NA	mg/L	405,5	397,75	343,3333	391,4286	552
SO4	mg/L	1078,3333	1062,5	775,8333	780	931,25
T-HARD	mg/L	408,3333	443,75	235	180	157,5
T.ALK	mg/L	78,8333	77,85	123	122,9286	111,5
-----Metals------						
AG	mg/L			0,004	0,007	0,003
AL	mg/L	0,0578	0,05	0,07	0,1774	0,1592
AS	mg/L			0,005	0,005	0,005
B	mg/L					
BA	mg/L	0,0275	0,026	0,0232	0,0251	0,0219
BE	mg/L			0,0002	0,0002	0,0002
BI	mg/L					
CD	mg/L			0,002	0,002	0,002
CO	mg/L	0,0428	0,0338	0,0343	0,0314	0,0328
CR	mg/L	0,017	0,008	0,008	0,008	0,008
CU	mg/L	0,1735	0,0964	0,1716	0,1763	0,1148
F	mg/L					
FE	mg/L	0,2322	0,2539	0,2838	0,2051	0,3557
HG	mg/L	0,0005	0,0005	0,0005	0,0005	0,0005
MN	mg/L	0,1078	0,0265	0,0455	0,0431	0,0347
MO	mg/L	0,4808	0,2978	0,3242	0,2723	0,2336
NI	mg/L	0,0308	0,0115	0,0177	0,0185	0,0063
PB	mg/L			0,005	0,011	0,005
SB	mg/L			0,07	0,045	0,1018
SE	mg/L			0,02	0,02	0,4178
SI	mg/L					
V	mg/L			0,006	0,006	0,007
ZN	mg/L	0,0036	0,0023	0,0046	0,0034	0,0041
-----Nutrients------						
NH3	mg/L				0,3382	0,3828
NH3-N	mg/L	21,9412	0,2812	0,522	19,45	21,3611
NO2-N	mg/L	0,1112	0,0652	0,0933	0,1779	0,3477
NO3-N	mg/L	10,6	11,2077	14,4737	13,97	21,6667
T.PO4	mg/L					0,58
TKN	mg/L					
-----Solids------						
TURB-L	NTU	1,7206	1,5	3,2474	2	5
TDS	mg/L	1951,1765	1943,8462	1665,2632	1643	1797
TSS	mg/L	1,8824	6,6154	8,2105	2	8
-----Trace Constituents------						
CN-F	mg/L	0,005	0,0418		0,0013	0,0025
CN-T	mg/L	0,0436	0,0769	0,0434	0,0528	0,0626
CN-WAD	mg/L	0,0248	0,0264	0,022	0,0229	0,0378

SAMPLE POINT : P5.2		2007	2008	2009	2010	2011
-----Field data------						
TEMP	deg C	10,4353	9,8837	9,6133	9,9	10,694
COND-F	ms/cm	0,176	0,177	0,2285	0,3225	0,1569
PH-F	pH unit	7,788	7,7675	7,7181	7,6	7,7014
-----Major Constituents------						
CA	mg/L	14,825	21,9333	18,4	18,9667	17,44
CL	mg/L	2,05	0,93	1,225	2,0333	1,88
CO3	mg/L	1	1	1	1	1
HCO3	mg/L	30,75	34,3333	34	36,3333	30,2
K	mg/L	1,2825	1,4	1,4275	1,4633	1,394
MG	mg/L	2,955	3,29	3,3225	3,4933	3,392
NA	mg/L	2,2625	2,7433	2,23	2,0267	1,986
SO4	mg/L	23,25	29	27,75	31	28,2
T-HARD	mg/L	58,75	52,6667	58	57,3333	51
T.ALK	mg/L	25,4	28,2	28	29,9333	29,64
-----Metals------						
AG	mg/L					
AL	mg/L	0,2107	0,1146	0,086	0,0931	0,1225
AS	mg/L					
B	mg/L					
BA	mg/L	0,0205	0,0237	0,019	0,0283	0,0212
BE	mg/L					
BI	mg/L					
CD	mg/L	0,002	0,002	0,002	0,002	0,002
CO	mg/L	0,004	0,0043	0,004	0,004	0,004
CR	mg/L	0,008	0,008	0,008	0,008	0,008
CU	mg/L	0,0131	0,015	0,0126	0,0123	0,019
F	mg/L	0,1253	0,1217	0,1213	0,1303	0,0706
FE	mg/L	0,0776	0,0687	0,0378	0,0427	0,0602
HG	mg/L	0,0005	0,0005	0,0005	0,0005	0,0005
MN	mg/L					
MO	mg/L					
NI	mg/L					
PB	mg/L	0,005	0,005	0,005	0,005	0,005
SB	mg/L					
SE	mg/L					
SI	mg/L					
V	mg/L					
ZN	mg/L				0,017	
-----Nutrients------						
NH3	mg/L					
NH3-N	mg/L	0,04	0,04	0,055	0,04	0,044
NO2-N	mg/L	0,001	0,0017	0,001	0,001	0,0018
NO3-N	mg/L	0,3	0,3333	0,3	0,4333	0,36
T.PO4	mg/L	0,01	0,0067	0,01	0,01	0,014
TKN	mg/L					
-----Solids------						
TURB-L	NTU	3,0354	2,6208	0,8787	1,222	1
TDS	mg/L	71,1042	74,3125	207,1064	74,88	71
TSS	mg/L	2,6125	2,5	1,1702	1,18	2
-----Trace Constituents------						
CN-F	mg/L					
CN-T	mg/L	0,005	0,0067	0,005	0,005	0,005
CN-WAD	mg/L					

SAMPLE POINT : P5.3		2007	2008	2009	2010	2011
-----Field data------						
TEMP	deg C	11,4127	10,3653	10,0535	10,5	10,9041
COND-F	ms/cm	0,1662	0,1976	0,2007	0,3005	0,2982
PH-F	pH unit	7,9024	7,8969	7,7209	7,6	8,4959
-----Major Constituents------						
CA	mg/L	14,88	17,65	19,225	16,3	18,05
CL	mg/L	2,325	1,2	1,6	3,6667	2,65
CO3	mg/L	1	1	1	1	1
HCO3	mg/L	37,25	37,5	25,25	24,3333	26
K	mg/L	1,246	1,32	1,4525	1,46	1,4525
MG	mg/L	3,026	2,71	3,3775	3,1533	3,4225
NA	mg/L	2,24	2,075	2,365	2,44	2,2425
SO4	mg/L	19,25	16,5	38,6	30,3333	32,5
T-HARD	mg/L	52	47,75	49,6	48	49,75
T.ALK	mg/L	30,65	30,8	19,28	19,9	21,5
-----Metals------						
AG	mg/L					0,003
AL	mg/L	0,3951	0,2295	0,094	0,1073	0,1542
AS	mg/L			0,03		0,005
B	mg/L					
BA	mg/L	0,0213	0,0203	0,0205	0,0235	0,02
BE	mg/L					0,0002
BI	mg/L					
CD	mg/L	0,002	0,0016	0,002	0,002	0,002
CO	mg/L	0,0043	0,004	0,004	0,004	0,004
CR	mg/L	0,008	0,008	0,008	0,008	0,008
CU	mg/L	0,0077	0,0061	0,0133	0,0171	0,0202
F	mg/L	0,1448	0,1558	0,0484	0,049	0,0563
FE	mg/L	0,2643	0,1684	0,0377	0,052	0,0766
HG	mg/L	0,0005	0,0005	0,0005	0,0005	0,0005
MN	mg/L					0,005
MO	mg/L					0,004
NI	mg/L		0,005			0,005
PB	mg/L	0,005	0,005	0,005	0,005	0,005
SB	mg/L					0,02
SE	mg/L					0,02
SI	mg/L					
V	mg/L					0,006
ZN	mg/L				0,018	0,017
-----Nutrients------						
NH3	mg/L					
NH3-N	mg/L	0,036	0,04	0,048	0,0467	0,04
NO2-N	mg/L	0,0013	0,0175	0,001	0,001	0,0015
NO3-N	mg/L	0,3	0,4	0,44	0,2667	0,325
T.PO4	mg/L	0,01	0,01	0,01	0,01	0,01
TKN	mg/L					
-----Solids------						
TURB-L	NTU	14,6229	9,2545	0,5488	1	1
TDS	mg/L	75,4375	70,3864	82,9286	78	73
TSS	mg/L	5,2292	5,7273	1,0952	1	2
-----Trace Constituents------						
CN-F	mg/L			0,005		
CN-T	mg/L	0,005	0,005	0,005	0,005	0,005
CN-WAD	mg/L			0,005		

SAMPLE POINT : P5.4		2007	2008	2009	2010	2011
-----Field data------						
TEMP	deg C	10,2137	9,802	9,54	9,8	9,7633
COND-F	ms/cm	0,1732	0,2283	0,5716	0,163	0,1363
PH-F	pH unit	7,798	7,7643	7,687	7,8	7,7147
-----Major Constituents------						
CA	mg/L	14,325	16,35	19,775	19,1	16,6
CL	mg/L	2,3	1,475	1,36	3,0667	2,2
CO3	mg/L	1	1	1	1	1
HCO3	mg/L	31	29,5	31,25	28	25
K	mg/L	1,1475	1,235	1,1325	1,4167	1,25
MG	mg/L	2,7425	2,83	3,49	3,56	3,315
NA	mg/L	1,985	2,145	2,4075	1,9467	1,79
SO4	mg/L	25,75	26,5	30,2	32,3333	32,5
T-HARD	mg/L	57,5	55	55,6	51	49,5
T.ALK	mg/L	25,35	24,075	24,84	23	20,5
-----Metals------						
AG	mg/L					
AL	mg/L	0,2498	0,1085	0,0874	0,0908	0,1124
AS	mg/L			0,11		
B	mg/L					
BA	mg/L	0,0198	0,021	0,0195	0,028	0,017
BE	mg/L					
BI	mg/L					
CD	mg/L	0,002	0,002	0,002	0,002	0,002
CO	mg/L	0,004	0,004	0,004	0,004	0,004
CR	mg/L	0,008	0,008	0,008	0,007	0,008
CU	mg/L	0,007	0,0062	0,0061	0,0058	0,0147
F	mg/L	0,096	0,1208	0,1812	0,0743	0,05
FE	mg/L	0,1321	0,0942	0,0628	0,0768	0,0773
HG	mg/L	0,0005	0,0005	0,0005	0,002	0,0005
MN	mg/L					
MO	mg/L					
NI	mg/L					
PB	mg/L	0,0043	0,005	0,005	0,005	0,005
SB	mg/L					
SE	mg/L					
SI	mg/L					
V	mg/L					
ZN	mg/L				0,022	
-----Nutrients------						
NH3	mg/L					
NH3-N	mg/L	0,055	0,04	0,044	0,04	0,04
NO2-N	mg/L	0,0013	0,0145	0,001	0,0013	0,0015
NO3-N	mg/L	0,475	0,4	0,66	0,2	0,3
T.PO4	mg/L	0,02	0,01	0,01	0,02	0,01
TKN	mg/L					
-----Solids------						
TURB-L	NTU	3,9417	2,8606	1,1947	1	1
TDS	mg/L	70,7083	71,9574	77,2553	75	79
TSS	mg/L	4,0833	2,8085	1,1915	1	2
-----Trace Constituents------						
CN-F	mg/L					
CN-T	mg/L	0,005	0,0053	0,005	0,005	0,005
CN-WAD	mg/L					

SAMPLE POINT : RS1		2007	2008	2009	2010	2011
-----Field data------						
TEMP	deg C	22,4688	22,5	21,1735	21,1096	22,0104
COND-F	ms/cm			7,8	1,92	
PH-F	pH unit	8,1875	8,2647	8,3167	8,2787	8,075
-----Major Constituents------						
CA	mg/L		60,6			
CL	mg/L		49,3182	30,5451	35,502	33,1481
CO3	mg/L					
HCO3	mg/L					
K	mg/L		1,08			
MG	mg/L		15,6			
NA	mg/L		7,08			
SO4	mg/L		90,1364	59,0588	56,902	53,0192
T-HARD	mg/L					
T.ALK	mg/L					
-----Metals------						
AG	mg/L					
AL	mg/L		0,03		0,07	
AS	mg/L					
B	mg/L					
BA	mg/L					
BE	mg/L					
BI	mg/L					
CD	mg/L					
CO	mg/L					
CR	mg/L					
CU	mg/L	0,005	0,005		0,005	
F	mg/L					
FE	mg/L	0,11	0,053			
HG	mg/L		0,0005			
MN	mg/L		0,001			
MO	mg/L					
NI	mg/L		0,005			
PB	mg/L					
SB	mg/L					
SE	mg/L					
SI	mg/L					
V	mg/L					
ZN	mg/L		0,138			
-----Nutrients------						
NH3	mg/L					
NH3-N	mg/L	15,7688	88,8529	9,3447	11,9706	12,6
NO2-N	mg/L	0,0038	0,0112	0,0039	0,0083	0,0309
NO3-N	mg/L	0,225	0,1	0,2922	0,1961	0,1423
T.PO4	mg/L	23,375	22,9314	9,1235	7,4157	8,5212
TKN	mg/L	114,24	189,1795			
-----Solids------						
TURB-L	NTU					
TDS	mg/L		722,9091	440,1176	396	416
TSS	mg/L		6357,7273	316,4118	467	795
-----Trace Constituents------						
CN-F	mg/L					
CN-T	mg/L					
CN-WAD	mg/L					

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SAMPLE POINT : S1.1		2007	2008	2009	2010	2011
-----Field data------						
TEMP	deg C	17,75	17,3947	16,2581	16,6	16,81
COND-F	ms/cm					
PH-F	pH unit	7,1643	7,0526	7,1839	7,1	7,18
-----Major Constituents------						
CA	mg/L					
CL	mg/L		33,1429	29,1333	36,4848	39,00
CO3	mg/L					
HCO3	mg/L					
K	mg/L					
MG	mg/L					
NA	mg/L					
SO4	mg/L		78,6429	66,7333	80	83,18
T-HARD	mg/L					
T.ALK	mg/L					
-----Metals------						
AG	mg/L					
AL	mg/L					
AS	mg/L					
B	mg/L					
BA	mg/L					
BE	mg/L					
BI	mg/L					
CD	mg/L					
CO	mg/L					
CR	mg/L					
CU	mg/L					
F	mg/L					
FE	mg/L					
HG	mg/L					
MN	mg/L					
MO	mg/L					
NI	mg/L					
PB	mg/L					
SB	mg/L					
SE	mg/L					
SI	mg/L					
V	mg/L					
ZN	mg/L					
-----Nutrients------						
NH3	mg/L					
NH3-N	mg/L	22,0069	21,9459	10,1638	4,2679	6,10
NO2-N	mg/L	0,0025	0,0188	0,1767	0,6453	0,66
NO3-N	mg/L	0,3724	0,1	3,4438	8,7212	6,41
T.PO4	mg/L	9,9517	9,4703	4,825	5,0424	3,43
TKN	mg/L	32,6207	31,8889			
-----Solids------						
TURB-L	NTU					
TDS	mg/L		326,5385	277,2667	452	303
TSS	mg/L		75,3077	29,5667	21	14
-----Trace Constituents------						
CN-F	mg/L					
CN-T	mg/L					
CN-WAD	mg/L					

SAMPLE POINT : SDP		2007	2008	2009	2010	2011
-----Field data------						
TEMP	deg C	12,0762	10,2	6,1	6,9	5,9167
COND-F	ms/cm	2,4837	0,168	0,5601	0,66	0,517
PH-F	pH unit	8,5743	8,2856	8,2972	7,8	7,6844
-----Major Constituents------						
CA	mg/L					
CL	mg/L	52	52,5	56,2308	61,1818	192
CO3	mg/L					
HCO3	mg/L					
K	mg/L					
MG	mg/L					
NA	mg/L					
SO4	mg/L	93	97,4167	83,3846	90,4545	112,25
T-HARD	mg/L					
T.ALK	mg/L					
-----Metals------						
AG	mg/L					
AL	mg/L	0,056	0,0533	0,0575	0,04	0,05
AS	mg/L					
B	mg/L					
BA	mg/L					
BE	mg/L					
BI	mg/L					
CD	mg/L					
CO	mg/L					
CR	mg/L					
CU	mg/L	0,007	0,0053	0,005	0,005	0,0063
F	mg/L					
FE	mg/L	0,4516	0,5683	0,4375	0,2305	0,1333
HG	mg/L					
MN	mg/L					
MO	mg/L					
NI	mg/L	0,005	0,005	0,005	0,005	0,005
PB	mg/L	0,005				
SB	mg/L					
SE	mg/L					
SI	mg/L					
V	mg/L					
ZN	mg/L	0,0104	0,011	0,0135	0,0073	0,0163
-----Nutrients------						
NH3	mg/L					
NH3-N	mg/L	11,9706	13,1571	6,1347	3,18	3,7493
NO2-N	mg/L	0,0024	0,0049	0,2395	0,2141	0,0071
NO3-N	mg/L	0,2941	0,2571	1,74	3,5	4,7867
T.PO4	mg/L	6,8529	6,0786	3,6	2,23	2,1013
TKN	mg/L	19,1471	18,1818			
-----Solids------						
TURB-L	NTU	20,6	16,6667	3,2	4	17
TDS	mg/L	405	407,1667	392,6667	419	280
TSS	mg/L	29,8	28,6667	3,3846	6	15
-----Trace Constituents------						
CN-F	mg/L					
CN-T	mg/L					
CN-WAD	mg/L					

SAMPLE POINT : S1.2		2007	2008	2009	2010	2011
-----Field data------						
TEMP	deg C	6,84	5,2333	5,7143	4,14	5,475
COND-F	ms/cm	0,7365	0,3287	0,4287	0,37	0,6427
PH-F	pH unit	8,062	7,8833	8,2814	7,93	7,56
-----Major Constituents------						
CA	mg/L					
CL	mg/L	8,05	3,7	9	8,36	8,78
CO3	mg/L					
HCO3	mg/L					
K	mg/L					
MG	mg/L					
NA	mg/L					
SO4	mg/L	125,8333	68	126	151,57	141,4
T-HARD	mg/L					
T.ALK	mg/L					
-----Metals------						
AG	mg/L					
AL	mg/L	0,755	1,302	0,3317	1,64	1,454
AS	mg/L					
B	mg/L					
BA	mg/L					
BE	mg/L					
BI	mg/L					
CD	mg/L					
CO	mg/L					
CR	mg/L					
CU	mg/L	0,012	0,0158	0,0107	0,01	0,0094
F	mg/L					
FE	mg/L	0,9342	1,9694	0,4908	2,42	1,9038
HG	mg/L					
MN	mg/L					
MO	mg/L					
NI	mg/L	0,005	0,0056	0,005	0,01	0,005
PB	mg/L					
SB	mg/L					
SE	mg/L					
SI	mg/L					
V	mg/L					
ZN	mg/L	0,0033	0,007	0,0027	0,01	0,0074
-----Nutrients------						
NH3	mg/L					
NH3-N	mg/L	1,4733	0,5433	2,05	2,13	1,92
NO2-N	mg/L	0,0243	0,0077	0,0232	0,07	0,1028
NO3-N	mg/L	1,2167	0,7833	1,5167	1,77	2,24
T.PO4	mg/L	0,215	2,1433	0,1117	0,14	0,942
TKN	mg/L	3,9267	1,3567			
-----Solids------						
TURB-L	NTU	61,8333	70	18,25	59	8
TDS	mg/L	271,1667	217,6	268,1667	314	389
TSS	mg/L	52,1667	40,4	14	62	13
-----Trace Constituents------						
CN-F	mg/L					
CN-T	mg/L					
CN-WAD	mg/L					

SAMPLE POINT : UG1		2007	2008	2009	2010	2011
-----Field data------						
TEMP	deg C		6,4125	8,83	8,9	10,2773
COND-F	ms/cm		3,8185	2,8317	2,415	0,8167
PH-F	pH unit		9,5075	10,2285	11,0	10,83
-----Major Constituents------						
CA	mg/L		749	325,875	201,225	110,848
CL	mg/L		343,375	117,085	9,2708	7,684
CO3	mg/L		22,23	12		
HCO3	mg/L		78,125	57	8,9583	4,72
K	mg/L		31,0725	69,569	56,0138	24,9044
MG	mg/L		449,4388	76,9684	9,1137	4,1352
NA	mg/L		195,2625	41,9867	221	
SO4	mg/L		2792,5	925,7	343,25	159,36
T-HARD	mg/L		3106,25			
T.ALK	mg/L		174,5875			
-----Metals------						
AG	mg/L		0,0045			
AL	mg/L		0,1525	0,395	1,2793	1,168
AS	mg/L		0,0051			
B	mg/L					
BA	mg/L		0,1394			
BE	mg/L		0,0002			
BI	mg/L					
CD	mg/L		0,002			
CO	mg/L		0,033			
CR	mg/L		0,0948			
CU	mg/L		0,026	0,0409	0,0063	0,007
F	mg/L		0,01			
FE	mg/L		0,5523	1,1354	1,1894	2,1457
HG	mg/L		0,0005		0,0005	0,0005
MN	mg/L		2,063	0,2023	0,042	0,0407
MO	mg/L		0,0556			
NI	mg/L		0,0785			
PB	mg/L		0,0135			
SB	mg/L		0,2675			
SE	mg/L		0,0225			
SI	mg/L		1,5453			
V	mg/L		0,0147			
ZN	mg/L		0,2475	0,0231	0,011	0,0095
-----Nutrients------						
NH3	mg/L					
NH3-N	mg/L		4,7775	10,5067	3,1017	9,0664
NO2-N	mg/L		0,2138	0,1104	0,0557	0,1867
NO3-N	mg/L		7,875	20,3667	5,1292	13,012
T.PO4	mg/L		0,948			
TKN	mg/L					
-----Solids------						
TURB-L	NTU		61,75	415	64	79
TDS	mg/L		5912,5	2321,2222	998	494
TSS	mg/L		155,75	339	135	170
-----Trace Constituents------						
CN-F	mg/L					
CN-T	mg/L		0,023	0,12		
CN-WAD	mg/L					

SAMPLE POINT : UG1OUT		2007	2008	2009	2010	2011
-----Field data------						
TEMP	deg C		8,7	6,0571	8,7	10,335
COND-F	ms/cm		4,835	2,6947	2,159	0,8498
PH-F	pH unit		8,6275	9,7971	10,9	10,762
-----Major Constituents------						
CA	mg/L		673,25	384,0167	177,9583	143,2319
CL	mg/L		231,25	165,5	9,0167	9,1571
CO3	mg/L		20,25	339,875		
HCO3	mg/L		100	85,0167	1	11,9524
K	mg/L		20,8275	38,1214	60,8225	20,229
MG	mg/L		506,55	241,5829	10,4908	28,3433
NA	mg/L		106,325	109,3		
SO4	mg/L		2760	1443,2	376,5833	318,5714
T-HARD	mg/L		3418,75	590		
T.ALK	mg/L		216,95			
-----Metals------						
AG	mg/L		0,003			
AL	mg/L		0,11	0,749	0,7136	0,6143
AS	mg/L		0,0053			
B	mg/L					
BA	mg/L		0,0813			
BE	mg/L		0,0002			
BI	mg/L					
CD	mg/L		0,002			
CO	mg/L		0,036			
CR	mg/L		0,047			
CU	mg/L		0,007	0,0171	0,006	0,0051
F	mg/L					
FE	mg/L		0,54	2,3689	0,8615	0,7654
HG	mg/L		0,0005		0,0005	0,0005
MN	mg/L		2,1892	0,0769	0,0393	0,0299
MO	mg/L		0,026			
NI	mg/L		0,078			
PB	mg/L		0,005			
SB	mg/L		0,02			
SE	mg/L		0,02			
SI	mg/L		0,006			
V	mg/L		0,024			
ZN	mg/L		0,1243	0,0191	0,0079	0,0057
-----Nutrients------						
NH3	mg/L					
NH3-N	mg/L		2,25		2,9233	3,8552
NO2-N	mg/L		0,1155		0,0499	0,1411
NO3-N	mg/L		3,5		5,3333	6,4619
T.PO4	mg/L		1,4575			
TKN	mg/L					
-----Solids------						
TURB-L	NTU		54		105	31
TDS	mg/L		4805		1002	684
TSS	mg/L		332,25		178	69
-----Trace Constituents------						
CN-F	mg/L					
CN-T	mg/L					
CN-WAD	mg/L					

SAMPLE POINT : UG2		2007	2008	2009	2010	2011
-----Field data------						
TEMP	deg C				10,3	10,7391
COND-F	ms/cm				1,517	1,1876
PH-F	pH unit				10,0	10,4322
-----Major Constituents------						
CA	mg/L				275,3714	357,6333
CL	mg/L				10,5	12,95
CO3	mg/L					
HCO3	mg/L				34,5	43,8333
K	mg/L				50,0707	37,0121
MG	mg/L				90,7886	186,0208
NA	mg/L					
SO4	mg/L				959,6429	1486,6667
T-HARD	mg/L					
T.ALK	mg/L					
-----Metals------						
AG	mg/L					
AL	mg/L				1,4743	1,5796
AS	mg/L					
B	mg/L					
BA	mg/L					
BE	mg/L					
BI	mg/L					
CD	mg/L					
CO	mg/L					
CR	mg/L					
CU	mg/L				0,006	0,0071
F	mg/L					
FE	mg/L				1,3369	2,7602
HG	mg/L				0,0005	0,0005
MN	mg/L				0,2339	1,1688
MO	mg/L					
NI	mg/L					
PB	mg/L					
SB	mg/L					
SE	mg/L					
SI	mg/L					
V	mg/L					
ZN	mg/L				0,0216	0,0264
-----Nutrients------						
NH3	mg/L					
NH3-N	mg/L				4,9457	7,6367
NO2-N	mg/L				0,0636	0,3988
NO3-N	mg/L				8,4286	13,7417
T.PO4	mg/L					
TKN	mg/L					
-----Solids------						
TURB-L	NTU				79	114
TDS	mg/L				1711	2460
TSS	mg/L				204	547
-----Trace Constituents------						
CN-F	mg/L					
CN-T	mg/L					
CN-WAD	mg/L					

SAMPLE POINT : UG2OUT		2007	2008	2009	2010	2011
-----**Field data**------						
TEMP	deg C				7,9	10,868
COND-F	ms/cm				1,535	0,9943
PH-F	pH unit				9,9	9,4688
-----**Major Constituents**------						
CA	mg/L				444,76	276,7792
CL	mg/L				12,96	13,3708
CO3	mg/L					
HCO3	mg/L				97,1	68,5833
K	mg/L				24,076	25,715
MG	mg/L				663,22	209,8567
NA	mg/L					
SO4	mg/L				3195	1694,5833
T-HARD	mg/L					
T.ALK	mg/L					
-----**Metals**------						
AG	mg/L					
AL	mg/L				0,526	3,5946
AS	mg/L					
B	mg/L					
BA	mg/L					
BE	mg/L					
BI	mg/L					
CD	mg/L					
CO	mg/L					
CR	mg/L					
CU	mg/L				0,005	0,0083
F	mg/L					
FE	mg/L				0,8059	6,4563
HG	mg/L				0,0005	0,0005
MN	mg/L				13,2762	2,4328
MO	mg/L					
NI	mg/L					
PB	mg/L					
SB	mg/L					
SE	mg/L					
SI	mg/L					
V	mg/L					
ZN	mg/L				0,0771	0,0301
-----**Nutrients**------						
NH3	mg/L					
NH3-N	mg/L				6,25	6,7208
NO2-N	mg/L				0,117	0,2529
NO3-N	mg/L				4,99	8,0833
T.PO4	mg/L					
TKN	mg/L					
-----**Solids**------						
TURB-L	NTU				45	163
TDS	mg/L				4649	2886
TSS	mg/L				91	255
-----**Trace Constituents**------						
CN-F	mg/L					
CN-T	mg/L					
CN-WAD	mg/L					

SAMPLE POINT : UGDW1		2007	2008	2009	2010	2011
-----**Field data**------						
TEMP	deg C			3,0263	2,2	The station was closed in 2011
COND-F	ms/cm			0,8428	0,288	
PH-F	pH unit			8,1021	7,9	
-----**Major Constituents**------						
CA	mg/L			152,1167	87,05	
CL	mg/L			2,3722	2,6	
CO3	mg/L			1		
HCO3	mg/L			110,5556	160	
K	mg/L			3,7822	4,53	
MG	mg/L			40,3333	27,55	
NA	mg/L			3,5571	7,52	
SO4	mg/L			361,6667	114	
T-HARD	mg/L					
T.ALK	mg/L					
-----**Metals**------						
AG	mg/L					
AL	mg/L			0,0556	0,05	
AS	mg/L					
B	mg/L					
BA	mg/L			0,0172		
BE	mg/L					
BI	mg/L					
CD	mg/L					
CO	mg/L					
CR	mg/L					
CU	mg/L			0,0051	0,0055	
F	mg/L					
FE	mg/L			0,1935	0,0535	
HG	mg/L				0,0005	
MN	mg/L			0,0821	0,0145	
MO	mg/L			0,0127		
NI	mg/L			0,011		
PB	mg/L			0,005		
SB	mg/L					
SE	mg/L			0,0217		
SI	mg/L					
V	mg/L					
ZN	mg/L			0,0082	0,003	
-----**Nutrients**------						
NH3	mg/L					
NH3-N	mg/L			0,2167	0,04	
NO2-N	mg/L			0,001	0,001	
NO3-N	mg/L			3,5833	2,05	
T.PO4	mg/L					
TKN	mg/L					
-----**Solids**------						
TURB-L	NTU			3,9786	0	
TDS	mg/L			429,1667	302	
TSS	mg/L			15,75	1	
-----**Trace Constituents**------						
CN-F	mg/L					
CN-T	mg/L					
CN-WAD	mg/L					

APPENDIX E

ENVIRONMENTAL AND SAFETY POLICIES STATEMENT

HEALTH, SAFETY AND ENVIRONMENTAL POLICY

The Kumtor Operating Company (KOC) recognizes the protection of the health and safety of its employees, contractors and the public along with environment management system as among the highest corporate priorities at all stages of our activities including exploration, operations and decommissioning, and is committed to the safety motto that "**no job is so important that we can not take the time to do it safely**" and to the following:

- compliance with applicable laws and regulations of the jurisdictions in which we operate, and generally accepted international industry practices;
- providing employees and contractors with a working environment free of uncontrolled hazards;
- identifying and eliminating or controlling potential risks to health and safety of employees, contractors and the public to levels as low as reasonably achievable, social and economic factors being taken into account;
- preventing environmental impacts and minimizing possible negative exposures to the environment due to company operations;
- achieving continual awareness of and improvement to our overall health, safety and environment performance.

In support of these commitments, KOC will:

- implement and maintain a formally approved health, safety and environment management system;
- identify the significant health and safety hazards and risks associated with company activities;
- set industrial factors of the company exposing to environment;
- set objectives and targets so as to improve continually KOC health, safety and environment management and performance;
- identify the potential for accidents and emergency situations and develop, maintain and test emergency response plans which provide for the protection of the health, safety and environment of our employees, the public, and the communities adjacent to our operations;
- undertake constructive dialogue with the communities located near KOC operations to make them understand the importance of KOC activities related to health and safety of local community;
- place and recycle industrial waste of the company by using methods providing absence, reducing or restriction of pollution;
- soil reclaiming and decommissioning of KOC facilities should be done timely and in accordance with assigned schedule;
- conduct regular audits to assess and ensure conformance to this policy;
- engage in constructive communication of this policy with all employees and relevant contractors and suppliers so they are aware of, and able to comply with their health, safety and environment responsibilities in a manner appropriate to their role in the organization, and to encourage them to make contributions to KOC's health, safety and environment management;

- provide employees at all levels with appropriate training so as to allow them to carry out their health, safety and environment duties and responsibilities;
- ensure the participation of employees in the development and implementation of health, safety and environment programs and procedures associated with their work places;
- provide adequate and appropriate resources to implement this policy;
- make this policy available to the public.

Robert Wunder,
President

December, 2011

CORPORATIVE INFORMATION

Top Management

MICHAEL FISCHER
President of Kumtor Operating Company

ANDREW SAZANOV
Vice president, Government and Corporate Relations

RODNEY STUPARYK
Vice President, Operation

JOHN SUTER
Vice president, administration and Human Resources

TONY MEADE
Вице-президент по кадрам и администрации

SANFORD STEPHENS
Vice president, Materials and Compliance

Main Office

720031, 24, Ibraimov Street,
Bishkek, Kyrgyz Republic
Tel.: (+996 312) 90-07-07, 90-08-08
Fax: (+996 312) 90-07-28, 59-15-26

Balykchy Marshalling Yard

721900, 9 Naryn Highway,
Balykchy, Kyrgyz Republic
Tel.: (+996 312) 90-07-39,
(+996 3944) 7-10-70, 7-10-71
Fax: (+996 312) 90-07-44,
(+996 3944) 7-10-45

Regional Information Center in Balykchy

721900, 9 Naryn Highway,
Balykchy, Kyrgyz Republic
Tel: (+996 775) 97-97-50

Karakol Regional Office

772206, 61, Pervomayskaya Street,
Karakol, Kyrgyz Republic
Tel.: (+996 3922) 5-77-99, 5-99-99
Fax.: (+996 3922) 5-12-12

Regional Information Center in Barscoon

Kyrgyz Republic, Jety-Oguz district
Barskoon, Volna Health Resort
Tel.: (+996 775) 97-97-50

Barskoon Bus Stop

Kyrgyz Republic, Jety-Oguz district
Barskoon
Tel./Fax: (+996 3946) 2-51-44

www.kumtor.kg

Kumtor Operating Company

Centerra Gold Inc.

720031, 24, Ibraimov Street,
Bishkek, Kyrgyz Republic
Tel.: (+996 312) 90-07-07, 90-08-08
Fax: (+996 312) 90-07-28, 59-15-26