Table 5: Groundwater monitoring points for Zibulo Colliery

<table>
<thead>
<tr>
<th>Site no.</th>
<th>Property owner</th>
<th>Yield (l/s)</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>UEB-6</td>
<td>RP Enslin</td>
<td>1.00</td>
<td>In use</td>
</tr>
<tr>
<td>EUB-17*</td>
<td>FC Cloete</td>
<td>2.00</td>
<td>In use</td>
</tr>
<tr>
<td>EUF-18*</td>
<td>FC Cloete</td>
<td>3.00</td>
<td>In use</td>
</tr>
<tr>
<td>EUB-33*</td>
<td>Boetie Gani</td>
<td>0.50</td>
<td>In use</td>
</tr>
</tbody>
</table>

*situated within the Klipspruit mine layout perimeter

The nine boreholes drilled for Geohydrological investigation with the proposed extension should be included as part of the monitoring network. The monitoring should be done for one hydrological year then it can be reviewed. The quarterly monitoring results should be submitted to DWA. Beesting mining should not be too close to the Ogies Navigation U/G because of the impact it will have on the groundwater resources of the area since it is used to store crude oil.

4.2 Water samples must be taken from all the monitoring boreholes by using approved sampling techniques and adhering to recognized sampling procedures. Samples should be analyzed for both organic as well as inorganic pollutants, as mining activity often lead to hydrocarbon spills in the form of diesel and oil. At least the following water quality parameters should be analyzed for:

- Major ions (Ca, K, Mg, Na, SO₄, NO₃, Cl, F)
- pH
- Electrical Conductivity (EC)
- Total Petroleum hydrocarbon (TPH)
- Total Alkalinity

These should be recorded on a data sheet. It is proposed that the data should be entered into an appropriate computer database and reported to the Department of Water Affairs.

4.3 A proper ground and surface water monitoring network should be established to monitor the quality and quantity of groundwater as per the report recommendation and ensuring that water used by other water users are safeguarded in accordance to chapter 14 of the National Water Act, 1998 (Act 36 of 1998).

4.4 The date, time and monitoring point in respect of each sample taken shall be recorded together with the results of the analysis.

4.5 Monitoring points shall not be changed prior to notification to and written approval by the Regional Head: Mpumalanga.

4.6 An Aquatic Scientist approved by the Regional Head: Mpumalanga must establish a monitoring programme for the following indices: Invertebrate Habitat Assessment System (IHAS) and the latest SASS (South African Scoring System). Sampling must be done once during the summer season and once during the winter season, annually, to reflect the status of the river upstream and downstream of the mining activities.

4.7 Water quality testing to be performed on the pollution control dams 1ML, 9ML and 41ML, on a quarterly basis in order to determine the risks to the receiving environment. The data gathered in the investigation must be reported annually to the Regional Head: Mpumalanga. If any concentrations levels as specified above are exceeded, the Licensee must institute an investigation to determine the cause of poor water quality.

4.8 Water quality testing must be conducted quarterly on the wastewater stream from the pollution control dam 1ML, 9ML and 41ML when returned back to the mine for use as process water.
4.9 The Licensee shall participate in any initiative such as Direct Estimation of Ecological Effect Potential (DEEEP) to determine the toxicity of complex tailings waste discharges. Both acute and chronic toxicity must be addressed and at least three taxonomic groups must be present when toxicity tests are performed.

4.10 Analysis shall be carried out in accordance with methods prescribed by and obtainable from the South African Bureau of Standards (SABS), in terms of the Standards Act, 1982 (Act 30 of 1982).

4.11 The methods of analysis shall not be changed without prior notification to and written approval by the Responsible Authority.

5. WATER RESOURCE PROTECTION

5.1 The impact of the activities of the mine on the ground water shall not exceed the in-stream water quality limit detailed in the water quality reserve for the area as indicated on the Table 6 below.

<table>
<thead>
<tr>
<th>Variable</th>
<th>RQO (mg/l)</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>6.5 – 8.4</td>
</tr>
<tr>
<td>Total Dissolved Solids</td>
<td>280</td>
</tr>
<tr>
<td>Sulphate (SO4)</td>
<td>60</td>
</tr>
<tr>
<td>Chloride (Cl)</td>
<td>20</td>
</tr>
<tr>
<td>Sodium (Na)</td>
<td>20</td>
</tr>
<tr>
<td>Magnesium (Mg)</td>
<td>20</td>
</tr>
<tr>
<td>Calcium (Ca)</td>
<td>25</td>
</tr>
<tr>
<td>Nitrate (NO3)</td>
<td>6</td>
</tr>
</tbody>
</table>

6. REPORTING

6.1 The Licensee shall update the water balance annually and calculate the loads of waste emanating from the activities. The Licensee shall determine the contribution of their activities to the mass balance for the water resource and must furthermore co-operate with other water users in the catchment to determine the mass balance for the water resource reserve compliance point.

6.2 The Licensee shall submit the results of analysis for the monitoring requirements to the Regional Head: Mpumalanga on a quarterly basis under Reference number 16/2/7/B100/C250.

6.3 The Licensee shall submit the nature and the quality of the waste disposed into the following dams.
- 1 ML Pollution Control Dam
- 9 ML Pollution Control Dam
- ML Pollution Control Dam

7. STORM WATER MANAGEMENT

7.1 Stormwater leaving the Licensee's premises shall in no way be contaminated by any substance, whether such substance is a solid, liquid, vapour or gas or a combination thereof which is produced, used, stored, dumped or spilled on the premises.
7.2 Increase runoff due to vegetation clearance and/or soil compaction must be managed, and steps must be taken to ensure that storm water does not lead to bank instability and excessive levels of silt entering the stream.

7.3 Storm-water shall be diverted from the mine complex site and roads and shall be managed in such a manner as to disperse runoff and concentrating the storm-water flow.

7.4 Where necessary works must be constructed to attenuate the velocity of any storm-water discharge and to protect the banks of the affected watercourses.

7.5 Storm-water control works must be constructed, operated and maintained in a sustainable manner throughout the impacted area.

7.6 Increased runoff due to vegetation clearance and/or soil compaction must be managed, and steps must be taken to ensure that storm-water does not lead to bank instability and excessive levels of silt entering the streams.

7.7 All storm-water that would naturally run across the pollution areas shall be diverted via channels and trapezoidal drains designed to contain the 1:50 year flood.

7.8 The polluted storm water system shall be designed and implemented to provide suitable routing and pumping capacity for contaminated storm water from the individual facilities to the respective storm water dams in accordance with the design specifications as contained in the Integrated Water Use Licence Application report.

7.9 The polluted storm water captured in the storm water control dams shall be pumped to the process water treatment plant for reuse and recycling.

8. PLANT AREAS AND CONVEYANCES

8.1 Pollution caused by spills from the conveyances must be prevented through proper maintenance and effective protective measures especially near all stream crossings.

8.2 All reagent storage tanks and reaction units must be supplied with a bunded area built to the capacity of the facility and provided with sumps and pumps to return the spilled material back into the system. The system shall be maintained in a state of good repair and standby pumps must be provided.

8.3 Any hazardous substances must be handled according to the relevant legislation relating to the transport, storage and use of the substance.

8.4 Any access roads or temporary crossings must be:

8.4.1 Non-erosive, structurally stable and shall not induce any flooding or safety hazard and

8.4.2 Be repaired immediately to prevent further damage.

9. ACCESS CONTROL

9.1 Strict access procedures must be followed in order to gain access to the property.

Access to the pollution control dams, must be limited to authorised employees of the Licensee and their Contractors only.

9.2 Notices prohibiting unauthorised persons from entering the controlled access areas as well as internationally acceptable signs indicating the risks involved in case of an unauthorised entry must be displayed along the boundary fence of these areas.
10. CONTINGENCIES

10.1 Accurate and up-to-date records shall be kept of all system malfunctions resulting in non-compliance with the requirements of this licence. The records shall be available for inspection by the Regional Head upon request. Such malfunctions shall be tabulated under the following headings with a full explanation of all the contributory circumstances:

10.1.1 Operating errors
10.1.2 Mechanical failures (including design, installation or maintenance)
10.1.3 Environmental factors (e.g. flood)
10.1.4 Loss of supply services (e.g. power failure) and
10.1.5 Other causes.

10.2 The Licensee must, within 24 hours, notify the Regional Head: Mpumalanga of the occurrence or potential occurrence of any incident which has the potential to cause, or has caused water pollution, pollution of the environment, health risks or which is a contravention of the licence conditions.

10.3 The Licensee must, within 14 days, or a shorter period of time, as specified by the Regional Head: Mpumalanga, from the occurrence or detection of any incident referred above, submit an action plan, which must include a detailed time schedule, to the satisfaction of the Regional Head: Mpumalanga of measures taken to:

10.3.1 Correct the impacts resulting from the incident;
10.3.2 Prevent the incident from causing any further impacts and
10.3.3 Prevent a recurrence of a similar incident.

11. INTEGRATED WATER AND WASTE MANAGEMENT

11.1 The Licensee must update an Integrated Water and Waste Management Plan (IWWMP), which must together with the updated Rehabilitation Strategy and Implementation Programme (RSIP), be submitted to the Regional Head: Mpumalanga for approval within one (1) year from the date of issuance of this licence.

11.2 The IWWMP and RSIP shall thereafter be updated and submitted to the Regional Head: Mpumalanga for approval, annually.

11.3 The Licensee must, at least 180 days prior to the intended closure of any facility, or any portion thereof, notify the Regional Head: Mpumalanga of such intention and submit any final amendments to the IWWMP and RSIP as well as a final Closure Plan, for approval.

11.4 The Licensee shall make full financial provision for all investigations, designs, construction, operation and maintenance for a water treatment plant should it become a requirement as a long-term water management strategy.
10. Analysis shall be carried out in accordance with methods prescribed by and obtainable from the South African Bureau of Standards, in terms of the Standards Act, 1982 (Act 30 of 1982).

11. The methods of analysis shall not be changed without prior notification to the Licensee and written approval by the Responsible Authority.

12. The Regional Head must be informed of any incident that may lead to under-groundwater being disposed of contrary to the provisions of this license, by submitting a report containing the following information:

12.1 Nature of the incident (e.g. operating malfunctions, mechanical failures, environmental factors, loss of supply services, etc.);

12.2 Actions taken to rectify the situation and to prevent pollution or any other damage to the environment; and

12.3 Measures to be taken to prevent re-occurrence of any similar incident.

13. The Licensee shall follow acceptable construction, maintenance and operational practices to ensure the consistent, effective and safe performance of the underground water removal system.

14. Reasonable measures must be taken to provide for mechanical, electrical or operational failures and malfunctions of the underground water removal system.

15. The Licensee must ensure in advance that alternative water supply for external water users is provided to these users should groundwater resources be impacted.

[END OF LICENCE]
APPENDIX IV

Specific conditions

Section 21(j) of the Act: Removing, discharging or disposing of water found underground if it is necessary for the effective continuation of an activity or for the safety of people

1. The Licensee is authorised to remove a total volume of 216 445 m³/a (two hundred and sixteen thousand four hundred and forty five cubic metres per annum) of underground water from Zibulo opencast located on Oogiesfontein 411S Portion 39, based on an average quantity of 593m³/d (five hundred and ninety three cubic meters per day), and dispose of the underground water into the pollution control dam(s) located on the farm Oogiesfontein 415 portion 39. Location of abstraction point: E 29° 02’ 43.9”, S 26° 01’ 59.0”.

2. The quantity of the water authorised to be removed and disposed of into the pollution control dam in terms of this licence may not be exceeded without prior authorisation by the Responsible Authority.

3. The quality of the water disposed into the pollution control dam shall not exceed the quality as specified in the Table 7 below:

<table>
<thead>
<tr>
<th>Variable</th>
<th>Average concentration</th>
<th>Maximum concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>4.5-6.5</td>
<td>6.5 9.0</td>
</tr>
<tr>
<td>Alkalinity (mg/l)</td>
<td>5-83</td>
<td>50</td>
</tr>
<tr>
<td>Aluminium (mg/l)</td>
<td>1-6</td>
<td>0.15</td>
</tr>
<tr>
<td>Calcium (mg/l)</td>
<td>17-400</td>
<td>32</td>
</tr>
<tr>
<td>Sulphate (mg/l)</td>
<td>20-1000</td>
<td>200</td>
</tr>
<tr>
<td>Suspended solids(mg/l)</td>
<td>140-2000</td>
<td>5</td>
</tr>
<tr>
<td>Magnesium(mg/l)</td>
<td>7-30</td>
<td>30</td>
</tr>
<tr>
<td>Potassium(mg/l)</td>
<td>4-20</td>
<td>50</td>
</tr>
<tr>
<td>Sodium(mg/l)</td>
<td>100</td>
<td>70</td>
</tr>
<tr>
<td>Lead</td>
<td>0.1-1</td>
<td>0.01</td>
</tr>
<tr>
<td>Manganese</td>
<td>0.1-1</td>
<td>0.01</td>
</tr>
<tr>
<td>Iron</td>
<td>&lt;0.1-1</td>
<td>0.01</td>
</tr>
<tr>
<td>Manganese</td>
<td>&lt;0.1-1</td>
<td>0.01</td>
</tr>
</tbody>
</table>

4. The Licensee shall provide any water user whose water supply is impacted by the water use with potable water.

5. The quantity of water removed from underground must be metered and recorded on a daily basis.

6. The groundwater levels shall be monitored every six months (once in the beginning of the dry season and once in the beginning of the wet season).

7. Self-registering flow meters must be installed in the delivery lines at easily accessible positions near the dewatering points.

8. Calibration certificates in respect of the pumps must be submitted to the Regional Head after installation thereof and thereafter at intervals of two years.

9. The date and time of monitoring in respect of each sample taken shall be recorded together with the results of the analysis.