Government of Western Australia
Department of Water and Environmental Regulation

Revised Works Approval

Works approval number	W6875/2023/1
Works approval holder	Perdaman Chemicals and Fertilisers Pty Ltd
ACN	121 263 741
Registered business address	Alluvion Building Level 18, 58 Mounts Bay Road PERTH WA 6000
DWER file number	INS-0002713 | APP-0035506
Duration	25/06/2024 to 25/06/2028
Date of issue	25/06/2024
Date of amendment	20/05/2026
Premises details	Project Ceres Part of Lot 700 on Plan 411759, Part of Lot 701 on Plan 411760, Part of Lot 706 on Plan 411760, Part of Lot 3013 on Plan 42282, Part of Lot 3014 on Plan 42282, Part of Lot 566 on Plan 28209, Part of Lot 567 on Plan 28209, Part of Lot 568 on Plan 28209, Part of Lot 571 on Plan 28209, Part of Lot 573 on Plan 28209, Part of Lot 581 on Plan 72793, Part of Lot 598 on Plan 77655, Part of Lot 599 on Plan 77665, Part of Lot 640 on Plan 29300, Part of Lot 644 on Plan 28840, Part of Lot 3000 on Plan 77070 and Part of Lot 3003 on Plan 4121422 BURRUP WA 6714 As shown in the premises maps in Schedule 1 and defined by the coordinates in Schedule 2.

Prescribed premises category description (Schedule 1, *Environmental Protection Regulations 1987*)	**Assessed production capacity**
Category 31: Chemical manufacturing	Urea: 6,200 tonnes per day (2.263 million tonnes of granulated product per annual period) Ammonia: 3,500 tonnes per day
Category 52: Electric power generation	101MWe
Category 58: Bulk material loading or unloading	2,200 tonnes per hour (2.263 million tonnes per annual period)
Category 85: Sewage facility	40m^3/day

This revised works approval is granted to the works approval holder, subject to the attached conditions, on 20 May 2026 by:

Karl Carrabotta
Digitally signed by Karl Carrabotta
Date: 2026.05.20 14:35:44 +08'00'

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

Works approval history

Date	Reference number	Summary of changes
25/06/2024	W6875/2023/1	Works approval granted.
20/02/2026	W6875/2023/1	Works approval amended authorising the commencement of commissioning and time limited operations.
20/05/2026	W6875/2023/1	CEO initiated amendment to correct clerical error on works approval.

Interpretation

In this works approval:

(a) the words 'including', 'includes' and 'include' in conditions mean "including but not limited to", and similar, as appropriate;

(b) where any word or phrase is given a defined meaning, any other part of speech or other grammatical form of that word or phrase has a corresponding meaning;

(c) where tables are used in a condition, each row in a table constitutes a separate condition;

(d) any reference to an Australian or other standard, guideline, or code of practice in this works approval:

  (i) if dated, refers to that particular version; and

  (ii) if not dated, refers to the latest version and therefore may be subject to change over time;

(e) unless specified otherwise, any reference to a section of an Act refers to that section of the EP Act; and

(f) unless specified otherwise, all definitions are in accordance with the EP Act.

NOTE: This works approval requires specific conditions to be met but does not provide any implied authorisation for other emissions, discharges, or activities not specified in this works approval.

Works approval conditions

The works approval holder must ensure that the following conditions are complied with:

General

Monitoring

1. The works approval holder must ensure that all monitoring equipment used on the premises to comply with the conditions of this Works Approval is calibrated, operated and maintained in accordance with the manufacturer's specifications.

2. The works approval holder must, where the requirements for calibration cannot be practicably met, or discrepancy exists in the interpretation of the requirements, bring these issues to the attention of the CEO accompanied with a report comprising details of any modifications to the methods.

3. The works approval holder must ensure that all continuous monitoring equipment used to comply with condition of this works approval is maintained so as to provide valid data for:

(a) greater than 90% of the measurement intervals in every calendar month, and

(b) greater than 95% of the measurement intervals over any 12 consecutive calendar months.

4. The works approval holder must ensure that all continuous monitoring equipment used to comply with condition(s) 35 and 52 is operated and calibrated in accordance with the CEMS Code and/or EN 14181 for the corresponding parameters as specified in Table 14.

Construction phase

Infrastructure and equipment

5. The works approval holder must:

(a) construct the infrastructure and equipment;

(b) in accordance with the corresponding design and construction requirements;

(c) at the corresponding infrastructure location; and

as set out in Table 1.

Table 1: Design and construction requirements

	Infrastructure	Design and construction requirements	Infrastructure location
1.	Ammonia plant	(a) Comprised of one ammonia train designed and constructed with autothermal reforming (ATR) technology; (b) The ammonia train shall include a gas Fired Heater; (c) Designed such that emissions from the Fired Heater shall be combined and discharged to atmosphere via a single Fired Process Heater & Fired Steam Superheat Common Stack that is at least 75 m high[1]; (d) The Fired Heater shall be fitted with low NOx burner designed to achieve a NOx concentration at the stack discharge point of 134mg/Nm^3 (referenced at 3% O_2, STP dry); (e) The Fired Process Heater & Fired Steam Superheat Common	Figure 3: General layout of Site C; Figure 7: Plan showing key infrastructure – Site C; Figure 8: Plan showing the location of infrastructure components,

	Infrastructure	Design and construction requirements	Infrastructure location
		Stack must be fitted with monitoring ports that meet the requirements of AS 4323.1; (f) A continuous emissions monitoring system shall be installed on the Fired Process Heater & Fired Steam Superheat Common Stack that: (i) monitors NO_2, SO_2 and CO; and (ii) adheres to the installation, calibration and operational quality controls of the CEMS Code; and (g) The ammonia train shall be designed and constructed such that there are no emissions of ammonia vented directly to atmosphere; (h) Designed and fitted with high integrity sealing on syngas and refrigeration compressors with a nitrogen barrier to minimise fugitive ammonia loss; (i) Designed and fitted with cryogenic wash units to minimise inerts and purging to fuel gas; (j) Compressors installed within the ammonia plant to be housed in partially enclosed compressor rooms; (k) The ammonia plant must include containment and bunding infrastructure (including storage tanks and containers) for the storage and containment of process condensates and other environmental hazardous materials to prevent discharge to the environment; (l) Designed and constructed to ensure that potentially contaminated stormwater is contained and directed to the Saline Water Pond; (m) Designed and constructed to ensure that potentially contaminated oily water is contained and directed to the oily water treatment unit (CPI); and (n) Installed with a dedicated Methyldiethanolamine (MDEA) containment and storage system to capture, segregate and contain potentially MDEA contaminated water within the ammonia plant for offsite removal.	exhaust stacks, vents and flares – Site C.
2.	Urea synthesis plant (2 units)	(a) Designed and constructed: (i) using Snamprogetti™ melt technology or equivalent; and (ii) such that emissions of ammonia from medium pressure vents are treated via a scrubbing system prior to discharge via the Granulator Stack(s); (b) Each urea synthesis unit shall include a Blowdown Vent stack ("Cold Vent Unit 2600" and "Cold Vent Unit 2700") that is at least 75 m high[1]; (c) The urea synthesis plants must include containment and bunding infrastructure (including storage tanks and containers) for the storage and containment of process condensates and other environmental hazardous materials to prevent discharge to the environment; (d) Designed and constructed to ensure that potentially contaminated stormwater is contained and directed to the Saline Water Pond; and	Figure 3: General layout of Site C; Figure 7: Plan showing key infrastructure – Site C; Figure 8: Plan showing the location of infrastructure components, exhaust stacks, vents and flares – Site C.

<table>
<tr><th></th><th>Infrastructure</th><th>Design and construction requirements</th><th>Infrastructure location</th></tr>
<tr><td></td><td></td><td>(e) Designed and constructed to ensure that potentially contaminated oily water is contained and directed to the oily water treatment unit (CPI).</td><td></td></tr>
<tr><td>3.</td><td>Urea granulator (2 units)</td><td>(a) Each granulator plant shall be designed and constructed to ensure that dust emissions are directed to a scrubbing system capable of achieving the following design criteria:
(i) NH_3 less than 20mg/Nm^3 (dry); and
(ii) PM_{10} less than 25mg/Nm^3 (dry);
(b) Each of the scrubbing systems installed on the granulator plants shall discharge emissions to atmosphere via separate stacks that are at least 75 m high[1];
(c) Each stack must be fitted with monitoring ports that meet the requirements of AS 4323.1;
(d) Each stack shall be fitted with a continuous emissions monitoring system that:
(i) monitors NH_3 and particulates; and
(ii) adheres to the installation, calibration and operational quality controls of the CEMS Code and/or EN 14181 for the monitored parameter as specified in Table 14;
(e) De-dusting systems shall be installed on each granulator at the following locations with exhaust air treated via the scrubbing system installed on the granulator stacks:
(i) top of the bucket elevator; and
(ii) the point that discharges from the vibrating screens onto the first conveyor belt;
(f) The urea granulator units must include containment and bunding infrastructure (including storage tanks and containers) for the storage and containment of process materials and other environmental hazardous materials to prevent discharge to the environment;
(g) Designed and constructed to ensure that potentially contaminated stormwater is contained and directed to the Saline Water Pond; and
(h) Designed and constructed to ensure that potentially contaminated oily water is contained and directed to the oily water treatment unit (CPI).</td><td>Figure 3: General layout of Site C;
Figure 7: Plan showing key infrastructure – Site C;
Figure 8: Plan showing the location of infrastructure components, exhaust stacks, vents and flares – Site C.
Figure 10: Schematic of dust control infrastructure on conveyor, shiploader and granulator</td></tr>
<tr><td>4.</td><td>Flares</td><td>(a) The flaring system shall include the following flares constructed to be no less than the height specified below:
<table>
<tr><th>Flare description</th><th>Height (m)[1]</th></tr>
<tr><td>Syngas Flare (3420-PK-102)</td><td>92</td></tr>
<tr><td>Ammonia Flare (3410-PK-101)</td><td>92</td></tr>
<tr><td>Ammonia Storage Flare (3430-PK-103)</td><td>30</td></tr>
<tr><td>Primary Urea Flare – Train 1 (2610-PK-112)</td><td>66</td></tr>
<tr><td>Secondary Urea Flare – Train 1 (2610-PK-113)</td><td>66</td></tr>
<tr><td>Primary Urea Flare - Train 2 (2710-PK-112)</td><td>66</td></tr>
<tr><td>Secondary Urea Flare – Train 2 (2710-PK-113)</td><td>66</td></tr>
</table></td><td>Figure 3: General layout of Site C;
Figure 8: Plan showing the location of infrastructure components, exhaust stacks, vents and flares – Site C.</td></tr>
</table>

	Infrastructure	Design and construction requirements	Infrastructure location
		(b) All flares shall be equipped with the following: (i) Instrumentation for continuously measuring the quantity of gas (kg) emitted via the flare per hour; and (ii) Pilot systems to ensure effective combustion of flared gas.	
5.	Power generation	(a) Power shall be supplied by two combined cycle gas turbines with a total power generating capacity of 100.3MWe and equipped with Heat Recovery Steam Generators (HRSG); (b) The combined cycle gas turbines shall be constructed so that emissions from each gas turbine: (i) discharge via the HRSG stack during normal operations; or (ii) during emergency of upset conditions when the HRSG is offline, discharge via the Bypass Stack; (c) Dry Low NOx burners shall be installed to treat emissions prior to discharge via the HRSG and Bypass stacks; (d) Selective Catalytic Reduction Technology shall be installed to achieve a NOx concentration at the HRSG Stack discharge point of 15 ppmv (32.3mg/Nm^3) [referenced at 15% O_2, STP dry]; (e) The HRSG stack and Bypass stack shall be at least 30.5 m high[1]; (f) Each stack must be fitted with monitoring ports that meet the requirements of AS 4323.1; (g) Each stack shall be fitted with a continuous emissions monitoring system that: (i) monitors NO_2, SO_2, NH_3 and CO; and (ii) adheres to the installation, calibration and operational quality controls of the CEMS Code and/or EN 14181 for the monitored parameter as specified in Table 14; (h) HRSG stacks to be fitted with silencers to achieve a sound power level of 104 dB(A); (i) The power generation units must include containment and bunding infrastructure (including storage tanks and containers) for the storage and containment of process materials and other environmental hazardous materials to prevent discharge to the environment; (j) Designed and constructed to ensure that potentially contaminated stormwater is contained and directed to the Saline Water Pond; and (k) Designed and constructed to ensure that potentially contaminated oily water is contained and directed to the oily water treatment unit (CPI).	Figure 3: General layout of Site C; Figure 7: Plan showing key infrastructure – Site C; Figure 8: Plan showing the location of infrastructure components, exhaust stacks, vents and flares – Site C.

	Infrastructure	Design and construction requirements	Infrastructure location
6.	Storage sheds, overland conveyor and ship loading facilities	(a) 2 x storage sheds designed and constructed to store maximum quantities of urea granules as follows: (i) Site C Storage Shed: 75,000 tonnes; and (ii) Port Storage Shed: 65,000 tonnes; (b) The urea storage sheds shall be constructed at least 6m high; (c) Materials handling systems comprising of: (i) a shiploader with a loading capacity of 2,200 tonnes per hours; and (ii) conveyor network for the transfer of urea granules from Site C to the ship loader; and (d) Dust control infrastructure and equipment shall be constructed in accordance with condition 6.	Figure 5: General layout of port infrastructure. Figure 10: Schematic of dust control infrastructure on conveyor, shiploader and granulator
7.	General	(a) Installation of noise barriers and panelling for targeted noise attenuation where required; (b) ASU compressors (main air, booster air and nitrogen) installed within dedicated acoustic enclosures; and (c) All major compressor piping (suction, discharge, main branches) fitted with acoustic insulation	Figure 3: General layout of Site C; Figure 7: Plan showing key infrastructure – Site C; Figure 8: Plan showing the location of infrastructure components, exhaust stacks, vents and flares – Site C.

	Infrastructure	Design and construction requirements	Infrastructure location
8.	Sewage treatment plant	The WWTP must be designed and installed to meet the following specifications: (a) Comprising the following equipment: (i) Balance pump, mixer and balance tank (~50 kL); (ii) Activated sludge bioreactor consisting of aeration section, clarifier section and buffer outlet section; (iii) A sludge storage tank (~10.5kL); (iv) A treated effluent holding tanks (~8 kL); (v) Decant pump and sludge pump; and (vi) Disinfection agent dosing skid. (b) Be able to receive and treat a combined sewage inflow of up to 40 m^3/day; (c) Able to treat sewage to the following output standards: (i) 5-day biochemical oxygen demand (BOD5) <20 mg/L; (ii) pH 5.5 – 8.5; (iii) Total suspended solids (TSS) <30 mg/L; (iv) Chemical oxygen demand <125mg/L; (v) Total nitrogen (TN) <40 mg/L; (vi) *E. coli* <13,000 MPN/100mL; and (vii) Residual free chlorine 0.1mg/L; (d) Flow meters are required to be installed on the inlet and outlet side of the plant to record both inflows and outflows from the sewage treatment plant; (e) Sampling point is required to be installed on the outlet of the treated water tank to enable collection of a water quality sample for laboratory analysis. (f) The sampling point above shall be installed with instrumentation for continuously monitoring pH and Residual free chlorine (mg/l); (g) Incorporate an alarm system of warning beacons, as well as audible and visual pump fault alarms, which will activate in the event of: (i) system faults; (ii) high tank levels; and (iii) tank overflows; (h) Installed with activated carbon filter canisters to the intermittent ventilation discharge points of the sewage balance tank and sludge holding tank; (i) All above ground infrastructure to be located on compacted ground within an earthen bund to contain spills; (j) All sewage conveyance, storage and treatment infrastructure must be designed and constructed to ensure that stormwater does not enter the sewage treatment system and sewage and treated wastewater storage infrastructure; and (k) All sewage storage and treatment tanks, transfer pipelines and conveyance infrastructure must be impermeable and free of leaks and defects.	Figure 4: General layout of Site F; Figure 9: Plan showing key infrastructure – Site F;

	Infrastructure	Design and construction requirements	Infrastructure location
9.	Chemicals / condensate storage	(a) All containers or tanks containing condensate, process by-products and/or reagents and chemicals used in the urea manufacturing process (that are solid or liquid at standard temperature and pressure) shall be situated within: (i) impervious bunded concrete compounds capable of containing 110% of the volume of the largest vessel / container in the bund and spills occurring from the height of the tanks; or (ii) other containment/technical solutions that achieve similar risk mitigation to part (i), taking into consideration applicable standards and requirements under the *Dangerous Goods Safety Act*, and the premises Safety Case/HAZOP; (b) Bunded areas shall drain towards a sump and include a sump pump for recovery of spilled liquids and stormwater; and (c) Sumps shall contain high level alarms to prevent overflowing.	Figure 3: General layout of Site C; Figure 4: General layout of Site F;
10.	Stormwater management	(a) The premises must be constructed such that: (i) process plant areas that are likely to collect and contain potential contamination from process activities are sealed and bunded to contain first flush stormwater prior to it being directed to the Saline Water Pond (as depicted in Figure 15 and Figure 16); (ii) process plant areas that are likely to collect and contain potentially hydrocarbon contaminated stormwater are sealed and bunded to contain first flush stormwater prior to it being directed to a corrugated plate interceptor (CPI) for treatment (as depicted in Figure 15 and Figure 16); (iii) stormwater collected from process plant areas, beyond the first flush volume is diverted to the Clean Stormwater Ponds; (iv) uncontaminated surface water runoff is diverted away from operational areas (as depicted in Figure 17 and Figure 18); (v) port side storage shed and associated infrastructure to include stormwater management infrastructure that collects and retains stormwater and runoff from port side infrastructure and prevents discharges of high turbidity water to the environment; (b) The CPI shall be designed to achieve a Total Recoverable Hydrocarbon content of 5ppm within treated wastewater; (c) The CPI shall be constructed so that treated wastewater is discharged into a Treated Water Pit prior to transfer to the Saline Water Pond; (d) The Treated Water Pit shall be constructed of materials that achieve a permeability of 1 x 10^{-9} m/s and fitted with high level and high-high level alarms; (e) The Treated Water Pit to be constructed to ensure that 500 mm freeboard is maintained above the high-high level alarm;	Figure 15: Stormwater plan for Site C; Figure 16: Stormwater plan for Site F; Figure 17; and Figure 18.

	Infrastructure	Design and construction requirements	Infrastructure location
		(f) Two Clean Stormwater Ponds shall be constructed with the following storage capacity designed to contain a 1% AEP, 24-hour rainfall event: (i) 8,000 m^3 (Site C); and (ii) 1,250 m^3 (Site F); (g) The Site C and F Clean Stormwater Ponds shall be lined with a HDPE geomembrane liner of at least 1.5 mm thickness to achieve a hydraulic conductivity of <1 x 10^{-9} m/s; and (h) All HDPE liners must comply with the requirements specified in condition 10.	
11.	Wastewater management	(a) The Final Observation Basin must be constructed as an impervious concrete basin and fitted with high level and high-high level alarms; and (b) The Final Observation Basin to be constructed to ensure that 500 mm freeboard is maintained above the high-high level alarm.	Figure 3: General layout of Site C; Figure 4: General layout of Site F.
12.	MUBRL tie in	(a) Fitted with a continuous monitoring analyser; (b) The sampling point specified in part (a) above must be installed with instrumentation for continuously monitoring flowrate (m^3/hr), accumulated flow (m^3), pH, temperature (degrees Celsius) electrical conductivity (µS/cm), Oxidation-Reduction Potential (mV), ammonia-N (µg/L), turbidity (NTU) and residual free chlorine (µg/L). (c) Fitted with sampling point to allow water samples to be obtained; and (d) Designed and constructed to allow wastewater discharges to be diverted in the event that wastewater exceeds allowable discharge criteria.	Figure 3: General layout of Site C; Figure 4: General layout of Site F.

Note 1: Height of stack is measured from ground level.

6. The works approval holder must ensure that dust control infrastructure and equipment is constructed and installed in accordance with:

(a) the corresponding design and construction / installation requirements; and

(b) at the corresponding infrastructure location,

as set out in Table 2.

Table 2: Construction and installation requirements for dust control infrastructure.

Infrastructure and equipment	Requirements	Location
Stockpiles, stackers and reclaimers	Situated within a fully enclosed urea storage shed	Storage sheds located at Site C and the port identified in Figure 5, 10 and 12.
Urea storage sheds	(a) Fully enclosed and fitted with air lock doors at each entrance; and (b) Designed and constructed to prevent the ingress of rainwater and stormwater and prevent dust emissions.	
Conveyors	Designed and constructed with a dual-cleaning system to minimise product carry back comprising of: (a) primary and secondary cleaner at the driver head; and (b) a V-plough return belt cleaner on at the tail pulley:	Conveyors: 4110-CV-001; 4130-CV-004; 4110-CV-002; 4130-CV-005; 4110-CV-003; 4130-CV-006; 4110-CV-011; 4130-CV-007; 4110-CV-012; 4150-CV-001; 4130-CV-001; 4150-CV-002; 4130-CV-002; 4150-CV-003; 4130-CV-003; 4150-CV-004; and Boom conveyor as depicted in Figure 10, 11 and 13.
	Conveyors shall be fully enclosed within a conveyor gallery or the product storage sheds.	Conveyors: 4110-CV-001; 4130-CV-004; 4110-CV-002; 4130-CV-005; 4110-CV-003; 4130-CV-006; 4110-CV-011; 4130-CV-007; 4110-CV-012; 4150-CV-001; 4130-CV-001; 4150-CV-002; 4130-CV-002; 4150-CV-004; 4130-CV-003; and Boom conveyor as depicted in Figure 10, 11 and 13.
	Conveyor shall be situated within a conveyor gallery that is enclosed except for on one side (the sea-side). The sea-side shall be fitted with a flexible skirting (gallery sealing) that allows movement of the ship loader conveyor while being able to contain dust within the conveyor gallery.	Conveyor 4150-CV-003 as depicted in Figure 10, 11 and 13.

Transfer points	Transfer chutes must be enclosed with curtains fitted at entry and exit points to minimise dust escape.	All transfer chutes.
	Transfer chutes must be situated within a fully enclosed transfer tower.	Transfer chutes transferring product between the following conveyors: 4110-CV-012 to 4110-CV-001 4110-CV-011 to 4110-CV-001 4110-CV-001 to 4110-CV-002 4110-CV-001 to 4130-CV-002 4110-CV-002 to 4110-CV-003 4130-CV-001 to 4130-CV-002 4130-CV-002 to 4130-CV-003 4130-CV-003 to 4130-CV-004 4130-CV-004 to 4130-CV-005 4130-CV-005 to 4130-CV-006 4130-CV-006 to 4130-CV-007 4150-CV-001 to 4150-CV-002 4150-CV-002 to 4150-CV-003 as depicted in Figure 10, 11 and 13.
	(a) Transfer towers equipped with dust extraction system to collect and treat dust from transfer of material; and (b) Dust extraction system to include bag filters fitted with high efficiency filtration media (99% filtration efficiency) and automatic air pulse cleaning.	Transfer towers: 4110-TT-001 4130-TT-003 4110-TT-002 4130-TT-004 4110-TT-003 4130-TT-005 4110-TT-004 4130-TT-006 4130-TT-001 4150-TT-001 4130-TT-002 as depicted in Figure 10.
	(a) Must be fitted with a dust extraction system; and (b) Dust extraction system to include bag filters fitted with high efficiency filtration media (99% filtration efficiency) and automatic air pulse cleaning.	Extraction system 4150-BF-002 which collects and treats dust from the: • ship loader boom conveyor loading point; and • boom conveyor head chute discharge point, as depicted in Figure 11.
Ship loader	Ship loader designed and constructed to enable slewing and luffing to minimise product drop height.	Ship loader (4150-SL-001) as depicted in Figure 11 and 12.
	Telescopic cascading chute fitted with a shroud to minimise the drop height of product into the ship.	Telescopic Chute (4150-TL-001) as depicted in Figure 10, 11 and 13.

Compliance reporting

7. The works approval holder must within 30 calendar days of the infrastructure or equipment required by condition 5 being constructed and/or installed:

(a) undertake an audit of their compliance with the requirements of conditions 5 and 6; and

(b) prepare and submit to the CEO an Environmental Compliance Report on that compliance.

8. The Environmental Compliance Report required by condition 7, must include as a minimum the following:

(a) certification by a suitably qualified engineer that the items of infrastructure or component(s) thereof, as specified in conditions 5 and 6, have been constructed in accordance with the relevant requirements specified in conditions 5 and 6;

(b) as constructed plans and a detailed site plan for each item of infrastructure or component of infrastructure specified in conditions 5 and 6; and

(c) be signed by a person authorised to represent the works approval holder and contains the printed name and position of that person.

Critical containment infrastructure

9. The works approval holder must:

(a) construct the critical containment infrastructure;

(b) in accordance with the corresponding design and construction; and

(c) at the corresponding infrastructure location

set out in Table 3.

Table 3: Water storage pond critical containment infrastructure

Criteria	Design and construction requirements	Infrastructure location
Saline Water Pond and Saline Water Evaporation Pond	(a) Each pond must be constructed with the minimum storage capacity specified below (excluding freeboard): (i) Saline Water Pond: 9,000 m^3 (ii) Saline Evaporation Pond: 5,000 m^3; (b) The Saline Evaporation Pond must be constructed to include a minimum freeboard of 500 mm; (c) The Saline Water Pond must be constructed to include a working freeboard of 350 mm; (d) Each pond must be lined with a HDPE geomembrane liner of at least 1.5 mm thickness to achieve a hydraulic conductivity of <1 x 10^{-9} m/s; (e) All HDPE liners must comply with the requirements specified in condition 10; (f) The Saline Water Pond shall be fitted with sensors capable of raising a High and High-High water level alarm; (g) Standby/transfer pumps are installed to automatically pump water from the Saline Water Pond to the	Figure 14: Saline Wate Pond and Saline Evaporation Pond

Criteria	Design and construction requirements	Infrastructure location
	Evaporation Pond during rainfall events (set at 350mm from the top of the pond); and (h) The Saline Water Pond must be fitted with apparatus to deter fauna from entering the pond.	

10. The works approval holder must ensure all HDPE liners comply with the properties listed in Table 4, and are constructed in accordance with the requirements specified in that table.

Table 4: HDPE liner installation requirements

	Item	Property/construction requirement
1.	Liner properties	HDPE liners must have the following properties: • Specific gravity of 0.94 or more (Test Method – ASTM D1505); • Melt index of 0.05 g to 0.30 g in 10 minutes (Test Method – ASTM D1238, condition E 190/2.16); • Carbon black content of 2-3% (Test Method – ASTM D1603); • Minimum tensile strength at yield of 16,000 kN/m^2; • Minimum tensile strength at break of 550 kN/m^2 (Test Method – ASTM D638, type IV 2); and • Minimum elongation at yield of 10%, and at break 300% (ASTM D638).
2.	Liner fabrication	• Liners must be fabricated to form the shape of the pond embankments; • All seams and joins made on the premises must be continuous; and • Panels of the liner must be overlapped by a minimum of 100 mm, prior to heat welding or mechanical joining.
3.	Welding materials	Membrane welding materials must be supplied by the liner manufacturer, and be identical with the liner membrane.
4.	Seams and joins	All seams and joins must be constructed and tested as watertight over their full length using a vacuum box test and air pressure test.
5.	Shear resistance	Shear resistance must be tested in accordance with ASTM D5321.

11. The works approval holder must within 30 calendar days of each stage of the Critical Containment Infrastructure identified by condition 9 being constructed:

(a) undertake an audit of their compliance with the requirements of conditions 9 and 10; and

(b) prepare and submit to the CEO a Critical Containment Infrastructure Report on that compliance.

12. The Critical Containment Infrastructure Report required by condition 11(b) must include as a minimum the following:

(a) a Quality Control / Quality Assurance Certificate from an independent experienced geotechnical specialist which demonstrates that each item of critical containment infrastructure or component thereof, as specified in condition 9, has been built and installed in accordance with the requirements specified in conditions 9 and 10;

(b) as constructed plans and a detailed site plan showing the location and dimensions for each item of critical containment infrastructure or component thereof, as specified in condition 9;

(c) photographic evidence of the installation of the infrastructure;

(d) records of any quality assurance/control testing undertaken to demonstrate the requirements of conditions 9 and 10, including the basis of any method specification adopted;

(e) a summary of HDPE geomembrane liner defects and repairs recorded during installation of the liner in accordance with conditions 9 and 10;

(f) details of any modifications to the original design together with the reasons why the modifications were necessary; and

(g) be signed by a person authorised to represent the works approval holder and contains the printed name and position of that person.

Noise monitoring

13. During construction works, the works approval holder must conduct monitoring of noise emissions at the locations specified in Table 5 in accordance with the corresponding requirements set out in that table.

Table 5: Noise monitoring requirements during construction works

Monitoring point reference[1]	Parameter	Sound measuring equipment	Unit	Frequency	Duration
Monitor 1; Monitor 2 – West Industrial Area; Monitor 3 – Yara boundary; and Monitor 4 – Heritage site 9439.	$L_{A10, 30min}$	Non-directional system	dB(A)	At commencement of construction works, ongoing	Continuous
	$L_{A90, 30min}$				
	$L_{Aeq\ (20Hz\ to\ 800Hz),\ 30\ min}$				

Note 1: As shown in Figure 19 of Schedule 3 and specified by the coordinates in Schedule 4.

14. The works approval holder must ensure that all noise measurements are carried out in accordance with Part 3 of the *Environmental Protection (Noise) Regulations 1997* (as applicable).

Dust management

15. The works approval holder must proactively manage dust generating activities on the premises by:

(a) conducting daily visual inspections of the premises while undertaking construction activities to monitor for dust control equipment availability, implementation and dust mitigation effectiveness;

(b) completing air quality inspection reports on days that pose a higher risk of dust emissions (including but not limited days where high wind conditions and high temperatures are experienced) that record the management measures that have been implemented to control dust, including watercart load sheets to record the total volume of water used for dust suppression; and

(c) utilising weather forecasting tools to inform daily work activities and dust suppression activities to target and mitigate dust emissions from premises activities (including Site C, Site F and Port areas, as depicted in Figures 3, 4 and 5, Schedule 1).

Dust monitoring

16. The works approval holder must undertake monitoring in Table 6 in accordance with the specifications in that table.

Table 6: Monitoring of ambient air quality

Monitoring point reference	Parameter	Unit	Averaging period	Frequency	Method	Management trigger criteria
Fixed dust monitors						
Monitor 1[1]; Monitor 2[1] – West Industrial Area; Monitor 3[1] – Yara boundary; Monitor 4[1] – Heritage site 9439; and Monitor 5[2] – Port	Particulates as $PM_{2.5}$	µg/m^3	10 minutes	Continuous for the duration of undertaking construction activities	As per manufacturer's specifications for 'ETS TP-2510 Dust Concentrator Sensor'[3].	N/A
	Particulates as PM_{10}					80 µg/m^3

Note 1: As shown in Figure 19 of Schedule 3 and specified by the coordinates in Schedule 4.
Note 2: Indicative location shown in Figure 20 of Schedule 3. Monitor to be positioned as close as practically possible to the heritage site(s) located to the west of the premises taking into consideration prevailing wind direction.
Note 3: Near real time monitor with response time of <90 seconds.

17. Immediately upon being notified of management trigger criteria specified in Table 6 being exceeded, the works approval holder must:

(a) conduct a trigger investigation within 20 minutes of being alerted to the management trigger criteria exceedance to identify any potential cause of the management trigger criteria exceedance; and

(b) upon identification of a potential on-site source/s during the trigger investigation conducted in accordance with part (a) of this condition, immediately control visible dust emissions by:

i. applying additional dust suppression/water loading to any dust generating areas within the premises; and/or

ii. increasing moisture conditioning of material being used for construction activities; and/or

iii. increasing watercart operations on roads and any dust generating areas within the premises; and/or

iv. limiting works on site to only essential activities to minimise dust generation; and/or

v. decreasing the operating speed of plant and equipment on site; and/or

vi. ceasing works; and/or

vii. implementing other dust mitigation measures to reduce dust from premises activities.

18. In the event that the management trigger criteria for a parameter in Table 6 is exceeded, the works approval holder must:

(a) continue to actively monitor dust levels for the duration of the event (until dust levels return below the trigger criteria);

(b) continue to apply additional dust mitigation measures for the duration of the event;

(c) maintain records (including photographic or video footage) of the work area(s) at the time of the exceedance;

(d) maintain records of the management trigger event including:

i. date(s), time and duration of the event;

ii. site specific weather conditions; and

iii. management actions that were implemented to reduce dust emissions.

19. The works approval holder must undertake monitoring in Table 7 in accordance with the specifications in that table.

Table 7: Monitoring of ambient meteorological conditions

Monitoring point reference	Parameters	Unit	Averaging period	Frequency	Method
Weather Station (WC1)[1]	Wind speed	m/s	10 minute	Continuous	As per manufacturer's specifications for 'AirMetER-DX' monitor.
	Wind direction	degrees			
	Temperature	°C	1 hour		

Note 1: As shown in Figure 21 of Schedule 3.

20. The works approval hold shall, within 60 days of completing all construction activities, provided to the CEO a report summarising any trigger exceedance events recorded in accordance with condition 18 including management action(s) taken.

Commissioning phase

Commissioning – Commencement and duration

21. The works approval holder may only commence commissioning of the infrastructure identified in condition 5 once the Environmental Compliance Report has been submitted for that infrastructure in accordance with condition 7 of this works approval.

22. The works approval holder may only commence commissioning for an item of critical containment infrastructure identified in condition 9:

(a) where the CEO has notified the works approval holder that the Critical Containment Infrastructure Report for that item of infrastructure as required by condition 11 meets the requirements of that condition; or

(b) where at least 10 business days have passed after the Critical Containment Infrastructure Report for that item of infrastructure as required by condition 11 has been submitted to the CEO.

23. The works approval holder must ensure that any commissioning activities undertaken for an item of infrastructure, or component(s) thereof, specified in Table

1 and Table 3 is only be carried out:

(a) in accordance with the corresponding commissioning phase;

(b) for the corresponding commissioning activities; and

(c) for the corresponding authorised commissioning duration,

as set out in Table 8.

Table 8: Commissioning activities and duration

Infrastructure	Commissioning phase	Authorised commissioning activities	Authorised commissioning duration
Infrastructure specified in condition 5 and 9	Pre-commissioning activities	Dry commissioning (without introduction of feedstock) and mechanical testing. Includes discharge of water associated with flushing and hydrostatic testing to the Multi-user Brine Return Line directly or via the Saline Water Pond.	Not specified
	Environmental Commissioning	Comprising the sequence of activities to be undertaken following the introduction of feedstock (including initial start-up activities) to test equipment integrity and operation, or to determine the environmental performance of equipment and infrastructure to establish or test a steady state operation and confirm design specifications.	270 days

24. The works approval holder must provide to the CEO:

(a) notification of the commencement of each phase of commissioning specified in Table 8 within 7 days of that phase of commissioning commencing; and

(b) notification of the completion of environmental commissioning within 7 days of environmental commissioning being completed.

Commissioning – Infrastructure and equipment

25. During commissioning, the works approval holder must ensure that the premises infrastructure and equipment listed in Table 9 and located at the corresponding infrastructure location is maintained and operated in accordance with the corresponding operational requirement set out in Table 9.

Table 9 Infrastructure and equipment requirements during commissioning and time limited operations

	Site infrastructure and equipment	Operational requirement	Infrastructure location
1.	Ammonia Synthesis Train	(a) The gas fired heater must be operated with low NOx burners. (b) All vented ammonia shall be directed to the flare for combustion. No ammonia shall be vented directly to atmosphere.	Figure 7: Key infrastructure location - Site C. Figure 8: Site C - Plan showing the location primary process infrastructure, exhaust stacks, vents and flares
2.	Urea synthesis plant (2 units)	All emissions of ammonia from medium pressure vents shall be treated via a scrubbing system prior to discharges via the Granulator Stack(s).	
3.	Urea granulators (2 units)	(a) Waste gas from the granulator units shall be directed to a scrubbing system for treatment prior to discharge to atmosphere via the granulator	

	Site infrastructure and equipment	Operational requirement	Infrastructure location
		stack(s). (b) De-dusting systems shall be operated on each granulator at the following locations whenever urea is being processed or handled in the granulator units: (i) Top of bucket elevator; and (ii) The point that discharges from the vibrating screens onto the first conveyor belts. (c) Waste gas from the de-dusting systems shall be directed to the granulator stack(s) via the scrubbing system.	
4.	Gas turbine generators	(a) Must be operated with low NOx burners. (b) Exhaust from the gas turbines must be discharged to atmosphere via the HRSG Stack operated with Selective Catalytic Reduction technology[1] . (c) In the event of the HRSG being offline due to system malfunction or failure, air emissions must be discharged to atmosphere via the HSRG bypass stack. (d) The HRSG bypass stack must not be used when the HRSG is operating at normal operating conditions.	
5.	Emergency diesel generators	Must only be operated for start-up purposes or under emergency conditions.	
6.	Ammonia Cracker Unit		
7.	Flares	(a) Pilot lights must be lit at all times during plant operations (b) Ammonia directed to the flare(s) must be combusted.	
8.	Blowdown vents	Waste gas must only be directed to the Blowdown Vents under emergency conditions to ensure safe operation of the plant.	
9.	Saline Water Pond and Saline Evaporation Pond	(a) An operational freeboard of at least 0.5 m must be maintained on the Saline Evaporation Pond at all times; (b) An operational freeboard of at least 0.35 m must be maintained on the Saline Pond at all times (c) Ponds liners are maintained free of defects to achieve a permeability of less than 1 x 10^{-9} m/s. (d) Wastewater held in the Saline Water Pond must not be discharged to the Multi-User Brine Return Line until sampling undertaken in accordance with 42 and/or 57 confirms that the wastewater, when discharged and mixed within the Multi-User Brine Return Line, meets the limit(s) specified in Table 18. (e) The Works Approval Holder must calculate and record the total discharge volume and the duration of each discharge from the Saline Water Pond to the Multi-User Brine Return Line.	Figure 8: Site C - Plan showing the location primary process infrastructure, exhaust stacks, vents and flares
10.	Sewage treatment plant	Production must not exceed 40m^3/day.	Figure 9: Key infrastructure – Site F.

Note 1: Excluding the limited period during commissioning when selective catalytic reduction technology is not available due to initial fine-tuning of the gas turbine generators.

26. During commissioning, the works approval holder must ensure that the dust control equipment specified in Table 10 and located at the corresponding infrastructure location is maintained in good working order and operated in accordance with the operational requirements set out in Table 10.

Table 10: Dust control infrastructure and equipment.

Infrastructure	Operational requirements	Location reference
Urea storage sheds	Air lock doors at each entrance are closed while product is being handled inside the shed. Sheds to be maintained free of defects to prevent the escape of dust.	Storage sheds located at Site C and the port identified in Figure 5, 10 and 12.
Conveyors	Belt cleaning systems operated when the conveyor is running to remove material carried back from the belt. Spillage from under the conveyors is removed regularly to prevent suspension of material once dried.	Conveyors: 4110-CV-001; 4130-CV-004; 4110-CV-002; 4130-CV-005; 4110-CV-003; 4130-CV-006; 4110-CV-011; 4130-CV-007; 4110-CV-012; 4150-CV-001; 4130-CV-001; 4150-CV-002; 4130-CV-002; 4150-CV-003; 4130-CV-003; 4150-CV-004; and Boom conveyor as depicted in Figure 10, 11 and 13.
	Conveyors shall be maintained within a fully enclosed conveyor gallery or the product storage sheds.	Conveyors: 4110-CV-001; 4130-CV-004; 4110-CV-002; 4130-CV-005; 4110-CV-003; 4130-CV-006; 4110-CV-011; 4130-CV-007; 4110-CV-012; 4150-CV-001; 4130-CV-001; 4150-CV-002; 4130-CV-002; 4150-CV-004; 4130-CV-003; and Boom conveyor as depicted in Figure 10, 11 and 13.
	Conveyor shall be situated within a conveyor gallery that is enclosed except for on one side (the sea-side). The sea-side shall be fitted with a flexible skirting (gallery sealing) that allows movement of the ship loader conveyor while being able to contain dust within the conveyor gallery.	Conveyor 4150-CV-003 as depicted in Figure 10, 11 and 13.
Transfer points	Transfer chutes must be enclosed with curtains fitted at entry and exit points to minimise dust escape.	All transfer chutes.
	Transfer chutes must be situated within a fully enclosed transfer tower.	Transfer chutes transferring product between the following conveyors: 4110-CV-012 to 4110-CV-001 4110-CV-011 to 4110-CV-001 4110-CV-001 to 4110-CV-002

Infrastructure	Operational requirements	Location reference
		4110-CV-001 to 4130-CV-002 4110-CV-002 to 4110-CV-003 4130-CV-001 to 4130-CV-002 4130-CV-002 to 4130-CV-003 4130-CV-003 to 4130-CV-004 4130-CV-004 to 4130-CV-005 4130-CV-005 to 4130-CV-006 4130-CV-006 to 4130-CV-007 4150-CV-001 to 4150-CV-002 4150-CV-002 to 4150-CV-003 as depicted in Figure 10, 11 and 13.
	Dust extraction system on transfer towers operating when product is being transferred between conveyors. Dust extraction system to include bag filters fitted with high efficiency filtration media (99% filtration efficiency) and automatic air pulse cleaning.	Transfer towers: 4110-TT-001 4130-TT-003 4110-TT-002 4130-TT-004 4110-TT-003 4130-TT-005 4110-TT-004 4130-TT-006 4130-TT-001 4150-TT-001 4130-TT-002 as depicted in Figure 10.
	Dust extraction system operating when product is being transferred between conveyors. Dust extraction system to include bag filters fitted with high efficiency filtration media (99% filtration efficiency) and automatic air pulse cleaning.	Extraction system 4150-BF-002 which collects and treats dust from the: • ship loader boom conveyor loading point; and • boom conveyor head chute discharge point, as depicted in Figure 11.
Ship loader	Telescopic cascading chute fitted with a shroud operated to minimise the drop height of product when loading into the ship.	Telescopic Chute (4150-TL-001) as depicted in Figure 10, 11 and 13.

27. During commissioning, the works approval holder must ensure visual inspections of the infrastructure specified in Table 11 are undertaken in accordance with the inspection requirements, and at the frequency set out in Table 11.

Table 11: Inspection requirements during commissioning and time limited operation.

Infrastructure	Inspection requirement	Frequency of inspection
Saline Water Pond and Saline Evaporation Pond	Pond perimeter inspection which checks for: (a) Visual integrity of the embankments and geomembranes including signs of seepage; and (b) Freeboard capacity.	Every 12 hours (following commencement of discharging wastewater into the ponds)

28. The works approval holder must maintain a written log of all inspections undertaken in accordance with condition 27, with each inspection signed off by the person who conducted the inspection.

Commissioning - Noise

29. During commissioning, the works approval holder must retain the services of a person qualified and experienced in the area of environmental noise assessment and who by their qualifications and experience is eligible to hold membership of the Australian Acoustical Society or the Australian Association of Acoustical Consultants to:

(a) carry out noise monitoring to investigate the nature and extent of as-built noise emissions from the premises;

(b) prepare noise modelling to predict the nature and extent of the as-built noise emissions from the premises;

(c) assess compliance of the predicted noise emissions against the relevant assigned levels specified in the *Environmental Protection (Noise) Regulations 1997*; and

(d) compile and submit to the works approval holder a report in accordance with condition 30.

30. A report prepared pursuant to condition 29(d) is to include:

(a) a description of the methods used for modelling noise emissions from the premises;

(b) details and the results of the monitoring and modelling undertaken pursuant to conditions 29(a) and 29(b);

(c) details and results of the assessment of the noise emissions from the premises, against the relevant assigned levels in the Environmental Protection (Noise) Regulations 1997 undertaken pursuant to condition 29(c); and

(d) an assessment of noise levels against the most recent previous noise assessment.

31. The works approval holder must submit to the CEO the report prepared pursuant to condition 29(d) as part of the Environmental Commissioning Report required by condition 43.

32. Where an assessment pursuant to condition 29(c) indicates that noise emissions do not comply with the relevant assigned levels in the *Environmental Protection (Noise) Regulations 1997*, the works approval holder must,

(a) prepare and submit to the CEO a plan to ensure the undertaking of the prescribed activities will not lead to any contravention of the *Environmental Protection (Noise) Regulations 1997*; and

(b) provide to the CEO a copy of the plan prepared pursuant to condition (a) with the Environmental Commissioning Report required by condition 43.

Commissioning – Air emissions

33. During commissioning, the works approval holder must ensure that the emission(s) specified in Table 12, are discharged only from the corresponding discharge point(s) and only at the corresponding discharge point location(s).

Table 12: Authorised discharge points during commissioning

Emission	Discharge point	Discharge point location
NOx, CO, SOx, PM, VOCs	Fire Process Heater & Fired Steam Superheat Common Stack (Unit 1100)	Figure 8: Site C - Plan showing the location primary process infrastructure, exhaust stacks, vents and flares
	Syngas Flare (3420-PK-102)	
	Ammonia Flare (3410-PK-101)	
	Ammonia Storage Flare (3430-PK-103)	
	Primary Urea Flare – Train 1 (2610-PK-112)	
	Secondary Urea Flare – Train 1 (2610-PK-113)	
	Primary Urea Flare - Train 2 (2710-PK-112)	
	Secondary Urea Flare – Train 2 (2710-PK-113)	
	Gas Turbine Generator - (3610-TG-001-A) HRSG Bypass Stack	
	Gas Turbine Generator - (3610-TG-001-B) HRSG Bypass Stack	
	Emergency Diesel Generator 1	
	Emergency Diesel Generator 2	
	Ammonia Cracker Unit	
NOx, CO, SOx, PM, VOCs, NH_3	Gas Turbine Generator - (3610-TG-001-A) HRSG Stack	
	Gas Turbine Generator - (3610-TG-001-B) HRSG Stack	
NH_3 and PM (urea)	Granulator Stack 1	
	Granulator Stack 2	
NH_3, H_2O, CO_2 and inerts such as H_2, N_2 and O_2	Blowdown Vent (Cold Vent Unit 2600)	
	Blowdown Vent (Cold Vent Unit 2700)	

34. During commissioning, the works approval holder must ensure that emissions from the discharge point listed in Table 13 for the corresponding parameter do not exceed the corresponding limit when monitored in accordance with condition 35.

Table 13: Air emission limits during commissioning and time limited operations

Discharge point	Emission	Limit (g/s)[1, 2]
Fire Process Heater & Fired Steam Superheat Common Stack	NOx (as NO_2)	6.68
	SO_2	0.048
	PM_{10}	0.13
Gas Turbine Generator (3610-TG-001-A) HRSG Stack and Gas Turbine Generator (3610-TG-001-B) HRSG Stack	NOx (as NO_2)	2.49
	SO_2	0.0575
	NH_3	0.6
	PM_{10}	0.21
Granulator Stack 1 and Granulator Stack 2	PM_{10}	5.07
	NH_3	4.06

Note 1: Emission limits to not apply during initial start-up activities defined in Table 21 provided that all reasonable and practicable measures are taken to minimise emissions.
Note 2: Emission limits apply to each specified discharge source and are not a combined limit.

Commissioning – Monitoring of air emissions

35. During commissioning, the works approval holder must monitor emissions:

(a) from each discharge point;

(b) at the corresponding monitoring location;

(c) for the corresponding parameter;

(d) at the corresponding frequency;

(e) for the corresponding averaging period;

(f) in the corresponding unit; and

(g) using the corresponding method,

as set out in Table 14.

Table 14: Monitoring of emissions to air

Discharge point	Parameter	Frequency	Averaging period	Unit	Method
Fire Process Heater & Fired Steam Superheat Common Stack (Unit 1100) [1, 2] Gas Turbine Generator (3610-TG-001-A) HRSG Stack [1, 3] Gas Turbine Generator (3610-TG-001-B) HRSG Stack [1, 3] Gas Turbine Generator (3610-TG-001-A) HRSG Bypass Stack A [1, 3] Gas Turbine Generator (3610-TG-001-B) HRSG Bypass Stack B [1, 3]	Flow rate	Continuous monitoring, once CEMS has been commissioned, verified and calibrated (to occur within 500 operational hours of completing initial start-up)	60 minutes	m^3/s	CEMS (CEMS Code)
	NO_x (as NO_2)			g/s mg/m^3	
	SO_2				
	CO				
Gas Turbine Generator (3610-TG-001-A) HRSG Stack [1, 3] Gas Turbine Generator Stack (3610-TG-001-B) HRSG Stack [1, 3]	NH_3		60 minutes	g/s mg/m^3	CEMS (EN 14181)
Granulator Stack 1[1] and Granulator Stack 2[1]	Flow rate		60 minutes	m^3/s	CEMS (CEMS Code)
	PM			g/s mg/m^3	
	NH_3				CEMS (EN 14181)

Note 1: All units are referenced to STP dry.
Note 2: Concentration units for all gases are referenced to 3% O_2.
Note 3: Concentration units for all gases are referenced to 15% O_2.

Commissioning – Monitoring (startup, shutdown and upset conditions)

36. The works approval holder must monitor and record the information listed in Table 15 in the corresponding unit for the event types as set out in Table 15.

Table 15: Startup, shutdown and upset condition monitoring

Event	Parameter/information	Unit
Each startup, shutdown or upset conditions event where gas is flared or vented.	Event type	NA
	Event cause	NA
	Start and finish date and time	NA
	Duration	Hours
	Average and maximum rate of ammonia directed to the flare and/or vent[1]	g/s
	Total mas of ammonia flared[1]	Tonnes
	Total mass of process gas flared[1]	Tonnes
	Total mass of each gas vented (N_2, H_2, NH_3, CO_2, O_2, H_2O) [1]	Tonnes
	Total mass of process gas vented[1]	Tonnes

Each discharge of waste gas via the HSRG Bypass Stack	Event cause	NA
	Start and finish date and time	NA
	Duration	Hours

Note 1: Total mass of gases flared / vented are calculated estimates based on measured flow data determining total gas volumes directed to the vent or flare.

Commissioning – CEMS

37. The works approval holder must, within 30 calendar days of completing successful calibration and verification of each CEMS installed in accordance with condition 5, submit to the CEO a CEMS Calibration Report.

38. The report required by condition 37 must include, but not be limited to, the information listed in Table 16 for the corresponding CEMS unit:

Table 16: CEMS reporting requirements.

CEMS unit	Information requirement
CEMS installed for measuring NO_2, SO_2, CO and particulates	1) details of the CEMS system specifications and location, as determined prior to the initial operation of the Figure Heater, urea granulators and power generators (combined cycle gas turbines) in accordance with Phase I and II of the CEMS Code; 2) the Quality Assurance plan, as required under section 2 of the CEMS Code; and 3) details of the successful calibration and verification of the installed CEMS system, as conducted within 500 operational hours of the premises in accordance with Phase III of the CEMS Code.
CEMS installed for measuring NH_3	1) details of the CEMS system specifications and location, as determined prior to the initial operation of the urea granulator demonstrating compliance with EN 15259 and QAL1 requirements of EN 14181; 2) the Quality Assurance plan that meets QAL3 requirements of EN 14181 and which includes procedures for ongoing annual surveillance tests in accordance with EN 14181; and 3) details of the successful calibration and verification of the installed CEMS system, as conducted within 500 operational hours of the urea granulators demonstrating compliance with QAL 2 requirements of EN 14181.

Commissioning – Discharge to marine waters

39. During commissioning, the works approval holder must ensure that the emission(s) specified in Table 17, are discharged only from the corresponding discharge point(s) and only at the corresponding discharge point location(s).

Table 17: Authorised discharge points during commissioning

Emission	Discharge point	Discharge point location
Process effluents such as cooling tower blowdown, desalination water treatment rejects, polishing wastes and seawater filter backwash	MUBRL	Discharge Point “C” in Figure 22: Wastewater discharge and monitoring locations.
Treated effluent from the sewage treatment plant		

Emission	Discharge point	Discharge point location
Stormwater and other wastewaters contained in the Saline Water Pond		

40. During commissioning, the works approval holder must ensure that emissions from the discharge point listed in Table 18 for the corresponding parameter do not exceed the corresponding limit when monitored in accordance with condition 41.

Table 18: Discharge to marine waters limits during commissioning and time limited operations

Discharge point	Parameter	Units	Limit
MUBRL	Total flow	ML/day	59.7
	Ammonia	µg/L	1,700
	Arsenic III	µg/L	140[1]
	Arsenic V	µg/L	275[1]
	Cadmium	µg/L	36[1]
	Chromium III	µg/L	459[1]
	Chromium IV	µg/L	8.5[1]
	Cobalt	µg/L	61[1]
	Conductivity	µS/cm	75,000 (55,000mg/L)
	Copper	µg/L	11[1]
	E. coli	MPN/100 mL	<13,000[1]
	Free chlorine	mg/L	<0.1
	Lead	µg/L	134[1]
	Mercury	µg/L	1.4[1]
	Nickel	µg/L	427[1]
	ORP	mV	680
	pH	pH units	6.9 - 8.3
	Selenium	µg/L	183[1]
	Silver	µg/L	49[1]
	Turbidity	NTU	63[1]
	Temperature	°C	Effluent discharge temperature to be less than 2 °C above the inlet seawater temperature for 80% of the time and not exceeding a maximum limit of 5 °C above
	Thermotolerant coliforms	CFU/100mL	910[1]
	Total petroleum hydrocarbons	µg/L	350[1]
	Vanadium	µg/L	3050[1]
	Zinc	µg/L	419[1]

Note 1: Limits are based on a monthly rolling average of weekly monitoring results recorded in accordance with conditions 41 and 56.

Commissioning – Monitoring of discharge to marine waters

41. During commissioning , the works approval holder must monitor emissions:

(a) from each discharge point;

(b) at the corresponding monitoring location;

(c) for the corresponding parameter;

(d) at the corresponding frequency;

(e) for the corresponding averaging period;

(f) in the corresponding unit; and

(g) using the corresponding method,

as set out in Table 19.

Table 19: Monitoring of marine discharges

Discharge point	Monitoring location	Parameter	Frequency	Averaging Period	Units	Method	
						Sample	Analysis
MUBRL	Figure 22: Monitoring locations	Total flow	Continuous	Daily	m^3/hr	N/A	
		Conductivity		N/A	µS/cm		
		Free chlorine			µg/L		
		Oxidation-reduction potential			mV		
		pH			pH units		
		Turbidity			NTU		
		Temperature			°C		
		Ammonia-N			µg/L		
		Temperature[1]	Daily and monthly	Daily samples: Weekly composite of daily spot sample During commissioning - Monthly grab sample: Spot sample comprising of three (3) replicate samples that are divided into duplicate samples During time limited operations - Biannual grab sample: Spot sample comprising of three (3) replicate samples that are divided into duplicate samples	°C	AS5667.1 AS5667.10	Weekly composite: Analysis undertaken by onsite laboratory During commissioning - Monthly samples: One duplicate from each sample analysed by onsite laboratory and the other analysed by a laboratory with NATA accreditation During time limited operation - Biannual samples: One duplicate from each sample analysed by onsite laboratory and the other analysed by a laboratory with NATA accreditation
		pH[1]			pH units		
		Conductivity[1]			µS/cm		
		Oxidation-reduction potential[1]			mV		
		Free chlorine[1]			µg/L		
		Aluminium			µg/L		
		Ammonia			µg/L		
		Arsenic (III)			µg/L		
		Arsenic (V)			µg/L		
		Cadmium			µg/L		
		Chromium (III)			µg/L		
		Chromium (IV)			µg/L		
		Cobalt			µg/L		
		Copper			µg/L		
		E. coli			MPN/100 mL		
		Lead			µg/L		
		Mercury			µg/L		
		Nickel			µg/L		
		Nitrate-N			µg/L		
		Nitrite- N			µg/L		
		Selenium			µg/L		
		Silver			µg/L		
		Thermotolerant coliforms			CFU/100mL		
		Total petroleum hydrocarbons			µg/L		
		Vanadium			µg/L		
		Zinc			µg/L		

Note 1: NATA accredited analysis not required

Commissioning – Wastewater monitoring

42. During commissioning , the works approval holder must monitor wastewater:

(a) at the specified monitoring location;

(b) for the corresponding parameter;

(c) at the corresponding frequency;

(d) for the corresponding averaging period;

(e) in the corresponding unit; and

(f) using the corresponding method,

as set out in Table 20

Table 20: Monitoring of wastewater

Monitoring location	Parameter	Frequency	Averaging Period	Units	Method	
					Sample	Analysis
1 - Saline Water Pond recirculation pump (shown in Figure 22)	Temperature	Prior to discharge to MUBRL	Spot sample	°C	AS5667.1 AS5667.10	Analysis undertaken by onsite laboratory[1]
	pH			pH units		
	Conductivity			µS/cm		
	Oxidation-reduction potential			mV		
	Ammonia			µg/L		
	Arsenic (III)			µg/L		
	Arsenic (V)			µg/L		
	Cadmium			µg/L		
	Chromium (III)			µg/L		
	Chromium (IV)			µg/L		
	Cobalt			µg/L		
	Copper			µg/L		
	E. coli			MPN/100 mL		
	Lead			µg/L		
	Mercury			µg/L		
	Nickel			µg/L		
	Selenium			µg/L		
	Silver			µg/L		
	Thermotolerant coliforms			CFU/100mL		
	Total petroleum hydrocarbons			µg/L		
	Vanadium			µg/L		
	Zinc			µg/L		
	Free chlorine			µg/L		

Monitoring location	Parameter	Frequency	Averaging Period	Units	Method	
					Sample	Analysis
2 - STP treated effluent tank (shown in Figure 22)	Total flow	Continuous	Daily	m^3/hr	N/A	
	Free chlorine		N/A	µg/L		
	pH			pH units		
	Biochemical oxygen demand (BOD)	Weekly	Spot sample	mg/L	AS5667.1 AS5667.10	Analysis undertaken by onsite laboratory[1]
	Chemical oxygen demand (COD)			mg/L		
	Total suspended solids (TSS)			mg/L		
	E. coli			MPN/100 mL		
	Thermotolerant coliforms			CFU/100mL		
4 - Oily water treatment system outlet (shown in Figure 22)	Total petroleum hydrocarbons	Continuous	Daily	ppm	N/A	
		Prior to discharge to Saline Water Pond	Spot sample		AS5667.1 AS5667.10	Analysis undertaken by onsite laboratory[1]

Note 1: Samples to be analysed by an off-site external NATA accredited laboratory once per quarter.

Commissioning – Reporting

43. The works approval holder must submit to the CEO an Environmental Commissioning Report within 60 calendar days of the completion date of environmental commissioning for the infrastructure specified in Table 1 and Table 3.

44. The works approval holder must ensure the Environmental Commissioning Report required by condition 43 of this works approval includes the following:

(a) a summary of the environmental commissioning activities undertaken, including timeframes and amount of granulated urea (and other products) produced;

(b) a summary of discharge events from the Saline Water Pond to the Multi-User Brine Return Line including the volume and duration of each discharge recorded in accordance with condition 25, and information detailing how it was determined that each discharge, once mixed in the Multi-User Brine Return Line, would achieve the limits specified in Table 18;

(c) a summary of the visual inspections recorded in accordance with condition 27 including a summary of any issues identified and actions taken or proposed to rectify those issues;

(d) reports required by conditions 31 and 32(b) relating to noise;

(e) the results of monitoring recorded in accordance with condition(s) 35, 41 and 42;

(f) for the monitoring undertaken in accordance with condition 41:

(i) a summary of the field and laboratory quality assurance / quality control QA/QC program;

(ii) copies of field monitoring records and field QA/QC documentation;

(iii) an assessment of reliability of field procedures and laboratory results;

(iv) copies of laboratory certificates of analysis and laboratory QA/QC records (onsite and external laboratories);

(v) a tabulated summary of results, as well as all raw data provided in an accompanying Microsoft Excel spreadsheet digital document/file (or a compatible equivalent digital document/file), with all results being clearly referenced to laboratory certificates of analysis;

(vi) an interpretive summary and assessment of results against the limits specified in condition 40; and

(vii) trend graphs to provide a graphical representation of results and to support the interpretive summary

(g) the number of hours that the emergency diesel generators and ammonia cracker unit were operated during commissioning;

(h) a summary of startup, shutdown and upset conditions recorded in accordance with condition 36;

(i) details of the ongoing calibration and verification of the installed CEMS system (excluding the initial calibration report required by condition 37), as conducted during the commissioning period in accordance with the CEMS Code or Annual Surveillance Test and QAL 3 requirements of EN 14181 including copies of any third-party reports generated from quality assurance testing conducted on CEMS;

(j) a summary of any complaints received and recorded in accordance with condition 60;

(k) a summary of the environmental performance of each item of infrastructure or equipment as constructed or installed (as applicable), which at minimum includes a comparison of any monitoring results against specifications listed in Table 1, Table 10, Table 13 and/or Table 18 (Note: Results of monitoring undertaken in accordance with Table 20 are not required to be compared against the limits specified in Table 18);

(l) a review of the works approval holder's performance and compliance against the conditions of this works approval; and

(m) where they have not been met, measures proposed to meet the manufacturer's design specifications and the conditions of this works approval, together with timeframes for implementing the proposed measures.

Time limited operation phase

45. The works approval holder may conduct time limited operations for the infrastructure specified in conditions 5 and 9 (as applicable):

(a) for a period not exceeding 240 calendar days from the completion date of environmental commissioning; or

(b) until such time as a licence for that item of infrastructure is granted in accordance with Part V of the *Environmental Protection Act 1986*, if one is granted before the end of the period specified in condition 45(a),

whichever is sooner.

Time limited operations – Infrastructure and equipment

46. During time limited operations, the works approval holder must ensure that the premises infrastructure and equipment listed in Table 9 and located at the corresponding infrastructure location is maintained and operated in accordance with the corresponding operational requirement set out in Table 9.

47. During time limited operations, the works approval holder must ensure that the dust control equipment specified in Table 10 and located at the corresponding infrastructure location is maintained in good working order and operated in accordance with the operational requirements set out in Table 10.

48. During time limited operations, the works approval holder must ensure visual inspections of the infrastructure specified in Table 11 are undertaken in accordance with the inspection requirements, and at the frequency set out in Table 11.

49. During time limited operations, the works approval holder must maintain a written log of all inspections undertaken in accordance with condition 27, with each inspection signed off by the person who conducted the inspection.

Time limited operations – Air emissions

50. During time limited operations, the works approval holder must ensure that the emission(s) specified in Table 12, are discharged only from the corresponding discharge point(s) and only at the corresponding discharge point location(s) (as shown in Schedule 3: Figure 8).

51. During time limited operations, the works approval holder must ensure that emissions from the discharge point listed in Table 13 for the corresponding parameter do not exceed the corresponding limit when monitored in accordance with condition 52.

Time limited operations – Monitoring of air emissions

52. During time limited operations, the works approval holder must monitor emissions:

(a) from each discharge point;

(b) at the corresponding monitoring location;

(c) for the corresponding parameter;

(d) at the corresponding frequency;

(e) for the corresponding averaging period;

(f) in the corresponding unit; and

(g) using the corresponding method,

as set out in Table 14.

Time limited operations – Monitoring (startup, shutdown and upset conditions)

53. During time limited operations, the works approval holder must monitor and record the information listed in Table 15 in the corresponding unit for the event types as set out in Table 15.

Time limited operations – Discharge to marine waters

54. During time limited operations, the works approval holder must ensure that the emission(s) specified in Table 17, are discharged only from the corresponding discharge point(s) and only at the corresponding discharge point location(s) (as shown in Schedule 3: Figure 22).

55. During time limited operations, the works approval holder must ensure that emissions from the discharge point listed in Table 18 for the corresponding parameter do not exceed the corresponding limit when monitored in accordance with condition 56.

Time limited operations – Monitoring of discharge to marine waters

56. During time limited operations , the works approval holder must monitor emissions:

(a) from each discharge point;

(b) at the corresponding monitoring location;

(c) for the corresponding parameter;

(d) at the corresponding frequency;

(e) for the corresponding averaging period;

(f) in the corresponding unit; and

(g) using the corresponding method,

as set out in Table 19.

Time limited operations – Wastewater monitoring.

57. During time limited operations, the works approval holder must monitor wastewater:

(a) at the specified monitoring location;

(b) for the corresponding parameter;

(c) at the corresponding frequency;

(d) for the corresponding averaging period;

(e) in the corresponding unit; and

(f) using the corresponding method,

as set out in Table 20.

Time limited operations – Reporting

58. The works approval holder must submit to the CEO a report on time limited operations within 60 calendar days of the completion date of time limited operations or 60 days before the expiration date of the works approval, whichever is sooner.

59. The works approval holder must ensure the report required by condition 58 of this works approval includes the following:

(a) a summary of the time limited operations, including timeframes and amount of granulated urea (and other products) produced;

(b) a summary of discharge events from the Saline Water Pond to the Multi-User Brine Return Line including the volume and duration of each discharge recorded in accordance with condition 46, and information detailing how it was determined that each discharge, once mixed in the Multi-User Brine Return Line, would achieve the limits specified in Table 18;

(c) a summary of the visual inspections recorded in accordance with condition 49 including a summary of any issues identified and actions taken or proposed to rectify those issues;

(d) the results of monitoring recorded in accordance with condition(s) 52, 56 and 57;

(e) for the monitoring undertaken in accordance with condition 57:

(i) a summary of the field and laboratory quality assurance / quality control QA/QC program;

(ii) copies of field monitoring records and field QA/QC documentation;

(iii) an assessment of reliability of field procedures and laboratory results;

(iv) copies of laboratory certificates of analysis and laboratory QA/QC records (onsite and external laboratories);

(v) a tabulated summary of results, as well as all raw data provided in an accompanying Microsoft Excel spreadsheet digital document/file (or a compatible equivalent digital document/file), with all results being clearly referenced to laboratory certificates of analysis;

(vi) an interpretive summary and assessment of results against the limits specified in condition 40; and

(vii) trend graphs to provide a graphical representation of historical results and to support the interpretive summary

(f) the number of hours that the emergency diesel generators and ammonia cracker unit were operated during time limited operations;

(g) a summary of startup, shutdown and upset conditions recorded in accordance with condition 53;

(h) details of the ongoing calibration and verification of the installed CEMS system, as conducted during time limited operations in accordance with the CEMS Code, or Annual Surveillance Test and QAL 3 requirements of EN 14181, including copies of any third-party reports generated from quality assurance testing conducted on CEMS;

(i) a summary of any complaints received and recorded in accordance with condition 60;

(j) a summary of the environmental performance of each item of infrastructure or equipment as constructed or installed (as applicable), which at minimum includes a comparison of any monitoring results against specifications listed in Table 1, Table 10, Table 13 and Table 18 (Note: Results of monitoring undertaken in accordance with Table 20 are not required to be compared against the limits specified in Table 18);

(k) a review of the works approval holder's performance and compliance against the conditions of this works approval; and

(l) where they have not been met, measures proposed to meet the manufacturer's design specifications and the conditions of this works approval, together with timeframes for implementing the proposed measures.

Records and reporting (general)

60. The works approval holder must record the following information in relation to complaints received by the works approval holder (whether received directly from a complainant or forwarded to them by the Department or another party) about any alleged emissions from the premises:

(a) the name and contact details of the complainant, (if provided);

(b) the time and date of the complaint;

(c) the complete details of the complaint and any other concerns or other issues raised; and

(d) the complete details and dates of any action taken by the works approval holder to investigate or respond to any complaint.

61. The works approval holder must maintain accurate and auditable books including the following records, information, reports, and data required by this works approval:

(a) the works conducted in accordance with conditions 5, 6 and 9;

(b) monitoring undertaken in accordance with conditions 27, 35, 36, 41, 42, 48, 52, 53, 56 and 57; and

(c) complaints received under condition 60.

62. The books specified under condition 61 must:

(a) be legible;

(b) if amended, be amended in such a way that the original version(s) and any subsequent amendments remain legible and are capable of retrieval;

(c) be retained by the works approval holder for the duration of the works approval; and

(d) be available to be produced to an inspector or the CEO as required.

Notification requirements – Non-compliance with conditions

63. The works approval holder must, within 48 hours of becoming aware of an exceedance of any limit specified in Table 13 or Table 18 of this works approval, notify the CEO in writing of that exceedance.

64. Pursuant to condition 63, the works approval holder must, within seven days of becoming aware of an exceedance occurring, provide a report to the CEO that includes the following information:

(a) which condition / limit was not complied with;

(b) the time and date and duration of the exceedance event;

(c) if any environmental impact occurred as a result of the exceedance and if so what that impact is and where the impact occurred;

(d) the details and result of any investigation undertaken into the cause of the exceedance;

(e) what action will be taken and the date by which it will be taken to prevent the exceedance occurring again; and

(f) for any exceedance of a limit specified in Table 13:

(i) all raw validated continuous ambient air quality monitoring and meteorological data collected in accordance with the Air Quality Management Plan for the seven-day periods immediately before and after the exceedance event occurred (in the format specified in Schedule 5); and

(ii) an assessment of monitoring results recorded in accordance with the Air Quality Management Plan against the corresponding Trigger and Threshold Criteria specified in that Plan.

Definitions

In this works approval, the terms in Table 21 have the meanings defined.

Table 21: Definitions

Term	Definition
Air Quality Management Plan	Means the most recent version of the Air Quality Management Plan that has been confirmed in accordance with conditions of Ministerial Statement 1180.
annual period	a 12 month period commencing from 1 July until 30 June of the immediately following year.
AEP	Annual Exceedance Probability
AS 4323.1	means Australian Standard *AS 4323.1 Stationary source emissions: selection of sampling positions*.
AS5667.1	means Australian and New Zealand Standard *AS/NZS 5667.1 Water quality - Sampling, Part 1: Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples*
AS5667.10	means the Australian and New Zealand Standard *AS/NZS 5667.11 Water quality – Sampling, Part 10: Guidance on sampling waste waters*.
ASTM D638	means the ASTM International standard *Standard test method for tensile properties of plastics (Designation: ASTM D638-14*), as amended from time to time.
ASTM D1238	means the ASTM International standard *Standard test method for melt flow rates of thermoplastics by extrusion plastometer (Designation: ASTM D1238-20)*, as amended from time to time.
ASTM D1505	means the ASTM International standard *Standard test method for density of plastics by the density – gradient technique (Designation: ASTM D1505-18)*, as amended from time to time.
ASTM D1603	means the ASTM International standard *Standard test method for carbon black content in olefin plastics (Designation: ASTM D1603-20)*, as amended from time to time.
ASTM D5321/D5321M-20	means the ASTM International standard *Standard test method for determining the shear strength of soil-geosynthetic and geosynthetic-geosynthetic interfaces by direct shear (Designation: ASTM D5321/D5321M-20*), as amended from time to time.
ATR	means autothermal reforming technology
BOD	Biochemical oxygen demand
books	has the same meaning given to that term under the EP Act.

Term	Definition
CEO	means Chief Executive Officer. CEO for the purposes of notification means: Director General Department administering the *Environmental Protection Act 1986* Locked Bag 10 Joondalup DC WA 6919 info@dwer.wa.gov.au
CEMS	Continuous Emissions Monitoring System
CEMS Code	means the *Continuous Emission Monitoring System (CEMS) Code for Stationary Source Air Emissions*, March 2016, Department of Environment Regulation, Perth WA, as amended from time to time
CFU/100mL	Colony Forming Units per 100 millilitres
CO	carbon monoxide
COD	Chemical oxygen demand
continuous	means to operate with an availability greater than 90 per cent on a calendar monthly basis.
CPI	corrugated plate interceptor
critical containment infrastructure	means the items of infrastructure listed in condition 5.
Critical Containment Infrastructure Report	means a report to satisfy the CEO that works of critical containment infrastructure have been constructed in accordance with the works approval.
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.
discharge	has the same meaning given to that term under the EP Act.
emergency conditions	means abnormal or upset operating scenarios requiring immediate action to protect plant integrity, personnel safety or the environment, including equipment failure, loss of utilities or activation of safety systems necessitating controlled blowdown or flaring.
emission	has the same meaning given to that term under the EP Act.
EN 14181	means the European Standard *EN 14181 Stationary source emissions - Quality assurance of automated measuring systems*
EN 15259	means the European Standard *EN 15259 Air quality - Measurement of stationary source emissions - Requirements for measurement sections and sites and for the measurement objective, plan and report*
Environmental Commissioning Report	means a report on any commissioning activities that have taken place and a demonstration that they have concluded, with focus on emissions and discharges, waste containment, and other environmental factors.
Environmental Compliance Report	means a report to satisfy the CEO that the conditioned infrastructure and/or equipment has been constructed and/or installed in

Term	Definition
	accordance with the works approval.
EP Act	*Environmental Protection Act 1986* (WA).
EP Regulations	*Environmental Protection Regulations 1987* (WA).
Experienced geotechnical specialist/engineer	means a person who: (a) holds a tertiary academic qualification in geotechnical engineering; (b) has a minimum of five years' experience working in the area / field of design engineering and certification of dams and/or evaporation ponds; and (c) is employed by an independent third party external to the works approval holder's business.
First flush stormwater	Means the first flush treatment systems that are designed and constructed to collect and treat a volume equivalent to a 1 in 3-month event ARI
freeboard	means the distance between the maximum surface water elevations and the top of retaining banks or structures at their lowest point
fully enclosed	means covered on all sides to: (a) prevent the release of dust emissions to the environment without treatment via a dust extraction system; (b) prevent the release of urea product to the environment; and (c) prevent the ingress and/or egress of water.
GL/year	gigalitres per year
HAZOP	means Hazard Operability Study, undertaken as part of the safety case assessment for major hazard facilities.
HDPE	High density polyethylene
HRSG	Heat Recovery Steam Generators
Initial start-up activities	means the period from the power generation turning on (initial operation of emergency diesel generators) until first urea production and stabilisation of units at nameplate capacity.
$L_{AS\ 90,30min}$ and $L_{AS\ 10,30min}$	means the A-weighted level exceeded for more than 90% and 10%, respectively, of the time over 30 minutes with the sound level meter set to 'Slow' time weighting
$L_{Aeq(20Hz-800Hz),30min}$	means the A-weighted equivalent noise level between 20 Hz and 800 Hz (one-third octave bands inclusive), averaged over 30 minutes
m	metre
m^3/day	cubic metres per day
mg/L	microgram per litre
ML/day	megalitres per day
mm	millimetre
MPN/100mL	Most Probable Number per 100 millilitres
MUBRL	Multi User Brine Return Line
mV	millivolts

Term	Definition
NH_3	ammonia
NO_2	nitrogen dioxide
NO_x	nitrogen oxides
non-directional system	means single microphone sound measuring equipment compliant with Schedule 4 of the Noise Regulations and capable of recording overall and one-third octave band statistical noise levels based on the A-weighted sound pressure level with 'Slow' time weighting (LAS)
NTU	Nephelometric Turbidity Units
O_2	oxygen gas
ORP	Oxidation-Reduction Potential
PM	particulate matter
$PM_{2.5}$	means particulate matter with an aerodynamic diameter of less or equal to 2.5 µm.
PM_{10}	means particulate matter with an aerodynamic diameter of less or equal to 10 µm and includes $PM_{2.5}$.
ppmv	parts per million by volume
premises	the premises to which this works approval applies, as specified at the front of this licence and as shown on the premises map (Figure 1) in Schedule 1 to this works approval.
prescribed premises	has the same meaning given to that term under the EP Act.
SO_2	sulfur dioxide
STP	means standard temperature and pressure (0°Celsius and 101.325 kilopascals respectively), dry
suitable qualified engineer	means a person who: (a) holds a tertiary academic qualification in civil engineering; (b) has a minimum of five years' experience working in the area / field of design engineering; and (c) is employed by an independent third party external to the Works Approval Holder's business.
µg/L	microgram per litre
$\mu g/m^3$	microgram per cubic metre
µS/cm	microsiemens per centimetre
VOCs	volatile organic compounds
waste	has the same meaning given to that term under the EP Act.
works approval	refers to this document, which evidences the grant of the works approval by the CEO under section 54 of the EP Act, subject to the conditions.
works approval holder	refers to the occupier of the premises being the person to whom this works approval has been granted, as specified at the front of this works approval.
WWTP	Wastewater Treatment Plant

END OF CONDITIONS

Schedule 1: Maps

Premises map

The boundary of the prescribed premises is shown in the map below (Figure 1).

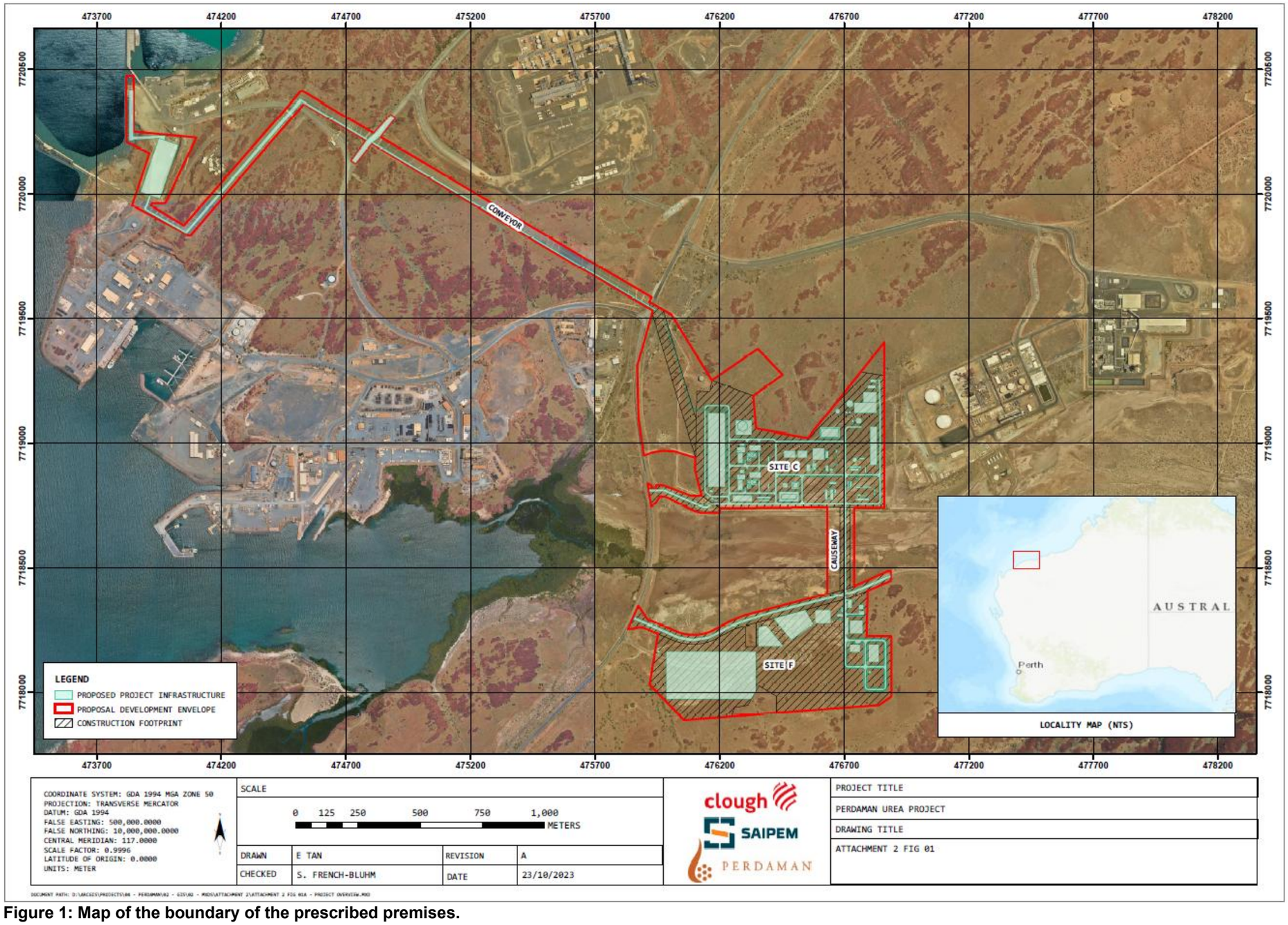


Figure 1: Map of the boundary of the prescribed premises.

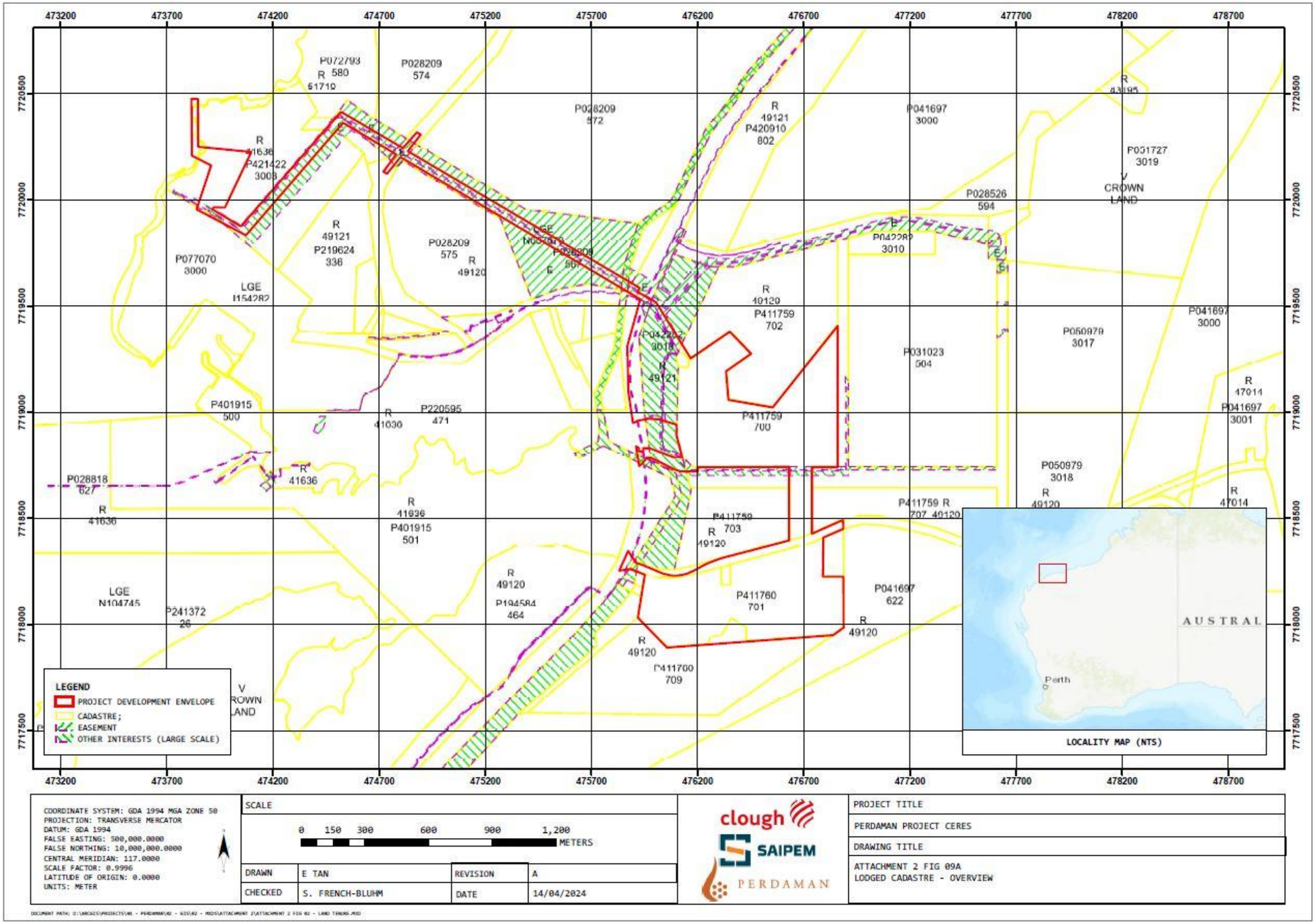


Figure 2: Map of the boundary of the prescribed premises, including premises tenure description

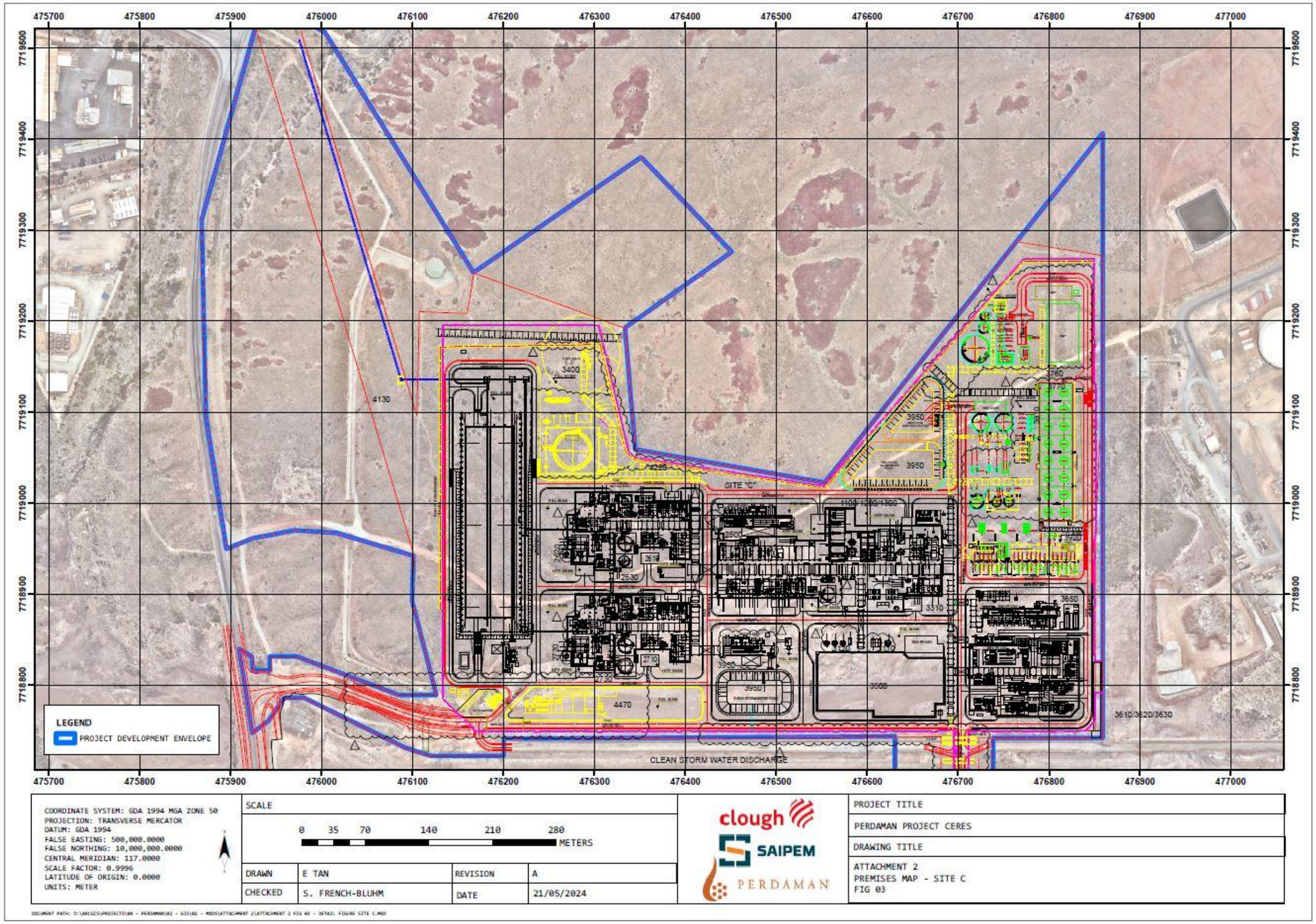


Figure 3: General layout of Site C

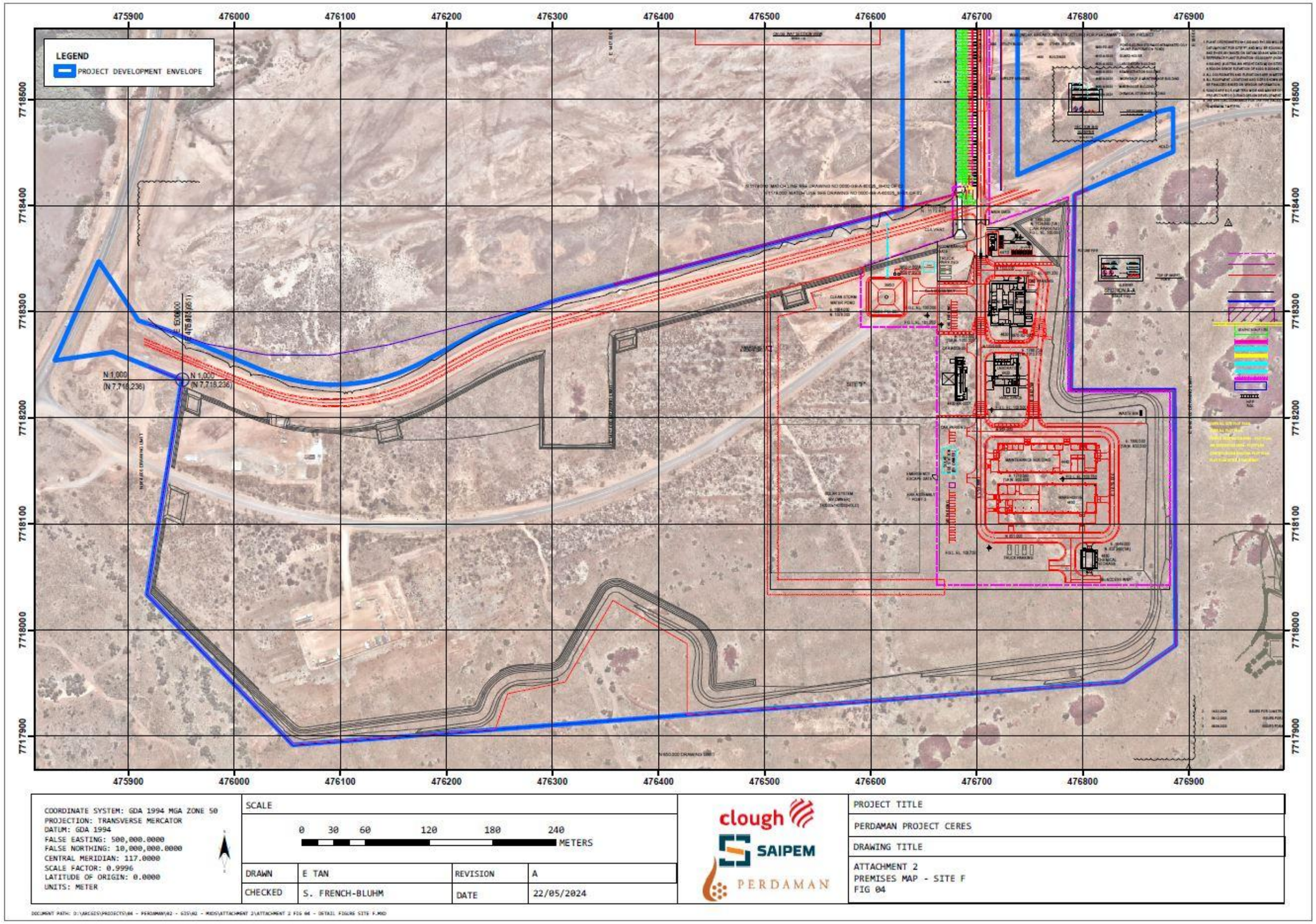


Figure 4: General layout of Site F.

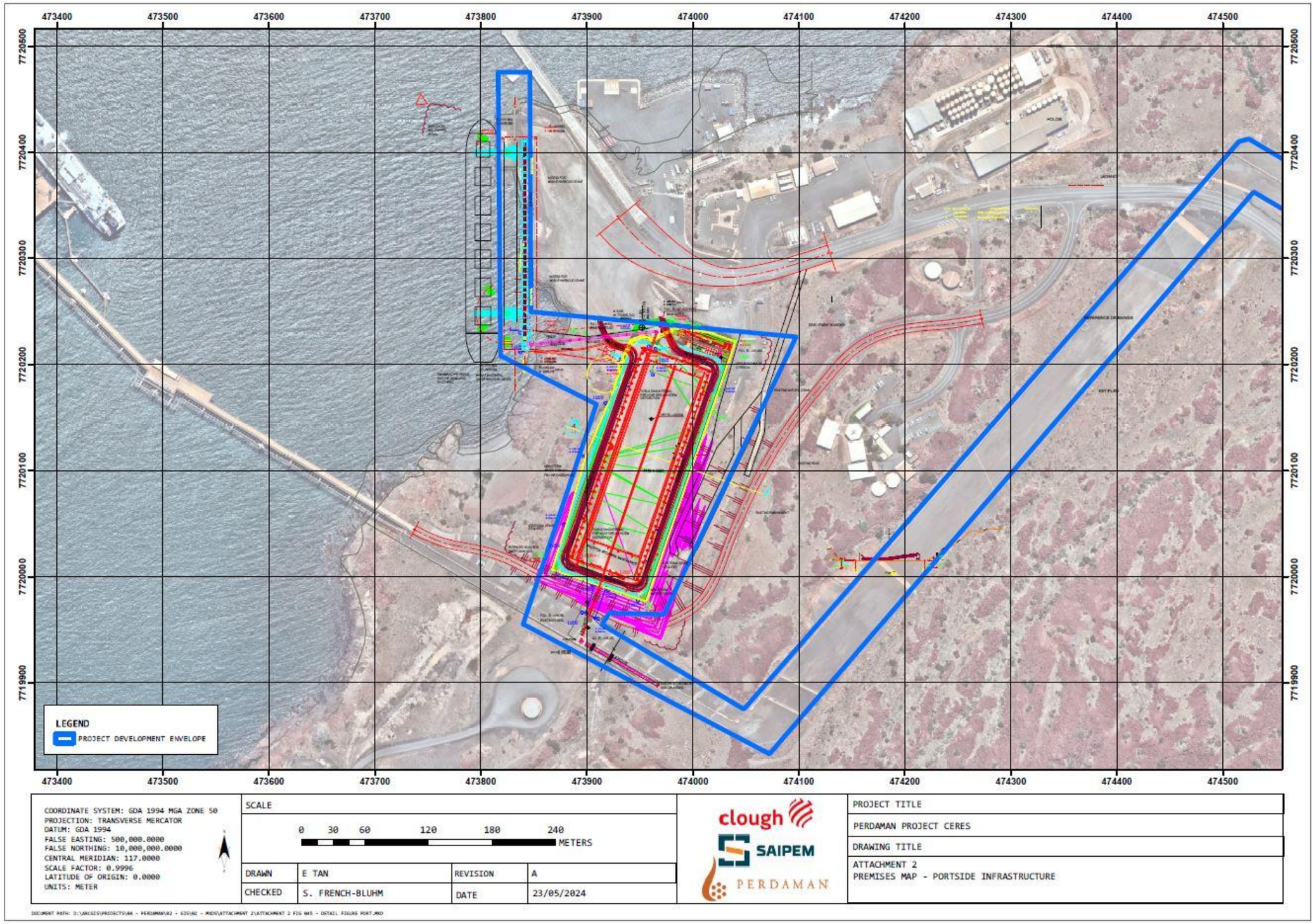


Figure 5: General layout of Port.

Schedule 2: Premises boundary coordinates

The corners of the premises boundary are the coordinates listed in Table 22.

Table 22: Premises boundary coordinates (GDA1994, Zone 50)

Object ID (as referenced in Figure 6)	Easting	Northing
1.	473818.3551	7720208.57
2.	473816.1321	7720475.773
3.	473846.091	7720475.773
4.	473847.1442	7720249.759
5.	474097.4422	7720226.219
6.	473972.4866	7719964.566
7.	473920.9671	7719965.772
8.	473914.2433	7719954.831
9.	474047.9595	7719875.208
10.	474515.1279	7720410.337
11.	474524.6018	7720412.701
12.	474811.3851	7720243.434
13.	474877.7047	7720319.14
14.	474894.9458	7720306.97
15.	474834.8537	7720229.582
16.	475926.0745	7719585.436
17.	475916.2592	7719567.129
18.	475985.1019	7719528.175
19.	476003.607	7719517.305
20.	476166.8922	7719253.508
21.	476351.2455	7719380.385
22.	476450.8959	7719276.285
23.	476333.4507	7719192.65
24.	476344.9185	7719059.03
25.	476553.0302	7719022.749
26.	476859.0902	7719406.636
27.	476859.028	7718742.08
28.	476738.3221	7718741.95
29.	476738.3221	7718428.882
30.	476885.005	7718491.661
31.	476885.2098	7718450.768
32.	476792.2813	7718410.347
33.	476788.6396	7718226.041
34.	476886.2837	7718226.266
35.	476887.5331	7717985.82
36.	476837.8817	7717951.298
37.	476055.2606	7717891.803
38.	475917.4353	7718033.736
39.	475950.5584	7718235.953
40.	475885.2164	7718262.136
41.	475830.6553	7718254.087
42.	475872.1336	7718347.625
43.	475909.7317	7718291.881
44.	475936.9184	7718282.592
45.	475973.2038	7718267.143
46.	476026.6028	7718244.872
47.	476058.4829	7718235.022

48.	476102.7883	7718231.61
49.	476146.5249	7718239.466
50.	476224.8158	7718278.214
51.	476298.5029	7718309.525
52.	476426.8398	7718343.294
53.	476630.4357	7718743.345
54.	476199.9991	7718741.121
55.	476199.9996	7718721.989
56.	476120.2239	7718721.989
57.	476091.9118	7718730.886
58.	475980.5443	7718786.182
59.	475958.7732	7718786.182
60.	475941.0264	7718760.244
61.	475923.5176	7718747.299
62.	475909.1997	7718839.724
63.	475923.1579	7718831.589
64.	475924.1184	7718816.049
65.	475943.0115	7718816.049
66.	475943.0115	7718831.589
67.	475972.5188	7718831.589
68.	476084.79	7718789
69.	476126	7718789
70.	476099.3857	7718892.72
71.	476100.9584	7718941.895
72.	476016.484	7718967.189
73.	475970.7422	7718970.114
74.	475923.7783	7718961.413
75.	475895.0625	7718949.836
76.	475872.7238	7719095.558
77.	475867.7829	7719311.193
78.	475929.5227	7719531.941
79.	474799.9443	7720202.256
80.	474736.9318	7720122.929
81.	474719.6933	7720133.357
82.	474779.0772	7720214.638
83.	474529.002	7720363.02
84.	474072.0963	7719833.009
85.	473839.6914	7719955.536
86.	473908.7541	7720162.824
87.	473818.3551	7720208.57

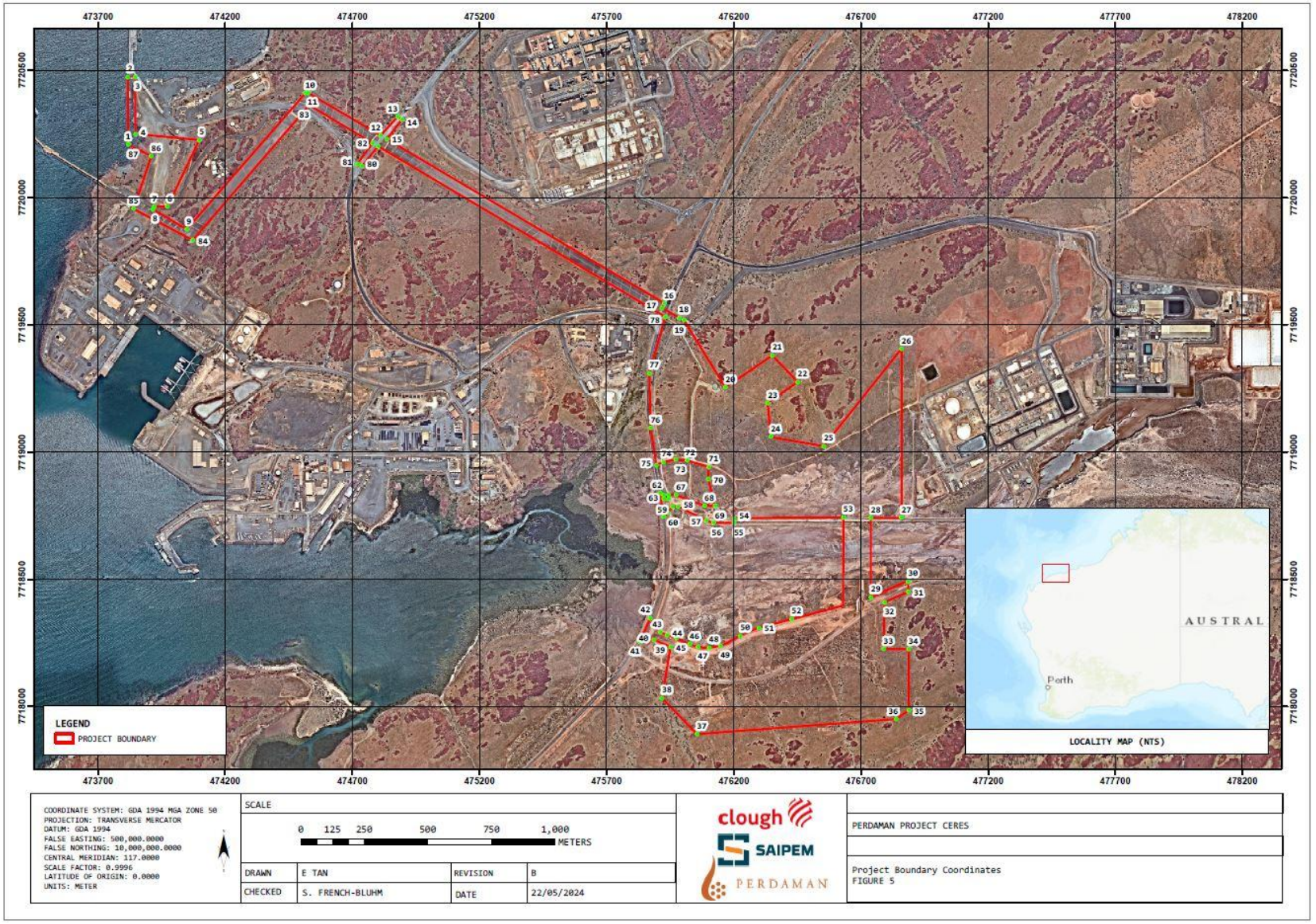
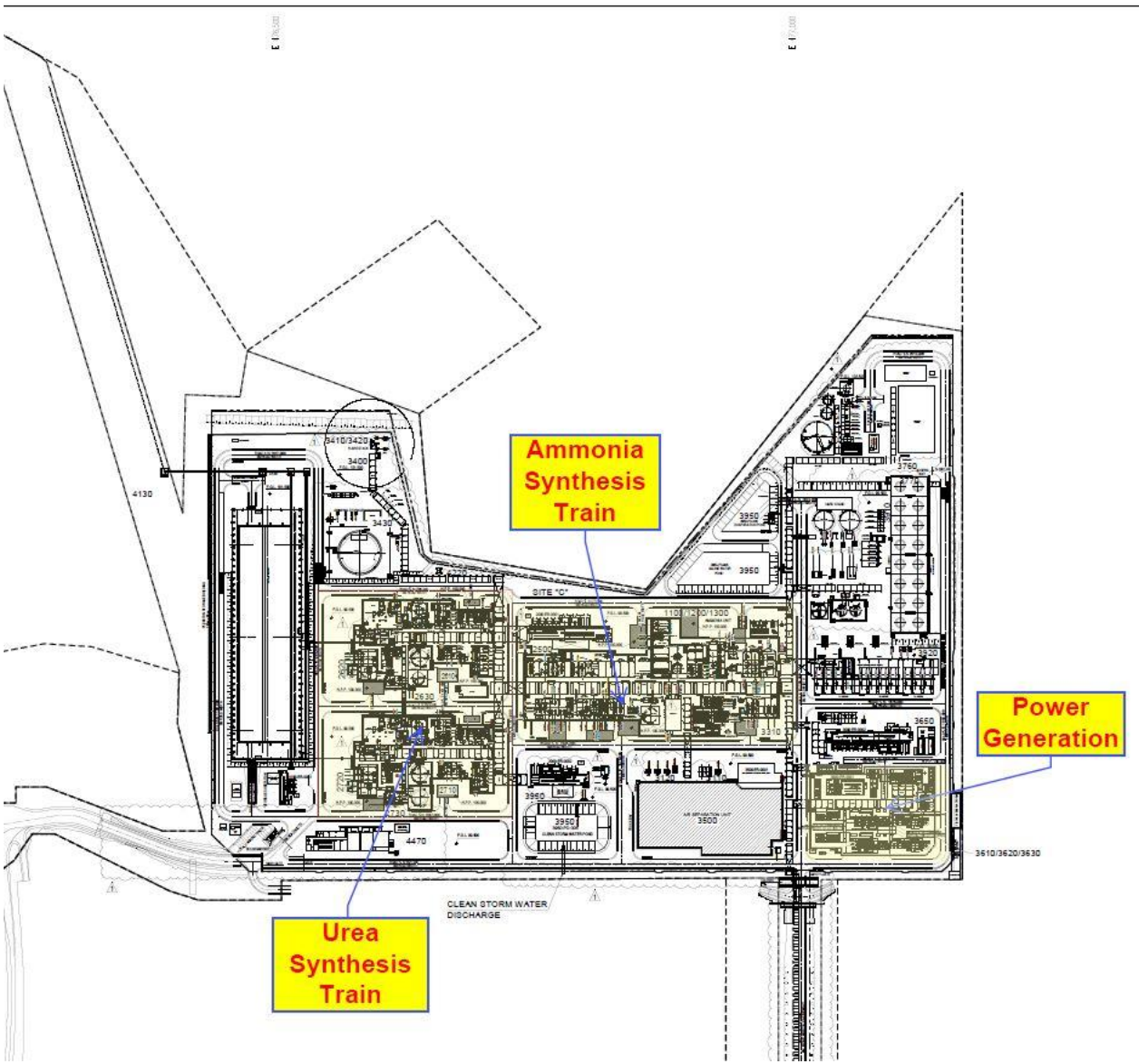


Figure 6: Prescribed premises boundary with cadastral reference point (as specified in Table 9).

Schedule 3: Plans and diagrams



WBS (WORK BREAKDOWN STRUCTURE) FOR PERDAMAN CERES PROJECT

0000	GENERAL	0000	GENERAL		
1000	SYNGAS BLOCK	1100	REFORMING AND PRETREATMENT		
		1200	CO SHIFT		
		1300	SYNGAS PURIFICATION (CO2 RECOVERY AND NWU)		
2000	PRODUCT BLOCK	2500	AMMONIA SYNTHESIS		
		2600	UREA GRANULATION	2610	UREA MELT TRAIN 1 (INCLUDING CO2 COMPRESSOR TRAIN)
				2620	UREA GRANULATION TRAIN 1
				2630	COMMON ITEM FOR BOTH UREA MELT TRAINS
		2700	UREA GRANULATION	2710	UREA MELT TRAIN 2 (INCLUDING CO2 COMPRESSOR TRAIN)
				2720	UREA GRANULATION TRAIN 2
				2730	COMMON ITEM FOR BOTH UREA GRANULATION TRAIND
3000	UTILITY BLOCK	3100	PLANT & INSTRUMENT AIR	3110	PLANT AIR (BACK-UP)
				3120	INSTRUMENT AIR (BACK-UP)
		3300	STEAM & CONDENSATE	3310	BFW / CONDENSATE
		3400	FLARE	3410	AMMONIA FLARE
				3420	SYNGAS FLARE
				3430	TANK FLARE
		3500	AIR SEPARATION UNIT	3510	AIR COMPRESSION
				3520	SEPARATION
				3530	LOX
				3540	COMPRESSED AIR
				3550	N2 COMPRESSION
				3560	LIN
		3600	POWER GENERATION	3610	GAS TURBINE
				3620	HRSG
				3630	STEAM TURBINE
				3650	EMERGENCY POWER (DIESEL GEN SETS)
		3700	WATER TREATMENT PACKAGE	3710	DESALINATION
				3720	POTABLE WATER
				3730	DEMINERALISATION
				3740	PLANT WATER
				3750	PROCESS/STEAM CONDENSATE POLISHING
				3760	WASTE WATER TREATMENT
				3770	SALT COLLECTION
		3800	SAFETY SYSTEMS	3810	FIRE DETECTION AND PROTECTION
				3820	GAS DETECTION
				3830	SAFETY SHOWER
		3900	OTHER UTILITIES	3910	COOLING WATER- ONCE-THROUGH SEA WATER
				3920	COOLING WATER - CLOSED LOOP
				3930	FIRE WATER
				3940	DRAINAGE (CIVIL)
				3950	PONDS (CLEAN STORM/CONTAMINATED OILY SALINE EVAPORATION POND)
				3960	POTENTIALLY CONTAMINATED WATER SYSTEM (PCWS)
				3970	LIFTING STATIONS FOR SANITARY WASTE
				3980	POTENTIALLY OILY CONTAMINATED WATER TREATMENT
				3990	NATURAL GAS AND FUEL GAS SYSTEM AND DISTRIBUTION
4000	OFFSITE SERVICES	4100	UREA HANDLING	4110	PRODUCT CONVEYING- TO STORAGE
				4120	PRODUCT STORAGE
				4130	PRODUCT CONVEYING- TO PORT
				4140	PRODUCT STORAGE- PORT
				4150	PRODUCT SHIPLOADING
		4200	STORAGE	4210	AMMONIA STORAGE TANK
				4220	AMMONIA STORAGE TANK BOIL-OFF UNIT
				4230	DIESEL STORAGE
				4240	LPG STORAGE
		4400	BUILDINGS	4410	ENTRANCE GATE
				4420	LABORATORY
				4430	ADMINISTRATION
				4440	MAINTENANCE
				4450	ROADS
				4460	WAREHOUSE
				4470	CONTROL ROOM
				4480	CHEMICAL STORAGE

Figure 7: Key infrastructure location - Site C.

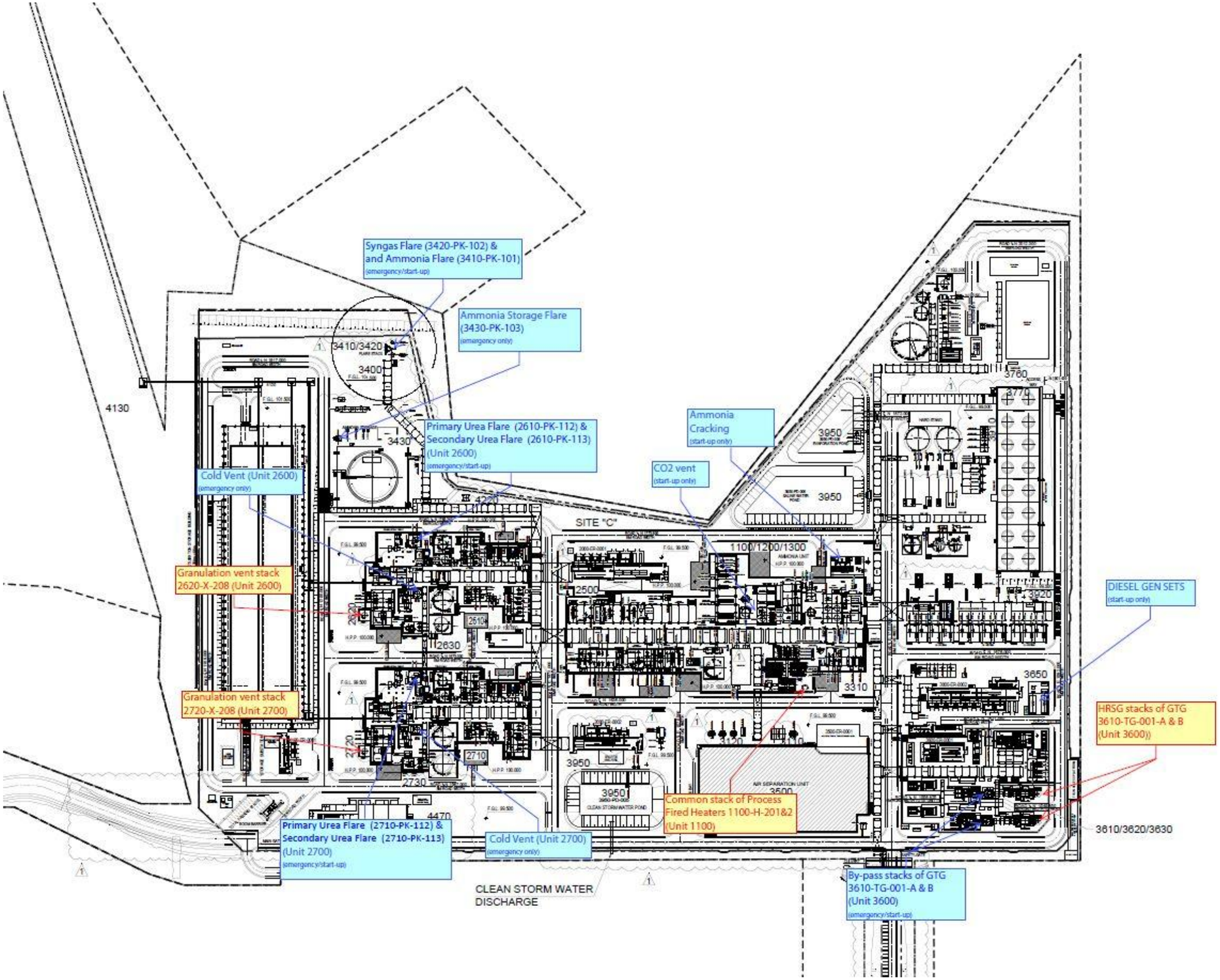


Figure 8: Site C - Plan showing the location primary process infrastructure, exhaust stacks, vents and flares

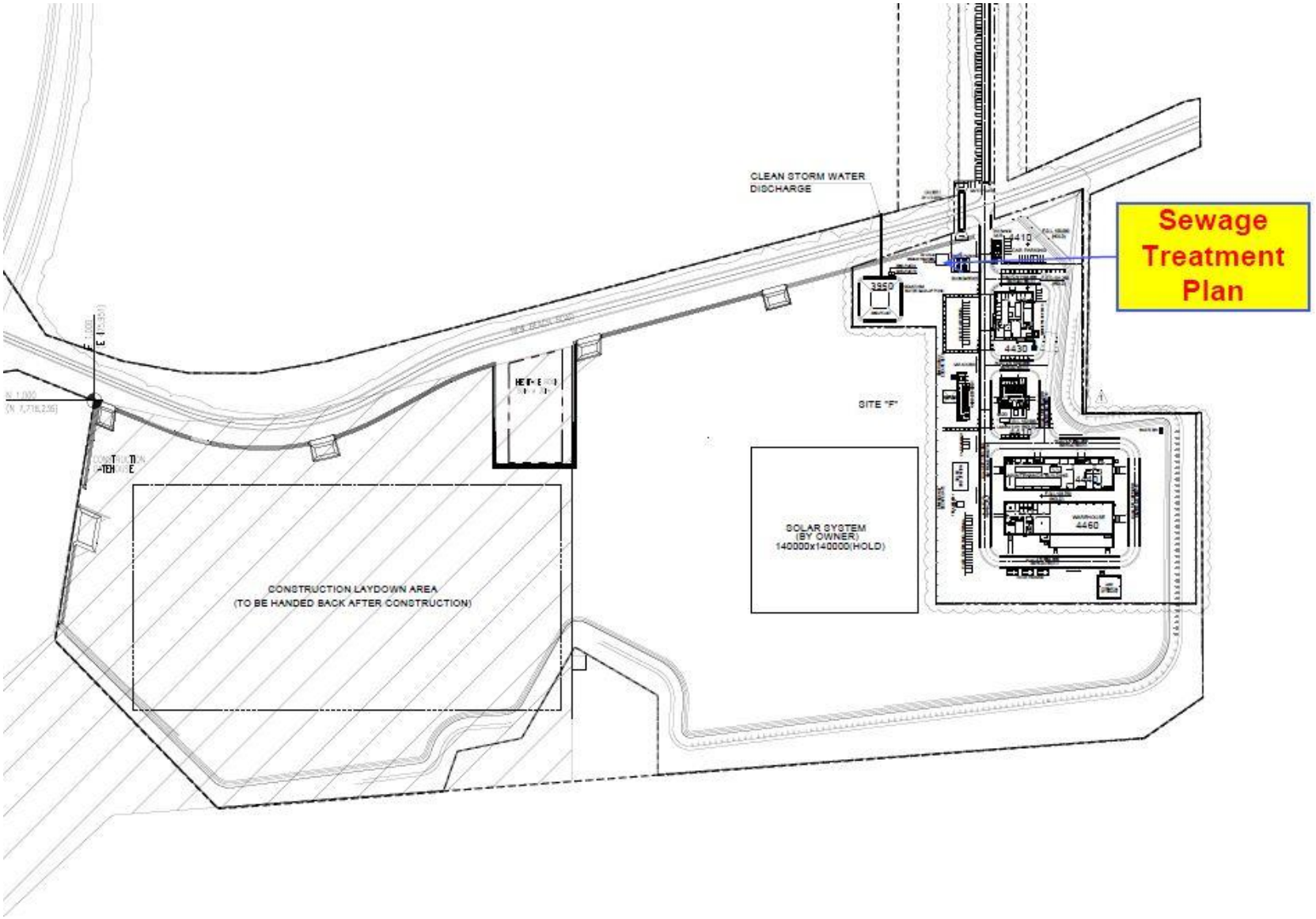


Figure 9: Key infrastructure – Site F.

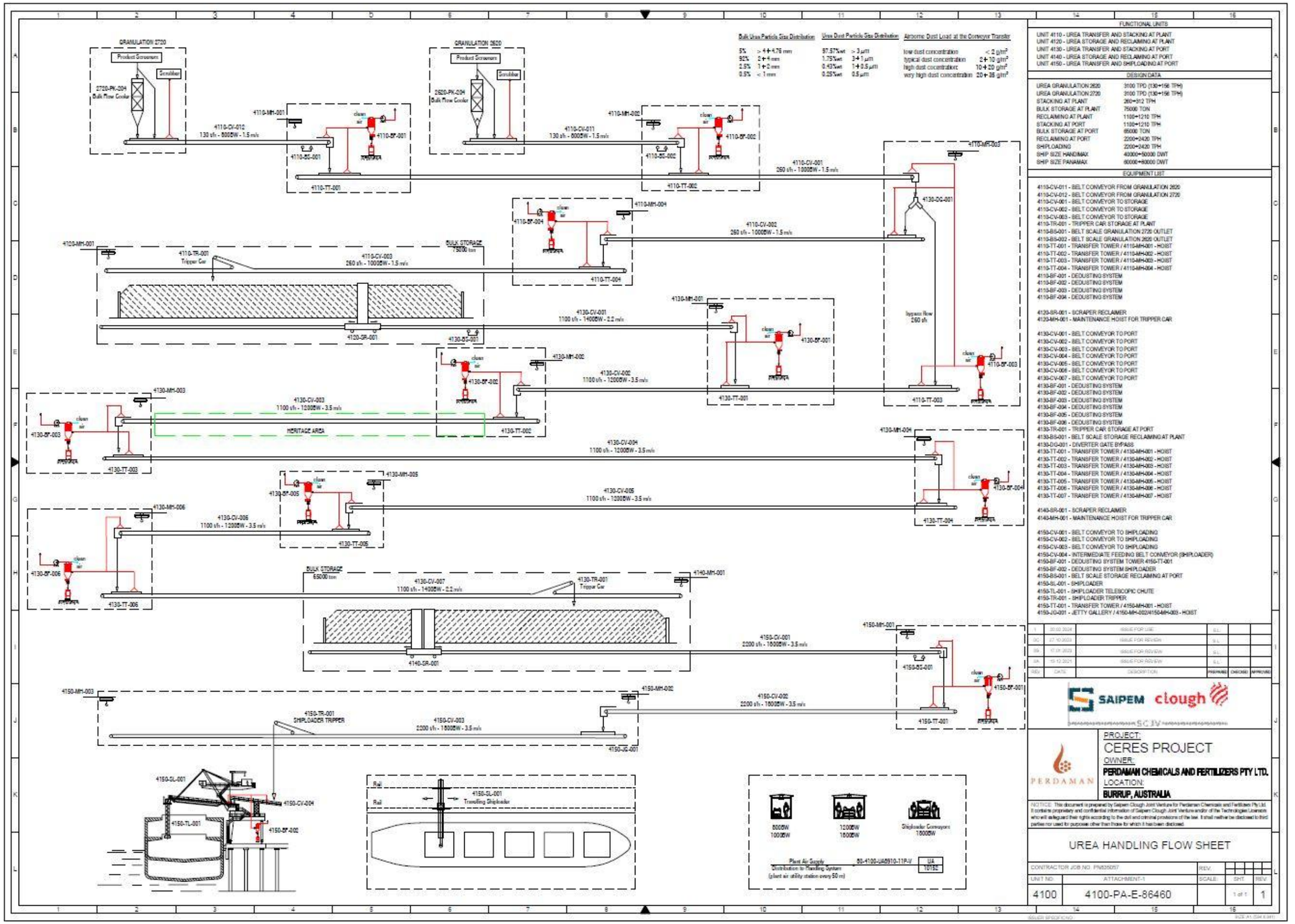


Figure 10: Schematic showing dust control systems on granulator, conveyor and shiploader.

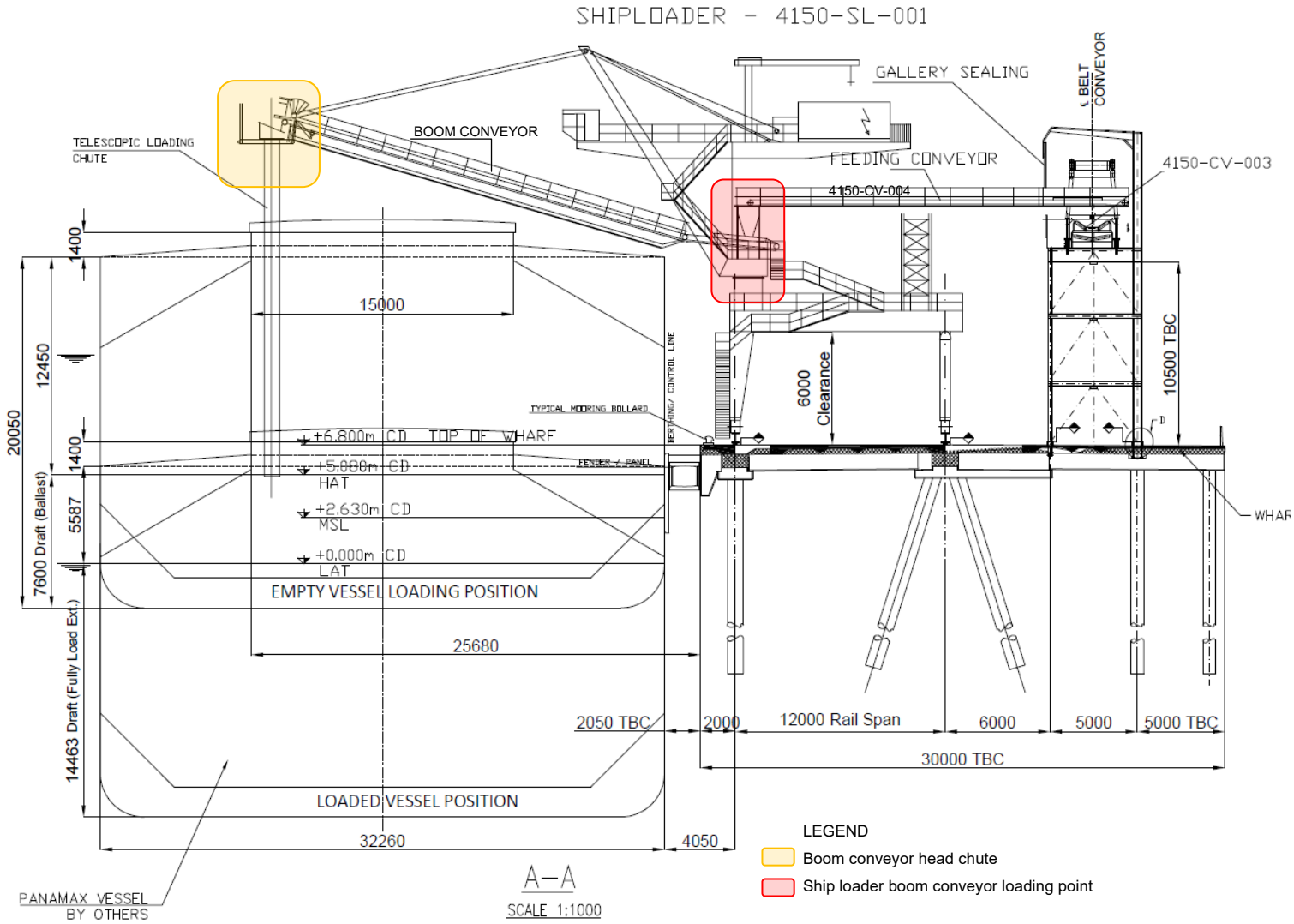


Figure 11: Plan of ship loader and associated conveyors

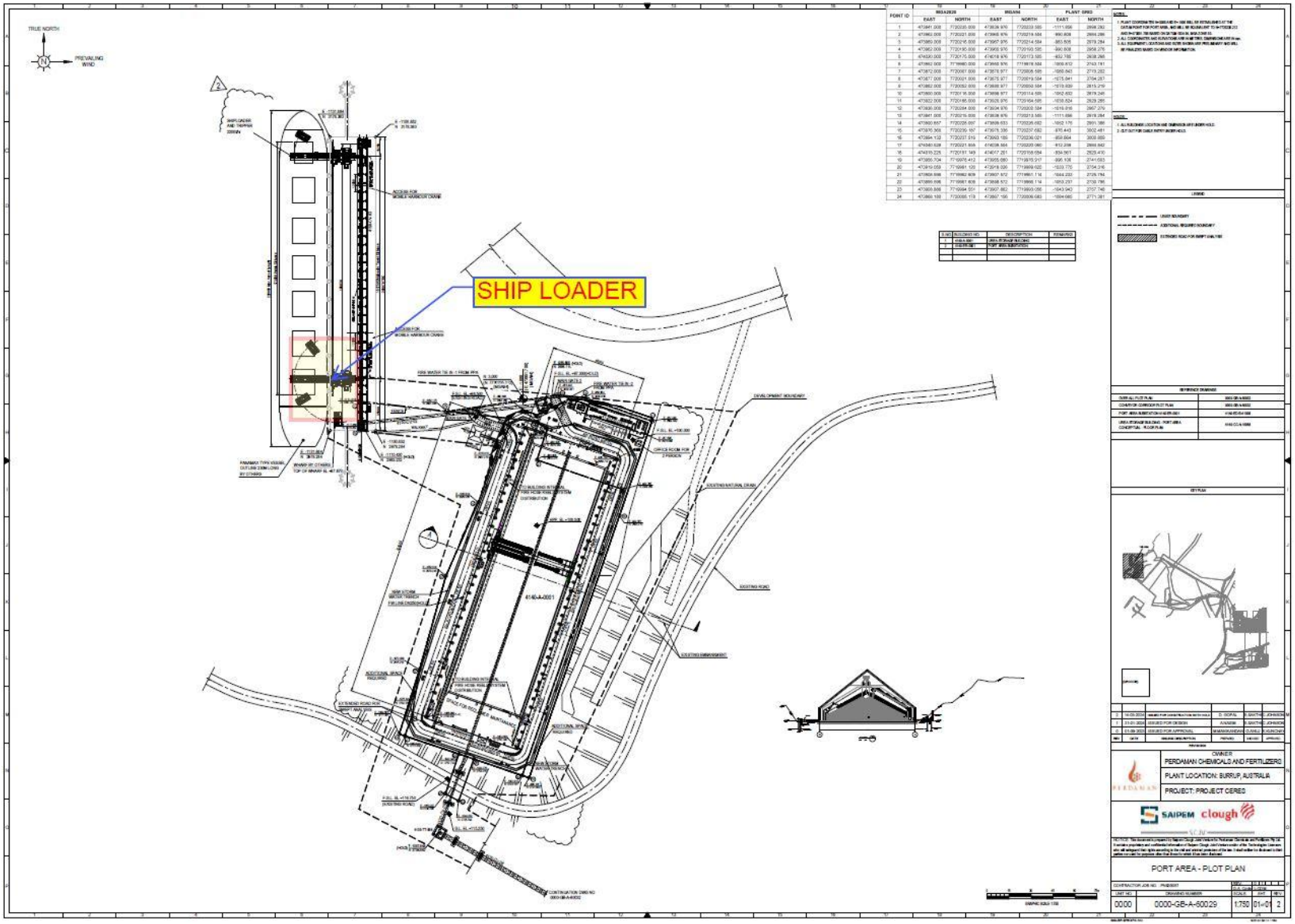


Figure 12: General layout of port infrastructure.

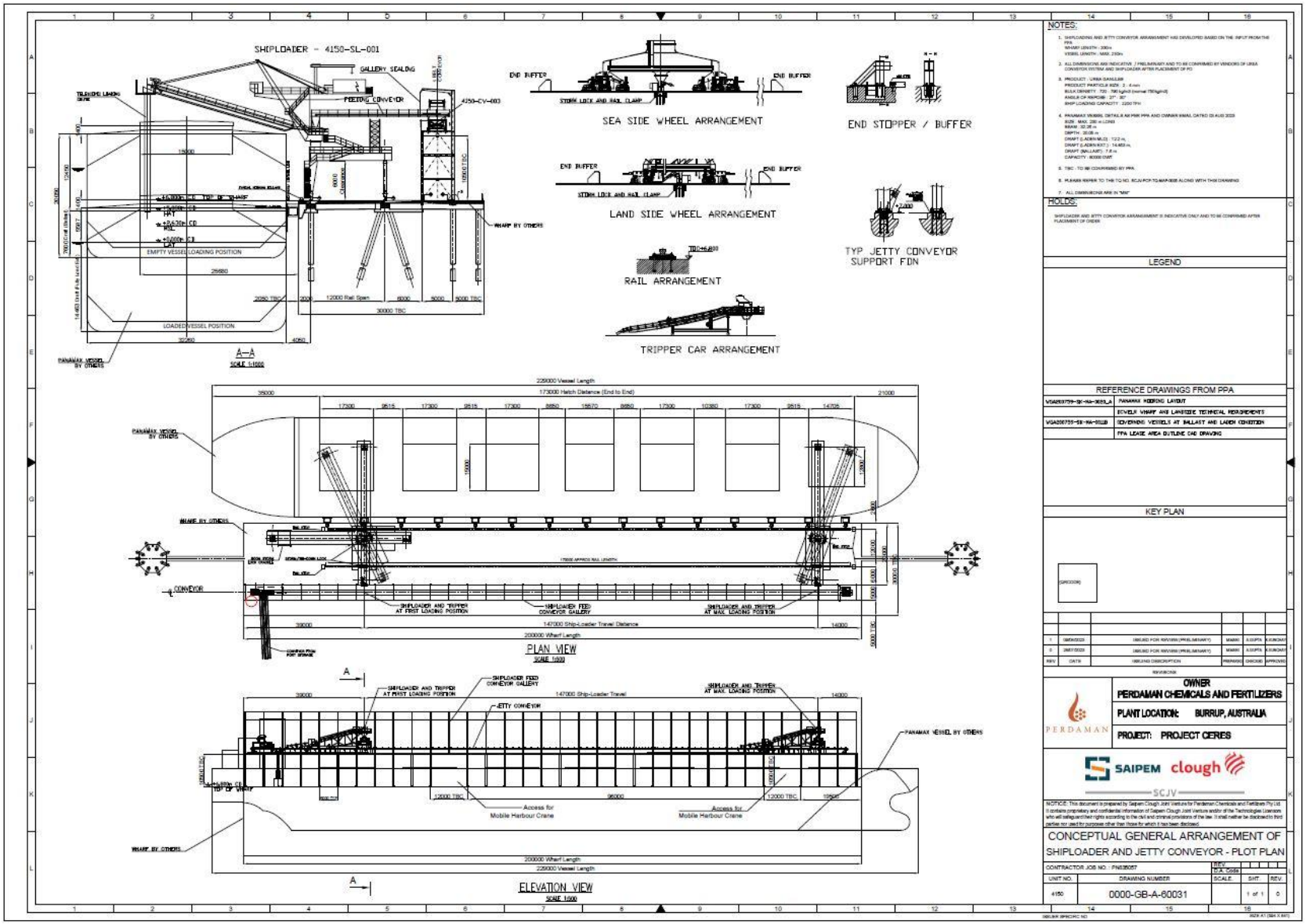


Figure 13: Conceptual layout of shiploader and jetty conveyor.

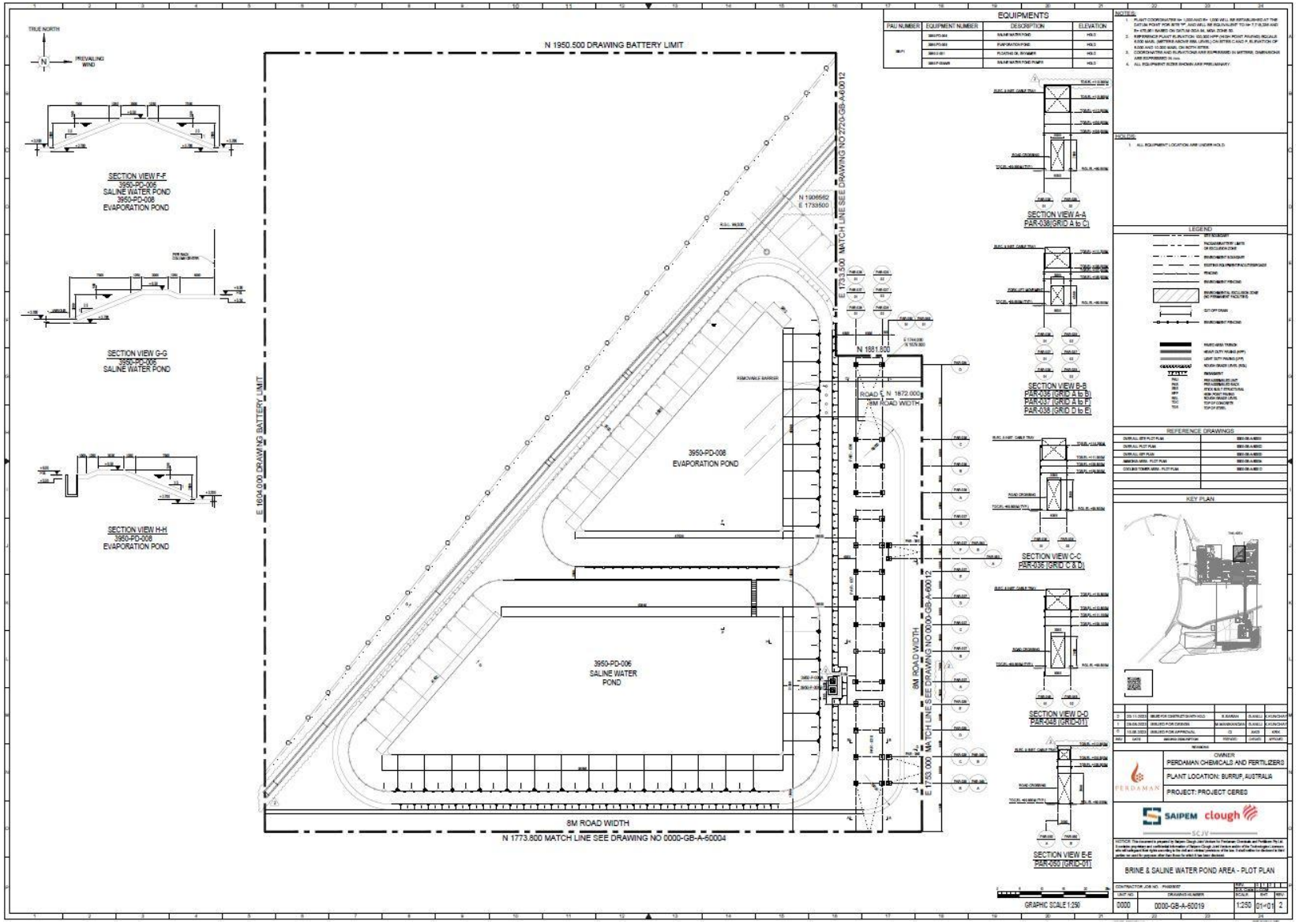


Figure 14: Saline Water Pond and Saline Evaporation Pond

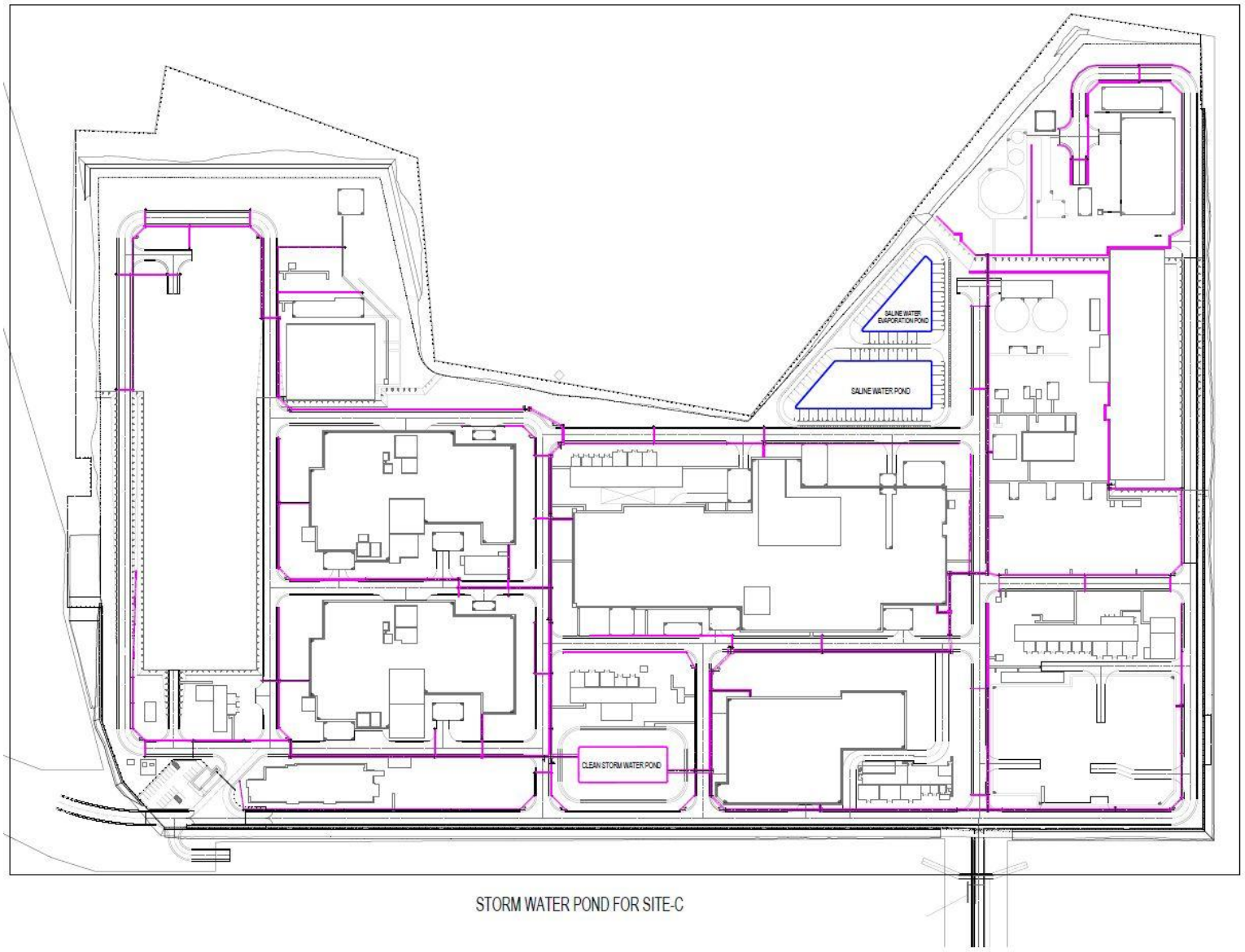


Figure 15: Stormwater plan for Site C

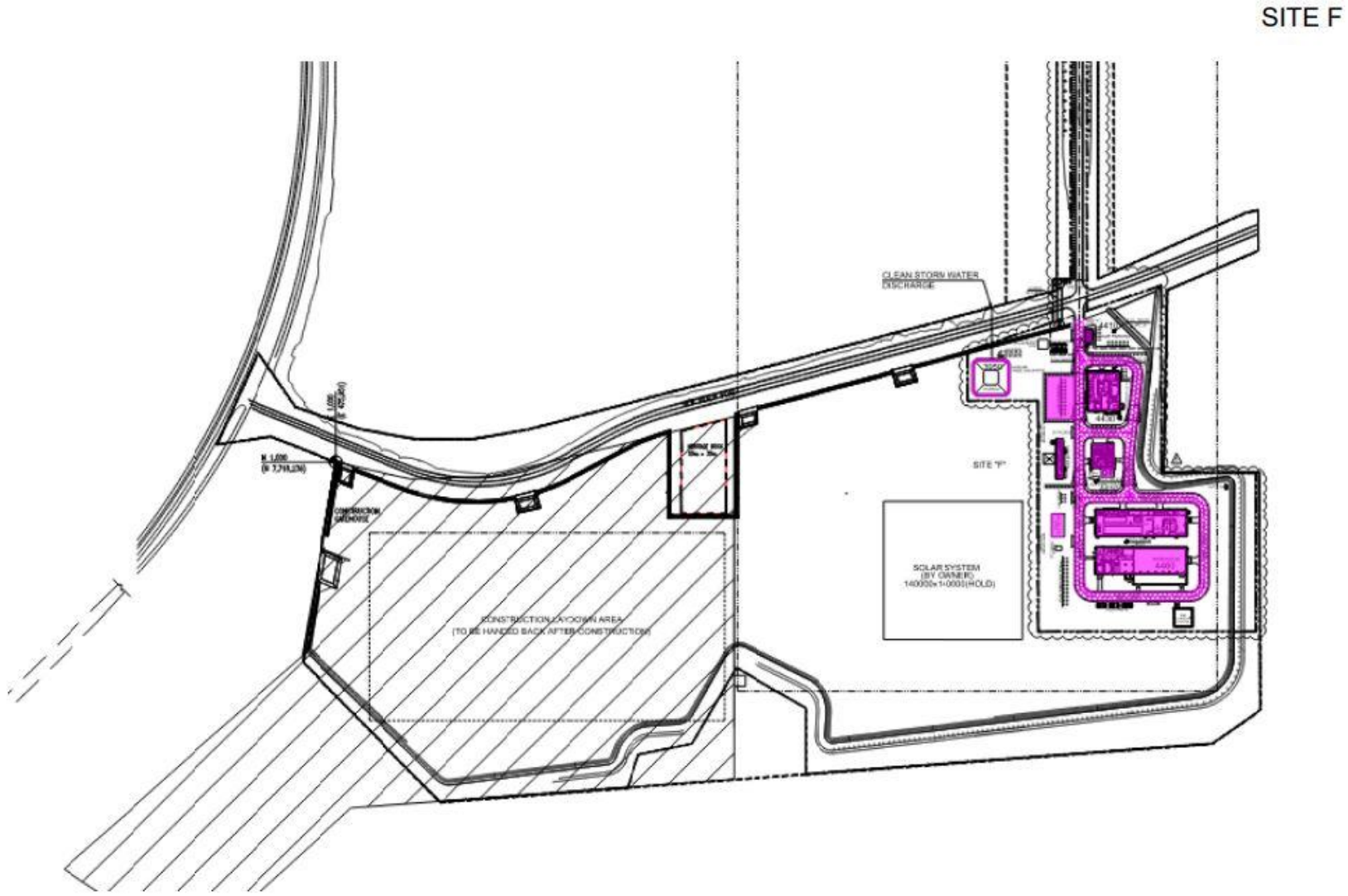


Figure 16: Stormwater plan for Site F.

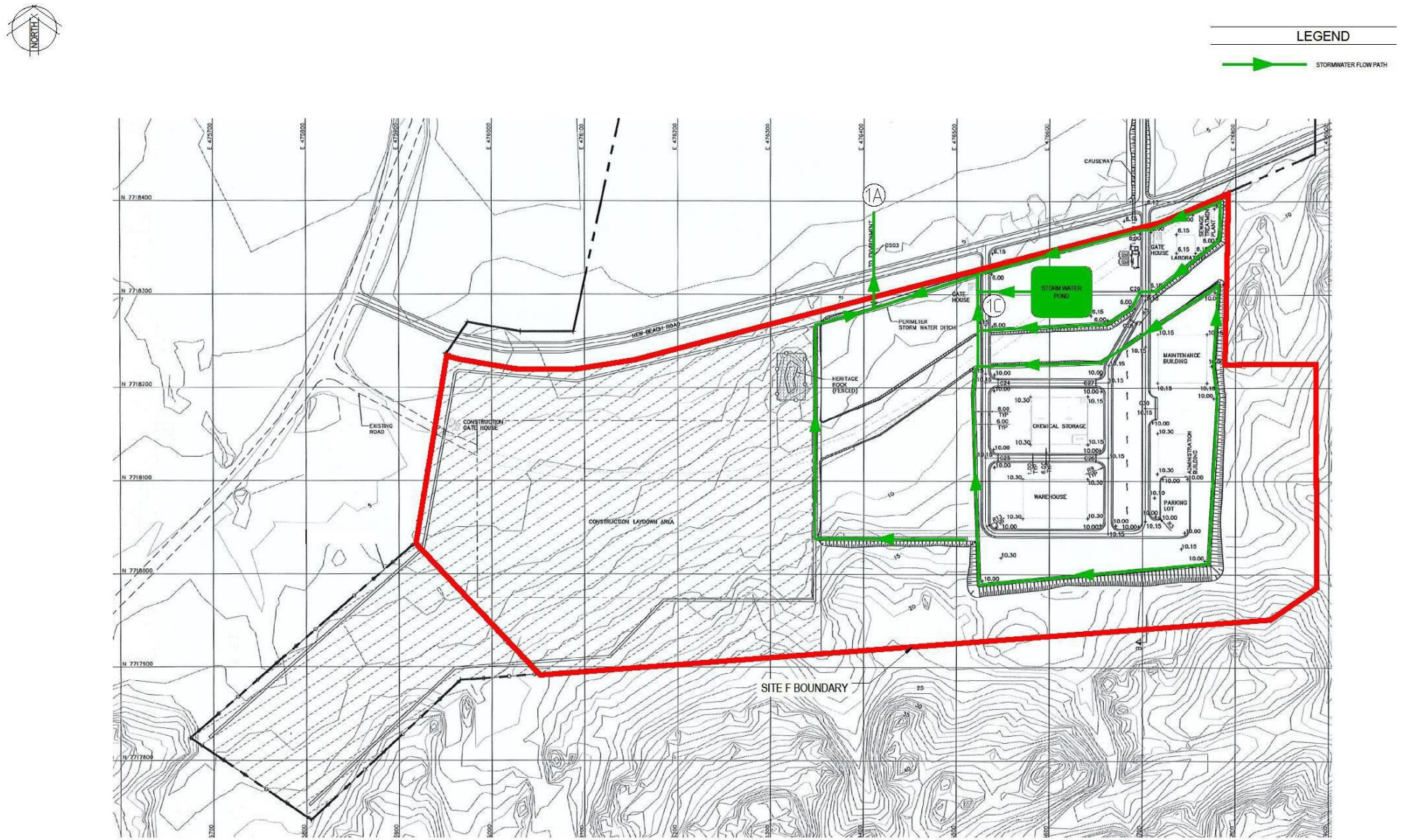


Figure 17: Stormwater flow path – Site F

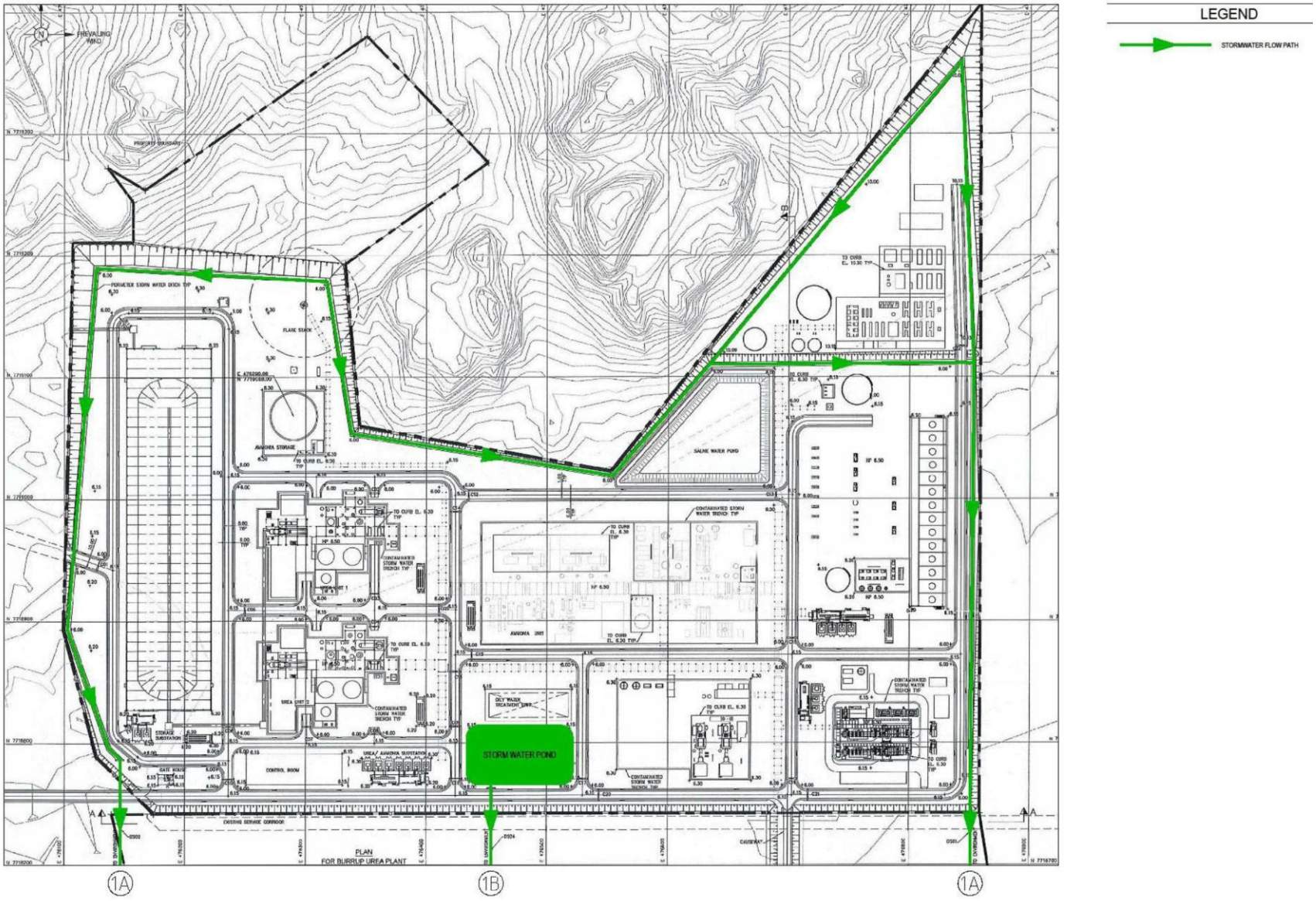


Figure 18: Stormwater flow path - Site C

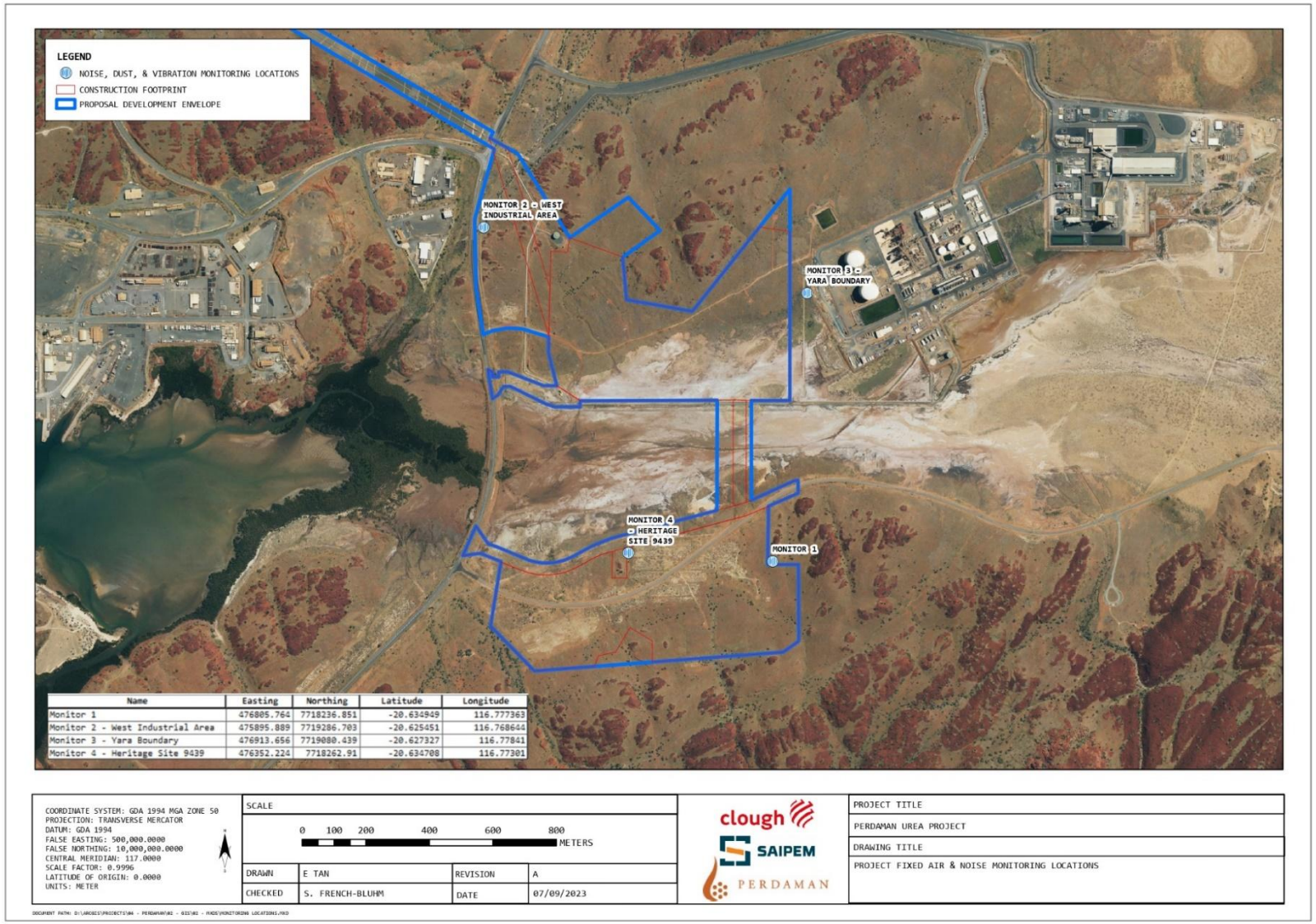


Figure 19: Location of noise and dust monitors – Site C and Site F

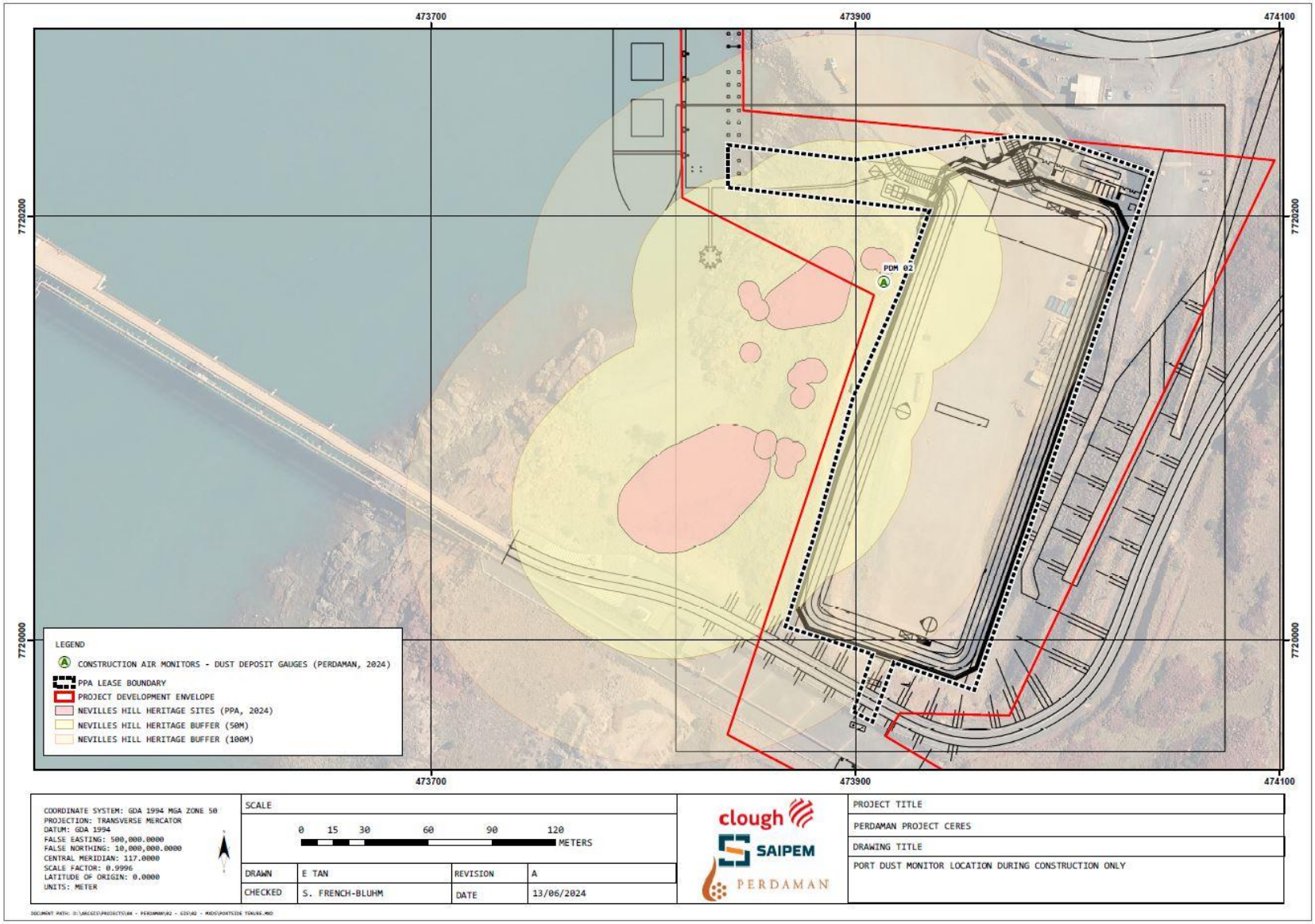


Figure 20: Location of dust monitor – Port

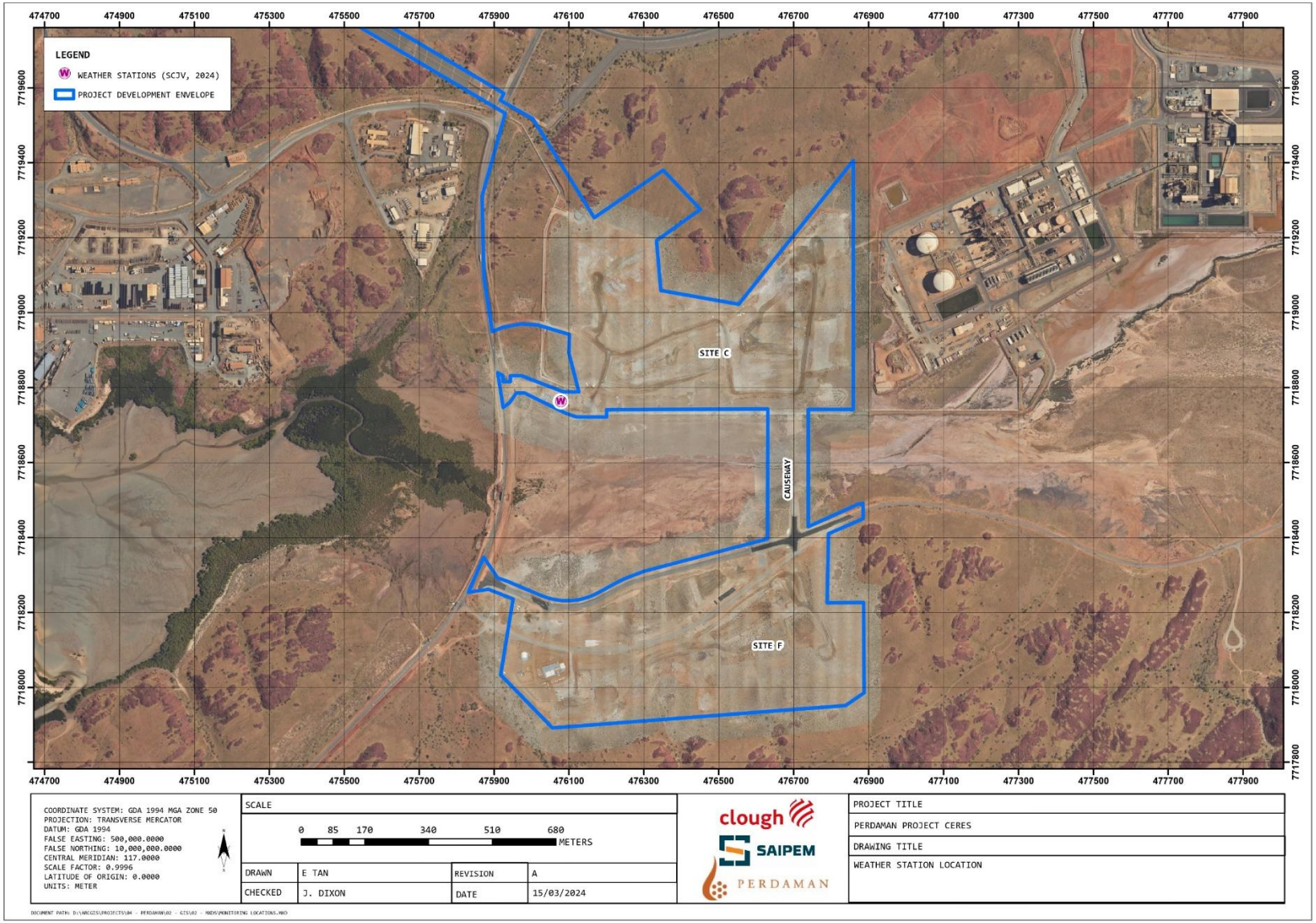


Figure 21: Project weather station location.

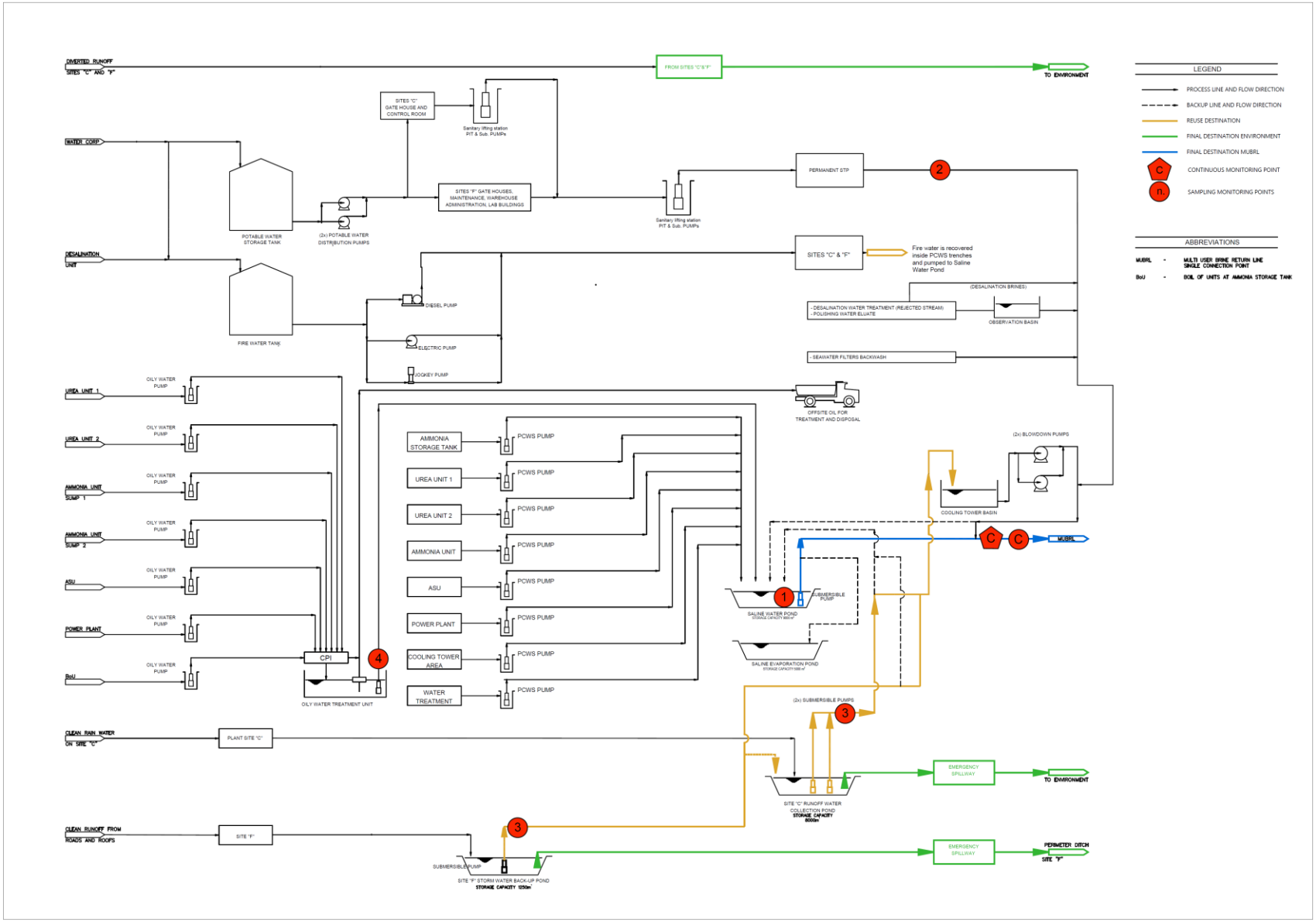


Figure 22: Wastewater discharge and monitoring locations.

Schedule 4: Dust monitor coordinates

The coordinates for the fixed monitors specified in Table 5 and Table 6 are listed in Table 23.

Table 23: Location of Noise and Fixed Dust Monitors (GDA1994; Zone 50)

Monitor	Easting	Northing
Monitor 1	476805.764	7718236.851
Monitor 2 – West Industrial Area	475895.889	7719286.703
Monitor 3 – Yara boundary	476913.656	7719080.439
Monitor 4 – Heritage site 9439	476352.244	7718262.91

Schedule 5: File format for monitoring data

The Works Approval Holder must ensure that validated (particle, gas and meteorological instrument data) results of continuous ambient air monitoring (i.e. excluding non-continuous monitoring such as deposition sampling) are provided as a comma delimited time series listing on a suitable computer readable medium. An example is given below. Variations on this format may be acceptable to DWER following discussions and approval from the DWER Air Quality Branch

```
SITE NAME:XXXXXXXXXX
column description
ddmmyyyy HHMM,x,x,x,…
ddmmyyyy HHMM,x,x,x,…
↓
↓
↓
ddmmyyyy HHMM,x,x,x,…
```

where:	**dd** is the two digit day of the month i.e. 01, 02,…,31
	mm is the two digit month of the year i.e. 01, 02,…,12
	yyyy is the four digit year i.e. 2009, 2010, …
	HH is the two digit hour code i.e. 00, 01,…,23
	MM is the two digit minute code i.e. 00, 10, 15,…,55
	x,x,x is the comma delimited decimal data.

The time period for comma delimited time series listing must represent the end of the data period. Hence the first timestamp for any day must be 0005 hours and the data associated with this time stamp must be the averaged data for the period up to this time i.e. from midnight to 0005 hours. The last time for any day must be 2400 and the data associated with this time stamp must be the averaged data for the period up to this time i.e. from 2355 hours to midnight.

If the above method of timestamping is not achievable by your system, then the time series listing can be timestamped at the **start** of the period with the first timestamp of each day being 0000 hours which represents data from midnight to 00:05 and ends at 2355 hours which represents data from 23:55 to midnight on the same day. Erroneous or invalid data must be denoted as a blank (**not** a space) or a numeric error code such as -99.0 within the data set. There should be no spaces in the data lines other than that between the date and time.

The covering documentation will indicate if the data timestamp is at the start of the data averaging period or the end of the data averaging period.

The following additional data is also required for each transect:

- Upwind concentration
- Windspeed during traverse
- Ambient temperature
- Sigma theta (maybe not)

An example five-minute averaged data set comprising eight parameters is provided below.

```
SITE NAME:- GENERIC AQMS
Date_Time,CO_ppm,NO_ppb,NO2_ppb,NOx_ppb,SO2_ppb,O3_ppb,PM10_ ug_m3,PM2.5_ug_m3
26/04/2013 2325,0.2,31.4,11.4,42.8,,0.2,10.0,5.3
26/04/2013 2330,0.2,26.6,12.6,39.3,,0.1,8.6,4.7
26/04/2013 2335,0.1,14.8,14.6,29.4,,0.1,8.2,5.1
26/04/2013 2340,,,,,,,,
26/04/2013 2345,,,,,,,,
26/04/2013 2350,0.2,25.7,16.2,42,,0.5,14.6,13.4
26/04/2013 2355,0.2,,15.8,36,,0.6,14.2,11.3
26/04/2013 2400,0.2,,15.1,35,,0.5,14.3,9.7
27/04/2013 0005,0.2,24.8,15.3,40.1,,0.5,12.8,9
27/04/2013 0010,0.3,27.1,14.6,41.8,,0.4,12.7,9.2
27/04/2013 0015,0.4,33.2,14.5,47.7,,0.4,13.0,8.9
27/04/2013 0020,0.5,26.5,12.6,39.1,,0.2,12.0,7.9
```

The following units must be used for ambient data submitted as a comma delimited time series listing:

Pollutant	Units	Minimum precision
Carbon monoxide	parts per million	X.X (tenth of a ppm)
all other gases	parts per billion	X (tenth of a ppb)
particles	micrograms per cubic metre	X.X (tenth of a µg/m^3)
wind speed	metres per second	X.X (tenth of a m/s)
wind direction	degrees from north	X.X (tenth of a degree)
sigma	degrees	X.X (tenth of a degree)
air temperature	degrees Celsius	X.X (tenth of a degree)
relative humidity	%	X.X (tenth of a %)
pressure	hectopascals	X.X (tenth of a hPa)
solar radiation	watts per square metre	X.X (tenth of a watt/m^2)

These units must be used unless approval has been obtained Air Quality Branch to use alternative units.

The proponent must provide:

- Data as five or 10 minute averages. If these are not available, then at shortest available averaging period;
- Site name, instrument manufacturer and model number;
- Site location (Latitude/Longitude GPS coordinates);
- Data validation procedure used to validate data; and
- All reported data must be time-stamped with the actual time to which the measurement refers.