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## Eugene Gallagher
## The Minserve Group Pty Ltd


# INFORMED SELECTION OF THE CHPP WASTE DISPOSAL SYSTEM

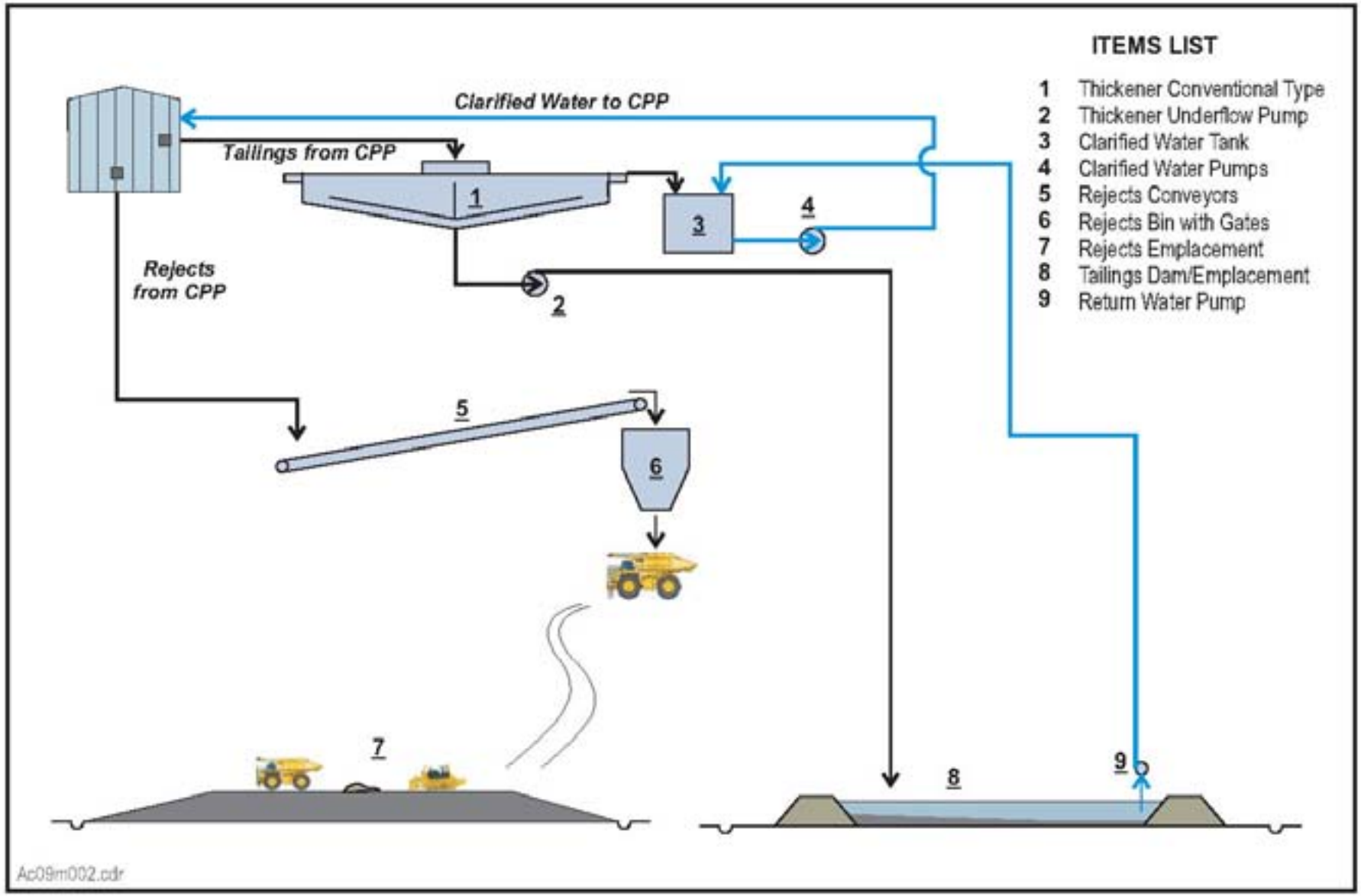
# Introduction

- Waste Disposal Options Considered
- Production Scenarios Considered
- Methodology & Assumptions
- Results
- Conclusions
- Acknowledgements

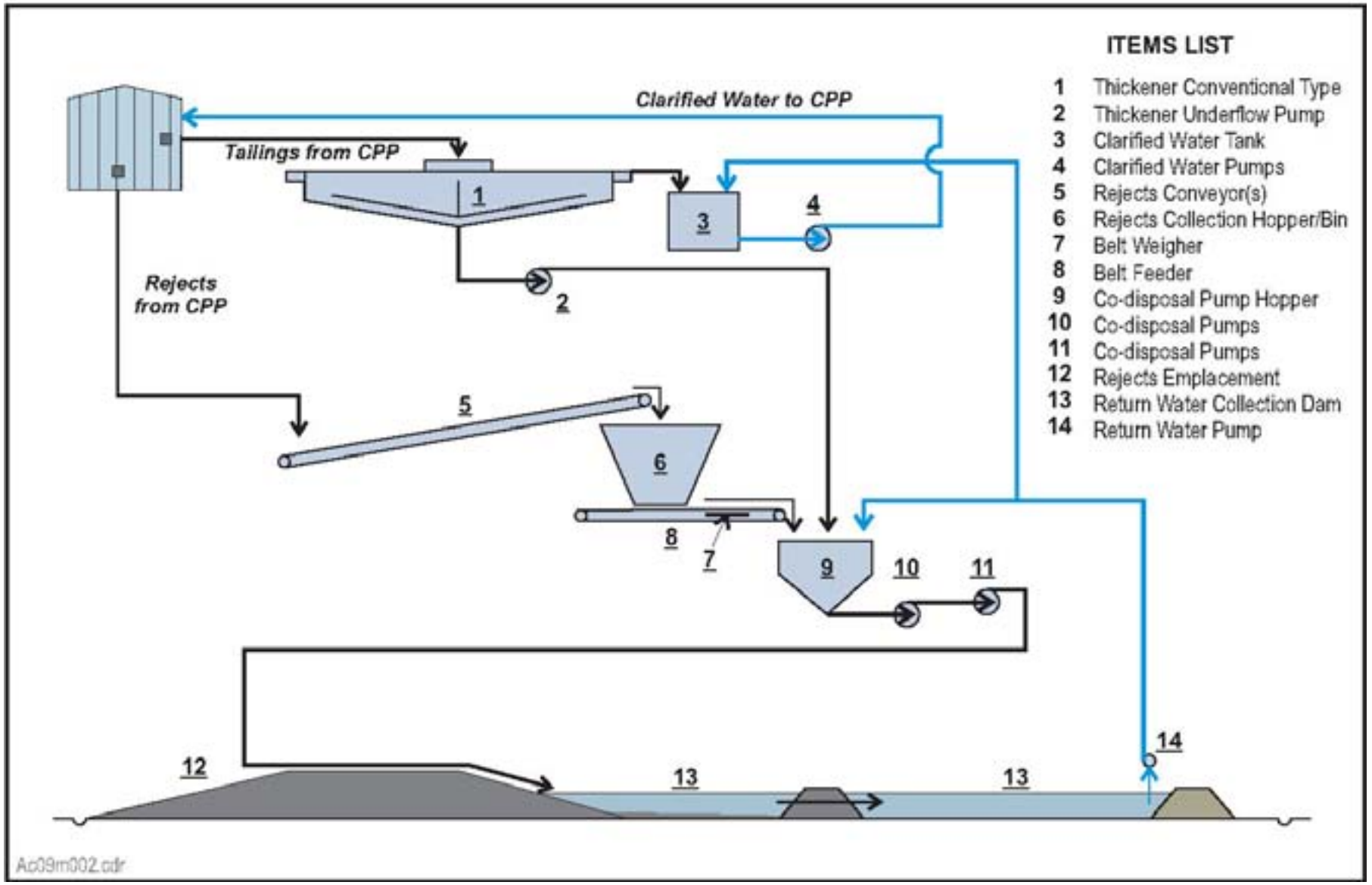
# Options considered

1. Separate rejects and tailings disposal
2. Conventional hydraulic co-disposal
3. Dense phase co-disposal using fines recycle
4. Combined disposal of rejects and filtered tailings
5. Combined disposal of rejects and high intensity flocculated tailings

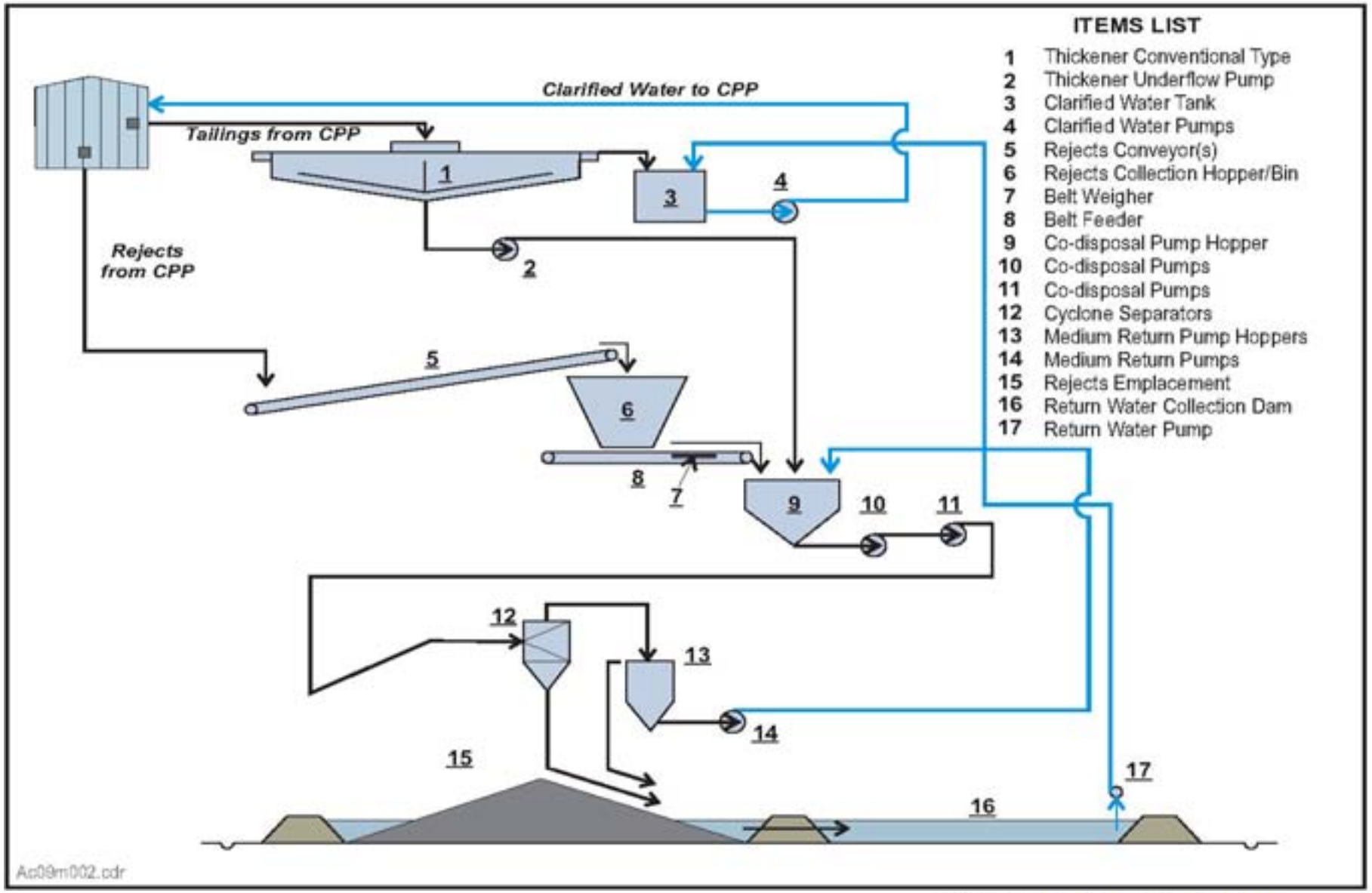
# Separate rejects and tailings disposal



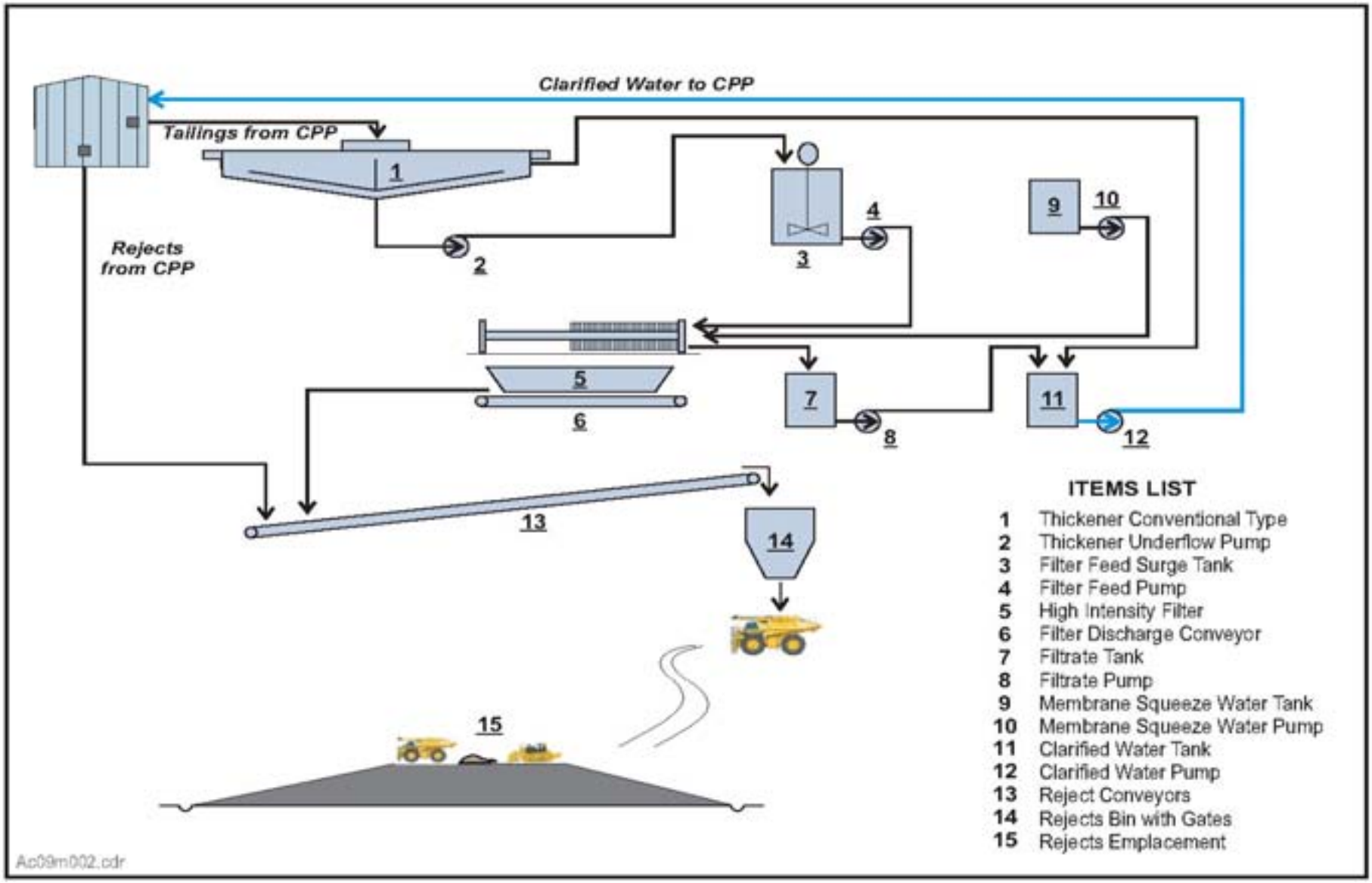
# Conventional hydraulic co-disposal



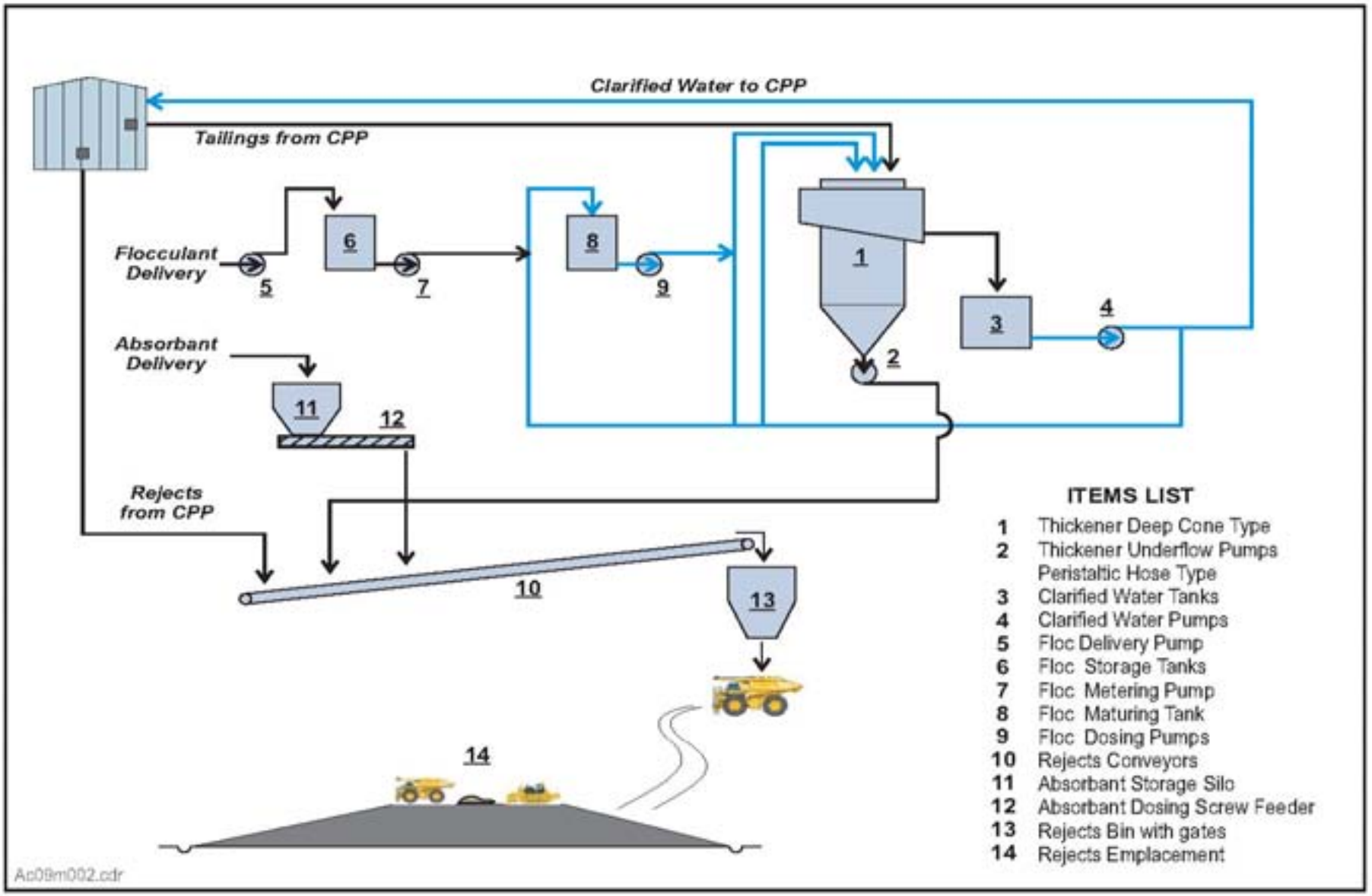
# Dense phase co-disposal with fines recycle



# Combined disposal of rejects with filtered fines



# Combined disposal of rejects with flocculated fines



# Production Scenarios Considered

CASE A - Untreated Fines

| Parameter | Units | CASE A1 | CASE A2 |
|---|---|---|---|
| Plant Feed | t/a ad | 2,500,000 | 10,000,000 |
| Operating Time | h/a | 7,000 | 7,000 |
| Coarse/fine reject sizing | mm | 0.25 | 0.25 |
| Coarse Fraction | %ROM | 85.0% | 85.0% |
| Coarse Yield | %ad | 77.6% | 77.6% |
| Coarse Rejects Rate | t/a | 475,000 | 1,900,000 |
| Fines Yield | %ad | 0.0% | 0.0% |
| Fines Rejects Rate | t/a | 375,000 | 1,500,000 |
| Total Yield | %ad | 66.0% | 66.0% |

CASE B - Untreated Fines

| Parameter | Units | CASE B1 | CASE B2 |
|---|---|---|---|
| Plant Feed | t/a ad | 2,500,000 | 10,000,000 |
| Operating Time | h/a | 7,000 | 7,000 |
| Coarse/fine reject sizing | mm | 0.25 | 0.25 |
| Coarse Fraction | %ROM | 85.0% | 85.0% |
| Coarse Yield | %ad | 77.6% | 77.6% |
| Coarse Rejects Rate | t/a | 475,000 | 1,900,000 |
| Fines Yield | %ad | 60.0% | 60.0% |
| Fines Rejects Rate | t/a | 150,000 | 600,000 |
| Total Yield | %ad | 75.0% | 75.0% |

# Methodology & Assumptions

## > Other Considerations

- Distance between CHPP and emplacement area (1.5km or 5km)
- Emplacement above ground or in pit

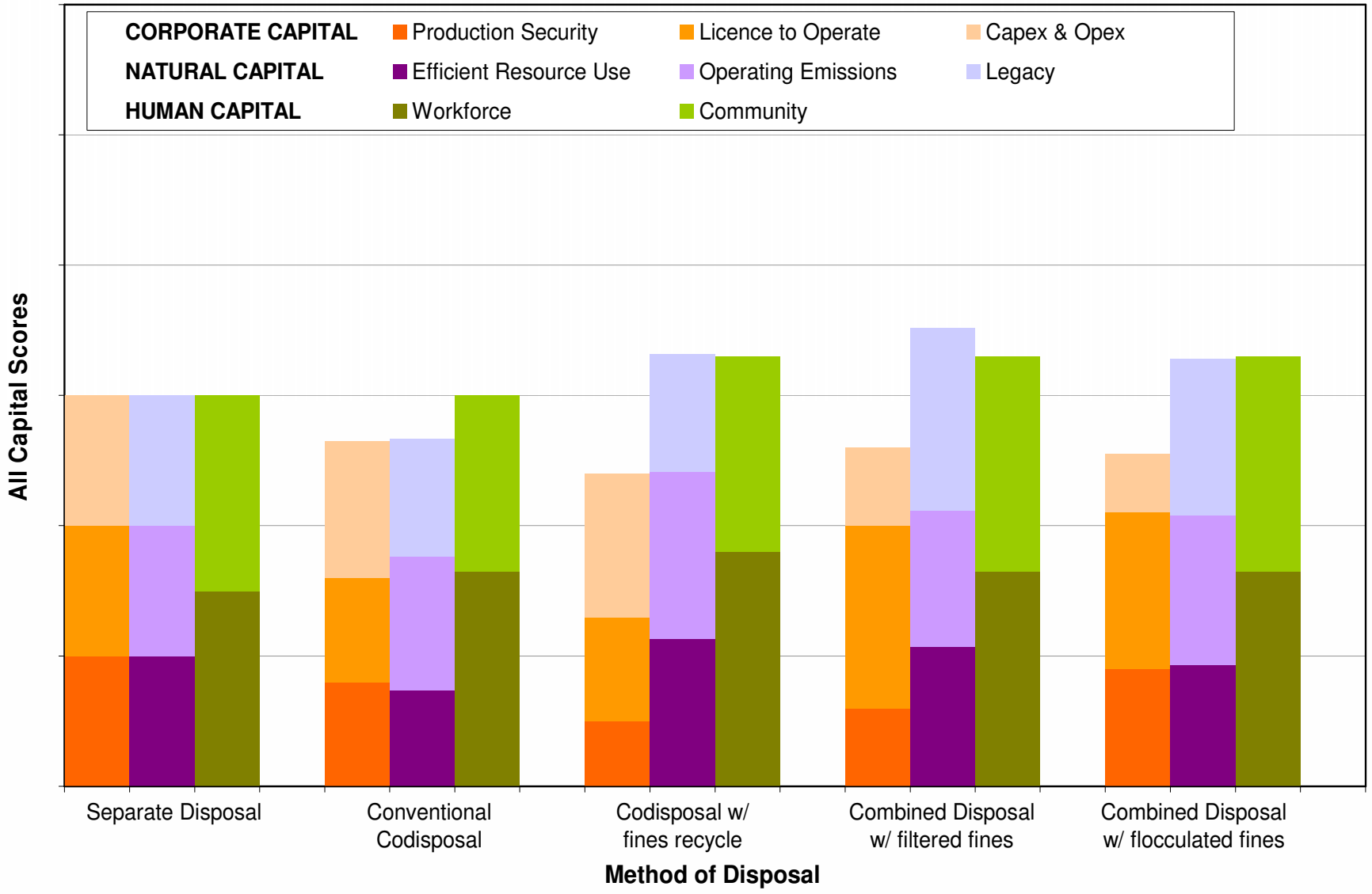
## > Selected Scenario

- Base Case A1
- 2.5Mtpa ROM
- Untreated fines
- 1.5km from CHPP
- Emplacement above ground

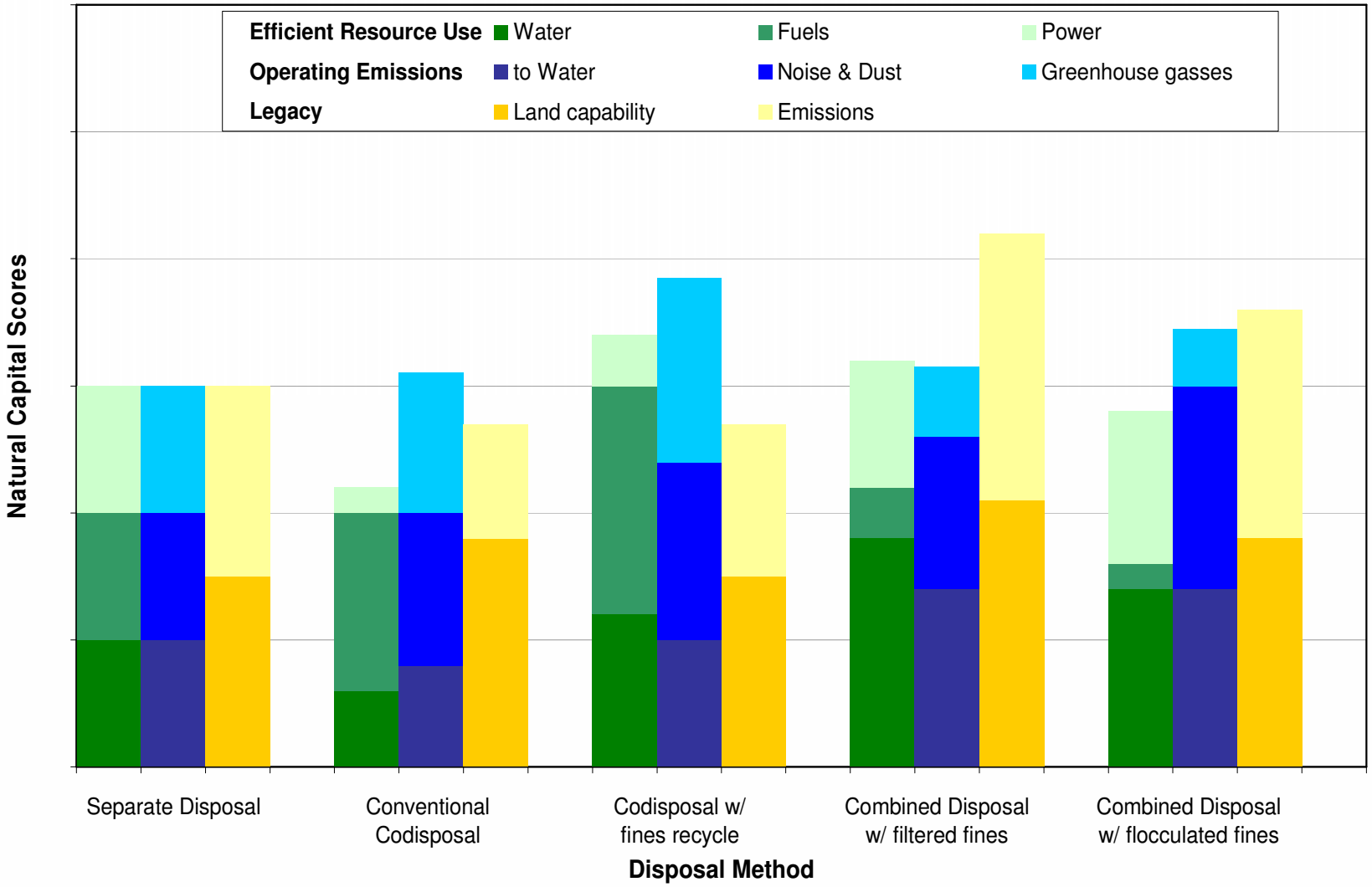
# Attributes of Waste Disposal Options

| Corporate Capital | Natural Capital | Human Capital |
|---|---|---|
| Production Security | Resource Use | Workforce |
| | Water | Safety and Health |
| | Fuels | Well-being |
| | Power | |
| Licence to Operate | Operating Emissions | Community |
| | To Water | Safety and Health |
| | Noise and Dust | Well-being |
| | Greenhouse Gases | |
| Net Present Value | Legacy | |
| Capex | Land Capability | |
| Opex | On-going Emissions | |

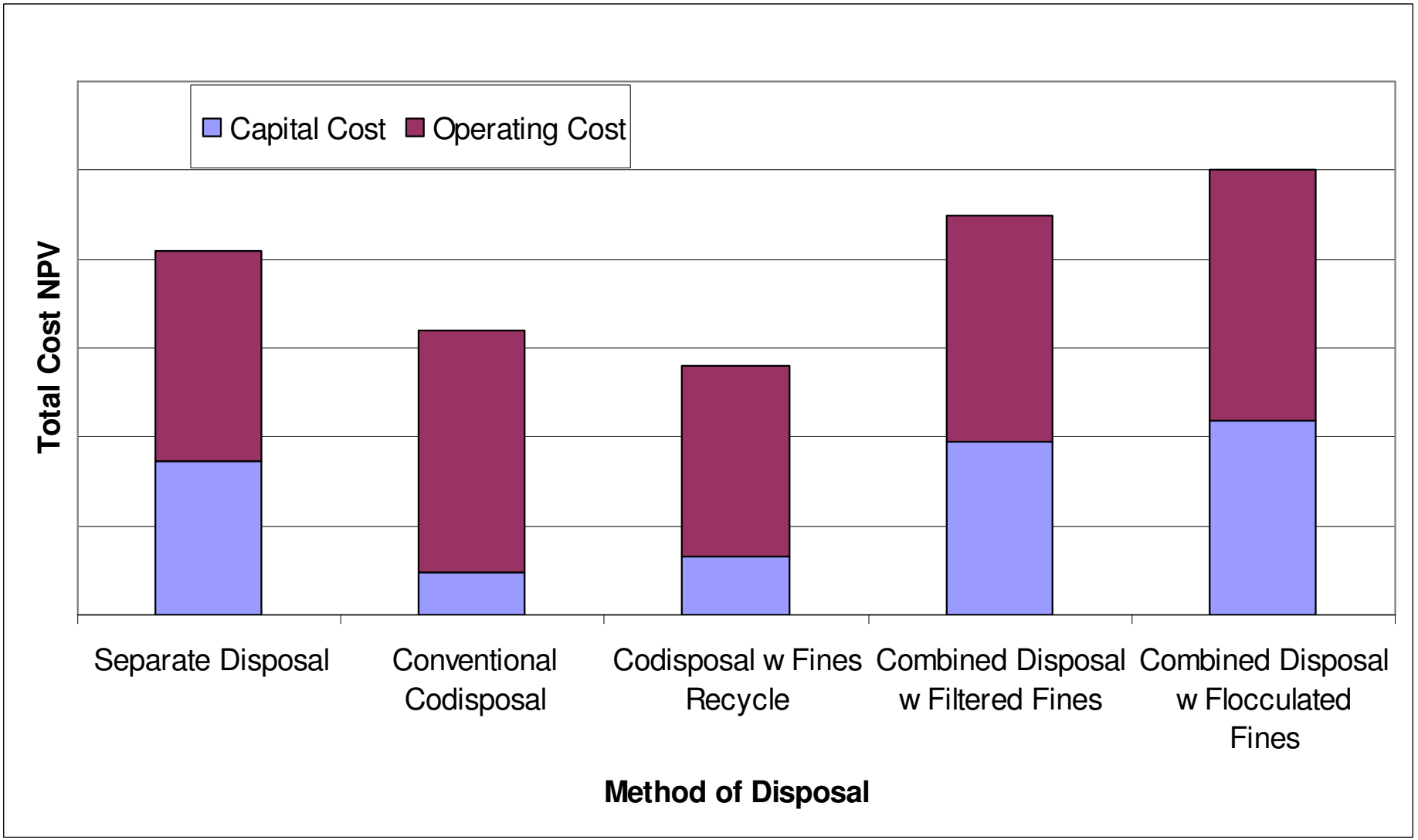
# Sustainable Analysis – All Attributes



# Sustainble Analysis – Natural Capital

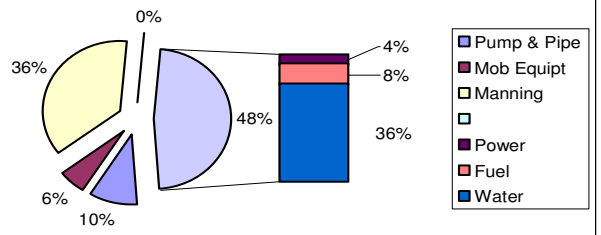


# Sustainble Analysis – Corporate Capital

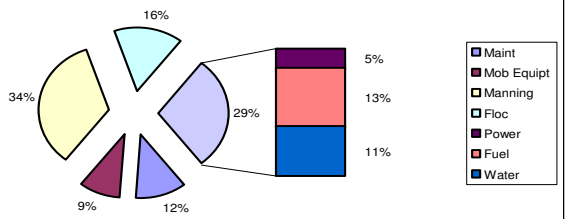


# Operating Cost Breakdown

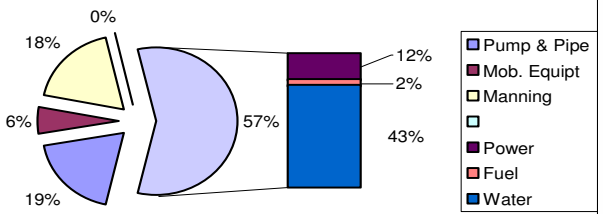
**Option 1**
**Separate Disposal**



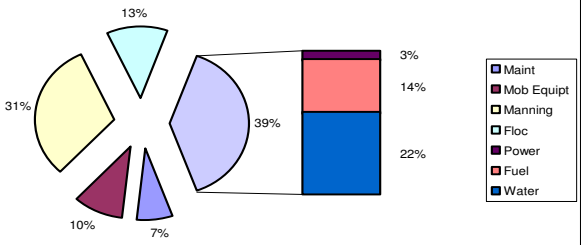

**Option 4**
**Combined Disposal w Filtered Fines**



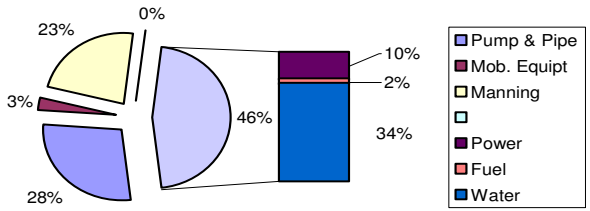

**Option 2**
**Conventional Codisposal**




**Option 5**
**Combined Disposal w Flocculated Fines**




**Option 3**
**Dense Phase Codisposal w Fines Recycle**



# Conclusions

- **Lessons:**
  - Cost analysis alone does not provide all the information needed to select the most suitable waste disposal system.
  - Ranking against a broad range of sustainability criteria provides a more complete picture of the standing of the various systems.
- **Messages:**
  - Detailed examination of costs, benefits and disadvantages can help to optimise new and existing waste disposal systems.
  - No system for disposal of CHPP waste is best for all situations. Each has strengths and weaknesses that will affect its suitability to a particular project.
  - The study established broad guidelines for system suitability but site-specific design and costing is still necessary.
- **Issues:**
  - In general, operating mines do not always keep good records of costs associated with management of waste disposal.
  - Wide variations in conditions and costs between different mine sites meant that it was not feasible to cover all combinations.

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