



# Environmental & Social Management System

## Water Resources Management Plan

<b>Water Resources Management Plan</b>		
Effective Date: 01.04.2016	Document Number: OMAS-ESMS-WR-PLN-001	Rev: 1

## TABLE OF CONTENTS

<b>1</b>	<b>INTRODUCTION.....</b>	<b>4</b>
1.1	DOCUMENT NUMBER .....	4
1.2	PURPOSE.....	4
1.3	APPLICATION.....	4
1.4	COMMENCEMENT .....	4
1.5	AUTHORITY AND MANAGEMENT .....	4
<b>2</b>	<b>SCOPE.....</b>	<b>5</b>
2.1	SCOPE OF THIS MANAGEMENT PLAN .....	5
2.2	OVERLAPS WITH OTHER MANAGEMENT PLANS .....	5
<b>3</b>	<b>ROLES AND RESPONSIBILITIES.....</b>	<b>5</b>
3.1	KEY ROLES AND RESPONSIBILITIES FOR MANAGEMENT PLAN IMPLEMENTATION .....	5
3.2	KEY INTERFACES.....	6
<b>4</b>	<b>PROJECT STANDARDS.....</b>	<b>6</b>
4.1	APPLICABLE TURKISH NATIONAL STANDARDS .....	7
4.2	OTHER COMMITMENTS TO AND REQUIREMENTS OF TURKISH GOVERNMENT AUTHORITIES .....	7
4.3	APPLICABLE INTERNATIONAL STANDARDS AND GUIDELINES .....	7
4.4	APPLICABLE CENTERRA AND OMAS STANDARDS, POLICIES AND PROCEDURES.....	8
4.5	OTHER INDUSTRY GUIDELINES WITH WHICH OMAS HAS COMMITTED TO COMPLY .....	8
4.6	SUMMARY OF APPLICABLE PROJECT STANDARDS .....	8
<b>5</b>	<b>MITIGATION MEASURES AND MANAGEMENT CONTROLS .....</b>	<b>11</b>
5.1	SUMMARY .....	11
5.2	IMPLEMENTATION AND OPERATION .....	12
<b>6</b>	<b>IMPLEMENTATION SCHEDULE .....</b>	<b>15</b>
6.1	REVIEW AND REVISION OF THIS MANAGEMENT PLAN .....	15
<b>7</b>	<b>MONITORING .....</b>	<b>15</b>
7.1	OVERVIEW OF MONITORING REQUIREMENTS .....	15
7.2	KEY MONITORING ACTIVITIES.....	15
7.2.1	<b>GROUNDWATER MONITORING PROGRAM .....</b>	<b>15</b>
7.2.2	<b>SURFACE WATER MONITORING PROGRAM .....</b>	<b>20</b>
7.2.3	<b>MONITORING OF ACID ROCK DRAINAGE POTENTIAL .....</b>	<b>23</b>
7.3	KEY PERFORMANCE INDICATORS .....	23
<b>8</b>	<b>TRAINING .....</b>	<b>24</b>
8.1	OVERVIEW .....	24
8.2	INDUCTION TRAINING .....	24
8.3	JOB-SPECIFIC TRAINING .....	24
8.4	OTHER TRAINING REQUIREMENTS.....	24
<b>9</b>	<b>AUDIT AND REPORTING .....</b>	<b>24</b>

Water Resources Management Plan		
Effective Date: 01.04.2016	Document Number: OMAS-ESMS-WR-PLN-001	Rev: 1

9.1	AUDITING .....	24
9.2	EXTERNAL AUDITING .....	25
9.3	RECORD KEEPING .....	25
<b>10</b>	<b>DOCUMENT CONTROL .....</b>	<b>25</b>

#### Tables

Table 1: Key Roles and Responsibilities .....	6
Table 2: Project Drinking Water Standards .....	9
Table 3: Effluent Wastewater Standards .....	11
Table 4: Key Management Controls .....	13
Table 5: Groundwater Monitoring & Sampling Program .....	19
Table 6: Surface Water Monitoring & Sampling Program .....	22
Table 7: ARD Monitoring Program .....	23
Table 8: Key Performance Indicators and Monitoring Measures .....	23

#### Figures

Figure 1: Groundwater Monitoring Locations .....	18
Figure 2: Surface Water Monitoring Locations .....	21

Water Resources Management Plan		
Effective Date: 01.04.2016	Document Number: OMAS-ESMS-WR-PLN-001	Rev: 1

## 1 INTRODUCTION

### 1.1 Document Number

This document is the Water Resources Management Plan for the Öksüt Gold Project. The document reference number for this Management Plan is OMAS-ESMS-WR-PLN-001.

### 1.2 Purpose

The purpose of this Management Plan is to:

- define the scope of the Management Plan and set out applicable management interfaces;
- define roles and responsibilities;
- outline the applicable Project Standards relevant to this Management Plan;
- define Project commitments, operational procedures and guidance relevant to this Management Plan;
- define monitoring and reporting procedures, including Key Performance Indicators;
- define training requirements;
- set out references for supporting materials and information.

### 1.3 Application

The requirements set out in this Management Plan apply to all OMAS activities throughout the lifecycle of the Öksüt Gold Project, including those carried out by contractors.

This Management Plan is based on the OMAS Environmental & Social Management System Framework (OMAS-ESMS-001), which is owned by the OMAS General Manager. Any subsequent changes to the OMAS Environmental & Social Management System (ESMS) Framework may result in changes to this Management Plan.

### 1.4 Commencement

This Management Plan applies from 1 April 2016.

### 1.5 Authority and Management

The OMAS General Manager approved this Management Plan on 1 March 2016.

This Management Plan is owned by the Health, Safety, Environment and Training Manager. This Management Plan will be reviewed on a minimum of a six monthly basis during construction and commissioning. During steady state operations, this Management Plan will be reviewed on an annual basis to determine whether any changes or updates are required to the plan; unless a more frequent update is required to reflect changing project design or procedures.

<b>Water Resources Management Plan</b>		
Effective Date: 01.04.2016	Document Number: OMAS-ESMS-WR-PLN-001	Rev: 1

Any requests for changes to this Management Plan must be addressed to the owner of this Management Plan and will be subject to appropriate review and approval processes as outlined in the Management of Change (MOC) Procedure set out in the ESMS Framework.

## **2 SCOPE**

### **2.1 Scope of this Management Plan**

This Management Plan covers all OMAS activities, including contractor activities. Implementation by contractors is addressed in the Contractor Management Framework (OMAS-ESMS-CM-PLN-001).

This Management plan covers all water used by OMAS from the point of abstraction through to its loss from the system in the heap leach facility or elsewhere.

### **2.2 Overlaps with other Management Plans**

This Management Plan is part of the overall suite of Management Plans developed for the OMAS Project and as described in the ESMS Framework Document (OMAS-ESMS-001).

This Management Plan has overlaps and cross-linkages to a number of other Management Plans which have water resource implications, including:

- The Community Health Safety and Security Management Plan (OMAS-ESMS-CHSS-PLN-001), particularly in relation to potential impacts on surface and groundwater resources used by local communities.
- The Emergency Response Plan (OMAS-ESMS-ERP-PLN-001), particularly in relation to accidental contamination of surface and groundwater resources.
- Stakeholder Engagement Plan (OMAS-ESMS-SEP-PLN-001), particularly in relation to potential impacts on surface and groundwater resources used by local communities.
- Mineral Waste Management Plan (OMAS-ESMS-WR-PLN-001), particularly in relation to waste rock management and the protection of surface and groundwater.
- Hazardous Materials Management Plan (OMAS-ESMS-HM-PLN-001), particularly in relation to control of potential contamination of surface and ground waters.
- Mine Closure Framework (OMAS-ESMS-MC-PLN-001), particularly in relation to the restoration of the HLF and WRD.
- Cyanide Management Framework (OMAS-ESMS-CY-PLN-001) in relation to management of cyanide.

## **3 ROLES AND RESPONSIBILITIES**

### **3.1 Key Roles and Responsibilities for Management Plan Implementation**

Principal roles and responsibilities for the implementation of this plan are outlined below.

<b>Water Resources Management Plan</b>		
Effective Date: 01.04.2016	Document Number: OMAS-ESMS-WR-PLN-001	Rev: 1

**Table 1: Key Roles and Responsibilities**

Role	Responsibilities
<b>OMAS General Manager</b>	<ul style="list-style-type: none"> <li>Approval of this Plan and resources required for implementation.</li> </ul>
<b>OMAS Health, Safety, Environment and Training Manager</b>	<ul style="list-style-type: none"> <li>Ensure Project compliance with the Project Standards and other requirements set out in this Plan.</li> <li>Overall responsibility for Plan scope and implementation.</li> <li>Development, monitoring and revision of this Plan.</li> </ul>
<b>Environmental Coordinator</b>	<ul style="list-style-type: none"> <li>Ensure that water monitoring is undertaken as set out in applicable Management Plans and Procedures.</li> </ul>
<b>Operational Department Managers and Principal Contractors</b>	<ul style="list-style-type: none"> <li>Ensure that relevant activities are undertaken in accordance with this Management Plan and related Procedures.</li> <li>Ensure that department personnel are fully trained in appropriate water and waste water management practices and requirements.</li> <li>Ensure incident<sup>1</sup> investigations are undertaken and reported.</li> </ul>
<b>Workplace Supervisors / Superintendents</b>	<ul style="list-style-type: none"> <li>Provide oversight and conduct routine work area inspections to ensure relevant activities are in accordance with this Management Plan and related Procedures.</li> <li>Report all hazards, non-conformances and incidents.</li> </ul>
<b>All employees and contractors</b>	<ul style="list-style-type: none"> <li>Comply with OMAS requirements.</li> </ul>

### 3.2 Key Interfaces

Key interfaces in the implementation of this Management Plan (i.e. roles with responsibility for delivering elements of this Management Plan) include:

- OMAS Project Manager, particularly in relation to implementation of construction practices to minimise uncontrolled discharges into watercourses;
- OMAS Mine Operations Manager, particularly in relation to controlled abstraction of water from local aquifers and the protection of water resources from uncontrolled discharges into watercourses.

## 4 PROJECT STANDARDS

Applicable Standards must be complied with for all Project activities (the “Project Standards”). Project Standards comprise:

- Applicable Turkish Standards;
- Turkish EIA requirements;

<sup>1</sup> Incidents are defined by reference to the Project finance documents, Centerra Incident Reporting Standard and OMAS ESMS Framework.

<b>Water Resources Management Plan</b>		
Effective Date: 01.04.2016	Document Number: OMAS-ESMS-WR-PLN-001	Rev: 1

- Other commitments to and requirements of Turkish Government authorities;
- Applicable international standards and guidelines;
- Applicable Centerra and OMAS standards, policies and procedures;
- Other industry guidelines with which OMAS has committed to comply.

#### **4.1 Applicable Turkish National Standards**

The following Turkish legislation is relevant to the Öksüt Project relating to water resources and their management:

- *Regulation on Protection of Wetlands*, Official Gazette No: 28962, Date: 04.04.2014;
- *Regulation on Management of Surface Water Quality (RMSWQ)*, Official Gazette No: 28483, Date: 30.11.2012;
- *Regulation on Protection of Groundwater Against Pollution and Deterioration*, Official Gazette No: 28257, Date: 07.04.2012;
- *Groundwater Law*, Law No: 167, Official Gazette No: 10688, Date: 23.12.1960;
- *Regulation on the Water for Human Consumption of the Ministry of Health of Turkey, limit values for drinking and utilization waters* (Ministry of Health, 2005);
- *Regulation on the Protection of Groundwater against Pollution and Degradation* (Ministry of Forestry and Water Affairs, 2012).

#### **4.2 Other Commitments to and Requirements of Turkish Government Authorities**

None applicable.

#### **4.3 Applicable International Standards and Guidelines**

The international standards which OMAS will implement are those set by the European Bank for Reconstruction and Development (EBRD).

The objectives of EBRD *Performance Requirement 3: Resource Efficiency and Pollution Prevention and Control* are to:

- “identify project-related opportunities for energy, water and resource efficiency improvements and waste minimisation;
- adopt the mitigation hierarchy approach to addressing adverse impacts on human health and the environment arising from the resource use and pollution released from the project”.

PR3 states the requirement for projects to meet the relevant EU substantive environmental standards, where these can be applied at the project level. Projects must also be designed to comply with applicable national law, and will be maintained and operated in accordance with national laws and regulatory requirements. When host country regulations differ from the levels and measures presented in EU requirements or other identified appropriate environmental standards, projects will be expected to meet whichever is more stringent.

The following European Union Directives are relevant to the Project and have been taken into account:

<b>Water Resources Management Plan</b>		
Effective Date: 01.04.2016	Document Number: OMAS-ESMS-WR-PLN-001	Rev: 1

- Directive 200/60/EC *Water Framework Directive*;
- Directive 2008/105/EC *on environmental quality standards in the field of water policy*, amending and subsequently repealing Council Directives 82/176/EEC, 83/513/EEC, 84/156/EEC, 84/491/EEC, 86/280/EEC and amending Directive 2000/60/EC of the European Parliament and of the Council;
- Directive 2006/118/EC *on the protection of groundwater against pollution and deterioration*;
- Decision No 2455/2001/EC *Establishing the List of Priority Substances in the Field of Water Policy*;
- Directive No. 98/83/EC *Criteria for Quality of Water for Human Consumption*;
- Directive 2009/90/EC laying down, pursuant to Directive 2000/60/EC of the European Parliament and of the Council, *technical specifications for chemical analysis and monitoring of water status*.

The World Health Organisation provides a list of limit values of chemicals in drinking water:

- Guidance values for drinking water quality established by the World Health Organisation (WHO, 2011).

#### **4.4 Applicable Centerra and OMAS Standards, Policies and Procedures**

Centerra Incident Reporting Standard (2014) and Centerra Environmental Incident Categorisation Reporting Standard (2015).

#### **4.5 Other industry guidelines with which OMAS has committed to comply**

OMAS will comply with the requirements of the International Code on the Management of Cyanide. As OMAS will operate a heap leach facility, the requirements related to the concentration of cyanide in tailings discharged to a tailings management facility are not relevant. Project Standards for cyanide relate to cyanide levels in the environment rather than in industrial facilities.

#### **4.6 Summary of Applicable Project Standards**

OMAS will comply with the more stringent of national standards, applicable EBRD requirements and applicable Centerra Standards, with these more stringent standards representing the Project Standards.

The ESIA, and this Management Plan, are based on the Turkish EIA prepared to comply with Turkish regulatory requirements. The ESIA and this Management Plan go beyond the approach adopted for the Turkish EIA in order to meet EBRD requirements. Where additional impacts have been identified, or mitigations proposed, these are in addition to those set out in the Turkish EIA and form additional voluntary commitments by OMAS and do not replace the core regulatory requirements as set out in the Turkish EIA.

Table 2 presents the Project Standards for drinking water. Effluent waste water standards are set out in Table 3 below.

<b>Water Resources Management Plan</b>		
Effective Date: 01.04.2016	Document Number: OMAS-ESMS-WR-PLN-001	Rev: 1

**Table 2: Project Drinking Water Standards**

Parameter	Units	Turkish Standard	EU Standard	Project Standard
Aluminium (Al)	mg/l	-	0.2	<b>0.2</b>
Ammonium ion (NH <sub>4</sub> )	mg/l	-	0.5	<b>0.5</b>
Antimony (Sb)	mg/l	0.0005	0.005	<b>0.0005</b>
Acrylamide	mg/l	0.0001	-	<b>0.0001</b>
Arsenic (As)	mg/l	0.01	0.01	<b>0.01</b>
Barium (Ba)	mg/l	-	0.7	<b>0.7</b>
Beryllium (Be)	mg/l	-	0.0002	<b>0.0002</b>
Benzene	mg/l	0.1	-	<b>0.1</b>
Benzopyrene	µg/l	0.01	-	<b>0.01</b>
Boron (B)	mg/l	1.0	0.5	<b>0.5</b>
Bromate	µg/l	10	-	<b>10</b>
Cadmium (Cd)	mg/l	0.005	0.003	<b>0.003</b>
Calcium ion (Ca <sup>2+</sup> )	mg/l	-	100	<b>100</b>
Chloride ion (Cl <sup>-</sup> )	mg/l	-	250	<b>250</b>
Chlorine (Cl)	mg/l	-	5	<b>5</b>
Chromium (Cr)	mg/l	0.05	0.05	<b>0.05</b>
Copper (Cu)	mg/l	2	1	<b>1</b>
Cyanide (CN)	mg/l	0.05	0.01	<b>0.01</b>
1,2-Dichloroethane	µg/l	3	-	<b>3</b>
Fluoride ion (F <sup>-</sup> )	mg/l	1.5	0.7-1.5	<b>0.7</b>
Hydrogen Sulphide (H <sub>2</sub> S)	mg/l	-	0.1	<b>0.1</b>
Iodine (I)	mg/l	-	1.0	<b>1.0</b>
Iron (Fe)	mg/l	-	0.2	<b>0.2</b>
Lead (Pb)	mg/l	0.01	0.01	<b>0.01</b>
Magnesium ion (Mg <sup>2+</sup> )	mg/l	-	30	<b>30</b>
Manganese (Mn)	mg/l	-	0.05	<b>0.05</b>
Mercury (Hg)	mg/l	0.001	0.0005	<b>0.0005</b>
Molybdenum (Mo)	mg/l	-	0.07	<b>0.07</b>
Nickel (Ni)	mg/l	0.02	0.02	<b>0.02</b>
Nitrate ion (as NO <sub>3</sub> <sup>-</sup> )	mg/l	50	50	<b>50</b>

<b>Water Resources Management Plan</b>		
Effective Date: 01.04.2016	Document Number: OMAS-ESMS-WR-PLN-001	Rev: 1

Parameter	Units	Turkish Standard	EU Standard	Project Standard
Nitrite ion (as NO <sub>2</sub> <sup>-</sup> )	mg/l	0.5	1.0	<b>0.5</b>
Phosphate ion (PO <sub>4</sub> <sup>2+</sup> )	mg/l	-	3.5	<b>3.5</b>
Pesticides	µg/l	0.1	-	<b>0.1</b>
Total pesticides	µg/l	0.5	-	<b>0.5</b>
Polycyclic aromatic hydrocarbons	µg/l	0.1	-	<b>0.1</b>
Selenium (Se)	mg/l	0.1	0.01	<b>0.01</b>
Silver (Ag)	mg/l	-	0.1	<b>0.1</b>
Sodium (Na)	mg/l	-	200	<b>200</b>
Sulphate ion (SO <sub>4</sub> <sup>2+</sup> )	mg/l	-	500	<b>500</b>
Strontium (Sr)	mg/l	-	2.0	<b>2.0</b>
Tetrachloroethane and Trichloroethane	µg/l	10	-	<b>10</b>
Trihalomethanes-total	µg/l	100	-	<b>100</b>
Vinyl chloride	µg/l	0.5	-	<b>0.5</b>
Uranium (U)	mg/l	-	0.015	<b>0.015</b>
Vinyl Chloride (C <sub>2</sub> H <sub>3</sub> Cl / H <sub>2</sub> C)	mg/l	-	0.0003	<b>0.0003</b>
Zinc (Zn)	mg/l	-	5	<b>5</b>
<b>Radiological Quality</b>				
Total α radioactivity	Bq/l	-	4	<b>4</b>
Total β radioactivity	Bq/l	-	1	<b>1</b>
<b>Physical Quality</b>				
pH	---		6.5 - 9.5	<b>6.5 - 9.5</b>
Taste	Score		As above	
Odour	Score		As above	
Colour	degree		As above	

**Notes:**

The table shows upper limit values, unless indicated otherwise as a range or lower limit value.

EU Standard is EU Directive 98/83/EC on Drinking Water Quality.

EU Standard for radioactivity expressed as Tritium 100 Bq/l with a total indicative dose of 0.1 mSv/year.

<b>Water Resources Management Plan</b>		
Effective Date: 01.04.2016	Document Number: OMAS-ESMS-WR-PLN-001	Rev: 1

**Table 3: Effluent Wastewater Standards**

Parameters	Unit	Comparative Standards		Project Standard
		Turkish Standard <sup>1</sup>	EU Guidance <sup>2</sup>	Range or Maximum Allowance
Water temperature	°C	<25	-	25
Odour	Sense	-	-	no odour
pH index	mgO/l	6.5-8.5	-	6.5-8.5
Conductivity	(µS/cm)	< 400	-	<400
Biochemical Oxygen Demand	mgO/l	<4	25	<4
Chemical Oxygen Demand	mgO/l	25-50	125	25-50
Cyanide	mg/l	-	-	0.5 <sup>3</sup>
Copper	(µg Cu/L)	<20	-	<20
Cadmium	(µg Cd/L)	<2	-	<2
Mercury	(µg Hg/L)	<0.1	-	<0.1
Nickel	(µg Ni/L)	<20	-	<20
Lead	(µg Pb/L)	<10	-	<10
Zinc	(µg Zn/L)	<200	-	<200
Ammonium	mg N/l	0.2	-	0.2
Total nitrogen	mg/l	0.5	15	0.5
Total phosphorus	mg/l	<0.03	2	<0.03
Faecal Coliform	(EMS/100 ml)	<10	-	<10
Total Coliform	(EMS/100 ml)	<100	-	<100

**Notes:**

<sup>1</sup> Turkish Standards relate to Class I 'High Water Quality' which includes surface waters with a high potential for drinking water, recreational purposes, trout production and livestock raising and farming.

<sup>2</sup> EU standards from Directive 91/271/EEC concerning urban waste water treatment

<sup>3</sup> There are no limit values in Turkish or EU legislation. Limit values have been taken from ICMC Guidance. Discharges to surface waters should not exceed 0.5 mg/l WAD cyanide nor result in a concentration of free cyanide in excess of 0.022 mg/l within the receiving surface water body, and downstream of any mixing zone approved by the applicable jurisdiction. WAD cyanide refers to metal cyanide complexes (Zn, Cd, Cu, Hg, Ni, and Ag) that dissociate under weak acid conditions of pH 4.5 to 6. Free cyanide refers to the sum of hydrogen cyanide (HCN) and cyanide ion (CN-) in a sample. Free cyanide is bioavailable and toxic to organisms in aquatic environments.

## 5 MITIGATION MEASURES AND MANAGEMENT CONTROLS

### 5.1 Summary

The general intent of this management plan is to ensure efficient, safe and sustainable management and protection of water resources in and around the mine site.

<b>Water Resources Management Plan</b>		
Effective Date: 01.04.2016	Document Number: OMAS-ESMS-WR-PLN-001	Rev: 1

## 5.2 Implementation and Operation

This Water Resources Management Plan will be implemented by means of the OMAS Environmental Monitoring and Measurement Procedure (OMAS-HSEC-PRC-009) which sets out an integrated approach to gathering and using information on surface and groundwater, flood events, and erosion. It also presents details on data QA/QC and evaluation and how OMAS will assess the significance of any changes to the baseline data and, where appropriate, identify the need for additional actions and mitigations. The following table presents the key management controls that OMAS will implement as part of this Plan.

<b>Water Resources Management Plan</b>		
Effective Date: 01.04.2015	Document Number: OMAS-ESMS-WR-PLN-001	Rev: 1

**Table 4: Key Management Controls**

ID	Applicability/ Activity	Control Description	Responsible Parties	Means of verification
WR01	Construction related sedimentation	Sediment ponds will be constructed at commencement of the construction phase. The ponds will detain and release water to the catchments without resulting in adverse increase in streamflow that would also result in channel scour and erosion.	OMAS Project (Construction) Manager	Site inspection
WR02	Loss of water sources during construction	Replacement water sources will be identified to replace springs lost within the EIA Permitted Area.	HSE&T Manager	Review of records
WR04	Water Abstraction from Epçe Aquifer	A water level monitoring programme will be implemented. If the expected drawdown is higher than predicted, pumps will be deepened or new wells drilled.	Environmental Coordinator	Water Resources Monitoring Procedure
WR05	Water Abstraction from Epçe Aquifer	An additional monitoring well will be installed between the mine's abstraction wells and local cooperative abstraction wells.	Environmental Coordinator	Site inspection
WR06	Surface Water Quality	<p>During the operations phase, surface water that comes into contact with the WRD, HLF and Open Pits (walls) will be diverted to collection ponds and sumps and will be routed back to the Ore Processing facility for reuse.</p> <p>Limit non-impacted water coming into contact with HLF, WRD and Pits by effectively operating upstream interception trenches.</p> <p>The HLP will be completely lined with geo-membrane.</p> <p>The WRD area will levelled (prior to operation) and seepage drainage channels will be operated to ensure seepage is collected and returned to the operation.</p> <p>Direct precipitation runoff from Pit walls will report to a collection sump and returned for re-use in the operation.</p>	OMAS Project (Construction) Manager	Site inspection

## Water Resources Management Plan

Effective Date:  
01.04.2015

Document Number:  
OMAS-ESMS-WR-PLN-001

Rev:  
1

ID	Applicability/ Activity	Control Description	Responsible Parties	Means of verification
WR07	Acisu Spring	Ongoing monitoring programme at the Spring to validate modelling.	Environmental Coordinator	Review of records

<b>Water Resources Management Plan</b>		
Effective Date: 01.04.2015	Document Number: OMAS-ESMS-WR-PLN-001	Rev: 1

## **6 IMPLEMENTATION SCHEDULE**

### **6.1 Review and Revision of this Management Plan**

This Management Plan will be reviewed on a minimum of a six monthly basis during construction and commissioning. During steady state operations, this Management Plan will be reviewed on an annual basis and any necessary revisions made to reflect the changing circumstances or operational needs of OMAS. Revision of this Management Plan will be the responsibility of the OMAS Health, Safety, Environment and Training Manager who is custodian of this Plan.

If material changes to operating procedures are required (as identified through the MOC Procedure contained within the OMAS ESMS Framework) this Management Plan may be updated on an “as required” basis.

Any revisions to this Management Plan will be uploaded to the OMAS Document Control Centre to ensure that all OMAS staff has access to the latest version of this Management Plan.

## **7 MONITORING**

### **7.1 Overview of Monitoring Requirements**

The Monitoring measures that are to be implemented during the operations phase to assess compliance with Project Standards (see Section 4: Project Standards) are described in the section.

In the event that monitoring identifies non-conformance with Project Standards, these will be investigated and appropriate corrective actions identified (see Component 12 Non-conformance incident and action management, OMAS ESMS Framework).

Water monitoring requirements are outlined in Table 7.2 of the Turkish EIA. Additional monitoring requirements are provided in Section 10.10 of the international ESIA. These requirements are reproduced below.

Where appropriate, participatory monitoring methods will be developed in consultation with local communities. These are defined in the Environmental Monitoring and Measurement Procedure.

### **7.2 Key Monitoring Activities**

The combined monitoring requirements from the Turkish EIA and the ESIA are set out below.

Additional monitoring measures may be added based on the goals identified in the preparation of the OMAS Mineral Waste Inventory, and Closure Plan. This will be based on quantitative data and will be focused on measuring progress towards achievement of closure goals.

#### **7.2.1 Groundwater Monitoring Program**

Groundwater will be monitored using several groundwater monitoring wells installed at the upstream and the downstream of the Project Facilities.

Groundwater levels and the field parameters (T, pH, EC) will be measured and groundwater samples will be collected and lab test will be performed on defined regular intervals. Details of the groundwater monitoring program are presented below:

Water Resources Management Plan		
Effective Date: 01.04.2015	Document Number: OMAS-ESMS-WR-PLN-001	Rev: 1

### **Heap Leach Facility**

The HLF is surrounded by four groundwater monitoring wells including HLP001, HLP0003 and HLP004 as downstream and HLP002 as upstream observation wells. The groundwater monitoring program will include monitoring and sampling of all of the four wells. Since the observation well HLP002 is located at the upstream of the Heap Leach Facility, the baseline data of the well will be used as reference measurement and will be compared with the other wells (HLP001, HLP0003 and HLP004) during the construction-operation, closure and post-closure periods. An additional groundwater well (HLP005) will be drilled in between HLP003 and HLP004. The proposed well will be located on the Heap Leach Facility' groundwater flow pathway identified by the numerical groundwater model. Any increase in cyanide concentration over the trigger level will trigger risk assessment studies and further technical investigations.

### **Waste Rock Dump**

Potential impacts to the groundwater will be monitored by using three observation wells located at the upstream and downstream of the waste rock dump. WRD003 is located at the upstream and the WRD002 and WRD001 are located at the downstream of the dump site. WRD001 is located relatively distant from the WRDe which will allow OMAS to monitor the longer term potential impacts and also assess attenuation and dilution affects. Upstream WRD002 will be used as reference and the monitoring results of the wells will be compared with the earlier measurements and with each other. Risk assessment and further technical investigations will be initiated if significant changes are observed in the monitoring results.

### **Open Pits**

Sampling and measurement of field parameters (T, pH, EC) will be carried out at the observation well GTP001 located at the downstream of the Güneytepe open pit and at the observation well KTP002B located at the downstream of the Keltepe open pit.

### **Springs and Other Groundwater Monitoring Locations**

- Monthly field parameters monitoring and quarterly sampling-lab analyses will be conducted at the spring OKDS21 located at the downstream of the heap leach facility and at the fountain OKDS22 located at the downstream of the waste rock dump.
- Acısu spring (OKSP56) will be monitored and sampled on a monthly basis. Monitoring program will include flow and field parameters (T, pH, EC) measurements and sampling for water quality analyses.
- OKSP32 located at the downstream of the waste rock dump will be monitored according to the schedule presented in Table 5.
- Monitoring and sampling will be conducted at OKSP55 (spring with similar water quality with Acısu which is located very close to the Zile Village and the abandoned iron mine) and OKDS28 (spring for Zile Village). Monitoring program is presented in Table 5.
- Monitoring and sampling will be conducted at OKDS27 (fountain of Öksüt Village located at the downstream of the Güneytepe Pit) and OKSP54 (spring located downstream of Güneytepe Pit) according to the schedule presented in Table 5.
- The water transmission line for the Yukarı Develi water sources will remain under the planned HLF area. With the purpose of providing an alternative water source, flow rate and quality measurements were performed at springs SP63, SP72 and SP73. A more detailed investigation will be conducted after the commencement of the Project with the aim of replacing the Yukarı Develi Transmission Line water sources. When appropriate alternative springs are identified, the selected water sources will be added to the monitoring and sampling program presented in Table 5.
- Two additional monitoring wells will be installed between the Project's water abstraction wells (E1 and E2) and the local cooperative abstraction wells (17198 and W46). Groundwater levels at the

## Water Resources Management Plan

Effective Date:  
01.04.2015

Document Number:  
OMAS-ESMS-WR-PLN-001

Rev:  
1

wells in the Epçe area will be continuously monitored during the Project's construction and operation phases. If the expected drawdown is greater than simulated, water abstraction rates will be reduced, existing wells will be deepened or new wells will be installed to supplement supply to Epçe so that there is no net loss in water supply or availability for other water users. Groundwater quality in well 17198 will be monitored during life of the Project as presented in Table 5.

- HLF sub-lining drainage system: Monitoring of site parameters, quality and quantitative measurements will be undertaken from the HLF sub-lining draining system.

A map showing the groundwater monitoring locations are presented in Figure 1.

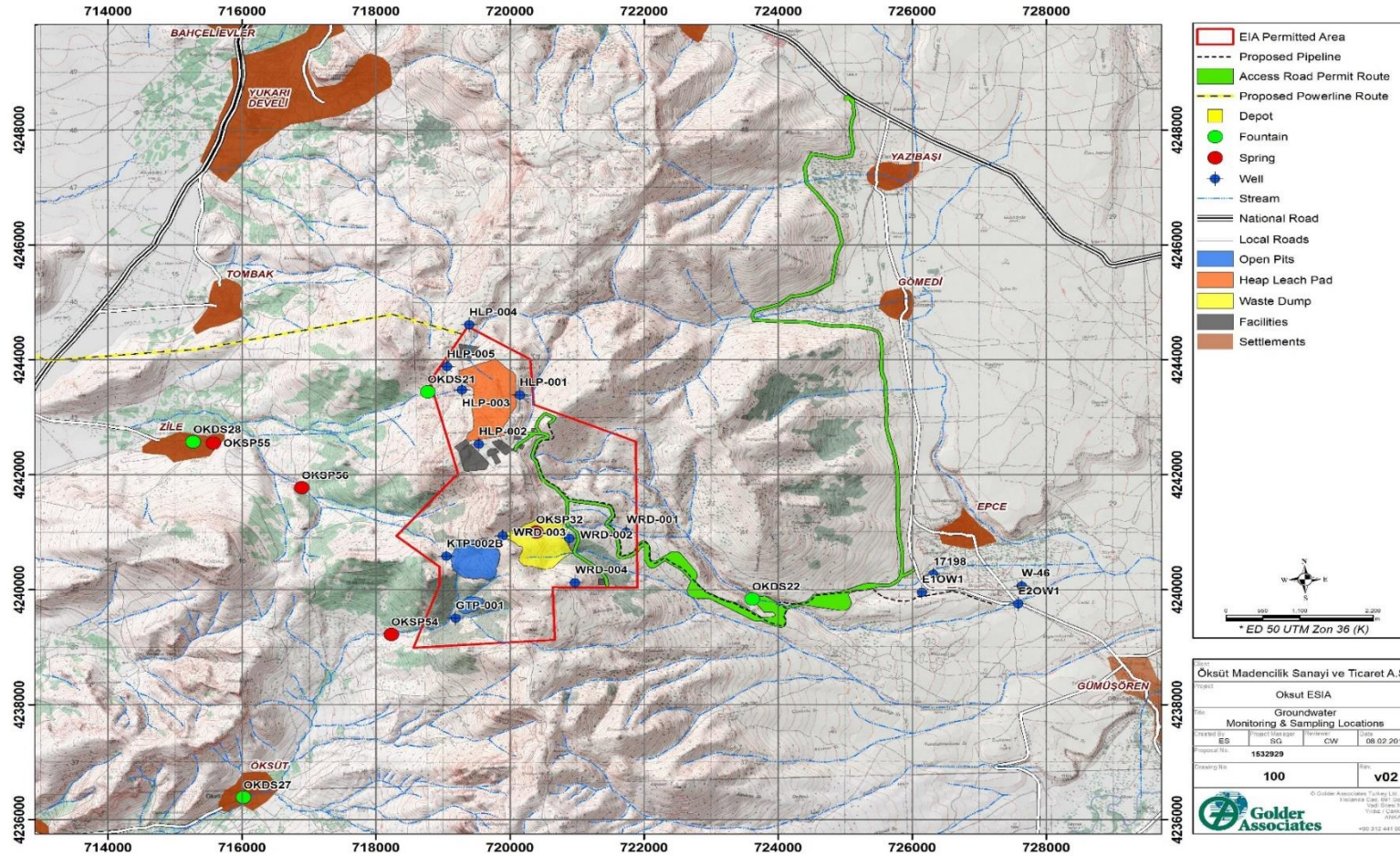
## Water Resources Management Plan

Effective Date:  
01.04.2015

Document Number:  
OMAS-ESMS-WR-PLN-001

Rev:  
1

**Figure 1: Groundwater Monitoring Locations**



## Water Resources Management Plan

Effective Date:  
01.04.2015

Document Number:  
OMAS-ESMS-WR-PLN-001

Rev:  
1

**Table 5: Groundwater Monitoring & Sampling Program**

Type of Spot	Measurement Spots	Parameter	Construction Stage	Operation Stage	Closure Stage		
					1 <sup>st</sup> Period	2 <sup>nd</sup> Period	3 <sup>rd</sup> Period
<b>Wells (Heap Leach Facility)</b>	HLF (HLP-001, HLP-002 <sup>1</sup> , HLP-003, HLP-004 <sup>1</sup> , HLP-005-Proposed Well)	Groundwater Level	Monthly	Monthly	Quarterly	6 Months	Once a year
		Field Parameters ( T, pH, EC)	Monthly	Monthly	Quarterly	6 Months	Once a year
		Chemical Parameters (Lab Analyses)	Quarterly	Quarterly	Quarterly	6 Months	6 Months
<b>Wells (WRD &amp; Pits)</b>	Keltepe Pit (KTP-002B) Güneytepe Pit (GTP-001 <sup>1</sup> ) WRD (WRD-001, WRD-002, WRD-003 <sup>1</sup> )	Groundwater Level	Monthly	Monthly	Quarterly	6 Months	Once a year
		Field Parameters ( T, pH, EC)	Monthly	Monthly	Quarterly	6 Months	Once a year
		Chemical Parameters (Lab Analyses)	Quarterly	Quarterly	Quarterly	6 Months	Once a year
<b>Wells (Epçe)</b>	Epçe (17198 <sup>2</sup> , W-46 <sup>2</sup> , E1OW1, E2OW1)	Groundwater Level	Monthly	Monthly	Quarterly	6 Months	Once a year
		Field Parameters ( T, pH, EC)	Monthly	Monthly	Quarterly	6 Months	Once a year
	Epçe (17198)	Chemical Parameters (Lab Analyses)	Quarterly	Quarterly	Quarterly	6 Months	Once a year
<b>Spring &amp; Fountains</b>	HLF (OKDS21) WRD (OKDS22, OKSP32) Yukarı Develi Spring <sup>3</sup> Öksüt (OKDS27, OKSP54) Zile (OKSP55, OKDS29) Acısu (OKSP56)	Flow Rate	Monthly	Monthly	Quarterly	6 Months	Once a year
		Field Parameters ( T, pH, EC)	Monthly	Monthly	Quarterly	6 Months	Once a year
		Chemical Parameters (Lab Analyses)	Quarterly	Quarterly	Quarterly	6 Months	Once a year

<sup>1</sup> continuous measurement will be done by means of pressure probe

<sup>2</sup> One observation well will be drilled between these two wells and one between E1 and E2 mine water supply wells and monitoring will be carried out at these 2 observation wells.

<sup>3</sup> Alternative water source will be identified during construction stage.

Water Resources Management Plan		
Effective Date: 01.04.2015	Document Number: OMAS-ESMS-WR-PLN-001	Rev: 1

## 7.2.2 Surface Water Monitoring Program

Surface waters located at the downstream of the Project Facilities will be regularly monitored. Monitoring will start during the construction period. The monitoring program will include measurement of site parameters, quantitative measurements (level/flow rate), sediment measurements and sampling for lab analyses. Sediment samples will be taken from the stream bed and analysed as per the parameters specified in the Regulation on the Management of Superficial Water Quality on an annual basis. The monitoring programme is summarised in Table 6.

### ***Downstream of the Heap Leach Facility***

Monitoring of the Mağaraboğazı creek (OKSW18) located at the downstream of the HLF has been undertaken as part of the baseline studies for the Turkish EIA. Monitoring of the quality OKSW18 will continue during the construction, operation and post-operation periods. In addition to quality measurements, suspended solids and sediment monitoring will be conducted.

### ***Downstream of the Waste Rock Dump***

Monitoring of the Kırpıklıdere (OKSW14) and Kurtlararkaç creeks located at the downstream of the waste rock dump has been commenced as part of the EIA studies for identification of the current baseline conditions. Monitoring of the quality of the Kırpıklıdere (OKSW14) and Kurtlararkaç creeks will continue during the construction, operation and post-operation periods. In addition to quality measurements, suspended solid and sediment monitoring will be conducted.

### ***Downstream of the Open Pit***

Monitoring work will be carried out on the Camboğaz creek (OKSW11) located downstream of the Güneytepe open pit.

### ***Contact Water Collection Ponds and Sumps***

Contact water will be collected in contact water ponds located at the downstream of the waste rock dump. Contact water of the ore stockpile and pits will be collected in sumps. Field parameters (T, pH, EC) will be monitored on a monthly basis and the water levels and flows will be measured on a daily basis to prevent any potential overflow. Water quality samples will be collected from the open pit contact water sumps and lab analyses will be conducted on a quarterly basis.

### ***Acısu and Öksüt Creek***

Weirs installed on the Acısu Creek and Öksüt Creek will take continuous flow measurements to monitor the hydrologic characteristics of these surface drainage features and the precipitation-flow relationships. Water samples will be collected quarterly to monitor the water quality of Acısu and Öksüt streams

A map showing the approximate location of surface water monitoring locations are presented in Figure 2.

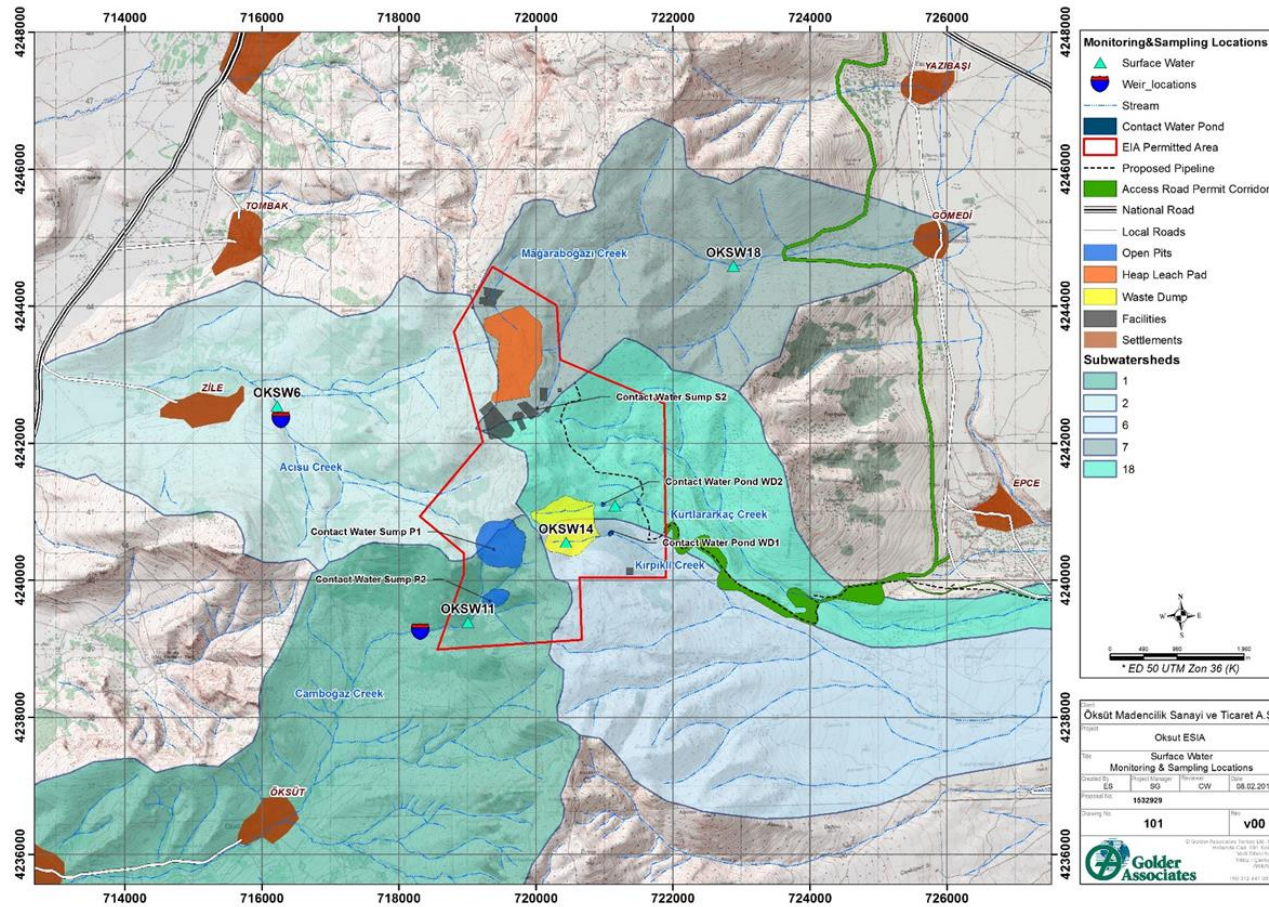
## Water Resources Management Plan

Effective Date:  
01.04.2015

Document Number:  
OMAS-ESMS-WR-PLN-001

Rev:  
1

**Figure 2: Surface Water Monitoring Locations**



## Water Resources Management Plan

Effective Date:  
01.04.2015

Document Number:  
OMAS-ESMS-WR-PLN-001

Rev:  
1

**Table 6: Surface Water Monitoring & Sampling Program**

Type of Spot	Measurement Spots	Parameter	Construction Stage	Operation Stage	Closure Stage		
					1 <sup>st</sup> Period	2 <sup>nd</sup> Period	3 <sup>rd</sup> Period
<b>Weir Locations</b>	Acısu Weir <sup>1</sup> (OKSW-6) Öksüt Weir (Camboğaz Creek (OKSW-11))	Flow Rate	Continuous	Continuous	Continuous	Continuous	Once a year
		Field Parameters (T, pH, EC)	Monthly	Quarterly	Quarterly	6 Months	Once a year
<b>Surface Water</b>	Mağaraboğazı Creek (OKSW-18) Kırpıklı Creek (OKSW-14) Camboğaz Creek (OKSW-11) Kurtlararkaç Creek	Flow Rate	Monthly	Quarterly	Quarterly	6 Months	Once a year
		Field Parameters (T, pH, EC)	Quarterly	Quarterly	Quarterly	6 Months	Once a year
		Chemical Parameters (Lab Analyses)	Quarterly	Quarterly	Quarterly	6 Months	Once a year
		Sediment Amount	Quarterly	Quarterly	Quarterly	-	-
		Sediment Chemical Analyses	-	Once a year	Once a year	-	-
<b>Collection Ponds/Sumps</b>	Waste Rock Contact Water Collection Pond <sup>1</sup> Pit contact water collection sumps Ore stockpile Contact Water Collection Ponds/Sumps Heap Leach Leachate Collection Pond <sup>1</sup>	Flow Rate	Monthly and continuous	Monthly and continuous	6 monthly and continuous	6 monthly and continuous	6 monthly
		Field Parameters (T, pH, EC)	Monthly	Quarterly	Quarterly	6 Months	Once a year
		Chemical Parameters (Lab Analyses)	Quarterly	Quarterly	Quarterly	6 Months	Once a year

<sup>1</sup> where continuous measurement will be done by means of pressure probe

Water Resources Management Plan		
Effective Date: 01.04.2015	Document Number: OMAS-ESMS-WR-PLN-001	Rev: 1

### 7.2.3 Monitoring of Acid Rock Drainage Potential

Acid Rock Drainage (ARD) occurs when sulphur contained in a rock which is in contact with air gets oxidized and comes into contact with rain, ground or surface water.

The acid generation and metal leaching potentials of the lithological units that will be excavated during the operation will be investigated by further rock and water geochemical analyses. Acid-base accounting and short term static tests on new lithologies encountered during the mining can be performed.

In addition to laboratory analyses, pH, EC and ORP field measurements and chemical analyses of contact waters occurred at the waste rock dump and the open pits will be compared with the results of the geochemical modelling predictions, so that new inputs to the final closure plan and designs can be obtained. The monitoring program is summarized in Table 7.

**Table 7: ARD Monitoring Program**

Stage of the Project	Component	Monitoring Spot	Monitoring Method	Parameter	Purpose
Operation period	Open-pit geologic/block model	Waste rock lithology and open-pit surface lithology	Evaluation of updated geologic model	Monitoring of amounts and rates of mine lithology	Operational waste rock management and obtaining of final closure planning
Construction and operation period	Waste rock and open-pit surface lithology	Selected rock samples	Static analyses	Acid generation and neutralization potentials, state of metal leachate generation	Analysis of rocks which have potential to generate ARD or which will be used for neutralization
Construction and operation period	Waste rock and open-pit surface lithology	Selected rock samples and/or existing kinetic analysis samples	Evaluation of updated results of on-going kinetic analyses	Evaluation of the data of acid generation speed, metal leachate generation rate obtained over the longer period	Update open-pit and waste rock dump closure plans and waste rock management plans
Operation period	Quality of contact water obtained at the site	Waste rock dump leachates and open-pit surfaces contact waters	Site measurements and sampling	pH, EC, ORP, measurements and chemical analyses	Comparisons with the results of the water quality estimation models, and operational waste rock management and closure planning

### 7.3 Key Performance Indicators

The table below summarises the key performance indicators and associated key monitoring actions that can be used to assess the progress and effectiveness of proposed mitigation strategies.

**Table 8: Key Performance Indicators and Monitoring Measures**

ID	KPI	Target	Monitoring measure
WR-KPI 01	Number of reported water resources management incidents	Target: zero non-compliances Minimise and continued improvement in number of reported non-compliances with this Plan.	Number of reported non-compliances per year
WR-KPI 02	Number of complaints related to water resources	Target: zero complaints Minimise and continued improvement in number of	Number of reported water resources related community complaints per

<b>Water Resources Management Plan</b>		
Effective Date: 01.04.2015	Document Number: OMAS-ESMS-WR-PLN-001	Rev: 1

ID	KPI	Target	Monitoring measure
	management	complaints received with respect of water resources.	year.

## 8 TRAINING

### 8.1 Overview

All necessary training is provided as part of induction training (to provide general awareness) and job-specific training as necessary.

### 8.2 Induction Training

All employees of OMAS and Contractors working at the Öksüt Gold Project site will be provided with general induction, site specific induction and a broad range of health, safety and environmental awareness training.

Appropriate Personal Protective Equipment (PPE) will be made available to personnel if required. All relevant personnel will be trained in the use and maintenance of protective equipment.

### 8.3 Job-Specific Training

All employees working at OMAS in water resource-related management activities shall be subject to routine toolbox training. This will include details on the importance of water resource conservation and management.

### 8.4 Other Training Requirements

Additional, specialist training shall be provided to key personnel involved in environmental water monitoring and sampling.

All Hydrogeologists/Environmental Officers undertaking monitoring and/or water sampling will be trained in the sampling protocols and QA/QC.

## 9 AUDIT AND REPORTING

### 9.1 Auditing

Daily inspections will be carried out by operational area superintendents / supervisors covering a broad range of operational aspects.

Any incidents identified during these inspections will be reported to the incident management system (Component 10 of the ESMS).

Conformance will be monitored in accordance with Component 11 of the ESMS (Monitoring and Evaluation).

All incidents and non-conformances will be reported as per the requirements of the OMAS ESMS as described in the OMAS ESMS Framework Document (OMAS-ESMS-001).

## Water Resources Management Plan

Effective Date:  
01.04.2015

Document Number:  
OMAS-ESMS-WR-PLN-001

Rev:  
1

### 9.2 External Auditing

Conformance with this plan will be subject to periodic assessment as part of the Centerra audit programme and separately by Project Lenders.

### 9.3 Record Keeping

Records of audits, inspections and incidents will be managed in accordance with OMAS procedures.

## 10 DOCUMENT CONTROL

File Name	Water Resources Management Plan
Document Number	OMAS-ESMS-WR-PLN-001
Approval Date	1st March 2016
Version Number	1