16 WASTE

16.1 INTRODUCTION

This chapter provides responses to submissions received on the draft environmental impact statement (EIS) related to waste management in the Queensland Curtis LNG (QCLNG) Gas Field Component.

In addition, where changes to the QCLNG Project description as detailed in *Volume 2, Chapters 7* and *11* have impacted waste management, these impacts, and measures to mitigate them, are described. Supplementary information is also supplied on aspects of waste management discussed in the draft EIS.

16.2 RESPONSES TO SUBMISSIONS

Table 3.16.1 provides a summary of the submissions received on waste management in the Gas Field and a response to those submissions.

Table 3.16.1 Response to Submissions on the Draft EIS

Issue Raised	QCLNG Response	Relevant Submissions(s)
Describe the operation and management of a waste transfer station	Refer to *Section 16.4.2*.	32
The Western Districts Regional Council (WDRC) may not have capacity to receive biosolids and other waste streams from QGC Ltd camps. Describe the waste management strategy for biosolids and other waste streams and arrangements with the WDRC	QGC will co-operate with the WDRC in managing waste to achieve the optimal outcome for the Council and QGC. This may include contributions to Council waste management facilities so that they have the capacity to manage waste from QGC activities	36
Consider the requirements for *ERA 58* and discuss the management of any regulated waste	QGC does not intend to accept and treat waste from tenures outside of the QCLNG Project and therefore *ERA 58* does not apply. The reference to *ERA 58* in *Section 11.3.1.4* of the draft EIS does not apply	32
Provide a detailed description of sewage treatment, sewerage systems, irrigation of treated water and irrigation water quality	Refer to *Section 16.4.1*	32

Issue Raised	QCLNG Response	Relevant Submissions(s)
Identify all Level 1 petroleum activities under Schedule 5 of the *EP Act*.	Under Schedule 5 of the *EP Regulation*, the Gas Field will trigger the following Level 1 petroleum activity: • likely to have a significant impact on a category A or B environmentally sensitive area • includes a Chapter 4 activity (as described in *Schedule 2* of the *EP Regulation 2008*) for which an aggregate environmental score is stated • carried out on a site containing a high hazard dam or significant hazard dam (refer *Volume 3, Chapter 11*).	32

16.3 SUPPLEMENTARY INFORMATION ON WASTE

Waste streams and expected volumes of waste from the Gas Field are described in *Volume 3, Chapter 16* of the draft EIS. The supplementary EIS considers impacts from waste where:

- changes to the Project description result in additional waste streams
- changes to the Project description result in significant additional volumes of waste
- additional, relevant information on waste streams is available
- there are proposed changes to the management methods for waste streams.

16.4 CHANGES TO THE PROJECT DESCRIPTION

As described in *Volume 2, Chapters 7* and *11*, there will be an increase in the footprint of the Project, materials required and the construction and operational requirements. This is likely to result in an increase in the quantities of waste generated. The waste streams described in *Volume 3, Chapter 16* of the draft EIS are unchanged. Despite the potential increase in volume of waste generated, the waste management measures proposed in *Volume 3, Chapter 16* of the draft EIS will still be applied. Further information is supplied below on the:

- management of sewage effluent
- operation of a waste transfer station.

16.4.1 Sewage Treatment

The proposed sewage treatment infrastructure will consist of modular sewage treatment plants (STP) with a capacity to treat effluent to Class C standards (according to *Queensland Water Recycling Guidelines 2005*). Resultant treated effluent will be used to irrigate defined areas. Based on evolving accommodation camp design, QGC considers Class C to be a suitable standard. The modular units come in a range from 50 to 1000 equivalent persons capacity. This will allow flexibility to meet the changing workforce numbers required throughout the Construction and Operation phases. Pump wells and balance tanks will allow the capability to insert or remove modular units to meet the expected demand. The inclusion of balance tanks will allow time for maintenance and emergency storage.

The STP will have a wet-weather storage capacity of up to three days in the event of excessive rainfall. In the event of longer rain periods, the treated effluent will be transported to a local municipal treatment plant for disposal until the weather and conditions are favourable for irrigation. Each STP will have appropriate management measures to prevent release of sewage to the environment. This includes adequate bunding, fencing and signage. All tanks will be fitted with float-level alarms to ensure an efficient response to any system failures.

16.4.1.1 Irrigation of Treated Sewage

Each camp will have a Sewage Effluent Management Plan (SEMP) for the management of the sewage treatment process and release of treated effluent to land.

The proposed irrigation areas will be calculated and assessed using the Model for Effluent Disposal using Land Irrigation (MEDLI) program, as well as a water balance model. Locations will be assessed on a case-by-case basis, catering for different soil types, soil hydraulic loading, rainfall, evaporation, vegetation communities, surface contours, proximity to watercourses, flood-prone areas and the surrounding environment. The irrigation system will comprise pressurised above-ground piping that connects to risers, set out evenly to disperse treated effluent across the disposal area. The irrigation zones will be fenced off from livestock, fauna and human traffic and will be appropriately signed to warn of non-potable water use. Each campsite will have numerous proposed cells or zones for irrigation; as camp capacity increases, additional cells will be introduced into the irrigation system to ensure the pressure disperses treated effluent efficiently across the irrigation area.

Table 3.16.2 describes, per camp, the volume of water requiring treatment per day, based on 240 litres per person per day, and the area required for irrigation, based on 1.6 ha required for every 100 persons. In total, and at maximum camp capacity, an estimated 70 ha is required for irrigation of treated effluent.

Table 3.16.2 Irrigation Requirements

Camp Site	Maximum number of personnel	Water Required per day (kL)	Area required (ha)
Wollebee Creek	1,650	396	26
Ruby	1,350	324	21
Jordan	900	216	15
Bellevue	500	120	8
Total	**4,400**	**1,056**	**70**

Table 3.16.3 provides water quality limits for contaminant release to land from the irrigation of treated effluent.

Table 3.16.3 Water Quality Parameters for Irrigation

Quality Characteristics	Units	Release Limits
Biological Oxygen demand (BOD)	mg/L	20 (max)
pH	scale	6.5-8.5 (range)
EC	us/cm	<1600
Total Dissolved Solids (TDS)	mg/L	<1000
Total Suspended Solids	mg/L	30 (max)
E.*Coli*	coliform forming units/100ml	<100(max)
Total Nitrogen	mg/L	35 (max)
Total Phosphorus	mg/L	10 (max)
Dissolved Oxygen	mg/L	2 (min)

A monitoring program will analyse samples of the treated effluent every six months. Any exceedence of acceptable levels will require an inspection and appropriate action by the STP manager or STP service provider; monitoring frequency levels will increase until the levels are reduced to below the required release limits and the plant is running at maximum efficiency. Daily monitoring of the STP will be undertaken by the camp manager and regular routine inspections will be undertaken by operational staff. Plant maintenance will occur every four months and be undertaken by the STP contractor.

16.4.1.2 Biosolids

For a 1,000-personnel camp, QGC expects to produce approximately 200 kL of biosolids per annum. QGC will consider a number of options for the disposal of biosolids, including transfer to appropriately licensed treatment and recycling facilities and the upgrade of Council facilities to accommodate biosolids generated by QGC activities. All transfer of biosolids will comply with waste tracking regulations.

16.4.2 Waste Transfer Stations

Waste Transfer Stations (WTS) will be located strategically across QGC tenements, nominally in proximity to camps and warehouse storage points. The WTS are intended to be recyclable- and hazardous-waste collection points. These locations will not be used for putrescible waste transfer. Putresible waste will be removed to an appropriately licensed facility from temporary, secure waste storages at camps. The WTS will be operated by a designated Waste Manager, who will be responsible for the daily operation and maintenance of the WTS, including a waste tracking system. Each WTS will be designed and located to minimise potential impacts and optimise waste recovery and reuse.

Site-specific design of the WTS has not been completed. Design will include an assessment of preferred transport routes and sensitive receptors, including proximity of residents, to minimise the impact of dust, noise and odour. Site selection will include an assessment of the topography, soil types and hydrology of potential locations and functionality based on logistics between construction fronts and other warehousing activities. Existing vegetation or planned vegetation will be considered to screen the site, provide a windbreak and limit litter dispersal. Fencing may be incorporated to prevent unauthorised access. Stormwater and drainage controls will be designed to divert overland flows away from WTS, ensure that potentially contaminated stormwater is kept separated from non-contaminated stormwater and incorporate gradients to minimise surface ponding. Stormwater settling and detention ponds may be required depending on the selected area and potential leachates, although chemical containers and waste oil will be stored in bunded areas.

A typical WTS will store various waste streams, including concrete, timber, tyres, wire, scrap metal, vegetation and contaminated soil (if required). A WTS will be made up of half-walls, to segregate the waste streams and prevent mixing, and concrete floors to minimise the risk of contamination of soils and water. Where required, the WTS will contain adequate fire breaks around the WTS and between waste streams. Fire breaks will be designed to protect the facility from external fire threats and contain any fire spreading within the station.

The level of waste stored will be relevant to the size and capacity of each location. Once it has reached a predetermined level, waste will be collected from the WTS by an appropriately licensed contractor for disposal. The Waste Manager will record all waste received and removed from the site in the waste tracking system and conduct regular inspections to ensure levels are within the scope of the station and in compliance with regulatory conditions.

QGC will co-operate with Councils to determine their requirements for managing waste from QGC waste transfer stations. Where required, QGC may return certain non-biodegradable waste streams to manufacturers for reuse. Any hazardous wastes will be managed in accordance with all relevant regulations.

16.5 CONCLUSION

The supplementary EIS has proposed additional controls to those in the draft EIS for managing waste. This includes a description of sewage effluent management for the expected number of personnel and the potential use of WTS. QGC will develop a Waste Management Plan based on a detailed understanding of all waste streams and volumes. With appropriate waste management controls, QGC considers that there is a very low risk of soil, water or air contamination.

QGC will co-operate with the relevant Councils to manage all waste streams once the volumes have been determined, which may include upgrade of Council facilities.