Surface Water Management Plan

Wellard's Darwin Integrated Live Export Facility

Report Number 23919.83021

Prepared for

Wellard

Prepared by

EnviroAg Australia

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This document provides information to address the intent of Project Number 23919 as agreed to by Wellard Rural Exports Pty Ltd.

Executive Summary

The Integrated Live Export Facility (ILEF) is defined within a Controlled Drainage Area (CDA). It has an area of about 25ha. The rainfall runoff from this area can contain entrained manures and thus contaminants. Most entrained manures are recovered in the sedimentation basins. The waste water is captured in a primary wastewater pond which is dewatered either to irrigation or alternately to a wet weather storage dam.

The design dimensions of the sedimentation, holding and terminal ponds were compared using both the current and applicable sections of the National Feedlot guidelines (MLA, 2012) and the FSIM hydrology model (Lott, 1998). The FSIM design would appear to be the more conservative of the approaches and these dimensions are to be adopted in the design of these structures in the proposed ILEF.

The total holding pond capacity will be 165ML. This exceeds the design criteria for medium strength waste. The NSW DEC Environmental Guideline for use of Effluent by Irrigation (2004) allows for a spill event 1 in 5 years for medium strength waste with a total pond capacity of 110 ML. The holding pond design for the ILEF allows for a spill event 1 in 12 years with a total capacity of 165ML.

The total available irrigable area is more than 40ha. The annual average yield of waste water from the ILEF is estimated to be about 190ML/year. The waste water yield from a 1 in 10 year rainfall event is estimated to be about 170ML/year. Thus the irrigation application rate is estimated to be about 1-6ML/ha/year. This is less than the expected crop water requirement of 10ML/ha/year. Some clean water will be available but this too will be limited. A crop water deficit is expect in late spring ("the build-up") and clean water will be held where ever possible to irrigate at this time to allow crop dry matter yields to be maximised.

A tail water system is placed below the irrigable areas. Grassed waterways and a large tailwater dam, capture rainfall runoff from the irrigable areas. Any spill from the waste water dams must pass through this system as well, thus increasing safe capture and diluting any release should that happen.

The design and operation of the ILEF affords a very high degree of protection to surface waters.

A surface water quality monitoring program will be implemented at the site, including baseline monitoring at Hardy Creek and Berry Creek. This will include six monthly monitoring for the first year to ensure that all of the design and surface water management procedures are effective in both wet and dry seasons. After this, monitoring will be on an annual and event-only basis (e.g. where surface flow to creek are observed, or after cyclones).

Any non-compliance, complaints or incidents will be handled in accordance with the Environmental Management Plan section 2.3, 2.4 and 2.5 respectively, including the implementation of any necessary corrective actions and reporting.

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1. Introduction

1.1 Site Description

This Surface Water Management Plan refers to a proposed ILEF site in Darwin, located at a property known as 'Livingstone Valley' and is located on Lot 5544 Hundred of Strangways, 2658 Stuart Highway (Figure 1).

The site is located on the western side of a plateau. Its location is such that it is at the top of the foothill slope adjoining the plateau. Water onsite drains to the west. The site has no creeks and sits at the top of a watershed. The site does not flood, and is considered the most suitable location considering the susceptibility of the low lying areas to water inundation. In a 1 in 10 year extreme rainfall event, the catchment outside the development site will be significantly water logged. (Please see Appendix A)

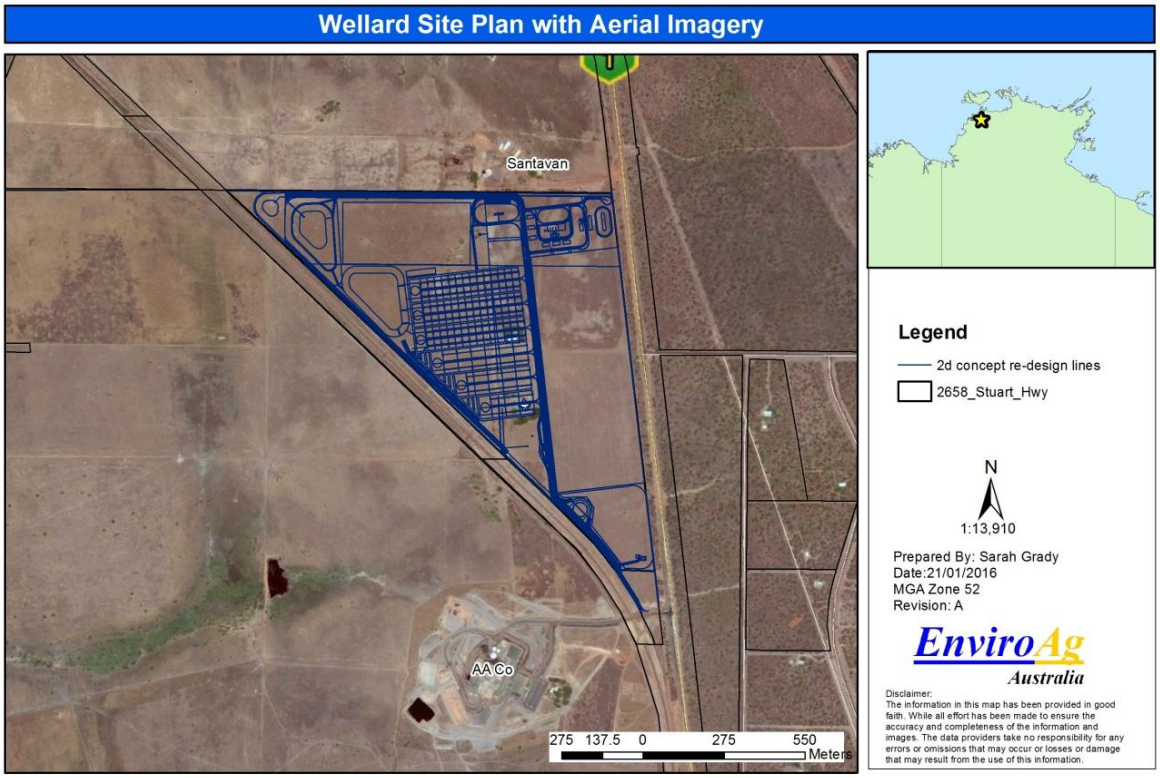

Figure 1 Darwin ILEF Site Satellite Image

1.2 Surrounding Area – Description

Adjacent properties downslope each have tributaries of Blackmore River - Berry Creek on AA Co. and Hardy Creek on Santavan. Hardy Creek is a tributary of Berry Creek, which runs into Blackmore River (15km from the site). Blackmore River runs for another 8km to Darwin Harbour.

The Natural Resources, Environment, the Arts and Sport (NRETAS) Aquatic Health Unit monitors a number of freshwater and estuarine sites in the Berry Creek and Blackmore River catchment as part of their annual reporting of the environmental condition of waterways within the Darwin Harbour Region. The last report card was in 2012 and this showed that total suspended solids (TSS), nitrates and total phosphorus were high, whilst electrical conductivity, turbidity, pH, dissolved oxygen, chlorophyll, total nitrogen and filterable reactive phosphorus were within the water quality objectives. The high nutrients and TSS were likely due to the increase in agricultural and urban development within the catchment.

The lower reaches of the Blackmore River and Berry Creek are estuarine and tidally influenced. However, because incoming tides are larger than outgoing tides, the upper reaches of Darwin Harbour are not well flushed. As a result, there is a tendency for fine sediments to become trapped, and nutrients and other

contaminants bound to the sediment may build up (DNREAS, 2010). Contamination of surface water may lead to toxic effects on the aquatic and riparian ecosystems downstream, as well as the people that use this water. This means that water quality should be maintained at a healthy level as much as possible upstream.

1.3 Integrated Live Export Facility (ILEF)

An ILEF is characterised by several key land uses:

(i) Large areas of roof;

(ii) Large areas of road and hard stand; and ancillary land uses;

(iii) Open stock holding pen areas for the PEQ and small holding yards / short term feedlot;

(iv) Sedimentation basins and waste water holding ponds;

(v) Irrigable area; and

(vi) Tail water capture system (grassed water ways, drains and pond).

Clean water from the rooves, roads and hard stands are diverted away from the operation areas of the ILEF to avoid contamination, and will be captured in rainwater tanks and the tail water system, and re-used for irrigation and dust suppression.

The ILEF and its ancillary facilities typically pose the greatest risk to water quality in the external environment. To meet water quality objectives uncontaminated runoff water from any areas upslope of the ILEF will be prevented from entering the ILEF facility or the associated land areas where waste may be collected, stored or treated.

The layout and surface water flow of the proposed ILEF is detailed in Appendix B. The controlled drainage area (CDA) of the proposed ILEF compromises a catchment with a total area of nearly 33 hectares (excluding roofs).

Clean stormwater is diverted around the perimeter of the site and is prevented from coming into contact with any potential contaminants from the ILEF. All potentially contaminated water generated from the ILEF (pens etc.) is diverted through a controlled drainage network, and will collect in a primary pond. This contaminated water is then pumped to a wet weather storage pond and is then pumped and re-used in the irrigation system. The waste water system has been designed to spill in a 1 in 10 extreme rainfall event, and will be routed through the tail water system, increasing dilution and mixing prior to any off-site discharge.

The majority of the tailings water from the irrigation system and other infrastructure (e.g. roads) will be diverted through a controlled drainage network to a tail water storage pond. This water will also be re-used within the irrigation areas. In the event of major weather event above the design rainfall events, a spillway will allow for discharge of water from the tail water pond. A water quality monitoring program will be undertaken, including up and downstream water quality monitoring of nearby Hardy and Berry Creeks to ensure that all of the design and surface water management procedures are effective.

The pens will be constructed of crushed and compacted ferricrete. This engineered surface will be essentially impermeable and resistant to traffic by cattle and machinery.

The sediment basins will be constructed of concrete. The design has been used elsewhere and had proven to be effective. The concrete basin can be accessed in wet weather. Solids recovered from the basins are placed on a pad that drains back to the sedimentation basin. The sedimentation basins will be designed and constructed so they have two parts to their storage capacity; a working volume and then peak discharge detention volume.

The design dimensions of the sedimentation, holding and terminal ponds were compared using both the current National Feedlot guidelines (MLA, 2012) and the FSIM hydrology model (Lott, 1998). The FSIM design would appear to be the more conservative of the two approaches and these dimensions have been adopted in the design of these structures in the proposed ILEF. This design meets the NSW EPA requirements for high strength waste water, and is considered conservative as this facility will only generate moderate strength waste water.

The total holding pond (primary pond and wet weather storage pond) capacity will be 165ML. This exceeds the design storm criteria (40ML), considerably (almost by a factor 4). The capacity of the terminal pond (tail water pond) is 20ML. This exceeds guideline values of 4.8ML.

The final release point for surface waters from the property is the by-wash from the tail water dam below the site. This passes water into the grassed drainage line in the railway easement.

The ILEF reduces gross runoff the property as much of the water that falls on it, is captured and reused. The tail water systems exert significant control on surface water management and it is expected that gross nutrient loss will also be less than that from the existing site where no controls exist.

For further detail on drain, sediment basin, and tail water pond design, please refer to the Wellard ILEF Hydrological Study Report 23919.80836.

2. Purpose

The purpose of the Surface Water Management Plan (SWMP) is to ensure potential risks to the quality and quantity of receiving surface water systems from the ILEF, including the downstream areas of Darwin Harbour are appropriately mitigated.

This SWMP has been prepared with reference to the following documentation:

- EPA South Australia Guidelines- Wastewater Irrigation Management Plan SA (EPA SA 2009).
- EPA Victoria Guidelines for Wastewater Irrigation (EPA Vic 1991)
- NSW Department of Conservation – Environmental Guidelines: Use of Effluent by Irrigation (DEC 2004)
- Water Quality objectives for the Darwin Harbour Region – Background Document (NT Govt 2010)
- Water Quality Protection Plan for Darwin Harbour (NT Dept LRM 2014)
- Environmental Management Plan – Wellard Darwin Integrated Live Export Facility Report 23919.79981 (EnviroAg Australia, 2015)
- Hydrological Assessment – Wellard Darwin Integrated Live Export Facility Report 23919.80836 (WaterBiz, 2015)
- Environmental Impact Assessment – Wellard Darwin Integrated Export Facility Report 23919.78606 (EnviroAg Australia, 2015).

3. Northern Territory Government Requirements

Results will be compared with the Northern Territory Department of Natural Resources, Environment, The Arts and Sports, (NRETAS) Aquatic Health Unit 'Water Quality Objectives for the Darwin Harbour Region. The water quality objectives are set to protect and maintain aquatic ecosystem health or environmental uses, any exceedance indicates a potential risk of adverse ecological effects. (NRETAS, 2010).

Hardy Creek and Berry Creek are tributaries into the Darwin Harbour, so the Northern Territory Government requires a full assessment of water quality including long term monitoring to be conducted (NRETAS, 2010). An annual report is required to be submitted to the NRETAS. Any exceedance of the objectives outlined in Table 1 indicates the need for investigation and/or management action.

Table 1 Water Quality Objectives as per NT NRETAS Guidelines

Water Quality Objective	Freshwater Rivers and Streams	Aquifer Fed Springs
DO% saturation	Maintain DO between 50-100% saturation	To be determined
pH	Maintain pH between 6.0 – 7.5	Maintain pH between 7.0 – 8.0
Turbidity (NTU)	Maintain turbidity <20NTU	To be determined
Conductivity (uS/cm)	Maintain conductivity <200uS/cm	Maintain natural conductivity range (320 – 390)
Total N (ug/L)	Maintain TN <230 ug/L	To be determined
Total NOx (ug N/L)	Maintain NOx <8ug/L	-
Total P (ugP/L)	Maintain TP <10ug/L	-
FRP (ugP/L)	Maintain FRP <5 ug/L	-
Chlorophyll a (ug/L)	Maintain Chl *a* <2 ug/L	-
TSS (mg/L)	Maintain TSS <5 mg/L	-

4. Responsibilities

The decisive responsibility for the adoption of this plan will lie with the directors of Wellard Rural Export Pty Ltd. The ILEF Manager will need to ensure that all activities associated with the operation of the ILEF are undertaken in accordance with relevant legislation. All records and monitoring data pertaining to the plan will be kept by the ILEF Manager for a minimum of five (5) years. The responsibilities of personnel involved in the project are outlined in Table 2.

Table 2 Responsibilities Associated with the Environmental Management Plan

Position	Responsibilities
Wellard Rural Export Pty Ltd	Overall responsibility for the site
ILEF Manager	Overall responsibility for implementation of SWMP
	Assesses the efficacy of the SWMP and where improvements are needed
	Ensures SWMP is maintained and reviewed
	Provides induction and training on the SWMP to all employees and contractors
	Ensures that resources and equipment are available to carry out tasks as required by SWMP
	Undertakes internal site audits
	Ensures all records and monitoring data pertaining to the plan are kept and maintained (including training records)
	Carries out annual review of SWMP
OHS Representative	Ensures all records of complaints and incidents regarding OHS are kept and maintained
Other managers	Ensure that all employees and contractors are aware of and adhere to SWMP procedures
	Liaise with ILEF Manager with regards to SWMP as required
All employees and contractors	Comply with SWMP
	Report any new environmental impacts that may arise to the ILEF Manager

5. Objectives

The objective of this SWMP is to discuss surface water movements across the development site and to discuss the management, monitoring and mitigation measures associated with such water movements.

5.1 Policy

Wellard's policy is to minimise the impacts of the ILEF on surface water systems and prevent harm to their ecosystems and those that use the water, in order to comply with the Northern Territory Water Quality Objectives.

5.2 Performance Objectives

No contaminated water leaving the site via surface water; and no contaminants attributable to the ILEF found in surface water.

6. Risk Assessment

Activity/Aspect	Potential impacts	Risk	Management measures	Residual Risk
Pre-export quarantine pens and feedlot management				
Surface runoff/spills of effluent to surface water	Contamination of surface water	MED	Runoff control and capture from compost manure pad and pens will prevent nutrient runoff. Earthen mound and drainage channels drain to tailwater systems along boundaries will catch any extra runoff. Hardy creek will be monitored monthly for the first year, then revised based on results.	LOW
Wastewater management				LOW
Surface runoff/spills of effluent to surface water	Contamination of surface water	MED	Wastewater holding ponds are adequate in size and are able to be dewatered quickly to irrigation area should they become too full. Facilities are located above the 1 in 100 year flooding levels. Earthen mound and drainage channels along boundaries will catch any extra runoff. Hardy creek will be monitored monthly for the first year, then revised based on results.	LOW
Diesel spill (water pump)	Contamination of surface water, contamination of groundwater, soil contamination	MED	The container will be double-bunded. Loading of container will be undertaken by experienced individuals. Spill kits will be available within easy access of all diesel storage areas.	LOW
Lime spill	Contamination of surface water, contamination of groundwater, soil contamination	LOW	The container will be double bunded Loading of container will be undertaken by experienced individuals. Spill kits available onsite.	LOW
Weed and pest management				LOW
Preparing herbicide (e.g. mixing herbicide and water/surfactants)	Contamination of surface water, soil contamination	LOW	Herbicide preparation will take place in a concreted area with bunding to ensure that spills do not contaminate porous and sensitive areas. Only staff trained on chemical handling or accredited contractors will carry this out. Chemicals stored away in a bunded lockable storage area Spill kits will be available onsite.	LOW

Activity/Aspect	Potential impacts	Risk	Management measures	Residual Risk
Applying herbicide to weeds	Contamination of surface water, off target spray	LOW	Use of a buffer zone alongside crops Use of herbicide application nozzles with larger droplet sizes will reduce off target damage/contamination. Weather conditions also need to be taken into account when spraying – herbicide will not be applied on windy or rainy days. Restricted to staff trained in herbicide application or accredited contractors. Herbicide will be applied as described on the label. Spill kits will be available onsite.	LOW

7. Implementation and Surface Water Management Strategy

As the ILEF is in an enclosed and controlled drainage area, surface water will be contained onsite via drains and storage ponds. These measures will provide significant intrinsic protection measures from unacceptable impacts resulting from transport of potential pollutants off the site in stormwater runoff. There is a high level of confidence in the measures for surface water protection, with a discharge off site only likely in an extreme weather event (e.g. cyclone) exceeding the accepted design criteria. For further detail on the design of the CDA please refer to the Hydrological Report 23919.80836.

The ILEF facility is defined within a CDA. It has an area of about 25ha. The rainfall runoff from this area can contain entrained manures and thus contaminants. Most entrained manures are recovered in the sedimentation basins. The waste water is captured in a primary wastewater pond which is dewatered either directly to irrigation or alternately to a wet weather storage dam.

The site of the ILEF is above any flood level. Clean stormwater is diverted around the perimeter of the site and is prevented from coming into contact with any potential contaminants from the ILEF. All potentially contaminated water generated from the ILEF (pens etc.) is diverted through a controlled drainage network, and will collect in a primary pond. This contaminated water is then pumped to a wet weather storage pond and is then pumped and re-used in the irrigation system. The waste water system has been designed to spill in a 1 in 10 extreme rainfall event, and will be routed through the tail water system, increasing dilution and mixing prior to any off-site discharge.

The majority of the tail water from the irrigation system and other infrastructure (e.g. roads) will be diverted through a controlled drainage network to a tail water storage pond. This water will also be re-used within the irrigation areas. In the event of major weather event above the design rainfall events, a spillway will allow for discharge of water from the tail water pond. A water quality monitoring program will be undertaken, including up and downstream water quality monitoring of nearby Hardy and Berry Creeks to ensure that all of the design and surface water management procedures are effective.

The design dimensions of the sedimentation, holding and terminal ponds were compared using both the current National Feedlot guidelines (MLA, 2012) and the FSIM hydrology model (Lott, 1998). The FSIM design would appear to be the more conservative of the two approaches and these dimensions have been adopted in the design of these structures in the proposed ILEF. This design meets the NSW EPA requirements for high strength waste water, and is considered conservative as this facility will only generate moderate strength waste water.

The total holding pond (primary pond and wet weather storage pond) capacity will be 220ML. This exceeds the design criteria (25ML), considerably (almost by a factor 10). The capacity of the terminal pond (tail water pond) is 30ML. This exceeds guideline values of 20ML.

The irrigable area is more than 40ha. The annual average yield of waste water from the ILEF is estimated to be about 190ML/year. The waste water yield from a 1 in 10 year rainfall event is estimated to be about 240ML/year. Thus the irrigation application rate is estimated to be about 4.75-6ML/ha/year. This is less than the expected crop water requirement of 10ML/ha/year. Some clean water will be available but this too will be limited. A crop water deficit is expect in late spring (“the build-up”) and clean water will be held where ever possible to irrigate at this time to allow crop dry matter yields to be maximised.

8. Monitoring

A surface water quality monitoring program will be implemented at the site, including 6 monitoring points, as illustrated in Appendix C**.**

This will include some baseline monitoring of Hardy Creek (3 samples), Berry Creek (2 Samples) and the discharge through the culvert under the rail corridor. Sampling of these sites was undertaken in early 2016.

Monitoring will be continued monthly for the first year of operation to ensure that all of the design and surface water management procedures are effective in both wet and dry seasons. After this, monitoring will be conducted on an annual and event-only basis (e.g. where surface flow to creek are observed, or after cyclones).

Any non-compliance, complaints or incidents will be handled in accordance with the Environmental Management Plan section 2.3, 2.4 and 2.5 respectively, including the implementation of any necessary corrective actions and reporting.

Any cracks or leaks in drains, channels, basins or dam walls are reported.

Table 3 Monitoring Plan to Satisfy Northern Territory Government Requirements

Monitoring	Bore water usage will be monitored via a meter, and recorded weekly. Water Monitoring will include baseline monitoring of Hardy Creek, Berry Creek and the rail corridor adjacent to the discharge point of the clean water storage pond. Please refer to Appendix C**.** Monitoring will be continued monthly for the first year of operation to ensure that all of the design and surface water management procedures are effective in both wet and dry seasons. After this, monitoring will be conducted on an annual and event-only basis (e.g. where surface flow to creek are observed, or after cyclones). This monitoring will include for the following analytes: • Temperature • Electrical conductivity; • Turbidity; • pH; • Dissolved oxygen; • Total suspended solids; • Chlorophyll; • Sodium; • Nitrates; • Ammonia; • Total nitrogen; • Total phosphorus; and • Filterable reactive phosphorus. These water quality parameters will also be monitored during any discharge event from the clean water storage dam.

Table 4 Incident Reporting

Incidents/Compliance failures	Any non-compliance, complaints or incidents will be dealt with as described in the EMP section 2.3, 2.4 and 2.5, respectively.
Environmental Emergency (e.g.water/ soil contamination)	The ILEF will have several spill kits available to reduce the spread of contamination. In the case of environmental pollution, the ILEF Manager will decide whether the NT EPA needs to be notified based on the extent of the environmental harm (see *Waste Management and Pollution Control Act* for the types of emergencies that are notifiable). • Ensure that site and personnel are safe • Notify supervisor and ILEF Manager • Dial 000, if required • IF SAFE TO DO SO, prevent any further pollution from occurring • ILEF Manager must inform the NT EPA within 24 hours of becoming aware of the incident by calling their Pollution Hotline 1800 064 567. An incident report form must then be completed to ensure that the incident can be reviewed, followed by a corrective action report.
Thresholds	The thresholds for reporting will be compared to the NT Water Quality objectives, as described in Table 1.
Corrective action	The ILEF manager will ensure that corrective actions are taken within an appropriate time frame to ensure that this management plan is adhered to in future.
Reporting	The ILEF Manager will document details of all non-conformances, incidents, corrective actions and complaints. Where an incident causes, or is threatening to or may threaten to cause, environmental nuisance or pollution resulting in material or serious environmental harm, EPA must be informed within 24 hours of first becoming aware of the incident as per the requirements of the Waste Management and Pollution Control Act. This Surface Water Management Plan will be reviewed as required, and in accordance with the audit schedule of the Environmental Management Plan. An annual environmental monitoring report (AEMR) will be furnished each year on the anniversary of the approval of the facility for its operation and submitted to NRETAS.
Relevant legislation, standards and guidelines	Water Act (NT) Waste Management and Pollution Control Act (NT) Water Quality Objectives for the Darwin Harbour Region – Background Document (NRETAS, 2010).

9. References

Department of Land Resources Management (2014). *Water Quality Protection Plan for Darwin Harbour*. Darwin, Australia.

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Environmental Protection Authority (EPA) Victoria (1991) *Guidelines for Wastewater Irrigation*. Carlton

Lott (1998). *Feedlot Hydrology – PhD Thesis.* University of Southern Queensland, Australia.

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Northern Territory Government (2013). *Water Act*. Darwin, Australia.

Northern Territory Government (2015). *Waste Management and Pollution Control Act*. Darwin, Australia.

NSW Department of Conservation (2004). *Environmental Guidelines: Use of Effluent by Irrigation*. Sydney, Australia.

South Australia Environmental Protection Agency (2009) *Wastewater Irrigation Management Plan*, Adelaide, South Australia.

WaterBiz (2015) Hydrological Assessment – Wellard Darwin Integrated Live Export Facility Report 23919.80836.

List of Appendices

Appendix A. Inundation Maps

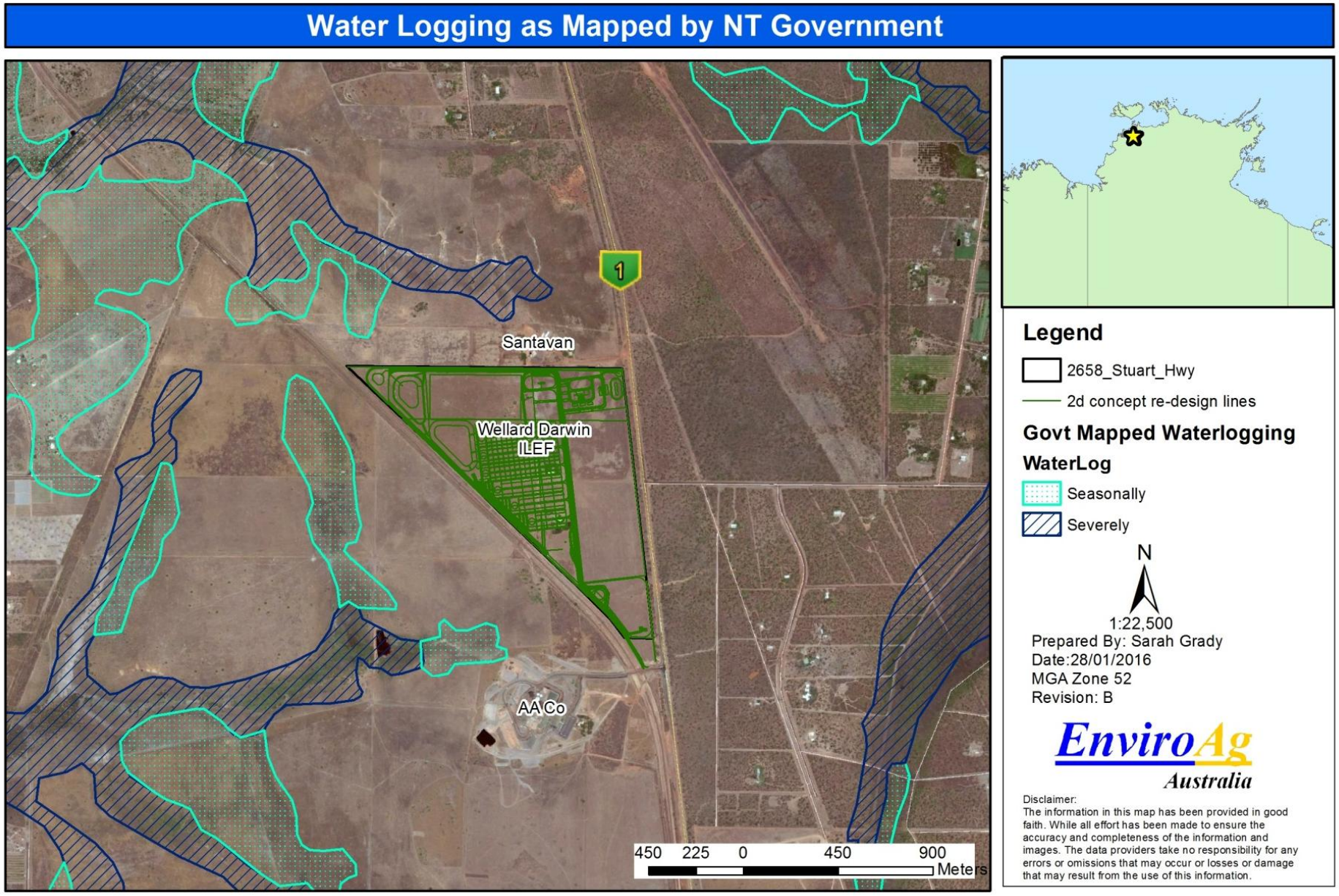


Figure 2 NT Government Water Logging (Sourced from the Northern Territory NR Maps 2014)

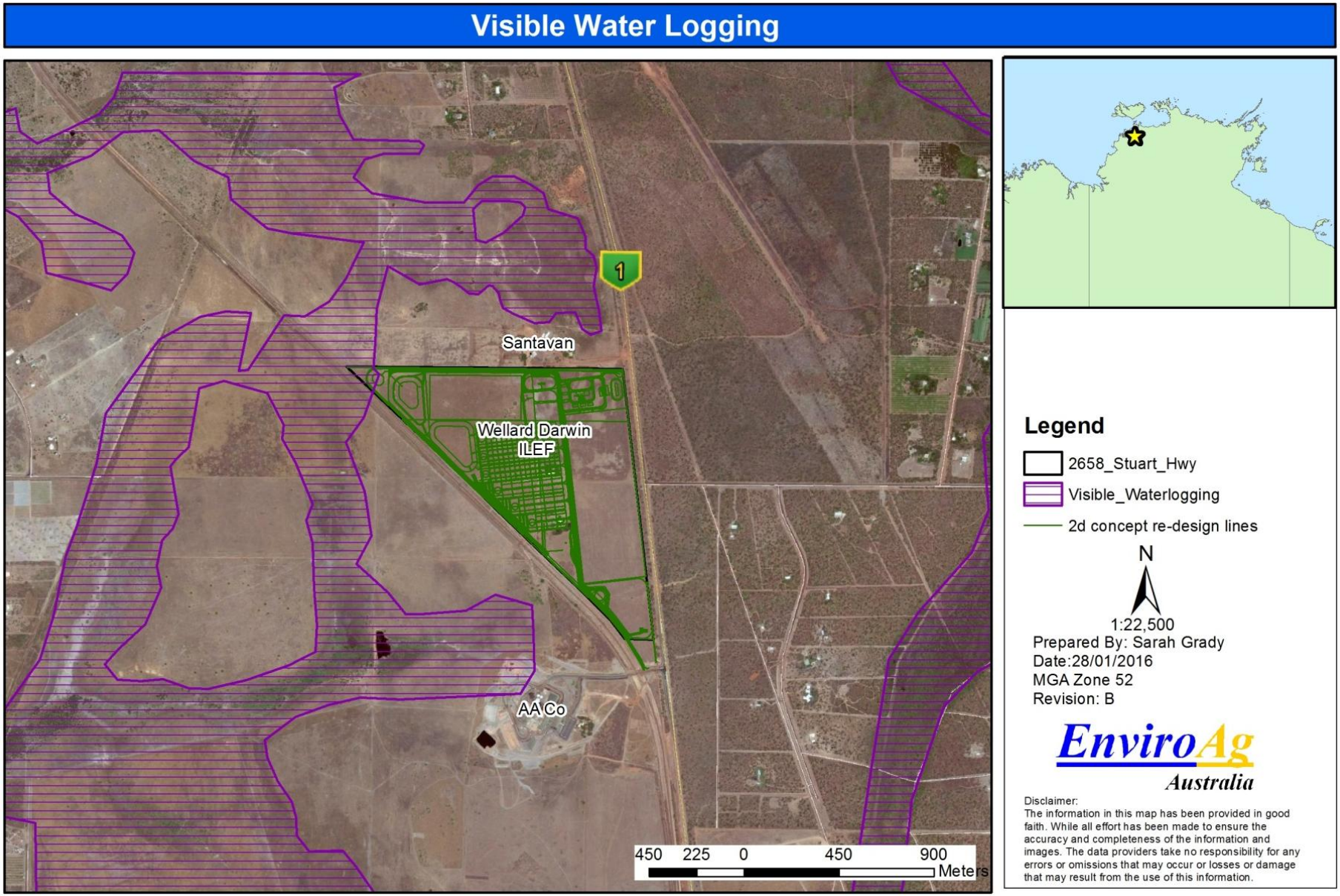
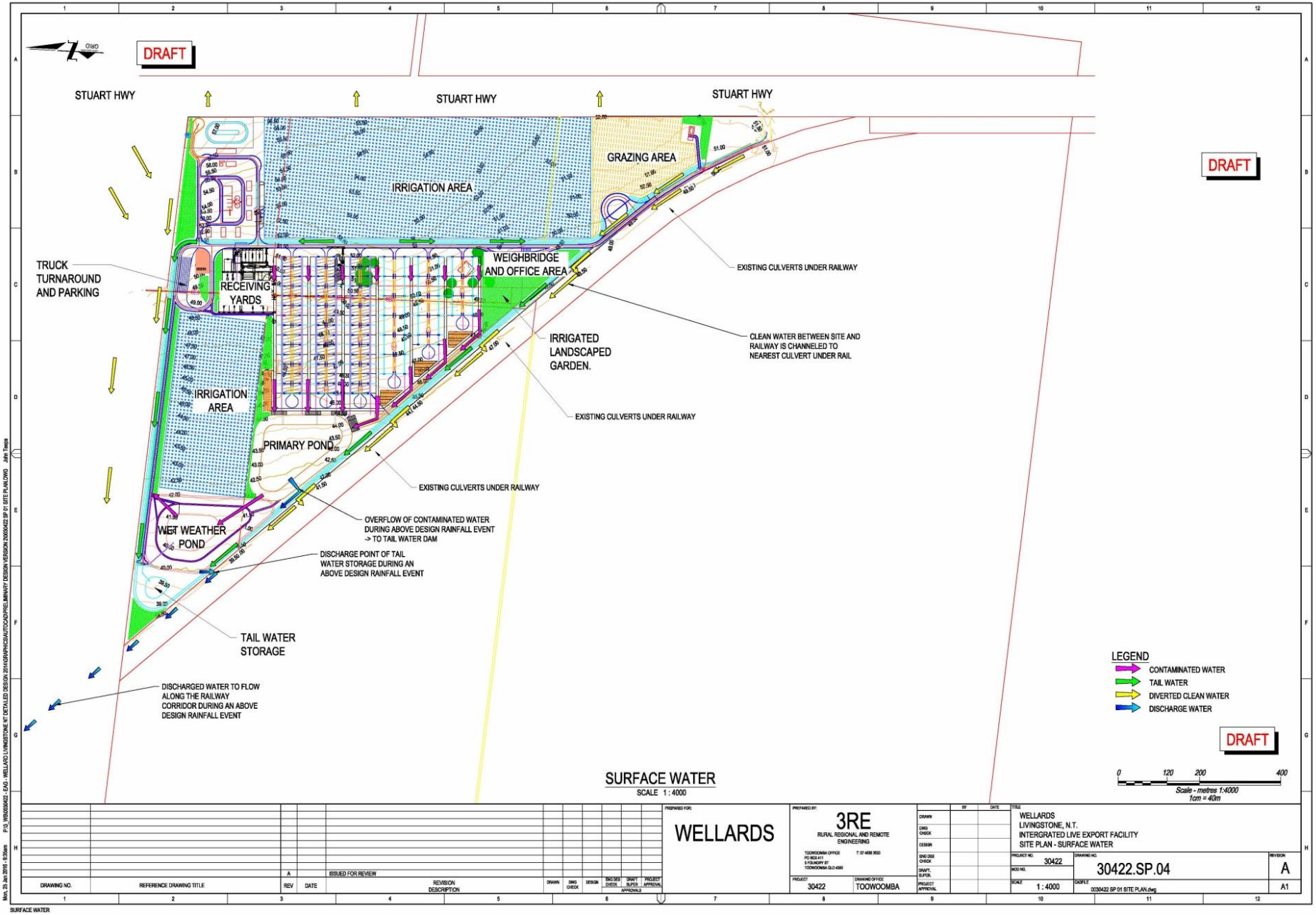


Figure 3 Visible Water Logging - Mapped from Aerial Imagery, Local Observations and Ground-truthing

Appendix B. Surface Water Site Plan


DRAFT
STUART HWY
STUART HWY
STUART HWY
GRAZING AREA
IRRIGATION AREA
TRUCK TURNAROUND AND PARKING
RECEIVING YARDS
WEIGHBRIDGE AND OFFICE AREA
EXISTING CULVERTS UNDER RAILWAY
CLEAN WATER BETWEEN SITE AND RAILWAY IS CHANNELED TO NEAREST CULVERT UNDER RAIL
IRRIGATED LANDSCAPED GARDEN.
IRRIGATION AREA
EXISTING CULVERTS UNDER RAILWAY
PRIMARY POND
EXISTING CULVERTS UNDER RAILWAY
OVERFLOW OF CONTAMINATED WATER DURING ABOVE DESIGN RAINFALL EVENT -> TO TAIL WATER DAM
WET WEATHER POND
DISCHARGE POINT OF TAIL WATER STORAGE DURING AN ABOVE DESIGN RAINFALL EVENT
TAIL WATER STORAGE
DISCHARGED WATER TO FLOW ALONG THE RAILWAY CORRIDOR DURING AN ABOVE DESIGN RAINFALL EVENT
LEGEND
CONTAMINATED WATER
TAIL WATER
DIVERTED CLEAN WATER
DISCHARGE WATER
DRAFT
0 120 200 400
Scale - metres 1:4000
1cm = 40m
SURFACE WATER
SCALE 1 : 4000
WELLARDS
3RE
RURAL REGIONAL AND REMOTE ENGINEERING
WELLARDS
LIVINGSTONE, N.T.
INTERGRATED LIVE EXPORT FACILITY
SITE PLAN - SURFACE WATER
30422
30422.SP.04
A
1 : 4000
A1
ISSUED FOR REVIEW
SURFACE WATER

Appendix C. Surface Water Monitoring Locations

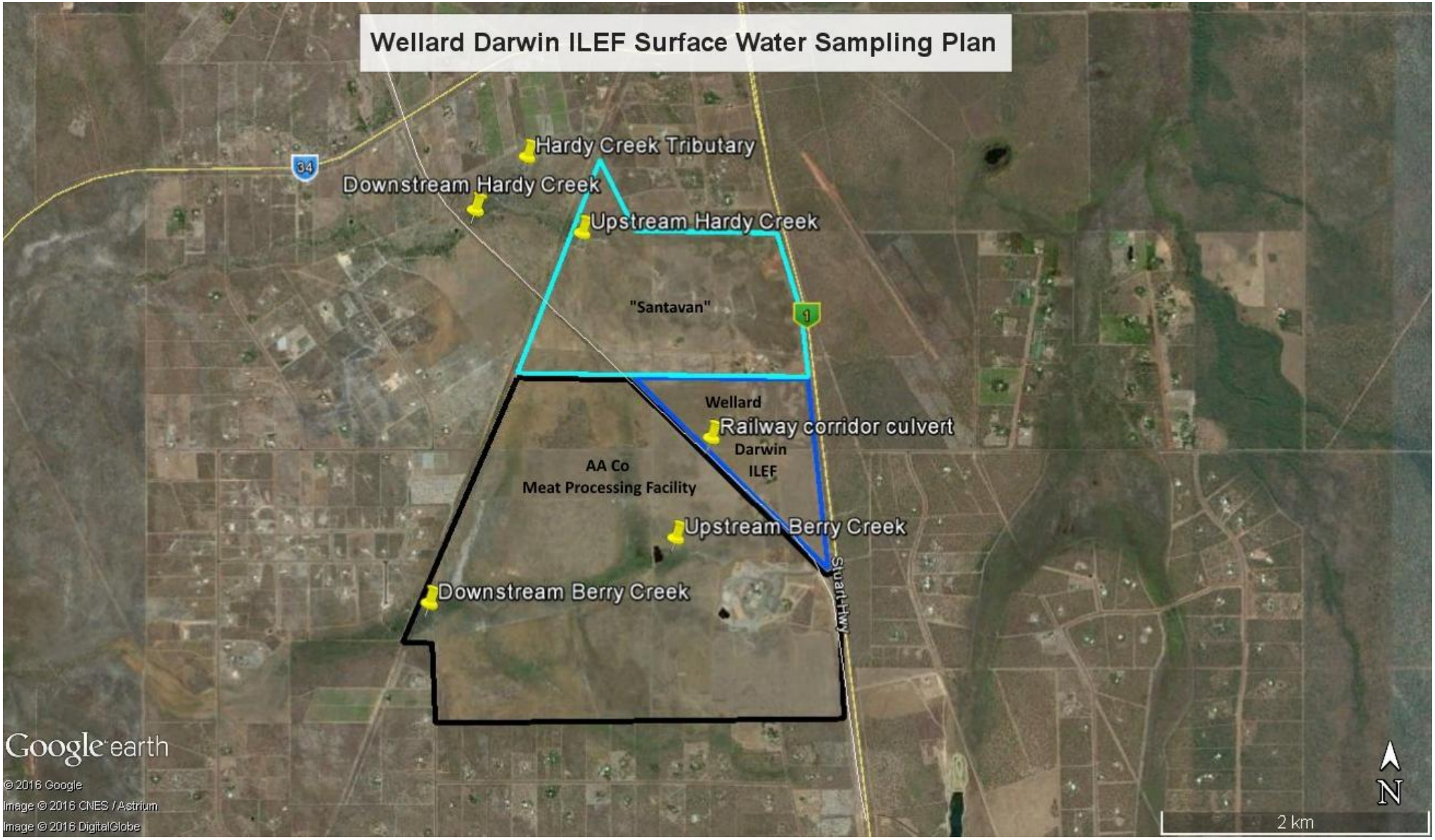

Wellard Darwin ILEF Surface Water Sampling Plan
Hardy Creek Tributary
Downstream Hardy Creek
Upstream Hardy Creek
"Santavan"
Wellard
Railway corridor culvert
Darwin
ILEF
AA Co
Meat Processing Facility
Upstream Berry Creek
Downstream Berry Creek
Stuart Hwy
34
1
Google earth
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Image © 2016 DigitalGlobe
N
2 km