Contaminated Land Management

Helen Jones WSP

Speaker Introduction – Helen Jones WSP

• Technical Executive in Contaminated Land Management at WSP.
• BSc Hon degree in Engineering Geology
• 22 years experience in engineering consultancy
• 9 years in Australia
  (Initially based in Melbourne then Brisbane)
• Vice president of ACLCA QLD
• Member ALGA
• Member EIANZ
• Chair Consult Australia Environment Committee
• Chartered Waste Manager (UK)
Overview

The intent of the Contaminated Land Impact Assessment is to review how construction of the Project would interact with identified existing contamination within the alignment.

The following aspects are discussed in this presentation:

• Works undertaken to support the EES
• Existing conditions and
• Summary of Issues Raised

Works Undertaken to Support the EES

- Baseline Environmental Site Assessment
- Desktop Review ASS
- Intrusive Investigations
- Development of Conceptual Site Model
- Landfill Gas Risk Assessment
- Risk Assessment
- Development of the Environmental Performance Requirements
Existing Conditions – Desktop Assessment

<table>
<thead>
<tr>
<th>Location</th>
<th>Usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northern Portion</td>
<td>Former industrial and agricultural usage. Currently use as waste operations, market gardening, nurseries and mixed industrial uses.</td>
</tr>
<tr>
<td>Central Portion</td>
<td>Formerly agricultural and mixed industrial (WTP, racetrack). Currently residential, Moorabbin Airport, Woodlands industrial estate, filled land &amp; man-made wetlands, potential ASS.</td>
</tr>
<tr>
<td>Southern Portion</td>
<td>Former and current agricultural. Residential, filled land and man-made wetlands, potential ASS.</td>
</tr>
</tbody>
</table>

Soil Contamination:

- Analytical results mix of Category C Contaminated Soil and Fill Material (for waste disposal purposes)
- Majority of Category C material located in north (landfill area).
Existing Conditions – Intrusive Investigations

Soil Contamination (continued):

- All samples tested below human health investigation levels (except one in the former landfill area).
- All samples below ecological investigation levels (except two in the former landfill area).

Existing Conditions – Intrusive Investigations

Landfill Waste, Landfill Gas and Leachate:

- Methane, carbon dioxide and/or carbon monoxide exceeding adopted criteria identified within landfill areas (Lot 1 Grange Road).
- Landfill waste and leachate identified within Lot 1 Grange Road. Contamination present within leachate including benzene, dissolved metals and PFAS.
- Anticipated interaction between leachate and groundwater in the vicinity of the landfills. PFAS identified in groundwater and surface water (Dunlop Drain).
Existing Conditions – Intrusive Investigations

Acid Sulfate Soils (ASS):

- Intrusive investigation undertaken in accordance with DELWP guidance.
- Potential and actual ASS have been identified from the central portion to the southern portion of the project area adjacent to Springvale Road.

Existing Conditions – Intrusive Investigations

Groundwater Contamination:

- Low pH, metals and dissolved methane contamination identified in wells in northern portion (targeting landfills).
- PFAS was reported in wells in northern portion (targeting landfills) and central portion (adjacent to Moorabbin Airport). Also identified in surface water (Dunlop Drain) to the north of Lot 1 Grange Road.
- Dissolved metals contamination identified in central and southern portions, variable TDS and pH conditions identified in the shallow aquifer, no BTEX, hydrocarbon or pesticide contamination.
- Hydrogeological modelling suggests that negligible effect on the groundwater system is likely from proposed embankment construction.
Summary of Issues Raised

- Historic landfill - leachate and landfill gas management
- Spoil management - ASS
- General environmental management - potential spills response, general contaminated groundwater and surface water management
- Proposed changes to EPR’s.

Historic landfill

- The northern bypass section is surrounded by a number of former landfills.
- The bypass will cross the western portion of a former landfill located at Lot 1 Grange Road.
- Concern has been raised around construction of structures such as piles through old landfill waste and the potential impact on ground water and other potential receptors.
**Bypass Construction**

Lot 1 Grange Road – Schematic “Floating pavement structure”

- Pavement and support piles
- Piles
- Brighton Formation - Sand

Waste thickness approx. 8 m

---

**Expert Statement - Mr Christopher Smitt**

- Comparisons drawn between the proposed project and Stevenson Road Landfill and the Huntsdale estate site.

- Dilution of landfill gas into leachate and connected groundwater is not considered to be the preferential pathway for gas flow.

- Environmental setting and risk associated with comparison sites not considered a appropriate comparison.

- Regulator approved WMMP and LGMP proposed to mitigate landfill risk
Landfill Gas

Risk mitigation for landfill gas has been included into the design including:

- impermeable barriers to drainage lines and services to prevent ingress and potential migration of gas;
- a passive landfill gas venting system beneath the roadway to reduce the risk of gas build up beneath the roadway corridor; and
- a landfill gas monitoring provision within the EPRs.
- Regulator approval will be sought for the above measures.

Spoil Management – Acid Sulfate Soils

- ASS is naturally occurring across extensive areas of Port Phillip Bay
- A desktop review and initial screening exercise included in EES
- Holocene aged geology was confirmed via geological mapping
- This situation is not uncommon in low lying coastal environments
Acid Sulfate Soils Management

The southern Project alignment will likely encounter soil and potentially rock formations which comprise metal sulphides (principally pyrite).

These soils will be managed using the Victorian statutory framework for management of Acid Sulfate Soil.

A project specific Acid Sulfate Soil Management Plan will be established to manage the risk using the Victorian Industrial Waste Management Policy (Waste Acid Sulfate Soils – WASS).

General Environmental Management

- A Project Construction Environmental Monitoring Plan (CEMP) is proposed.

- The CEMP will be written in accordance with the Environment Protection Authority Victoria (EPA) guidance – Best Practice Environmental Management - Environmental Guidelines for major Construction Sites.

- The CEMP will be prepared and approved by the Regulator prior to construction activities commencing.
Dewatering – potentially contaminated groundwater

- No deep excavations are currently proposed in the project design.
- Piles within the landfill areas will be driven / displacement to mitigate the need to dewater.
- This has resulted in limited contaminated groundwater management information being included within the proposed CEMP.
- If this situation changes during detailed design then specific provisions will be included in the water monitoring and management plan (WMMP) and CEMP.

Proposed changes to the EPRs – From Submissions

<table>
<thead>
<tr>
<th>No</th>
<th>Proposed Amendment</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Amendment to AQ2 to mitigate odour impact</td>
<td>No visual putrescible waste material identified during investigations</td>
</tr>
<tr>
<td>2</td>
<td>Amendment to EPR W3 to secure proposed protection measures relating to ASS and potential spill management.</td>
<td>The identified management plans (SMP, WMMP and CEMP) are proposed to be developed in line with Victorian legislative guidance and Best Practice Environmental Management.</td>
</tr>
<tr>
<td>3</td>
<td>Potential for Council’s assets (not specified) to be impacted by a change of landfill gas flow.</td>
<td>No existing Council infrastructure has been identified as being a concern in relation to pathway linkages and new pathway generation. Mitigation measures have however been included within the design to ameliorate the potential for increased lateral migration. The design will be submitted to EPA for approval along with a LFG management plan as proposed by the EES.</td>
</tr>
<tr>
<td>4</td>
<td>EPR CL1</td>
<td>Procedure for unforeseen contamination that includes temporary containment removal and verification is typically included as part of the CEMP documentation.</td>
</tr>
</tbody>
</table>
## Continued

<table>
<thead>
<tr>
<th>No</th>
<th>Proposed amendment</th>
<th>Comment</th>
</tr>
</thead>
</table>
| 5  | Soil Management Plan (SMP) | The SMP will consider contaminated soils and other in-ground solid wastes including Asbestos.  
   The intent of the SMP is to specifically consider management of identified contaminated land (including ASS) for the purposes of facilitating construction. |
| 6  | Amendment to CLR 3 – 5 | Landfill gas management and monitoring are considered as part of the EES submission.  
Mitigation measures have been included within the design  
Lot 1 Grange Road landfill area does not currently possess an engineered capping system, gas is currently passively venting to the atmosphere.  
If a landfill gas capture and destruction system were to be employed then this would need to comprise an integrated system for the Project corridor and landfill.  
The Project reference design would not preclude capping, capture or destruction of landfill gas in the future.  
The Project has a defined pathway for design, review, consultation and construction which is considered to be robust and appropriate for the proposed activity.  
Regulator review and approval stages are included in this process. |
| 7  | Amendment to EPR CL1 in relation to soil management, water management and vapour | The WMMP should be expanded to consider contaminated groundwater management within the alignment.  
Specific consideration has been given to landfill gas (including trace gases) risk as part of the EES.  
Health and safety risks associated with the management of soil or groundwater contamination impacted by volatile contaminants will be included within the relevant SMP / WMMP / CEMP, all of which will be subject to EPA review and approval.  
ASS, landfill gas and PFAS will be subject to specific management plans that will be reviewed and approved by the EPA prior to implementation. |
Summary

It is my opinion that the proposed approach to contaminated material management outlined within the EES is appropriate and consistent with industry best practice and the relevant regulatory guidance.