Government of Western Australia
Department of Water and Environmental Regulation

Amendment Notice 2

Licence Number	L8904/2015/1
Licence Holder	Cleanaway Solid Waste Pty Ltd
ACN	120 175 635
File Number:	DER2015/001648
Premises	Banksia Road Putrescible Landfill Banksia Road CROOKED BROOK WA 6236 Being Lot 2 on Plan 65861 Certificate of Title Volume 1670 Folio 568
Date of Amendment	18 January 2019

Amendment

The Chief Executive Officer (CEO) of the Department of Water and Environmental Regulation (DWER) has amended the above Licence in accordance with section 59 of the *Environmental Protection Act 1986* (EP Act) as set out in this Amendment Notice. This Amendment Notice constitutes written notice of the amendment in accordance with section 59B(9) of the EP Act.

Stephen Checker

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Date: 2019.01.18 16:14:25 +08'00'

Stephen Checker

MANAGER WASTE INDUSTRIES

REGULATORY SERVICES

an officer delegated under section 20 of the *Environmental Protection Act 1986* (WA)

Definitions and interpretation

Definitions

In this Amendment Notice 2, the terms in Table 1 have the meanings defined.

Table 1: Definitions

Term	Definition
ACN	Australian Company Number
Amendment Notice	refers to this document
Application	refers to the licence amendment application and supporting documentation submitted to DWER for the construction of the Cristal Pond and CC2: 'License amendment application – Cleanaway Solid Waste Pty Ltd – Banksia Road Landfill Site' (Golder Associates, 1 December 2017). (*refer to Appendix 1: Key Documents for detailed listing)*
Category/ Categories/ Cat.	categories of Prescribed Premises as set out in Schedule 1 of the EP Regulations
CC2	Cristal Cell 2, the proposed new cell for Cristal pigment waste to replace the MIC Cell and being assessed through this Amendment Notice.
CEO	means Chief Executive Officer. CEO for the purposes of notification means: Director General Department Administering the *Environmental Protection Act 1986* Locked Bag 33 Cloisters Square PERTH WA 6850 info-der@dwer.wa.gov.au
Controlled Waste	has the meaning given to the term in the Controlled Waste Regulations
Controlled Waste Regulations	*Environmental Protection (Controlled Waste) Regulations 2004* (WA)
Decision Document	means the decision document authorised by a Delegated Officer which accompanied the Existing Licence
Delegated Officer	an officer under section 20 of the EP Act
Department	means the department established under section 35 of the *Public Sector Management Act 1994* and designated as responsible for the administration of Part V, Division 3 of the EP Act.
DWER	Department of Water and Environmental Regulation
EPA	Environmental Protection Authority
EP Act	*Environmental Protection Act 1986* (WA)
EP Regulations	*Environmental Protection Regulations 1987* (WA)
Existing Licence	The Licence issued under Part V, Division 3 of the EP Act and in force prior to the commencement of and during this Review
LWCWD	means the document titled 'Landfill Waste Classification and Waste Definitions 1996', published by the Chief Executive Officer of the Department of Environment and as amended from time to time
Licence Holder	Cleanaway Solid Waste Pty Ltd
m^3	cubic metres
MIC Cell	Refers to the existing cell for Cristal pigment waste constructed under works approval W5096/2012/1, operated since 2013 and due to reach completion in 2018
Minister	the Minister responsible for the EP Act and associated regulations
Noise Regulations	*Environmental Protection (Noise) Regulations 1997* (WA)

NORM	Naturally occurring radioactive materials
Prescribed Premises	has the same meaning given to that term under the EP Act.
Premises	refers to the premises to which this Amendment Notice applies, as specified at the front of this Amendment Notice.
Risk Event	as described in *Guidance Statement: Risk Assessment*

Amendment Notice

This amendment is made pursuant to section 59 of the *Environmental Protection Act 1986* (EP Act) to amend the Licence issued under the EP Act for a prescribed premises as set out below. This notice of amendment is given under section 59B(9) of the EP Act.

This notice is limited only to an amendment to the activities under Categories 61 (construction of a new cell and associated leachate pond for the ongoing disposal of pigment waste).

The following guidance statements have informed the decision made on this amendment:

- *Guidance Statement: Regulatory Principles (July 2015)*
- *Guidance Statement: Setting Conditions (October 2015)*
- *Guidance Statement: Land Use Planning (February 2017)*
- *Guidance Statement: Decision Making (February 2017)*
- *Guidance Statement: Risk Assessment (February 2017)*
- *Guidance Statement: Environmental Siting (November 2016)*

Amendment description

Proposed new Cristal pigment waste cell & Cristal Pond (Category 61)

Cleanaway Solid Waste Pty Ltd (the Licence Holder) submitted an application on 1 December 2017 to amend licence L8904/2015/1 (Existing Licence) to allow the construction of a new cell (CC2) and associated Cristal Pond (leachate) for the disposal of pigment waste generated by Cristal Pigment Australia Pty Ltd (Cristal) from the production of titanium oxide at their Millennium Inorganic Chemicals premises in Bunbury.

The new cell is required to replace the existing Cristal pigment cell ("MIC Cell") at the Premises constructed under works approval W5096/2012/1, which commenced operation in 2013 and is expected to reach completion in 2018. An increase or change to the approved design capacity for the Premises under Category 61 is not being requested under the Application. The MIC Cell was designed to hold 350,000m^3 of Cristal pigment waste received over a period of approximately 5 years, and CC2 is also designed to hold 350,000m^3 deposited over 5 years.

The Application also includes a proposal to construct a 19,000m^3 lined leachate pond ("Cristal Pond") for the holding of supernatant water decanted from both MIC Cell and CC2.

The Application and supporting documents are listed in the Key Documents table in Appendix 1 of this Amendment Notice.

Classification of activity under Category 61

Category 61 is defined in the *Environmental Protection Regulations 1987* as follows:

> *Liquid waste facility: premises on which liquid waste produced on other premises (other than sewerage waste) is stored, reprocessed, treated or irrigated.*

The deposition of Cristal pigment waste is considered by the Delegated Officer to be a

Category 61 activity due it being delivered to the Premises in liquid form (slurry with ~15% solids), produced on another premises (Millennium Inorganic Chemicals), and is stored and treated on the Premises by way of dewatering within the Cristal cell.

Cristal pigment waste characterisation

Cristal pigment waste is a fine-grained silicate with typically 14 – 15% solids by mass. More detailed physical and chemical properties of the waste were investigated by WML Consultants in 2011 as part of the works approval application to construct the MIC Cell, with updated analysis undertaken in Golder & Associates (2017) to support the Application. The waste has a chemical composition predominantly made of iron (II) and iron (III) hydroxides, aluminium hydroxide, manganese hydroxide, magnesium hydroxide, calcium chloride, carbon, and titanium oxide. The waste contains low levels of naturally occurring radioactive materials (NORM) including uranium (25 – 50ppm) and thorium (300 – 700ppm). The most common elements within leachate from the waste are calcium, sodium and chloride, but aluminium, manganese, magnesium and potassium are also present.

According to the Application, the contaminant levels within Cristal pigment waste meet Class IV waste under the Landfill Waste Classifications and Waste Definitions 1996 (LWCWD); however the LWCWD relate to solid wastes and chemical analysis of the leachate which drains from the waste infers that minimal amounts of contaminants leach out of the waste, with all contaminants measured being below Class I criteria with the exception of molybdenum.

Cristal pigment waste is a Controlled Waste as listed in Schedule 1 of the *Environmental Protection (Controlled Waste) Regulations 2004* (Controlled Waste regulations) – *Waste from the production, formulation, or use of inks, dyes, pigments, paints, lacquers or varnish*. The waste also contains additional contaminants as listed in Schedule 1 of the Regulations, including but not limited to *zinc compounds*, *lead; lead compounds*, *arsenic*; *arsenic compounds* and *cobalt or cobalt compounds*.

Proposed works

CC2 will be divided into two stages, with Stage 1 (northern portion) being completed and commissioned prior to the completion of Stage 2 (southern portion). The construction schedule will comprise three phases as follows:

- Phase 1: Construction of the Cristal pond, to be completed during the first quarter of 2018 to allow commissioning of the pond in June 2018.
- Phase 2: Bulk earthworks for Stages 1 and 2 of CC2, Stage 1 pre-liner works, and completion of stage 1 works (including liner, concreting, decant infrastructure, slurry delivery and stormwater management). Works are intended to commence in the last quarter of 2018 to allow commissioning in mid-2019.
- Phase 3: Completion of remaining works for Stage 2 of CC2 (including liner works and the installation of pipework). Works are intended to commence in the last quarter of 2019 to allow for commissioning in early 2020.

As part of the Application, the Licence Holder provided the overarching design document 'Cristal Cell 2 and Associated Leached Pond Design' containing information and justification on the proposed design and future operation of the Cristal pond and CC2. In addition to design details, this document includes Cristal pigment waste characterisation information, proposed monitoring and inspections, a stability analysis (including seismic loading scenarios) and a copy of the Geotechnical and Hydrogeological Report which determined the suitability of excavated material for the construction of the embankments.

Specific to the construction phase, the Application also included Cristal Pond and CC2 works specifications, and a Construction Quality Assurance Plan containing information on the responsibilities and hold points for the various aspects of the design during the construction phase which can be reported against in a Construction Quality Assurance Plan following

construction.

Proposed operation

Due to the phased construction schedule, initial operation of CC2 will be limited to the Stage 1 area which will be commissioned prior to completing construction of Stage 2.

Cristal pigment waste will be delivered to the Premises in tankers and pumped to CC2 where it is discharged via one of five spigots located around the crest of CC2. Prior to the completion of Stage 2, deposition will be via three spigots on the perimeter of Stage 1. Operating spigots will be changed as required (approximately weekly) to ensure a uniform beach is formed during deposition, and a supernatant pond against the central portion of the western embankment.

Supernatant water will be removed from the surface of CC2 and directed to the Cristal pond via a floating pump. Consolidated water from the base of CC2 will gravitate via the underdrainage network to sumps, from which water is pumped to the Cristal pond via submersible pumps.

The 19,000m^3 Cristal Pond is projected to hold up to 17,000m^3 of water, including supernatant leachate collected from the surface of the MIC Cell initially, and all leachate collected from the surface and underdrainage of CC2. Leachate stored in the pond will either evaporate or be collected by Cristal for re-use as process water at their facilities.

As part of the Application, the Licence Holder provided a copy of the Operations Environmental Management Plan for the Cristal pond and CC2 which contains detailed information about their design, operation and environmental management aspects.

Scope of assessment and amendments

This amendment notice includes an assessment of environmental risks for the construction and operational phases of CC2 from the information presented in the Application, and the details of amendments and/or addition of regulatory controls commensurate to the risks assessed.

The Delegated Officer has also captured relevant aspects of the Application as licence conditions as appropriate, to ensure the approvals granted by this amendment notice relate only to what was proposed in the Application.

Administrative changes have also been made to the Licence to update it, as required. These changes do not have any direct relevance to the environmental risk assessment for the Premises

Other approvals

The Licence Holder lodged a Planning Approval application with the Shire of Dardanup for the construction of CC2 under the Planning and Development Act 2005. The Applicant provided DWER with a copy of the granted Planning Approval.

Amendment history

Table 2 provides the amendment history for L8904/2015/1, since it was issued on 3 August 2015.

Table 2: Licence amendments

Instrument	Issued	Amendment
L8904/2015/1	22/10/2015	Licence amendment to authorise operation of leachate evaporation pond 3, constructed under W5748
	5/05/2016	Licence amendment to: • change company name; • authorise operation of cell 12 constructed under W5748; and • address stormwater upgrades
	21/07/2016	Licence amendment to: • Accept approximately 3,000 tonnes per annual period of drill muds for blending and disposal to landfill; and • increase allowable volumes of TWM Processed Septage to 3,000 tonnes per annual period.
	13/04/2017	Licence amendment for: • construction and operation of three composite HDPE liner Class III landfill cells (cells 6, 7 and 8); • construction and operation of a phytocapping trial on Class III landfill cell 5; and • review of Premises operations and regulatory controls.
	2/02/2018	Amendment Notice 1 to reflect the completion of cell 6 construction and authorise its use.
	18/02/2019	Amendment Notice 2 for a new Cristal pigment waste cell & Cristal Pond under Category 61

Location and receptors

The Premises is a major regional landfill located within a predominantly rural area. The Dardanup town site is the closest residential area, located about four kilometres northwest of the Premises and the major regional Bunbury City centre is located about 17 kilometres northwest of the Premises. Immediately north and adjacent to the Premises are the following other premises which are prescribed under Part V of the EP Act:

- The former Shire of Dardanup Class II putrescible landfill (Lot 81 on Plan 403943);
- The Shire of Dardanup Transfer Station (Licence L8888/2015/1);
- The Wellington Group of Councils Compost Facility (Licence L8746/2013/1);
- The Dardanup Wastewater Treatment Plant (Registration R0292/1993/1); and
- The Fitonia Pty Ltd Composting Facility (Licence L7089/1997/11).

Table **3** below lists the relevant sensitive land uses in the vicinity of the Prescribed Premises which may be receptors relevant to the proposed amendment due to the unknown extent of groundwater abstraction in the area.

Table 3: Receptors and distance from activity boundary

Residential and sensitive premises	Distance from Prescribed Premises
Rural residential properties	• ~0.5 km south of the southwest corner of the Premises, separated by the Dardanup Conservation Park and Boyanup State Forest. • ~0.9 km due west of the Premises. • ~1 km west south west of the southwest corner of the Premises • ~1.5 km due south of the Premises, separated by the Dardanup Conservation Park and Boyanup State Forest. • ~1.5 km north west of the north west corner of the Premises. • ~1.5 km north east of the north east corner of the Premises separated by the Dardanup Conservation Park and Boyanup State Forest. • ~1.75 km east north east from the eastern boundary of the Premises separated by the Dardanup Conservation Park and Boyanup State Forest.

Table 4 below lists the relevant environmental receptors in the vicinity of the Prescribed Premises which may be receptors relevant to the proposed amendment.

Table 4: Environmental receptors and distance from activity boundary

Environmental receptors	Distance from Prescribed Premises
Dardanup Conservation Park and Boyanup State Forest.	Immediately adjacent (0m) south and east of the Premises boundary
Threatened ecological communities	Four priority Threatened Ecological Communities (TEC's) are present within the adjacent Dardanup Conservation Park. The 500 metre buffers extend within eastern edge of the Premises boundary.
Geomorphic wetland: Multiple use Palusplain and Dampland (flat, seasonally waterlogged)	Approximately 400 metres south west through north west of the Premises boundary.
Crooked Brook (significant stream)	• Located approximately 1100m south/ south west of the Premises boundary flowing in a generally east west direction. • A minor watercourse located approximately 750 metres south of the Premises boundary across a ridge line also flows into Crooked Brook. • Other minor watercourses originate in the Palusplain areas approximately 400 metres west of the Premises Boundary.

Surface water

The topography within and adjacent to the Premises slopes down to the west onto the Palusplain wetland. Minor water ways within the Palusplain wetland flow into the southerly located Crooked Brook or northerly located Ferguson River. Both water courses flow into the Preston River that enters the Leschenault Estuary.

Groundwater

As detailed in the Decision Document of the Existing Licence, it is understood that a superficial aquifer is present within the Yoganup geological formation between 30m to 40m below ground level, which is connected to the upper part of the Leederville aquifer. It is also possible that further isolated perched aquifers occur under the Premises 15 – 20m below ground level.

Groundwater flow at the Premises is understood to be in a predominantly westerly direction, tending slightly northwards.

Risk assessment

Table 5 and

Table **6** below describe the Risk Events associated with the amendment consistent with the *Guidance Statement: Risk Assessments*. Both tables identify whether the emissions present a material risk to public health or the environment, requiring regulatory controls.

Exclusions

The following general matters are excluded from DWER's assessment and control under Part V of the EP Act:

- Human health risks posed to site staff, visitors or contractors working on the Premises: In accordance with DWER's *Guidance Statement: Risk Assessments* (February 2017), DWER excludes employees, visitors or contractors of the Applicant as potential receptors of emissions. Protection of these parties is provided for under other state legislation and jurisdictions (i.e. the Department of Mines, Industry Regulation and Safety (DMIRS) / WorkSafe and the *Occupational Health and Safety Act 1984*). DWER's risk assessment therefore only focuses on potential public health impacts to receptors outside the Premises.
- Radiation risks (naturally occurring radioactive materials; NORM): DWER does not have carriage of the regulation of radiation risks at the Premises. The *Radiation Safety Act 1975* is administered by the Radiological Council, an independent statutory authority advising and responsible to the Minister for Health. Daily administration of the *Radiation Safety Act 1975* is delivered by personnel of the Radiation Health Branch, part of the Environmental Health Directorate of the Department of Health. The Applicant referred the Radiation Management Plan Cleanaway Banksia Road Waste Disposal Facility (Radiation Professionals, 2018) to the Radiological Council, which was approved for registration in November 2018 under permit number RS77/2018 29488.

Table 5: Risk assessment for proposed amendments during construction

Risk Event						Consequence rating	Likelihood rating	Risk	Reasoning
Source/Activities		**Potential emissions**	**Potential receptors**	**Potential pathway**	**Potential adverse impacts**				
All works to construct CC2 and Cristal Pond	Earthworks, clearing and stockpiling works during construction, Vehicle and equipment operation during construction	Fugitive dust	Various rural residential receptors as close as 0.5 km south of the Premises	Air/wind dispersion	Amenity impacts (Fugitive dust from earthworks is not expected to be a health irritant)	*Slight* (Minimal impact to amenity, due to distance and temporary nature of works)	*Possible* (Impact to amenity could occur at some time)	***Low*** Acceptable not subject to controls	Due to the scale and duration of works, distance to sensitive receptors and the proposed controls, any dust generated can be adequately regulated by Section 49 and the general provisions of the EP Act. The Licence Holder has the following controls in place which have been considered: • water truck and dust suppression chemicals available for use as required; • complaints management system; • response to complaints by site manager or delegate; and • the implementation and monitoring of speed limits on unsealed roads.
		Noise				*Minor* (Low level impact to amenity. Noise able to travel over large distance in meteorological conditions that are conducive. Works are temporary)	*Possible* (Impact to amenity from noise could occur at some time)	***Medium*** Acceptable subject to controls	Due to the scale and duration of works, distance to sensitive receptors and the proposed controls, any noise generated should be adequately regulated under the Noise Regulations. The Licence Holder has the following controls in place: • Complaints management system (CMS); • Response to all complaints within 24 hours

Table 6: Risk assessment for proposed amendments during operation

Risk Event						Consequence rating	Likelihood rating	Risk	Reasoning
Source/Activities		**Potential emissions**	**Potential receptors**	**Potential pathway**	**Potential adverse impacts**				
All	Vehicles: unloading of slurry into CC2 and reloading of return leachate from Cristal pond	Slurry or leachate spillage to ground	• Rural residences abstracting groundwater as close as 0.5 km from the Premises • Multiple use Palusplain and Dampland wetlands 400m SW • Crooked Brook 1100m SSW	Infiltration into local soil structure to superficial ground-water migrating in a W-NW direction	Amenity impacts from contamination of the ground-water abstracted locally (1 – 2km). Ecosystem impacts in surface waters from contamination	*Major* (Contaminated groundwater affecting abstraction bores used for domestic and agricultural purposes could last many years and result in actual loss of property value; both are considered as high level impacts to amenity)	*Rare* (Given likely low volumes of waste that might be involved in spillages, the potential consequence could only occur in exceptional circumstances)	***Medium*** Acceptable subject to controls	Spillages during offloading of slurry or loading of leachate are unplanned and not expected to be high quantities. The likelihood of spillages causing high level impacts to amenity is very low. The Licence Holder has the following controls in place: • Dedicated offloading lay-by area; • Tankers will offload slurry into pipelines which are attached to spigots positioned to direct the discharge directly into the intended area of CC2 • Tankers will have a visual indicator “tell-tale tank” that there is enough leachate available to reload for return to Cristal. This will prevent unnecessary loading attempts. • Daily inspections of site • Cleanup of any spillages.
		Noise	Various rural residential receptors as close as 0.5 km south of the Premises	Air/wind dispersion	Amenity impacts	*Slight* (There will be no change to the consequence of noise emissions from unloading. This source is considered to pose minimal impact to amenity)	*Unlikely* (Impact to amenity from these vehicles is not expected to occur in most circumstances)	***Low*** Acceptable not subject to controls	Due to the scale of noise from tanker vehicles (compared with other noise sources on the Premises) and distance to sensitive receptors, any noise generated should be adequately regulated under the Noise Regulations.The Licence Holder has the following controls in place: • Complaints management system; • Response to all complaints within 24 hours
		Fugitive dust liftoff from CC2 surface			Public health and amenity impacts	*Moderate* (Dust liftoff could result in the transfer of Cristal waste contaminants to neighbouring properties. This is considered to be a low level off-site impact at the local scale.)	*Unlikely* (Given the nature of the Cristal waste, the consequence is considered unlikely to occur in most circumstances.	***Medium*** Acceptable subject to controls	Dust liftoff from CC2 could contain contaminants; however is not expected to be significant at the Premises due to the moist clay-like nature of the Cristal waste and the distance to residential receptors. The Licence Holder has a water truck and dust suppression chemicals available on the Premises at all times, and is already required by the licence to maintain the material in a damp state.
CC2	Storage/ treatment of Cristal pigment waste in CC2	Seepage or overflow of leachate from CC2	• Rural residences abstracting groundwater as close as 0.5 km from the Premises • Multiple use Palusplain and Dampland wetlands 400m SW • Crooked Brook 1100m SSW	Infiltration into local soil structure to superficial ground-water migrating in a W-NW direction	Amenity impacts from contamination of the ground-water abstracted locally (1 – 2km). Ecosystem impacts in surface waters from contamination	*Major* (Contaminated groundwater affecting abstraction bores used for domestic and agricultural purposes could last for many years and result in actual loss of property value; both are considered as high level impacts to amenity)	*Unlikely* (Given the proposed controls, impacts are not expected to occur in most circumstances)	***Medium*** Acceptable subject to controls	Due to the proposed controls by the Licence Holder for controlling discharge from CC2, the contamination of groundwater causing high level amenity impacts is not considered to be a likely consequence. The Licence Holder has the following controls in place to prevent the leakage or overflow from CC2: • Design seepage rate through basal lining system should not exceed 10L/ha/day (0.365L/m^2/year) • CC2 is lined with HDPE geomembrane overlying geosynthetic clay layer (GCL) over compacted subgrade. • Under-liner pressure relief system which will detect unexpected seepage through CC2 floor • Over-liner drainage collection system • Removal of supernatant water and underdrainage from CC2 and transfer to Cristal Pond (automatic pumps with level sensors) • Daily inspections of pond levels, maintenance of levels below the maximum operating level (MOL) • Maintenance of at least 1m freeboard • Weekly inspections of crest and diversion drain condition • Diversion of stormwater away from CC2 infrastructure • CC2 designed to contain 1 in 100 AEP rainfall event. • Monitoring of groundwater quality and level within the vicinity of the cell

Risk Event						Consequence rating	Likelihood rating	Risk	Reasoning
Source/Activities		**Potential emissions**	**Potential receptors**	**Potential pathway**	**Potential adverse impacts**				
Cristal pond	Transfer and storage of Cristal pigment leachate in Cristal pond	Seepage or overflow of leachate from Cristal pond	• Rural residences abstracting groundwater as close as 0.5 km from the Premises • Multiple use Palusplain and Dampland wetlands 400m SW • Crooked Brook 1100m SSW	Infiltration into local soil structure to superficial ground-water migrating in a W-NW direction	Amenity impacts from contamination of the ground-water abstracted locally (1 – 2km). Ecosystem impacts in surface waters from contamination	*Major* (Contaminated groundwater affecting abstraction bores used for domestic and agricultural purposes could last for many years and result in actual loss of property value; both are considered as high level impacts to amenity)	*Unlikely* (Given the proposed controls, impacts are not expected to occur in most circumstances)	***Medium*** Acceptable subject to controls	Due to the proposed controls by the Licence Holder for controlling leakage or overflow from the new Cristal pond, the contamination of groundwater is not considered to be a likely consequence. The Licence Holder has the following controls in place: • Water transfer system is fitted with level sensor probes which start and stop pumps automatically when pre-set operating levels are reached. • All visible pipelines able to be isolated with shut-off valves which are bunded. • Design seepage rate through basal lining system should not exceed 10L/ha/day (0.365L/m^2/year) • Cristal pond is lined with HDPE geomembrane overlying geosynthetic clay layer (GCL) over compacted subgrade. • Monitoring of groundwater quality and level within the vicinity of the cell • Daily inspections of pond levels, maintenance of pond levels below the maximum operating level (MOL) • Maintenance of at least 1m freeboard • Diversion of storm water away from the Cristal Pond infrastructure • Sized to contain a 1 in 20 AEP rainfall event plus the 90th percentile wet season. • Daily weather monitoring. • Capacity to remove storm volume from Cristal Pond within a four day period to minimize overtopping risk • Design of the CC2 to allow temporary storage of rainfall if there is risk of Cristal Pond levels exceeding the MOL.
Risk Event: Seismic activity	Embankment deformation during seismic events	Seepage or overflow of leachate from CC2	• Rural residences abstracting groundwater as close as 0.5 km from the Premises • Multiple use Palusplain and Dampland wetlands 400m SW • Crooked Brook 1100m SSW	Infiltration into local soil structure to superficial ground-water migrating in a W-NW direction	Amenity impacts from contamination of the ground-water abstracted locally (1 – 2km). Ecosystem impacts in surface waters from contamination	*Major* (Contaminated groundwater affecting abstraction bores used for domestic and agricultural purposes could last for many years and result in actual loss of property value; both are considered as high level impacts to amenity)	*Rare* Given the proposed controls and low likelihood of seismic events included in the analysis, the potential consequence is only considered possible in exceptional circumstances)	***Medium*** Acceptable subject to controls	Due to the design and the likelihood of significant seismic activity, the contamination of groundwater is considered to be very rare consequence. The Licence Holder has the following mitigating factors and controls in place which are relevant to the event of seismic activity: • The location of the Premises is considered low hazard for seismicity according to the *Atlas of Seismic Hazard Maps of Australia* • The Application included an embankment stability analysis under static and pseudo-static (seismic) scenarios which indicated that minimum factor of safety (FoS) values will be met or exceeded by all pond embankments as per the design. • A simplified deformation analysis has been undertaken on the pond embankments assuming a magnitude 9 earthquake, which indicated that loss of containment is unlikely as long as the design is adhered to and the freeboard is maintained.
Risk Event: Extreme rainfall	Erosion of embankments	Seepage or overflow of leachate from CC2 or Cristal pond	• Rural residences abstracting groundwater as close as 0.5 km from the Premises • Multiple use Palusplain and Dampland wetlands 400m SW • Crooked Brook 1100m SSW	Infiltration into local soil structure to superficial ground-water migrating in a W-NW direction	Amenity impacts from contamination of the ground-water abstracted locally (1 – 2km). Ecosystem impacts in surface waters from contamination	*Major* (Contaminated groundwater affecting abstraction bores used for domestic and agricultural purposes could last for many years and result in actual loss of property value; both are considered as high level impacts to amenity)	*Rare* Given the proposed controls and infrastructure design, the potential consequence is only considered possible in exceptional circumstances)	***Medium*** Acceptable subject to controls	Due to the design and the likelihood of rainfall severe enough to impact on embankments, the contamination of groundwater is considered to be a rare consequence The Licence Holder has the following controls in place: • The lining systems for both CC2 and the Cristal Pond incorporate erosion protection for the drainage sand by way of a 100mm layer of crushed builder's rubble. • The storm water management system for the Premises includes bunding and periodic downpipes to direct storm water away from CC2 and the Cristal Pond. • Weekly inspections of pond and cell embankment condition, and drains/trenches for any sediment accumulation. • Inspections following rainfall events • Maintenance or repair of any damage if observed during inspections.

Decision

The Delegated Officer has considered the Existing Licence and the risk assessment in Table 5 and Table 6 and has determined that the Application to construct CC2 and the Cristal Pond is acceptable subject to regulatory controls.

Due to a low risk rating, the Delegated Officer does not consider conditions necessary for the control of noise from the construction or future operation of CC2 and the Cristal Pond. Regulatory controls are suitable to mitigate the remaining environmental risks which were assessed as having a medium risk rating.

All amendments and/or controls are explained below, including administrative amendments being made which are necessary but not directly related to the risk assessment, amendments being made which are relevant because of the risk assessment, and recommended future amendments to the Licence which are relevant because of the risk assessment but cannot be included until the completion of construction and submission of a compliance document to DWER which satisfies the Delegated Officer.

Attempts have been made to keep amendments relating to CC2 and the Cristal Pond as separate from existing conditions, to enable ease of removal after the completion of all phases of works.

Administrative amendments

The following additional amendments have been made to the licence which are administrative and not directly related to a risk assessment:

Conditions relevant to construction phase approved under this Amendment Notice:

- Definition added for “CC2” (including delineation between stage 1 and 2)
- Definition added for “Cristal Pond”
- Existing definition for “Works” modified to “Landfill Cell Works”
- Separate definition added for “Cristal Pond and CC2 Works”
- Modification to condition 1.3.1 and 3.3.2 to clearly delineate “Landfill cell 6 – 8 Works” from “Cristal Pond and CC2 Works”
- Schedule 2; Plans 13 – 22 are added showing various aspects of the Cristal pond and CC2 works as referred to in conditions

Future conditions considered for operational phase (subject to completion of construction and submission of a compliance document that demonstrates compliance with licence conditions):

- Existing controls on the licence relevant to the MIC Cell will be revised to include “CC2”
- Existing controls on the licence relevant to the MIC Cell Leachate Pond will be revised to also relate to the “Cristal Pond”
- Condition 1.4.4 of the Existing Licence will be updated to reflect the new cell CC2 and the new Cristal Pond
- The overall Premises Map will be updated to include the Cristal Pond, CC2 (stage 1 and stage 2) and associated infrastructure

Construction – Fugitive dust

Conditions relevant to construction phase approved under this Amendment Notice:

- A condition (1.4.13) on the Existing Licence already requires active fugitive dust suppression measures. This condition currently excludes the area labelled “J & P Corporation Pty Ltd management area” on Premises Map 1, which coincides with the area of works for CC2 and the Cristal Pond. Premises Map 1 has been amended so that this area is no longer excluded from dust conditions, as it is applicable to the construction activities.
- A condition (3.1.2) on the Existing Licence already requires the maintenance of a complaints management system. The condition is applicable to any complaints received during the construction period and does not require amendment.

Operation – Slurry or leachate spillage to ground during unloading

Conditions relevant to construction phase approved under this Amendment Notice:

- A new condition has been added to the Licence which requires the construction of CC2 and Cristal Pond related infrastructure to be in accordance with the key specifications proposed in the Application. All specifications are presented in a table linked to the condition, and include the requirement to construct a sealed concrete apron surrounded by a bund for the use of trucks unloading Cristal pigment slurry to CC2.
- An additional condition will also require the submission of a construction compliance document and a construction quality assurance validation report to verify that each of Phase 1, Phase 2 and Phase 3 works to complete the Cristal Pond and CC2 were done in accordance with the Licence requirements.

Future conditions considered for operational phase (subject to completion of construction and submission of a compliance document that demonstrates compliance with licence conditions):

- The Licence will be amended by the addition of a condition which requires the unloading of Cristal pigment waste to occur on the sealed concrete apron.

Accidental spillages which occur despite the abovementioned controls would also be subject to the regulation through the *Environmental Protection (Unauthorised Discharges) Regulations 2004*.

Operation – Fugitive dust lift-off from CC2 surface

Future conditions considered for operational phase (subject to completion of construction and submission of a compliance document that demonstrates compliance with licence conditions):

- A condition (1.4.4) on the Existing Licence already requires the maintenance of Cristal pigment slurry within the MIC Cell in a damp state. This condition will be amended to also include CC2.
- A condition (1.4.13) on the Existing Licence already requires active fugitive dust suppression measures. This condition will inherently apply to the management of dust from the surface of CC2, after the removal of the mention of exclusion zone for the area labelled “J & P Corporation Pty Ltd management area” on Premises Map 1.

If dust emissions occur despite the above controls, the general provisions of the EP Act may also be used to regulate pollution or environmental harm.

Operation – Seepage or overflow of leachate from CC2 or the Cristal Pond (including transfer, storage and seismic events)

Conditions relevant to construction phase approved under this Amendment Notice:

- A new condition has been added to the Licence which requires the construction of CC2 (stage 1 and stage 2) and Cristal Pond related infrastructure to be in accordance with the specifications that were proposed in the Application. All specifications are presented in a table linked to the condition and are relevant to the size of the proposal and the associated leachate risks, including (but not limited to):
    - adequate sizing of containment (overflow risks);
    - batter slopes (containment integrity);
    - lining systems (leakage risks);
    - pump capacities (overflow risks); and
    - storm water management (overflow risks).
- A condition has also been added for the submission of a construction compliance document and a construction quality assurance validation report to verify that Phase 1, Phase 2 and Phase 3 works to complete the Cristal Pond and CC2 were done in accordance with the Licence requirements.

Future conditions considered for operational phase (subject to completion of construction and submission of a compliance document that demonstrates compliance with licence conditions):

- A condition (1.2.1) on the Existing Licence requires the maintenance of a storm water management system, which includes the requirement for clean storm water not to be directed to the MIC Cell. This condition will be revised after the completion of Phase 1 works to require stormwater to also be directed away from CC2 and the Cristal Pond.
- A condition (1.4.4) on the Existing Licence already requires the maintenance of all leachate pipes, drains, gravity feeds and sumps to be free of leaks, blockages or other defects in relation to the MIC Cell. This condition will be amended to also apply to CC2.
- A condition (1.4.3) on the Existing Licence already regulates how the disposal of “liquid waste” (Cristal pigment waste) should be disposed of at the Premises. This condition will be amended to reflect the new Cristal pond, CC2 (stage 1) and CC2 (stage 2) and include a number of operational control as relevant at each stage:
    - Following a storm, the contents of the Cristal Pond will be pumped to remove storm volume within a maximum four day period to minimize overtopping risk;
    - Daily inspections of pond levels, maintenance of levels below the maximum operating level (MOL)
    - Maintenance of at least 1m freeboard in the Cristal Pond under normal operating conditions;
    - Maintenance of at least 1.8m freeboard in CC2 (stage 1 only) under normal operating conditions;
    - Maintenance of at least 1.7m freeboard in CC2 (stage 2 completed) under normal operating conditions;
- Two conditions (2.4.1 and 2.4.2) on the Existing Licence already require the monitoring of groundwater bores at the Premises for a range of contaminants. These conditions are relevant to the risk of leachate escape but are considered adequate and should not require any change after completion of works.

Licence Holder's comments

The Licence Holder was provided with the draft Amendment Notice on 07 December 2018. Comments received from the Licence Holder on 17 January 2019 have been considered by the Delegated Officer as shown in Appendix 2.

Amendment

1. Definitions of the Licence are amended by insertion of the red text shown in underline below:

   'CC2' refers to the proposed Cristal pigment slurry disposal cell whose construction and resulting structure will be divided two stages, in the areas labelled 'Cristal Cell 2 stage 1' and 'Cristal Cell 2 stage 2' in Plans 13 and 14 in Schedule 2 of the Licence;

   'Cristal Pond' refers to the proposed pond for the collection and storage of leachate (underdrainage and supernatant water) collected from the MIC Cell and CC2, labelled 'Cristal Pond' in Plans 13 and 14 in Schedule 2 of the Licence;

   'Landfill Cell Works' means the construction of landfill cells 6, 7 and 8 as detailed in Condition 1.3.1, Table 1.3.1 and depicted in the Plans 1 through 8 in Schedule 2 of the Licence.

   'Cristal Pond and CC2 Works' means the construction of the Cristal Pond and CC2 stage 1 and stage 2 as detailed in Condition 1.3.4, Table 1.3.3 and depicted in Plans 13 and 14 in Schedule 2 of the Licence.

2. Condition 1.3.1 of the Licence is amended by insertion of the red text shown in underline below:

   1.3.1 The Licence Holder must undertake the Landfill Cell Works and ensure that the infrastructure specified in Column 1 of Table 1.3.1 meet or exceed the specifications in Column 2 of Table 1.3.1 for the infrastructure in each row of Table 1.3.1.

3. The Licence is amended by insertion of the following Conditions 1.3.4 and 1.3.5, and associated Table 1.3.3:

   1.3.4 The Licence Holder must undertake the Cristal Pond and CC2 Works and ensure that the infrastructure specified in Column 1 of Table 1.3.3 meet or exceed the specifications in Column 2 of Table 1.3.3 for the infrastructure in each row of Table 1.3.3.

   1.3.5 The Licence Holder must not depart from the specifications in Table 1.3.3 except:
   (a) where such departure is minor in nature and does not materially change or affect the infrastructure; or
   (b) where such departure does not increase risks to public health, public amenity or the environment;
   and all other Conditions in this Licence are still satisfied.

Table 1.3.3: Cristal Pond and CC2 Works specifications	
Column 1	**Column 2**
Infrastructure	**Specifications (design and construction)**
1: Phased construction	Construction will be completed in three phases which will require separate commissioning as follows: (a) Phase 1: complete the Cristal pond (earthworks, liner and associated return water system); (b) Phase 2: bulk earthworks for CC2, and completion of CC2 stage 1 (including composite lining system, concrete works, decant infrastructure and slurry delivery pipelines); and (c) Phase 3: completion of CC2 stage 2 (including composite lining system and slurry delivery pipelines).
2: Overall arrangement Cristal Pond	The Cristal Pond must be constructed to meet the arrangement shown in Plan 14 of Schedule 2, and must: (a) Have holding capacity of at least 19,000m^3; (b) Be adequately sized to contain a 1 in 20 (5%) ARI rainfall event plus the 90th percentile wet season while maintaining an additional 0.5m freeboard (total freeboard of at least 1.0m above the maximum operating level); (c) Be lined with HDPE / geosynthetic clay layer (GCL) composite liner consistent with infrastructure item 5; (d) Achieve a minimum separation distance of 2 metres from its lowest floor level to the highest seasonal groundwater table; (e) Have upstream and downstream batter face angles not steeper than 1V:3H (18°); (f) Include a return water system which enables the receipt of supernatant water and rainfall collected from the surface of the MIC cell and CC2 via the decant water system (infrastructure item 7), leachate underdrainage from CC2 via the leachate collection system (infrastructure item 6), and any intercepted groundwater or seepage intercepted via the under-liner pressure relief system (infrastructure item 8); (g) Include a water recovery system which connects the Cristal pond to the existing MIC Leachate Pond and leachate storage tanks, enabling the transfer of the Cristal Pond contents for transfer off the Premises; (h) Include a new indicator tank linked to the existing leachate tanks, equipped with a float which is clearly visible from the Cristal Pigment slurry unloading position; (i) Have all visible pipelines associated with the return water system and the water recovery system able to be isolated with shut-off valves which are bunded; and (j) Automatic pumps with level sensors enable the automatic removal of supernatant water from the Cristal Pond to the existing MIC Cell Leachate Pond when maximum operating levels are reached.
3: Overall arrangement CC2	CC2 must be constructed to meet the arrangement shown in Plan 15 of Schedule 2 and must: (a) Be divided into two stages for construction and commissioning, as depicted in Plan 15 of Schedule 2; (b) Have a holding capacity 350,000m^3; (c) Be adequately sized to contain 1 in 100 (1%) ARI rainfall event while maintaining a 0.5m freeboard (total freeboard of at least 1.8m above the maximum operating level); (d) Achieve a minimum separation distance of 2 metres from its lowest floor level to the highest seasonal groundwater table; (e) Have upstream and downstream batter face angles not steeper than 1V:3H (18°); (f) Be lined with HDPE / geosynthetic clay layer (GCL) composite liner consistent with infrastructure item 5;

Table 1.3.3: Cristal Pond and CC2 Works specifications	
Column 1	**Column 2**
Infrastructure	**Specifications (design and construction)**
	(g) Include a dedicated concrete-lined and bunded unloading area for vehicles carrying Cristal pigment slurry fit for the purpose of preventing the possibility of spillage or overflow to the environment during unloading; (h) Include a slurry transfer system comprised of pipelines that can direct Cristal pigment slurry directly from the concrete unloading area to the perimeter of CC2 and into one of at least 5 spigots suitably located as shown in Plan 13 of Schedule 2, to distribute slurry that forms a beach within CC2 which gently slopes towards the western embankment (for supernatant water collection); (i) Include a leachate collection system consistent with infrastructure item 6; and (j) Include a decant water system consistent with infrastructure item 7.
4: CC2 and Cristal Pond earthworks	CC2 and the Cristal Pond must comprise of earthworks and sub-base preparation in accordance with the following physical controls and limits: (a) Foundation and embankment materials must be compacted to a minimum of 95% Standard Maximum Dry Density in accordance with AS 1289.5.1.1; (b) fill compacted in layers <300 mm; (c) all earthworks relating to the Cristal Pond and CC2 accompanied by level 1 geotechnical testing, as per AS 3798; and (d) all earthworks inspected, approved and reported on by a geotechnical engineer, including final construction quality assurance.
5: CC2 and Cristal Pond composite liner system	The Cristal Pond and CC2 must be constructed to include a composite lining system that meets the following specifications: (a) Consists of a high density polyethylene (HDPE) geomembrane overlying a geosynthetic clay layer (GCL), over a layer of compacted subgrade; (b) The lining systems described in (a) cover the entire floor and internal walls of the Cristal Pond and CC2, up to the backfill anchor trench, as shown in Plan 19 and Plan 20 of Schedule 2; (c) The base of CC2 also includes an under-liner pressure relief system and an over-liner drainage collection system (refer to infrastructure items 6 and 8 for further detail); (d) The HDPE geomembrane layer is at least 2mm thick, and manufactured from virgin first-quality polyethylene resin with a minimum density of 0.932g/cm^3 and shall not contain more than 2% clean recycled polymer by weight; (e) The HDPE geomembrane layer and all joins are fit for purpose, placed without damage, and with panel overlaps of at least 75mm; (f) The GCL layer comprises at least 2 layers of geotextile encapsulating and needle punched across a layer of dry bentonite (layer comprising at least 80% activated sodium bentonite by weight), and is thermally locked; (g) The GCL layer and all joins are fit for purpose, placed without damage, and with panel overlaps of at least 300mm; and (h) Design seepage rate through basal lining systems does not exceed 10L/ha/day (0.365L/m^2/year).
6: CC2 leachate collection system	The CC2 composite lining system is overlain by a leachate collection system to enable the collection of leachate from the base of CC2 for transfer to the MIC Cell Leachate Pond (linked to the Cristal Pond), and must adhere to the following: (a) Comprise geotextile wrapped 90mm perforated plastic pipes embedded within a 400mm sand filtration layer which is protected by a 100mm layer of drainage aggregate (as shown in Plan 22 of Schedule 2); (b) All sand used in the filtration layer with particle size between 0.075mm to 35mm; (c) All aggregate used in the drainage aggregate layer has a particle size not

Table 1.3.3: Cristal Pond and CC2 Works specifications	
Column 1	**Column 2**
Infrastructure	**Specifications (design and construction)**
	exceeding 100m; (d) Perforated leachate collection pipes are arranged in rows over the base of CC2 stage 1 and CC2 stage 2 composite liners as shown in Plan 21 of Schedule 2, with adjacent rows positioned no greater than 25m apart; (e) Leachate is gravity fed to two sumps (one in CC2 stage 1 and one CC2 stage 2) each fitted with pumps able to transfer 7.2m^3 of leachate per hour to the MIC Cell Leachate Pond; and (f) All visible pipelines are able to be isolated with shut-off valves which are bunded.
7: CC2 decant water system	CC2 must include a decant water system to enable the collection and transfer of supernatant water and rainfall that collects on the surface of CC2 as follows: (a) A submersible centrifugal pump with a floating intake system and a capacity of 125m^3/hr is positioned as shown in Plan 13 of Schedule 2 to collect supernatant water and rainwater from the surface of CC2 and transfer it to the Cristal Pond; (b) The capacity of the pump and pipeline infrastructure is sufficient to achieve a return rate of at least 110,000m^3 per annum, plus additional capacity for rainwater. (c) All visible pipelines are able to be isolated with shut-off valves which are bunded.
8: CC2 under-liner pressure relief	Under-liner pressure relief system to detect unexpected seepage and/or encroachment of groundwater levels under CC2 must: (a) Be comprised of an arrangement of perforated 110mm pipes in the base of CC2 stage 1 and CC2 stage 2, underneath the composite liner system, which direct any liquid captured to a sump within the geocomposite drainage zone in the eastern embankments of CC2 as shown in Plan 17 and Plan 18 of Schedule 2); and (b) A pump is installed in the sump which is fit for purpose to pump any liquid captured directly to the Cristal Pond, as shown in Plan 17 of Schedule 2.
9: Construction quality assurance	The construction of the Cristal Pond and CC2 and associated infrastructure must be undertaken in accordance with the following construction quality assurance practices: (a) All damage to any liner materials must be fully repaired (b) Level 1 inspection and testing as per AS 3798 for the following: (i) completion of removal of topsoil; (ii) placing of imported or cut material; (iii) compaction and adding/ removal of moisture; (iv) trenching and backfilling; (v) test rolling; and (vi) testing. (c) Compaction testing as per AS 1289.5.1.1; (d) Post liner construction leachate drainage layer leak detection testing; (e) an independent third party must verify construction quality assurance of the composite lining system of the Cristal Pond and CC2 as specified in Infrastructure Item 5 of Table 1.3.3 in the Licence; and (f) all quality control testing, unless specified otherwise, shall be carried out by a laboratory holding current NATA accreditation for all test methods referred to or required.
10: Storm water management	The storm water management system for the construction and operation of the Cristal Pond, CC2 stage 1 and CC2 stage 2 must: (a) be consistent with stormwater management required by Condition 1.2.1 of the Licence. (b) ensure all excavation and construction earthworks control stormwater using drains,

Table 1.3.3: Cristal Pond and CC2 Works specifications	
Column 1	**Column 2**
Infrastructure	**Specifications (design and construction)**
	bunds and the grading of surfaces. (c) ensure stormwater arising within the excavations is directed to stormwater pond/s sized to accommodate a 1 in 100 year, 24-hour storm event (132 mm). (d) Surface water management drains and culverts for the direction of storm water to the stormwater pond/s must be sized to accommodate a 1 in 20 ARI storm event or greater, without overtopping.

4. Condition 1.4.13 of the Licence is amended by deletion of the text shown in strikethrough below:

1.4.13 The Licence Holder must actively manage fugitive dust emissions on the Premises~~, except within the J & P Corporation Pty Ltd management area~~, by:
(a) application of dust suppressant chemicals;
(b) application of stormwater or leachate via a sprinkler system or water cart to the active tipping area;
(c) application of stormwater via a water cart;
(d) sealing of roads; and/ or
(e) use of a street sweeper.

5. Condition 3.3.2 of the Licence is amended by insertion of the red text shown in underline below:

3.3.2 The Licence Holder must submit a Construction Compliance Document to the CEO, following the construction of each landfill cell 6, 7 and 8 of the Landfill Cell Works:
(a) prior to the placement of any waste in the landfill cell; and
(b) excluding Landfill Cell Works specific to Condition 1.3.1 infrastructure item 4.

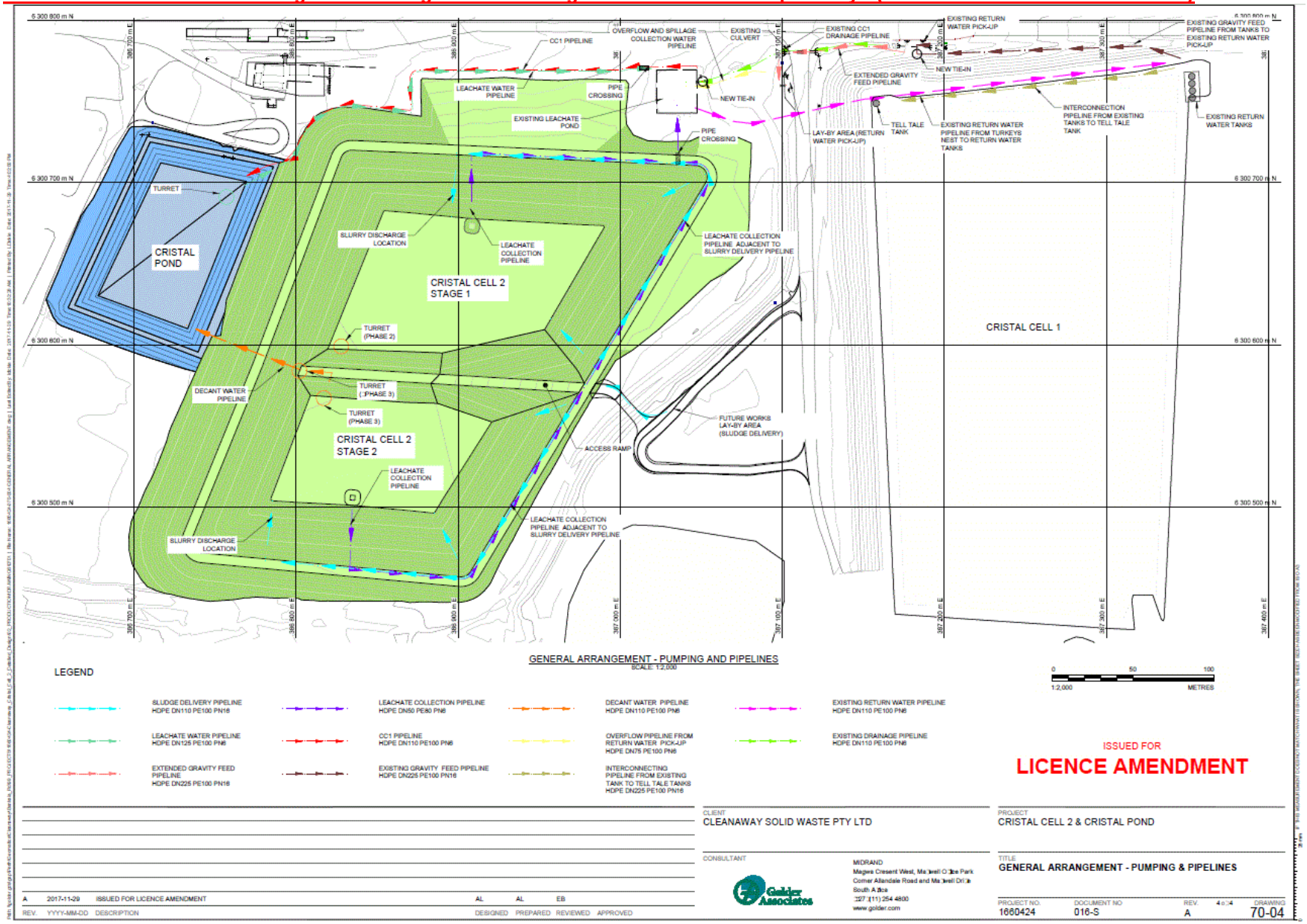
6. The Licence is amended by insertion of the following Condition 3.3.5:

3.3.5 The Licence Holder must submit a construction compliance document to the CEO following the construction of each Phase 1, 2 and 3 of the Cristal Pond and CC2 Works, that:
(a) includes a detailed description addressing how each as-constructed item of infrastructure and equipment meets the applicable specifications in Table 1.3.3, as required by Condition 1.3.4;
(b) includes a description of, and explanation for, any departure from the applicable specifications in Table 1.3.3 including how the departure complies with Condition 1.3.5;
(c) contains as-constructed plans for the applicable phase of Cristal Pond and CC2 Works;
(d) contains photographs of the applicable phase of works to support the descriptions provided under (a);
(e) is signed by a person authorised to represent the Licence Holder and contains the printed name and position of that person within the company; and
(f) is accompanied by a construction quality assurance validation report that:

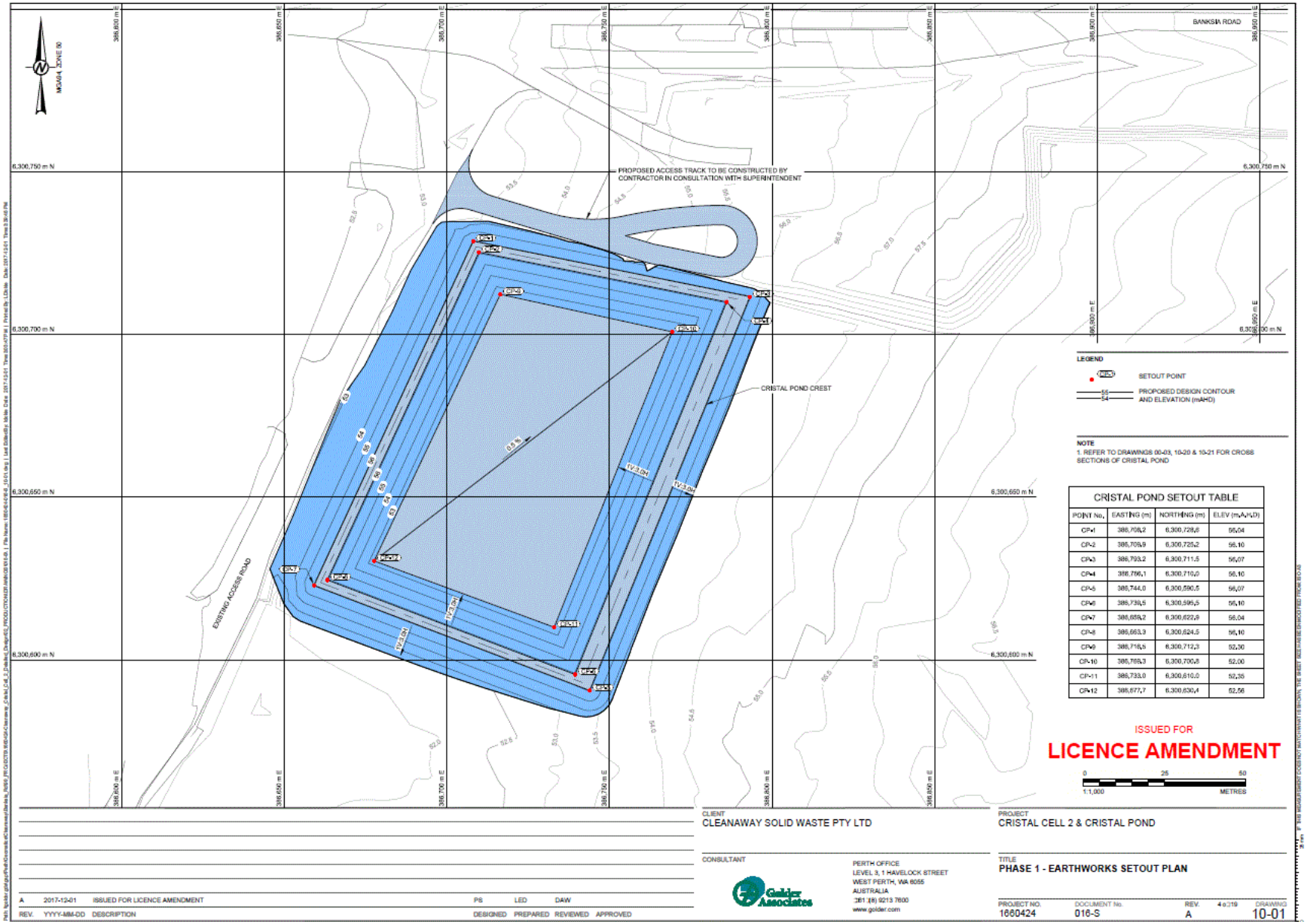
i. is written and certified by a suitably qualified, independent, third party professional engineer that has undertaken construction quality assurance on the completed Cristal Pond and CC2 Works;
ii. confirms the details reported by the Works Approval Holder under (a) and (b); and
iii. is signed by the suitably qualified independent third party professional engineer and contains the printed name, position and company of that person.

7. The Licence is amended by the insertion of Plans 13 through 22 in Schedule 2.

Plan 13: Cristal Pond and CC2 general arrangement showing leachate and decant pathways (Source: Golder Associates 2017)



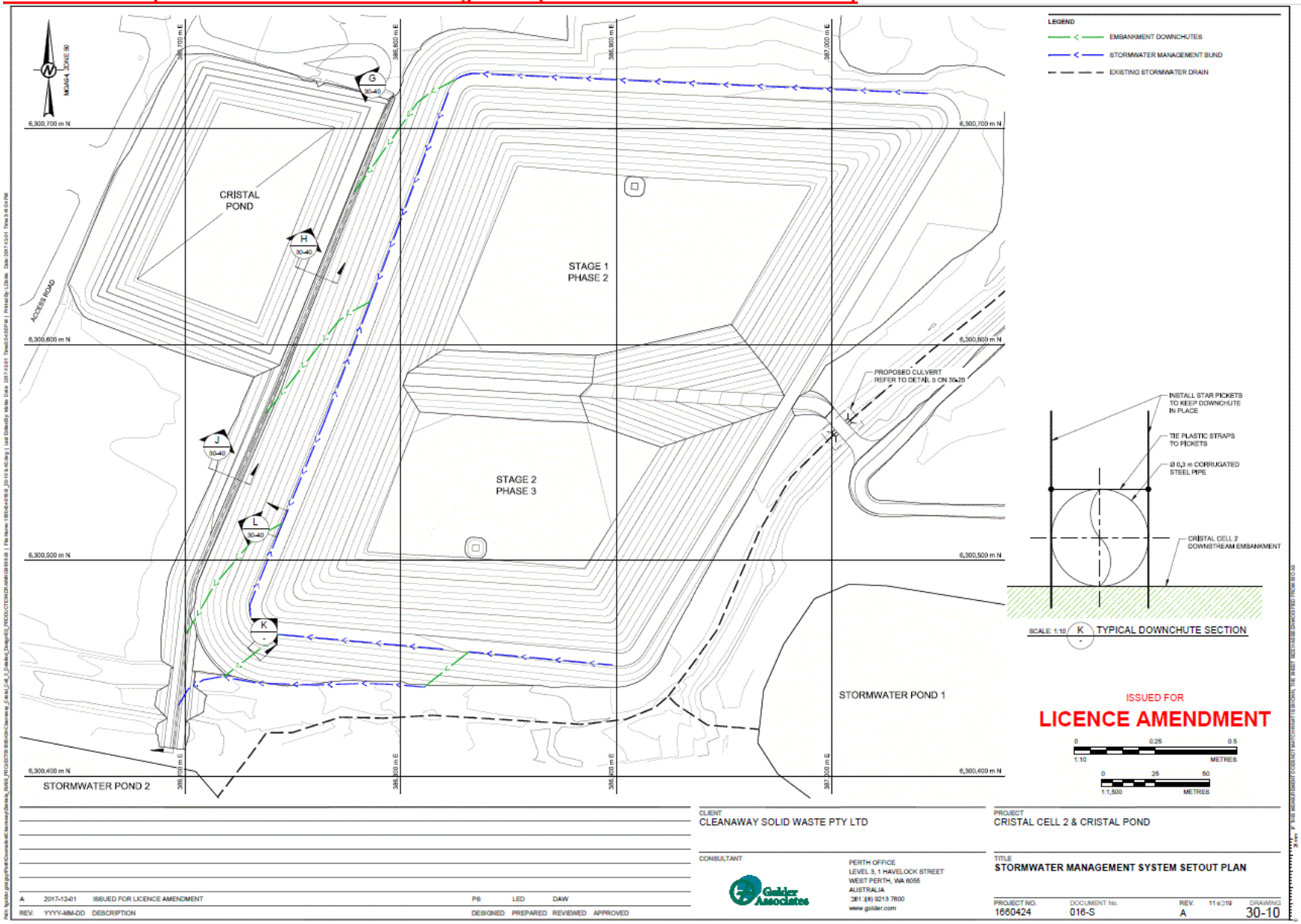
Plan 14: Cristal Pond earthworks plan (Source: Golder Associates 2017)



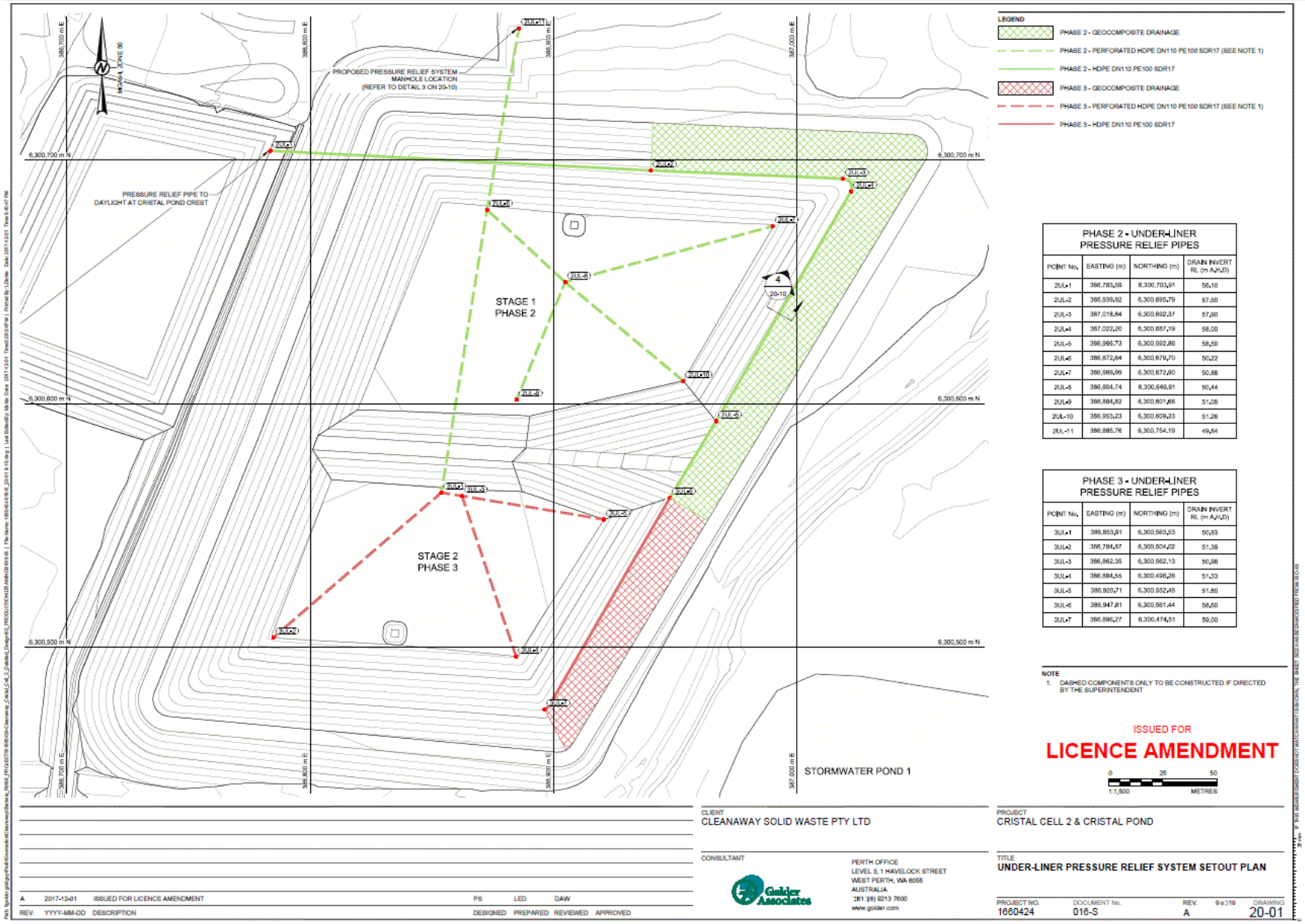
Plan 15: CC2 Stage 1 and Stage 2 earthworks plan (Source: Golder Associates 2017)

Licence: L8904/2015/1

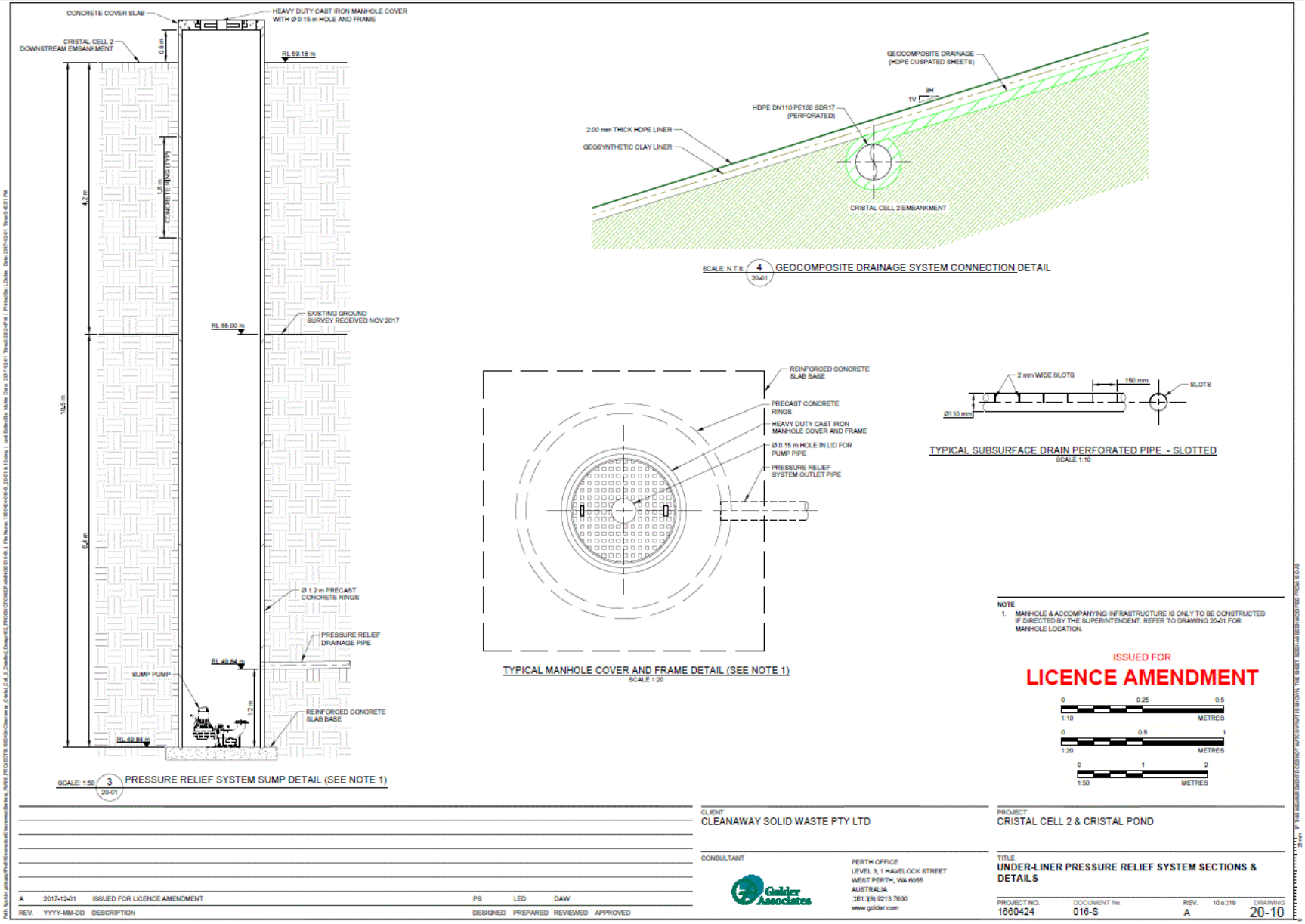
Plan 16: Cristal pond and CC2 stormwater management (Source: Golder Associates 2017)



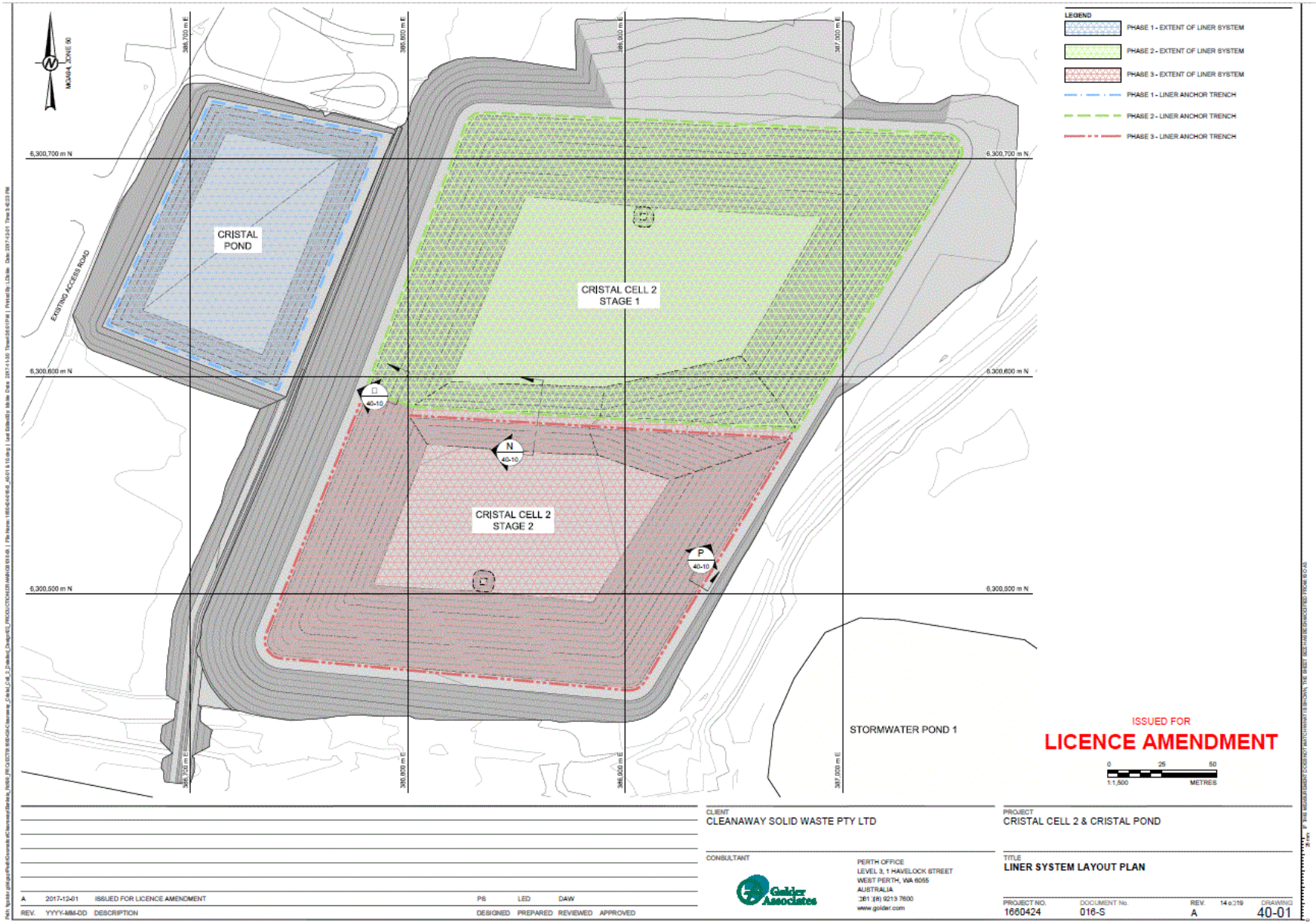
Plan 17: CC2 under-liner pressure relief system arrangement (Source: Golder Associates 2017)



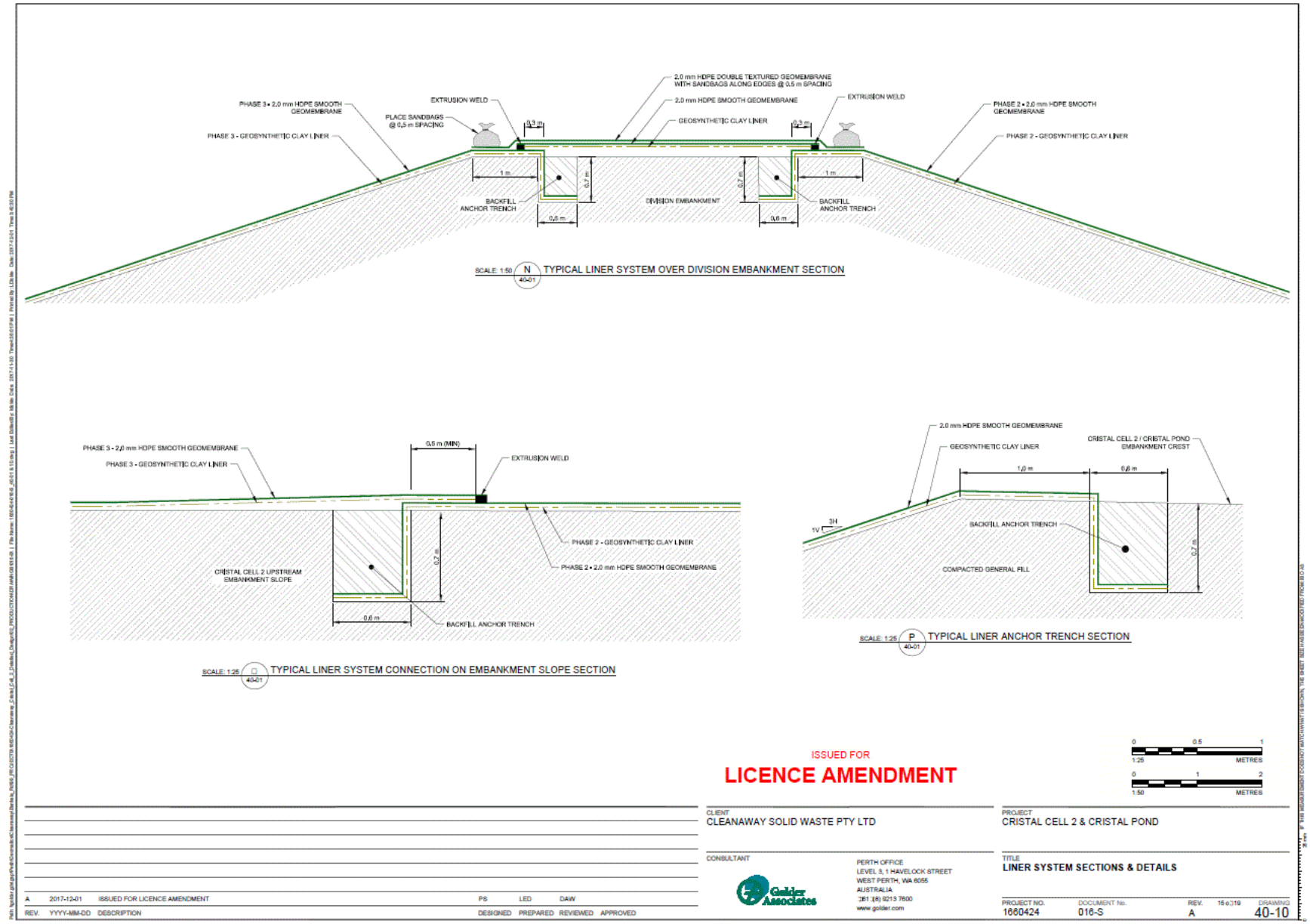
Plan 18: CC2 under-liner pressure relief system pipework detail (Source: Golder Associates 2017)



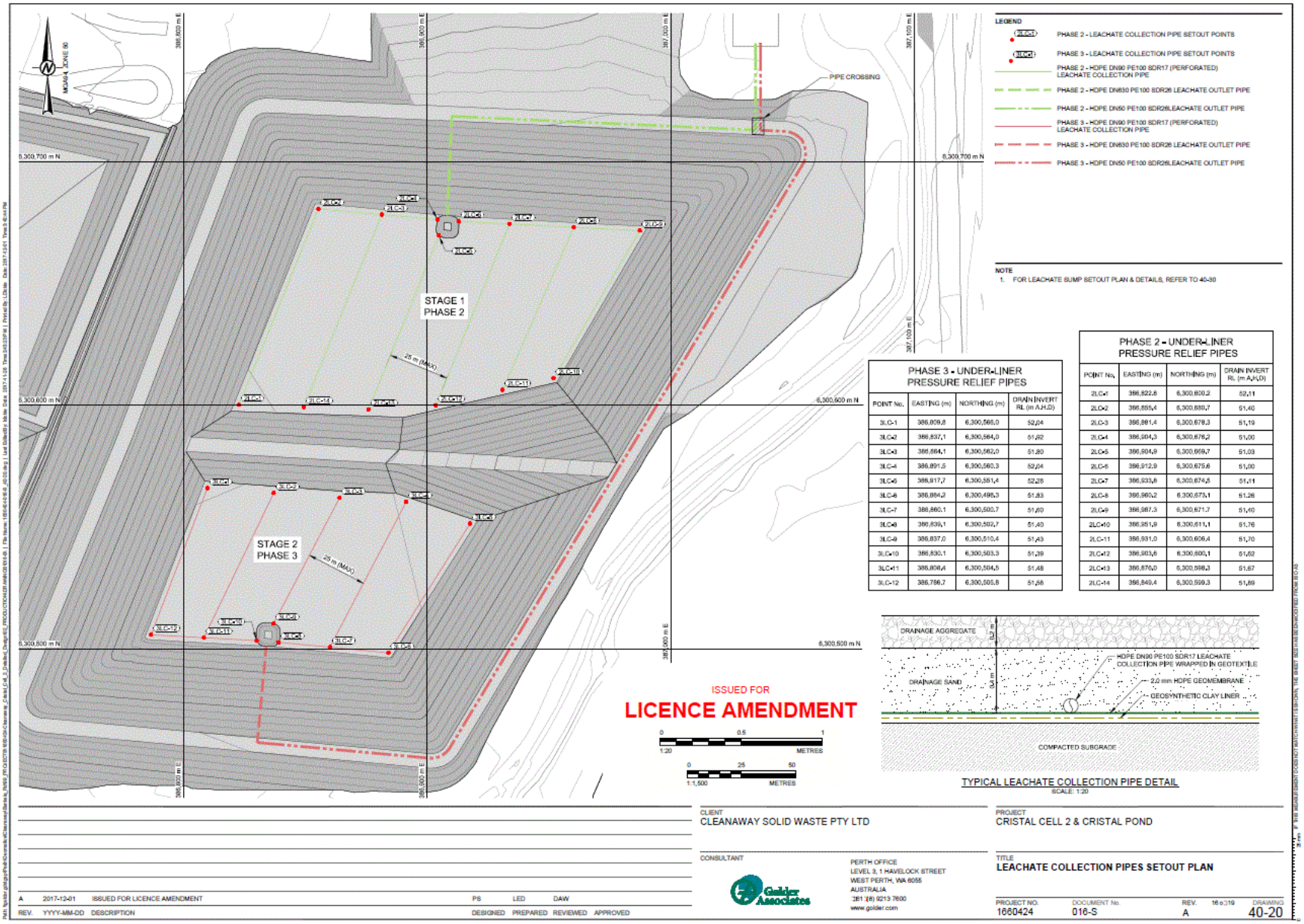
Plan 19: Cristal pond and CC2 liner system extents (Source: Golder Associates 2017)



Plan 20: Cristal pond and CC2 liner system section detail (Source: Golder Associates 2017)



Plan 21: CC2 over-liner leachate collection system arrangement (Source: Golder Associates 2017)



PHASE 3 - UNDER-LINER PRESSURE RELIEF PIPES

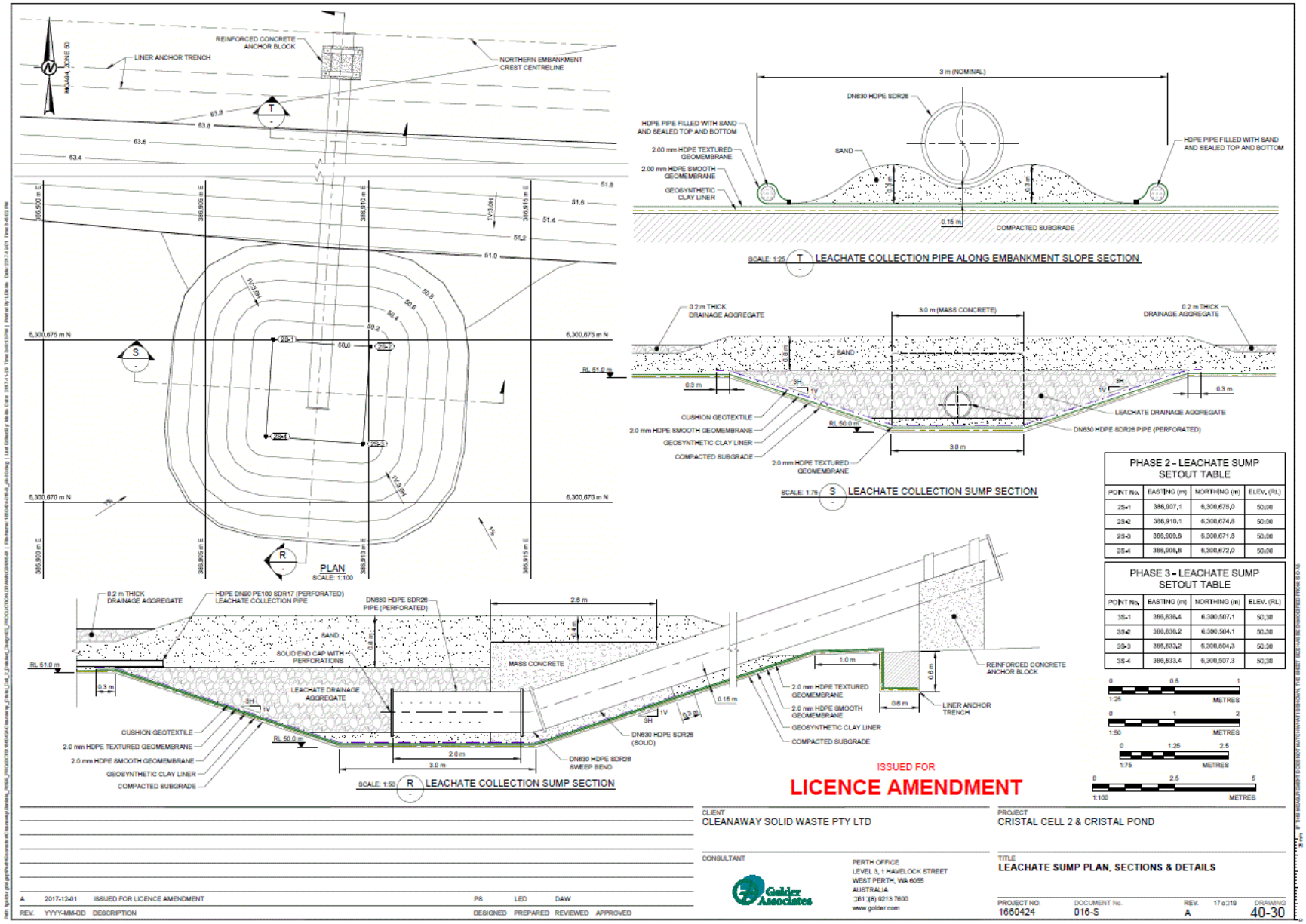
POINT No.	EASTING (m)	NORTHING (m)	DRAIN INVERT RL (m A.H.D)
3LC-1	386,809.8	6,300,566.0	52.04
3LC-2	386,837.1	6,300,564.0	51.92
3LC-3	386,864.1	6,300,562.0	51.80
3LC-4	386,891.5	6,300,560.3	52.04
3LC-5	386,917.7	6,300,551.4	52.28
3LC-6	386,854.2	6,300,495.3	51.83
3LC-7	386,860.1	6,300,500.7	51.80
3LC-8	386,839.1	6,300,502.7	51.40
3LC-9	386,837.0	6,300,510.4	51.43
3LC-10	386,830.1	6,300,503.3	51.39
3LC-11	386,808.4	6,300,504.5	51.48
3LC-12	386,786.7	6,300,505.8	51.56

PHASE 2 - UNDER-LINER PRESSURE RELIEF PIPES

POINT No.	EASTING (m)	NORTHING (m)	DRAIN INVERT RL (m A.H.D)
2LC-1	386,822.8	6,300,600.2	52.11
2LC-2	386,855.4	6,300,680.7	51.40
2LC-3	386,881.4	6,300,678.3	51.19
2LC-4	386,904.3	6,300,676.2	51.00
2LC-5	386,904.9	6,300,669.7	51.03
2LC-6	386,912.9	6,300,675.6	51.00
2LC-7	386,933.6	6,300,674.5	51.11
2LC-8	386,960.2	6,300,673.1	51.26
2LC-9	386,987.3	6,300,671.7	51.40
2LC-10	386,951.9	6,300,611.1	51.76
2LC-11	386,931.0	6,300,606.4	51.70
2LC-12	386,903.6	6,300,605.1	51.62
2LC-13	386,876.0	6,300,598.3	51.67
2LC-14	386,849.4	6,300,599.3	51.69

Licence: L8904/2015/1

Plan 22: CC2 over-liner leachate collection system section detail (Source: Golder Associates 2017)



PHASE 2 – LEACHATE SUMP SETOUT TABLE

POINT No.	EASTING (m)	NORTHING (m)	ELEV. (RL)
2S-1	386,907.1	6,300,675.0	50.00
2S-2	386,910.1	6,300,674.8	50.00
2S-3	386,909.8	6,300,671.8	50.00
2S-4	386,906.8	6,300,672.0	50.00

PHASE 3 – LEACHATE SUMP SETOUT TABLE

POINT No.	EASTING (m)	NORTHING (m)	ELEV. (RL)
3S-1	386,836.4	6,300,507.1	50.30
3S-2	386,836.2	6,300,504.1	50.30
3S-3	386,833.2	6,300,504.3	50.30
3S-4	386,833.4	6,300,507.3	50.30

Licence: L8904/2015/1

Appendix 1: Key documents

	Document title	In text ref	Availability
1.	'License amendment application – Cleanaway Solid Waste Pty Ltd – Banksia Road Landfill Site', Golder Associates, 1 December 2017 • Completed licence amendment application form; • Attachment 1A – 10 year lease agreement between Lessor J & P Corporation Pty Ltd and Lessee Cleanaway Solid Waste Pty Ltd commencing 1 September 2016; • Attachment 2 – Premises maps; • Attachment 3A – Part 3. Proposed Activities (Golder Associates, December 2017); • Attachment 4 – Copy of email consultation between Cleanaway Solid Waste Pty Ltd and Shire of Dardanup; • Attachment 6A – Emissions and Discharges (Golder Associates, December 2017); • Attachment 6B – Waste Acceptance (Golder Associates, December 2017); • Attachment 7 – Siting and Location (Golder Associates, December 2017); • 'Cleanaway Banksia Road Waste Management Facility Cristal Cell 2 and Associated Leachate Pond Design'. (Golder Associates, December 2017); • 'Geotechnical and Hydrogeological Report, Cristal Cell 2, Banksia Road Landfill, Dardanup' (Golder Associates, March 2017); • 'Cleanaway Banksia Road Waste Management Facility Cristal Cell 2 and Cristal Pond Works Specifications'. (Golder Associates, November 2017); • 'Cleanaway Banksia Road Waste Management Facility, Cristal Cell 2 and Cristal Pond Construction Quality Assurance Plan'. (Golder Associates, November 2017); • 'Cleanaway Banksia Road Waste Management Facility, Cristal Cell 2 and Cristal Pond Safety in Design'. (Golder Associates, November 2017); and • 'Cleanaway Solid Waste Pty Ltd - Banksia Road Landfill, CC2 and Cristal Pond Operations Environmental Management Plan'. (Golder Associates, December 2017).	Application	DWER records (A1572744)
2.	Works Approval W5096/2012/1 – Banksia Road Putrescible Landfill	W5096/2012/1	accessed at www.dwer.wa.gov.au
3.	DER, July 2015. Guidance Statement: Regulatory Principles. Department of Environment Regulation, Perth.	DER 2015a	accessed at www.dwer.wa.gov.au
4.	DER, October 2015. Guidance Statement: Setting Conditions. Department of Environment Regulation, Perth.	DER 2015b	
5.	DER, November 2016. Guidance Statement: Risk Assessments. Department of Environment Regulation, Perth.	DER 2016a	
6.	DER, November 2016. Guidance Statement: Decision Making. Department of Environment Regulation, Perth.	DER 2016b	

Appendix 2: Summary of Licence Holder comments

The Licence Holder was provided with the draft Amendment Notice on 7 December 2018 for review and comment. The Licence Holder responded on 17 January 2019. The Licence Holder accepted the proposed Licence Amendment conditions with no further comment.