

## **12.0 ASSESSMENT OF ALTERNATIVE PUMPING STATION SITES**

### **12.1 Introduction**

12.1.1 Alternative sites for three of the proposed pumping stations in Tai Lam Valley, Tai Lam Chung Tsuen and Luen On San Tsuen were identified at the commencement of the Study as a result of consultation with village representatives. Thus, in addition to the selected sites shown in Drawing 1.1a, four alternative sites were also considered during the preliminary environmental assessment. These sites included:

- C one site for the Tai Lam Valley pumping station situated adjacent to the selected site;
- C one site for the Tai Lam Chung Tsuen pumping station situated on the site of a garage on the access road into Tai Lam Chung Tsuen; and
- C two alternatives for the Luen On San Tsuen pumping station, one situated just east of the selected site and one in the centre of Luen On San Tsuen next to the small tributary.

12.1.2 The locations of both the alternative and selected site locations for these areas are shown in Drawing 1.2.

### **12.2 Environmental Assessment**

12.2.1 The pumping station sites ultimately chosen for Tai Lam Valley, Tai Lam Chung Tsuen and Luen On San Tsuen for inclusion in the proposed sewerage scheme, were selected on the basis of the requirements of the local villagers. However, all the sites were subject to a preliminary environmental assessment and it was concluded that construction of the pumping stations on any the sites would not give rise to insurmountable environmental impacts or adverse residual impacts.

12.2.2 The details of the assessment in comparison to the selected sites is summarised in Tables 12.1, 12.2 and 12.3 for Tai Lam Valley, Tai Lam Chung Tsuen and Luen On San Tsuen respectively.

12.2.3 It can be seen that based upon the assessment, the two sites in Tai Lam Valley are equal in terms of noise, air and water quality, waste and heritage but the alternative site is marginally preferred from a landscape and visual and ecological perspective as this site as it would not require the infilling of a pond which has some ecological, landscape and visual value. However, no significant residual impacts are predicted by the loss of the pond and based upon its environmental acceptability and particularly preference stated during consultation with the villagers, this site was selected.

12.2.4 In respect of the Tai Lam Chung Tsuen pumping station alternatives, the environmental issues associated with both are considered equal in terms of noise, water quality and heritage effects. However, due to the preference to preserve the trees and vegetation on the selected site, the alternative site would be preferable from an ecological and landscape and visual perspective. However, due to the potential contamination on the garage site, the selected site would be

preferable from a waste management perspective. In addition, odour modelling has predicted that there is the potential for operational odour impacts at the closest sensitive receivers and while this could be mitigated by the inclusion of a higher emission source for the deodoriser vent, the selected site is preferable in this respect. Overall, the selected sites ranks marginally better than its alternative.

- 12.2.5 All three sites in Luen On San Tsuen are considered equal from a water quality, waste, ecology, heritage and landscape and visual perspective. However, based upon predictions that the alternative 1 site may give rise to operational odour impacts without mitigation, the adjacent selected and alternative 2 sites are equal and the third would not be preferred. In respect of noise, restriction of construction activities during school exam periods would be required at both the selected site and alternative 2 adjacent but other than this the noise levels can be mitigated to acceptable levels and the two sites are considered equal. Based upon the same level of mitigation, alternative site 1 marginally fails to meet the 75 dB(A) criteria with a predicted noise value of 77dB(A) during the use of the crane and additional measures would be required for this site. Based upon this, this site is not preferred over the other two.

**Table 12.1 Summary of Environmental Assessment of Pumping Station Sites at Tai Lam Valley**

<b>Environmental Parameter</b>	<b>Selected Site</b>	<b>Alternative Site</b>	<b>Conclusion</b>
Air Quality	Dust impacts can be controlled with mitigation. Site slightly closer to the sensitive receivers but odour concentrations within the standards.	Dust impacts can be controlled with mitigation. Odour concentrations slightly less than selected site due to increased distance from the ASRs.	Equal
Noise	Construction noise impacts acceptable with mitigation. Operational pump noise within the standard and no mitigation required.	Construction noise impacts acceptable with mitigation. Operational pump noise within the standard and no mitigation required.	Equal
Water Quality	Emergency overflow designed to discharge into adjacent estuary. Impact will be short-term and localised and predicted to be insignificant.	Emergency overflow designed to discharge into adjacent estuary. Impact will be short-term and localised and predicted to be insignificant.	Equal
Waste Management <sup>(1)</sup>	4122 m <sup>3</sup> surplus material for disposal from sewer alignment, 923 m <sup>3</sup> from pumping station. Impact of transportation and disposal insignificant.	As the alternative pumping station is directly adjacent to the original location, it is considered that no significant additional quantity of surplus waste material will be generated from pumping station or associated sewer alignment construction.	Equal
Ecology	The selected site will result in the permanent loss of bare ground, orchard and 363m <sup>2</sup> of brackish fish pond. The fish ponds are of medium ecological value and the magnitude of this loss is medium. Impact significance is therefore ranked as medium. Residual impacts not unacceptable.	The pumping station will occupy a small area of grassland, no important species were recorded. The ecological value of this habitat is low. Therefore, impact significance is ranked as insignificant.	On ecological grounds, the alternative site is preferred to the selected site.
Heritage	Survey not possible due to hardstanding and fish pond. Due to adjacent location of the site, similar results as alternative site predicted.	Site area artificially raised with no archaeological potential. Test pit revealed no archaeological deposits (See Appendix G). Stratigraphical section also provided in Appendix G.	Equal
Landscape and Visual	Half the site encroaches on to an existing pond and will result in the loss of bankside vegetation and aquatic habitat of some landscape quality	Situated on derelict land and partially screened by trees. Better screening from Castle Peak Road and minimal landscape impact.	Alternative site preferred

(1) Assumes plan area of both sites is the same

**Table 12.2 Summary of Environmental Assessment of Pumping Station Sites at Tai Lam Chung Tsuen**

Environmental Parameter	Selected Site	Alternative Site	Conclusion
Air Quality	Dust impacts can be controlled with mitigation. Operational odour predictions within standards at closest Air Sensitive Receiver.	Dust impacts can be controlled with mitigation. Odour concentrations within limits at the closest ASRs with predictions of 1.2 and 2.5 odour units for stability classes D and F respectively.	Equal
Noise	Construction noise impacts acceptable with mitigation. Operational pump noise within the standard and no mitigation required.	Construction noise impacts acceptable with mitigation. Operational pump noise within the standard and no mitigation required.	Equal
Water Quality	Emergency overflow designed to discharge into adjacent estuary. Impact will be short-term and localised and predicted to be insignificant. Located on verge of nullah and control of run-off a key issue.	Emergency overflow designed to discharge into adjacent estuary. Impact will be short-term and localised and predicted to be insignificant. Control of site run-off containing contaminated material key issue.	Equal
Waste Management <sup>(1)</sup>	3259 m <sup>3</sup> surplus material for disposal from sewer alignment, 1079 m <sup>3</sup> from pumping station. Impact of transportation and disposal insignificant.	Alternative pumping station will produce 1180m <sup>3</sup> additional quantity of surplus waste material from sewer alignment construction. Not a significant increase and impacts considered equal. However, alternative site identified as being potentially contaminated due to the presence of a vehicular garage and heavy soiling observed. Site would require contaminated land investigation and careful handling procedures.	Selected site preferred as no contamination.
Ecology	Located on site of mixed habitats of bare ground, grassland and some trees. Ecological value low and impact of construction insignificant.	No ecological value due to presence of garage.	On ecological grounds, the alternative site is marginally preferred.
Heritage	Test pit and auger tests revealed no archaeological deposits.	Not surveyed as potentially contaminated.	Equal

**Table 12.2 Cont'd...**

<b>Environmental Parameter</b>	<b>Selected Site</b>	<b>Alternative Site</b>	<b>Conclusion</b>
Landscape and Visual	Visually prominent but partial screening by new planting. Clearance of vegetation required so landscape impacts higher.	Visually prominent. Possible improvement to visual amenity by replacement of garage. Landscape impact low as no vegetation present.	Alternative site marginally preferred.

(1) Assumes plan area of both sites is the same

**Table 12.3 Summary of Environmental Assessment of Pumping Station Sites at Luen On San Tsuen**

Environmental Parameter	Selected Site	Alternative Site 1 (adjacent to nullah)	Alternative Site 2 (adjacent to selected site)	Conclusion
Air Quality	Dust impacts can be controlled with mitigation. Odour predictions negligible at the closest ASR and within criteria	Dust impacts can be controlled with mitigation. Due to close proximity of ASRs, odour standard marginally exceeded for stability class F with a reading of 6.9. Mitigation in the form of an increased vent height would be required.	Dust impacts can be controlled with mitigation Odour criteria not exceeded at closest ASR	Selected site and alternative 2 equal but alternative 1 not preferred.
Noise	Noise predictions within limits overall with mitigation. Restriction of some construction activity during exam periods required. Operational pump noise within the standard and no mitigation required.	More stringent control of construction required to reduce levels to acceptable. Operational pump noise within the standard and no mitigation required.	Noise predictions within limits overall with mitigation. Restriction of some construction activity during exam periods required. Operational pump noise within the standard and no mitigation required.	Selected site and alternative 2 adjacent equal. Alternative 1 not preferred.
Water Quality	Emergency overflow designed to discharge into adjacent estuary. Impact will be short-term and localised and predicted to be insignificant.	Emergency overflow designed to discharge into adjacent estuary. Impact will be short-term and localised and predicted to be insignificant.	Emergency overflow designed to discharge into adjacent estuary. Impact will be short-term and localised and predicted to be insignificant.	Equal
Waste Management <sup>(1)</sup>	1590 m <sup>3</sup> surplus material for disposal from sewer alignment, 462 m <sup>3</sup> from pumping station. Impact of transportation and disposal insignificant.	Alternative pumping station will produce 147 m <sup>3</sup> additional quantity of surplus waste material from sewer alignment construction. Not a significant increase and impacts considered equal.	As the alternative pumping station is directly adjacent to the original location, it is considered that no significant additional quantity of surplus waste material will be generated from pumping station or associated sewer alignment construction.	Equal

**Table 12.3 Cont'd...**

<b>Environmental Parameter</b>	<b>Selected Site</b>	<b>Alternative Site 1 (adjacent to nullah)</b>	<b>Alternative Site 2 (adjacent to selected site)</b>	<b>Conclusion</b>
Ecology	Located on site of low ecological value and impact of construction insignificant.	Located on site of low ecological value and impact of construction insignificant.	Located on site of low ecological value and impact of construction insignificant.	Equal
Heritage	Not surveyed as under hardstanding. In area of low archaeological potential.	Not surveyed as under hardstanding. In area of low archaeological potential.	Not surveyed as under hardstanding. In area of low archaeological potential.	Equal
Landscape and Visual	Landscape impacts low as little vegetation present. Visually prominent.	Landscape impacts low as little vegetation present. Visually prominent.	Landscape impacts low as little vegetation present. Visually prominent.	Equal

(1) Assumes plan area of both sites is the same