The PERC Reporting Code & the EU Extractive Directive 2006/21/EC, *et al*

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PERC Code – Table 1 Checklist of Assessment & Reporting Criteria

Proven Mineral Reserve … is the economically mineable part of a measures mineral resource as may be modified by **environmental** and governmental factors (Modifying Factors)

- Reporting of Mineral Exploration Results
  - … known impediments to obtaining a licence to operate in area
  - … geochemical matters such as ARD/AMD potential for waste
  - … groundwater issues
- Estimation & Reporting of Mineral Resources
  - … environmental & legal permitting
- Estimation & Reporting of Mineral Reserves
  - … choice of mining method
  - … environmental & legal factors

PERC Code – Appendix 2 Rules of Conduct & Guidelines 1

- Competent Persons SHOULD strive to protect the natural environment and ensure that the consequences of their work do not adversely affect the safety, health and welfare of themselves, colleagues and members of the public.

PERC Code – Appendix 2 Rules of Conduct & Guidelines 2

- Competent Persons should Ensure that mineral reserve estimates acknowledge the likely environmental impact of development and ensure that appropriate allowances are made for mitigation and remediation

MODIFYING FACTORS

In the context of EU legal requirements for environmental protection, these are some of the main drivers of Modifying Factors

- EU Extractive Waste Directive 2006/21/EC
  - EU Best Available Techniques Reference Document for Mining Waste Management
  - [http://eippcb.jrc.es/pub/english.cgi/0/733169]

- EU Environmental Liability Directive 2004/35/CE
- EU Habitats Directive 92/43/EEC
- EU Water Framework Directive 2000/60/EC
- EU Groundwater Directive 80/68/EEC
- EU Waste Directive 2008/98/EC
- EU EIA Directive 85/337/EEC
- EU SEVESO Directive 96/82/EC

Modifying Factors = Measures in EU Environmental Law. E.g.

- Water Framework Directive 2000/60/EC - Article 1. The purpose of the Directive is to establish a framework which … *'aims at enhanced protection and improvement of the aquatic environment, inter alia, through specific **measures** for the progressive reduction of discharges, emissions and losses of priority substances and the cessation or phasing-out of discharges, emissions and losses of the priority hazardous substances'*

- Habitats Directive 92/43/EEC - Article 2. … '***Measures*** *taken pursuant to this Directive shall be designed to maintain or restore, at favourable conservation status, natural habitats and species of wild fauna and flora of Community interest'*

- *EIA Directive 85/337/EEC - Article 2. 'Member States shall adopt all **measures** necessary to ensure that, before consent is given, projects likely to have significant effects on the environment by virtue, inter alia, of their nature, size or location are made subject to a requirement for development consent and an assessment with regard to their effects'*

See also the Mining Waste, Environmental Liability, and SEVESO Directives, etc.

EU Extractive Waste Directive 2006/21/EC - Article 1

Subject matter

This Directive provides for **measures**, procedures and guidance to **prevent or reduce as far as possible any adverse effects on the environment**, in particular water, air, soil, fauna and flora and landscape, and any resultant risks to human health, brought about as a result of the management of waste from the extractive industries.

EU Extractive Waste Directive 2006/21/EC – Article 4

General requirements

1. Member States shall take the necessary measures to **ensure** that extractive waste is managed without endangering human health and **without using processes or methods** which **could harm the environment**, and in particular without risk to water, air, soil and fauna and flora, without causing a nuisance through noise or odours and without adversely affecting the landscape or places of special interest.

EU Extractive Waste Directive 2006/21/EC – Article 4

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PERC Code

- Competent Persons should **ensure** that mineral reserve estimates acknowledge **the likely environmental impact** of development and ensure that appropriate allowances are made for **mitigation and remediation**

EU Extractive Waste Directive 2006/21/EC – BAT (1)

- The measures … shall be based, inter alia, on the **best available techniques**, …
- Best Available Techniques is as defined in the IPPC Directive (96/61/EC)
- 'best available techniques' means the most effective and advanced stage in the development of activities and their methods of operation which indicate the practical suitability of particular techniques for providing in principle the basis for emission limit values designed to prevent and, where that is not practicable, generally to reduce emissions and the impact on the environment as a whole

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Reference Document on Best Available Techniques for Management of Tailings and Waste-Rock in Mining Activities.

EU Commission July 2004, adopted Jan. 2009

EU Extractive Waste Directive 2006/21/EC – BAT (2)

- ‘techniques’ shall include both the technology used and the **way in which the installation is designed, built, maintained, operated and decommissioned**;

- ‘available techniques’ means those developed on a scale which allows implementation in the relevant industrial sector, under economically and technically viable conditions, taking into consideration the costs and advantages, whether or not the techniques are used or produced inside the Member State in question, as long as they are reasonably accessible to the operator;

- ‘best’ means most effective in achieving a high general level of **protection of the environment as a whole**.

EU Extractive Waste Directive 2006/21/EC – Article 5

Requirement for Waste Management Plans (1)

- Sustainable Development
- Prevention of Waste production & Reduction of Waste production and its harmfulness by considering:
  - Design Phase consideration
  - Choice of mineral extraction method
  - [Geochemical] changes in waste once extracted and stored above ground
  - Placing waste back in excavation where environmentally sound
  - Use of less dangerous substances for the treatment of mineral resources

EU Extractive Waste Directive 2006/21/EC – Article 5

Requirement for Waste Management Plans (2)

- Recovery, reuse of extracted waste
- In relation to the safe short and long term disposal arrangements for waste in operational and after-closure phases, design choice must consider;
  - minimal or no after-closure monitoring
  - prevention of long-term negative impacts
  - geotechnical stability

EU Extractive Waste Directive 2006/21/EC – Article 5

The waste management plan **shall provide sufficient information** to enable the competent authority to evaluate the operator's ability to meet … his/her obligations under this Directive.

The plan **shall explain**, in particular, how the **[mining] option and method chosen** … will fulfil the [binding] objectives [for] the waste management plan … [to prevent or reduce waste production and its harmfulness]

EU Extractive Waste Directive 2006/21/EC – Article 10

Excavation Voids

- Member States shall ensure that the operator, when placing extractive waste back into the excavation voids for rehabilitation and construction purposes, whether created through surface or underground extraction, takes appropriate measures in order to:
  - Secure stability
  - Prevent pollution of soil, surface & groundwaters
  - Monitor placed waste and void

EU Extractive Waste Directive 2006/21/EC – Article 11

Construction & Management of Waste Facilities (2)

- The competent authority shall satisfy itself that, in constructing a new waste facility or modifying an existing waste facility, the operator ensures that:
  - … the waste facility is suitably located, taking into account in particular … obligations relating to protected areas
  - … and contaminated water and leachate is collected
  - … the facility is suitably constructed, managed and maintained
  - … arrangements made for post-closure rehabilitation of land
  - … after-care is provided

EU Extractive Waste Directive 2006/21/EC – Article 14

Financial Guarantee

- Financial guarantee required PRIOR to the commencement of operations
- Guarantee to cover ALL obligations under the directive, including after-closure

EU Extractive Waste Directive 2006/21/EC – Article 14

Environmental Liability

- The mining waste directive amends the EU Environmental Liability Directive (ELD)(2004/35/EC) to include mining waste activities.
- The ELD requires:
  - that all specified risk activities must put in place environmental damage preventative measures
  - remediate the consequences of an environmental damage event

Commission Decision in relation to Article 14 of MWD

Article 1 (of 2009/335/EC)

1. Member States and competent authorities **shall** base the calculation of the financial guarantee referred to in Article 14 of Directive 2006/21/EC on the following:

   (a) the likely impacts on the environment and on human health of the waste facility;

   (b) the definition of the rehabilitation including the after use of the waste facility;

   (c) applicable **environmental standards and objectives**, including physical stability of the waste facility, minimum **quality standards** for the soil and water resources and maximum release rates of contaminants;

   d) the technical **measures** needed to achieve environmental objectives, in particular **measures** aiming at ensuring the stability of the waste facility and limit environmental damages;

Draft Commission Decision in relation to Article 14 of MWD

Article 1 (of 2009/335/EC) (Cont.)

1. Member States and competent authorities shall base the calculation of the financial guarantee referred to in Article 14 of Directive 2006/21/EC on the following:

   …

   (e) the **measures** required to achieve objectives during and after closure, including land rehabilitation, after closure treatment and monitoring if required, and, if relevant, measures to reinstate biodiversity;

   (f) the estimated time scale of impacts and required mitigation **measures**;

   (g) an assessment of the costs necessary to ensure land rehabilitation, closure and after closure including possible after closure monitoring or treatment of contaminants.

2. The assessment referred to in point (g) shall be performed by independent and suitably qualified third parties and shall take into account the possibility of unplanned or premature closure.

Restoration Options under the ELD (Annex II)

- Primary Restoration
  - Restoration to baseline conditions / favourable conservation status
  - Degree of intervention to be selected (full, limited, none)
- Complementary Restoration
  - Return to baseline not possible
  - Upgrade or improve other sites or develop new
- Compensatory Restoration
  - interim losses

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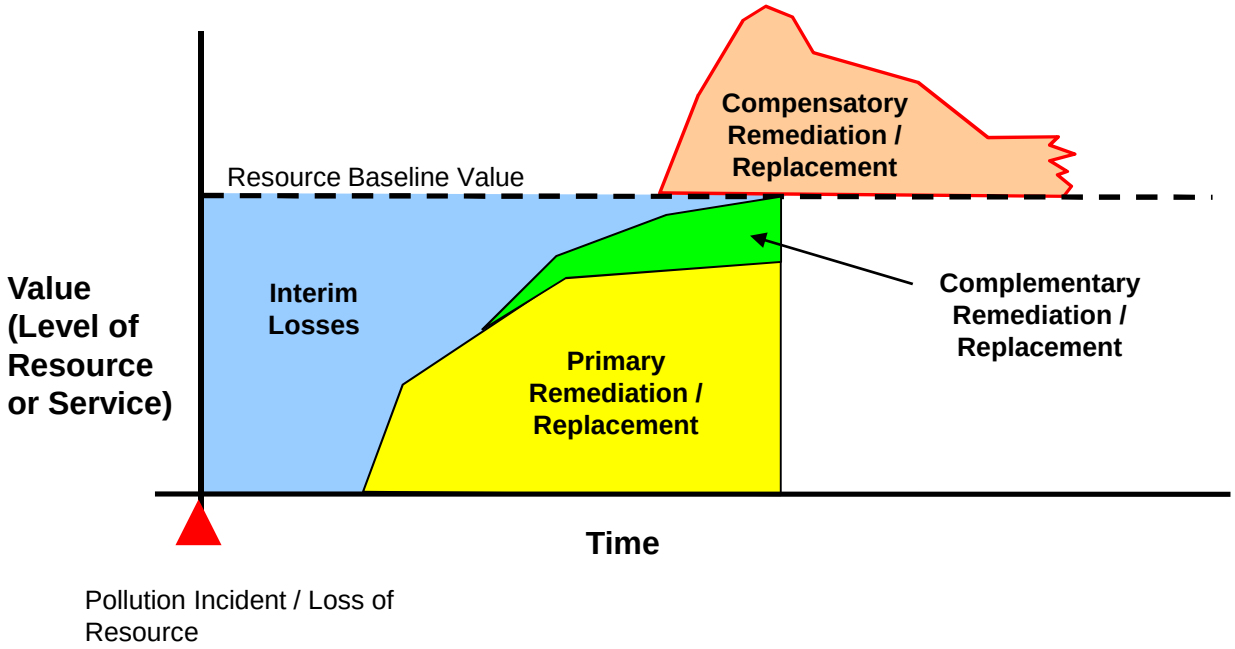
- Compler
  - Return
  - Upgrac
- Compen
  - interim

Same architecture is used to decide how to replace/compensate for a habitat lost due to a mine development

Relationship between Primary, Complementary & Compensatory Remediation / Replacement



- Primary remediation/replacement mechanism used to guide competent authorities is Equivalency Analysis.
- http://www.envliability.eu/

EU Extractive Waste Directive 2006/21/EC – Article 7

- The Competent Authority shall NOT grant a permit unless it is satisfied that the operation will comply with the requirements of the Mining Waste Directive.
- Permits (and Waste Management Plans) have to be periodically considered

Key Environmental Mitigating Factors Influencing Resource Estimation / Mine Design

- Water Emissions
  - Mill Design
    - Reagents
    - Circuits for marginal metals
    - mill water treatment and discharge
  - Mine Design
    - **Waste management**
    - Underground / Pit
    - Backfill
    - Unfavourable geochemistry
  - Closure / Aftercare plan
  - Accident risk
- Noise, Vibration
  - Sterilised zones
- Air
  - Waste management
  - Mine design (u.g. / o.p.)
  - Mill discharges (standard BAT)
- Landscape / habitats / protected species
  - **Waste management**
  - Underground or Open pit
  - Sterilised zones
  - Habitat replacement
  - Mill discharges
  - Closure / aftercare plan
  - Accident risk

End

Remember

EU Environmental ‘Measures’ & Standards = Mitigation Factors

Thank You !

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