Eastern Basin
Short-term solution
Cabinet's instruction: Parallel measures for AMD mitigation (1)

1. **Ingress control**
   - Concept aimed at preventing surface water leakage to mine void – implies reduced volume of AMD formed
   - Translates into lower pumping and treatment costs
   - Regulators approved pit deposition in Western Basin to seal open pits
   - Florida Lake-Fleurhof Dam Canal in Central Basin – stream leak into mine void eradicated
   - Three similar canals proposed for Central Basin (pending RoD from DEA)
   - Studies underway in Eastern Basin to identify ingress hotspots with proposed solutions
   - WCA/WDM programmes with municipalities to decrease water loss from reticulation systems

2. **“Polluter pays” principle (NWA Section 19(20) cost recovery)**
   - Wits AMD legacy arose due to >120 years mining in the region
   - As far as is practically possible, relevant mines to be identified and legislation invoked so that these mines are held accountable for environmental liabilities ascribed to their operations

3. **Environmental Levy**
   - Discussions convened with National Treasury on proposed levy on existing mines
   - Potential revenue stream to offset costs incurred by Government
   - Engagement with stakeholders on proposed levy planned for 2015
   - Pending approval of Tax Policy Unit, levy could be implemented in the 2016/2017 fiscal year
   - If invoked, implication is that mining sector is contributing to AMD mitigation costs
Cabinet’s instruction: Parallel measures for AMD mitigation (2)

4. Monitoring
   • Intensive monitoring (DWS, CSIR, mines and municipality) to assess AMD impacts and evaluate interventions
   • Surface and groundwater improvement in Western Basin since emergency works commissioned
   • Central Basin AMD plant has stabilised AMD level close to ECL – AMD impact obviated
   • Eastern Basin challenged due to large, intricate void; illegal miners destroying equipment

5. Research/Pilot Studies
   • DWS managing database of potential AMD treatment technologies; 89 companies registered (lab-scale to pilot plants)
   • DWS/WRC Task Team established to screen promising technologies for pilot scale testing in the Western Basin
   • Intention is to reduce costs and secure all-round beneficial technology
   • Four technologies selected for piloting in Western Basin over next three years (commence 2015)
   • Mintek currently testing SAVMN (State-funded development) on pilot scale in Western Basin (August 2014)

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Long-term solution
Feasibility Study – Long-term Solution to Wits AMD

- Parallel process as per Cabinet instruction – identify long-term solution to remove salinity
- Study commenced 30 January 2012; finalised 31 July 2013 (18 months)
- Planning study based on:
  - Existing information
  - Monitoring initiatives
  - Technical considerations
  - Regulatory matters
  - Financial and Procurement models
  - Institutional arrangements
  - Water resource, Socio-economic and Environmental objectives
  - Stakeholder inputs, inclusive of Government

MAIN OBJECTIVE OF THE FEASIBILITY STUDY:
- Identify the most cost-effective, technically-sound, legally-defensible, economically-viable and environmentally-sustainable LONG-TERM SOLUTION TO REMOVE OR SUITABLY REDUCE SALT LOAD IN VAAL RIVER SYSTEM DUE TO AMD

Possible application of AMD

GOAL: To eliminate (or suitably reduce) underground mine water induced salt loading of the Vaal/Crocodile River systems

Water Streams Considered

- Untreated AMD
- Neutralised AMD
- Neutralised and Desalinated AMD

Mining (Recovery of Gold)
- Agriculture
- Industry
- Rivers
- Domestic
- Industry
Key findings and immediate actions (long-term solution)

- **Recommended solution:**
  - Expand emergency works and de-salinate AMD thus ensuring water security in the VRS to avoid socio-economic and environmental disasters
  - Direct Agency(ies) to implement on Design-Build-Operate-Maintain (DBOM) contract
  - Secure suitable funding with cost-recovery
  - Commence with Environmental Impact Assessment
  - Appoint service providers for construction through Agency(ies)
  - Secure c&f-take agreements for beneficial use of reclaimed (purified) AMD
  - Initiate studies in the Western Basin (real-time, pilot plant testing)
  - Communicate with stakeholders

Progress (long-term solution)

- DWS & NT approval on use of LHWP funding mechanism to fund Wits AMD mitigation
  - Government Guarantee as per letter from Minister of Finance (22 April 2014)
  - Cost-recovery from the Vaal River Raw Bulk Water Tariff applicable
  - Funding mechanism subject to TCTA being directed by Minister of Water and Sanitation
- Proposed implementing Agent(s) identified – appointment(s) pending
- Roll-out of LTS pending sanction of Minister and/ or IMC on AMD
- Target date for commissioning LTS is 2016/ 2017
CAPEX and OPEX Estimates

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<th>Description</th>
<th>Western</th>
<th>Central</th>
<th>Eastern</th>
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<td>CAPITAL COSTS (CAPEX) – STI</td>
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<td>1360</td>
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<tr>
<td><strong>Grand Total for CAPEX</strong></td>
<td>2560</td>
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<tr>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>CAPITAL COSTS (CAPEX) – LTS</td>
<td>1 410</td>
<td>2 280</td>
<td>2 970</td>
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<td><strong>Grand Total for CAPEX</strong></td>
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<tr>
<td>Average Annual O&amp;M and Lifecycle Costs (OPEX) – STI and LTS</td>
<td>230</td>
<td>330</td>
<td>430</td>
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<td><strong>Grand Total for OPEX per annum</strong></td>
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Base Date: March 2012

Excluded: Pipelines to possible remote industrial users;
Acquisition of servitudes; Movable furniture and equipment; and Professional Fees.

AMD mitigation implications on Vaal Tariff

Emergency works
- 2015/2016 projected increase of R0.23 per m³
- 2016/2017 projected increase of R0.29 per m³

Long-term solution (neutralisation and de-salination)
- 2017 onwards, projected increase of R0.99 per m³

Consultations on the projected increase with Vaal River Raw Bulk Water Users have commenced and further engagements will continue.
Acid Mine Drainage: Upper Olifants

Bottlenecks requiring immediate resolution

• LHWP funding mechanism must be unlocked for project continuity
• O&M service provider to be appointed for Central Basin
• Further upgrade to Western Basin to treat sporadic surface decant (Mine tails' proposal)
• Direct Agency(ies) for long-term solution implementation to promote
  • EIA
  • Land access
  • PSP appointment
• Consultations must be finalised with VRS users to explain Tariff increment
• Off-take agreements for de-saturated AMD from LTS must be concluded

➤ Establish AMD/ Mine Water Unit with national functions like:
  • Oversight
  • Project management
  • Integration and co-ordination of processes within DWS, other relevant national and provincial depts. as well as private sector
  • Pre-emptive management of AMD/mine water issues across SA
    • Operational mines (~104)
    • Mined in derelict mines (State liability)
    • Proposed mines in all mining provinces must be assessed for socio-economic gains versus impact on environment
STATUS QUO ON MINES OPERATING WITHOUT WATER USE AUTHORISATION
(July 2014 – October 2014)

- Hundred and four (104) mines were identified using water unlawfully
- Eighty one (81) mines were investigated
- Twenty three (23) are in the process of being investigated
- Forty three (43) Pre-directives were issued against mines
- Twelve (12) Directives were issued against mines
- Six (6) Criminal cases were instituted against mines
- Fifty one (51) applications for water use authorisations were received by DWS
  - Six (6) withdrawals by applicants
  - Four (4) decline
  - Four (4) pending Delegated Authority decision
- Forty eight (48) did not apply for water use authorisation
- Five (5) Water Use Authorisation were issued:
  - Two (2) General Authorisations
  - Three (3) Water Use Licences
Thank You