Teys Australia Beenleigh Pty Ltd

Transitional Environmental Program (TEP) MAN17840

Stormwater Management

MILESTONE 4 REPORT

30 June 2016

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1. Executive Summary

As outlined in Transitional Environmental Program (TEP)_MAN 17840, Teys are pleased to provide a written report for the performance indicator 4, confirmation that the Detailed Design has been developed, in accordance with the milestone commitment date identified in the approved TEP. As per recent formal, correspondence (DEHP ref 101/0007645: MAN17840; CR60910) dated 25 May 2016, the due date for this milestone is 30 June 2016.

The proposed detailed design employs a divided approach to stormwater management at the site, breaking the areas into an Eastern and Western catchment. An eastern catchment pond is proposed to capture run off from the holding pens; and the western catchment designed to collect run off from the holding pens on the western side of the property respectively.

The proposal has been developed to comply with the agreed standard of a 1 in 20 year, 24 hour storm event. This is, in accordance with best practice management outlined in the *MLA National Beef Cattle Feedlot Environmental Code of Practice, 2nd Edition.* The completion of this report signifies that Teys Australia Beenleigh Pty Ltd has completed Phase 1 and 2 of the approved Transitional Environmental Program (TEP MAN17840) and has begun preparations to begin Phase 3.

2. Introduction

Teys Australia formally engaged Feedlot Services Australia Consulting (FSA) to undertake development of a detailed design that would meet the objectives of the TEP. Milestone 4 is described in further detail below, as outlined in section 'Phase 2' within the approved TEP MAN 17840:

Milestone 4

Detailed design will comply with the agreed design standard of a 1 in 20 year, 24 hour storm event, as outlined in the Establishment and Operation of Beef Cattle Feedlots in Queensland (Skerman 2000) and the National Guidelines for Beef Cattle Feedlots.

Detailed design may include the following (depending on final option selection);

- Any additional catchment area analysis for holding pens to determine volume of run-off in a 1 in 20 year, 24 hour storm event. Pump sizing and infrastructure required, e.g. floating pontoon, electricity, level switch, pipework.
- Concrete spillway and scour protection designed and certified by a Registered Professional Engineer of Queensland (RPEQ) to comply with a minimum 50 year ARI design flow.
- Earthen basin and/or wetland design (drawings) for managing stormwater for a 1 in 20 year, 24 hour storm event.
- Earthen bund and/or concrete bund to prevent contamination of stormwater (if practicable)
- Swale drains or other means for catching contaminated run-off from holding pens.
- Outlet weir of the decommissioned pond/s to be altered (depending on final option

decision).

The detailed design report prepared by FSA, titled 'Stormwater TEP Project' is attached, for information.

3. Design Concept

As per Milestone 2 completion report, Teys had engaged GHD to conduct conceptual analysis of stormwater management solutions and variations. This was, a series of proposals that would each seek to prevent release of (potentially contaminated) stormwater.

The proposed design concept, further developed by FSA, employs a divided approach to stormwater management at the site, breaking the areas into an Eastern and Western catchment. An eastern catchment pond is proposed to capture run off from the holding pens; and the western catchment designed to collect run off from the holding pens on the western side of the property respectively. Consideration has been made for exclusion of clean water, which is to be achieved by installation of diversion banks. It is noted that options, or components of options outlined in the milestone 2 report were combined/adjusted in the final solution (as detailed in the following sections) to deliver the most cost effective and environmentally sustainable solution to managing contaminated stormwater at Teys Beenleigh meat processing facility.

Figure 1 illustrates the break-up of the site for the purpose of stormwater management. Both ponds are designed to capture run off from their respective catchments assuming a 1 in 20 year ARI 24-hour storm event, with consideration for exclusion of clean surface run off from adjacent areas, not used for cattle holding. These conceptual catchment are captured in greater detail in the Drawing 8508-DRAFT-01, in the documentation attached.

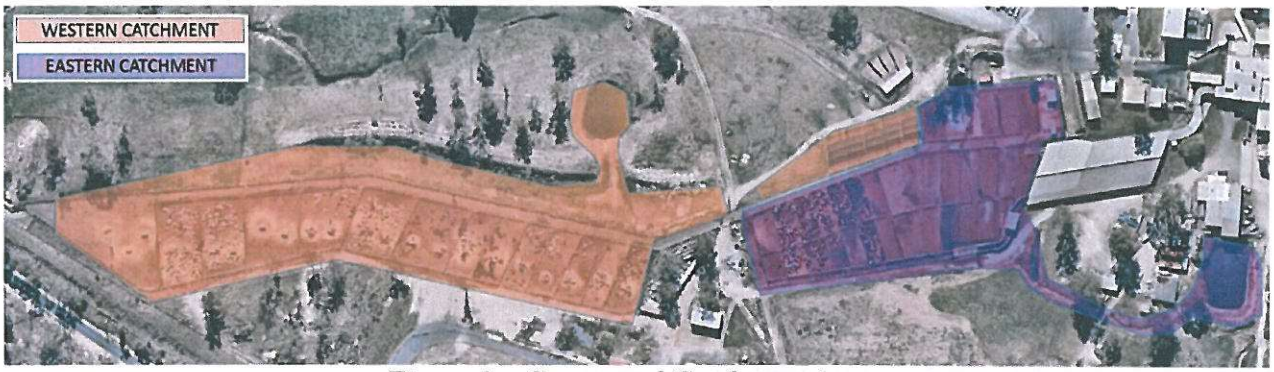


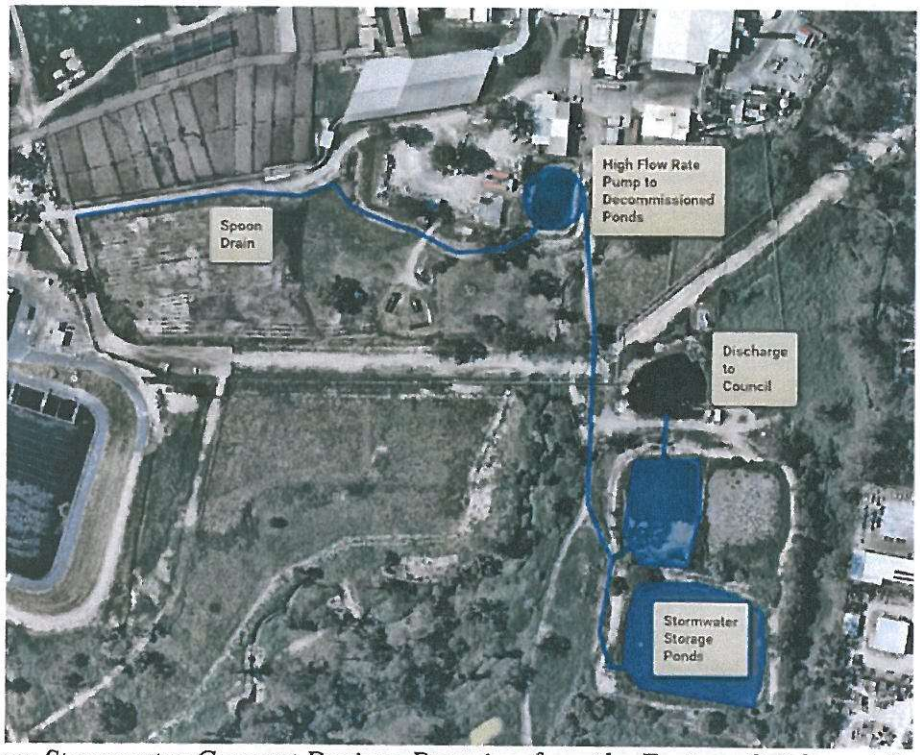
Figure 1 – Conceptual Catchment Areas

As per previous milestone report (2), Teys anticipated the division of catchment areas on a conceptual level. This idea has been further developed by FSA, and is the preferred solution to stormwater management at the facility. The remainder of the detailed design, will be discussed by catchment area, respectively.

4. Eastern Stormwater Catchment – Detailed Design

Conceptual design for the eastern component of the stormwater catchment included:

- The installation of a high flow rate pump station on the Eastern Catchment Pond to pump contaminated stormwater into the decommissioned waste water treatment ponds; and,
- A spoon/catchment drain to the west of the eastern stormwater pond and south of the cattle holding pens to direct all contaminated stormwater to the eastern stormwater pond.



Eastern Stormwater Concept Design: Pumping from the Eastern Catchment Pond to the Stormwater storage ponds.

Scope

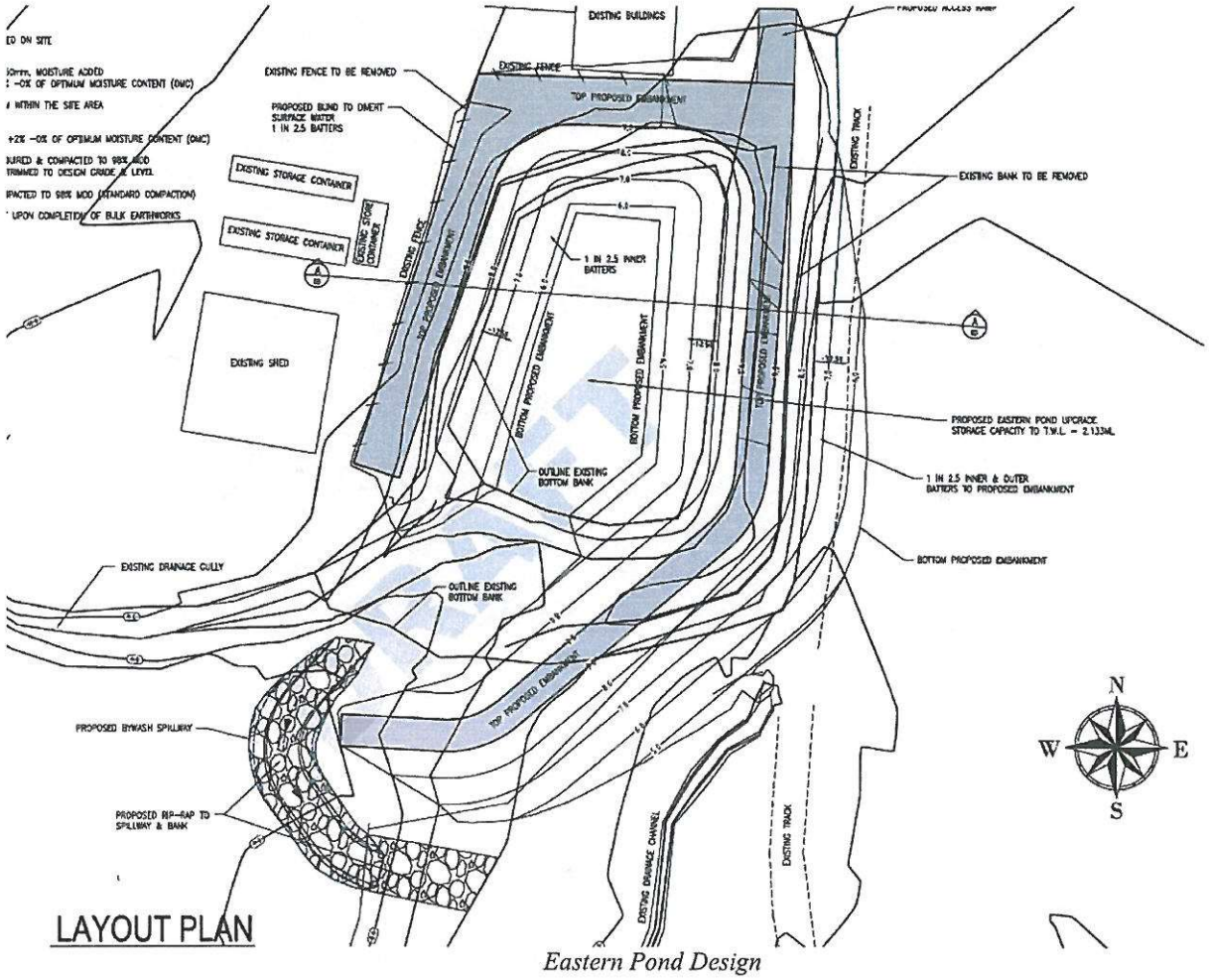
To progress this concept, FSA were engaged to undertake the following detailed design for this eastern catchment:

- Review of structural integrity of existing eastern stormwater catchment pond for ongoing utilisation and carry out design of any rehabilitation works required;
- Pump options assessment (diesel vs electric life cycle assessment). This is to include feasibility of aerial power connection from WWTP Switchboard;
- Design of weir and by-wash for the pond;
- Assess pipework options for above and/or below ground routing;
- Design of catchment drains to the south of the holding pens to direct water toward the contaminated stormwater pond;
- Design of the refurbishment of existing drain from south eastern corner of the cattle holding pens to the contaminated stormwater pond;
- Design of all drains, traps and hydraulic systems to meet the above mentioned requirements;

Pond Design

The detailed design for this eastern catchment, specifies an increase in volume of the existing pond, including some remediation to further stabilise the earthen structure ensuring longevity of the solution. The volume anticipated in this catchment area, during a 1 in 20 year ARI 24 hour storm intensity, frequency duration, has been calculated to be 2.53ML. Due to limitations of the natural and built environment surrounding this pond (being a natural stream and existing, working buildings which form part of the meat processing facility) a pond of this holding volume is not

constructible in this location. The detailed design proposes development of a 2.13ML, clay lined pond with built in capability for pond cleaning requirements.



Eastern Pond Design

Design Limitations

The redesign of the eastern pond has taken into consideration, the topography, current infrastructure, and land use limitations. Overall, the eastern catchment pond is limited by land to use for an upgrade of the stormwater management system.

The shape of the pond is also limited as there is a stream order to the south of the pond (south creek) and buildings, none of which are able to be moved without significant capital investment in the Beenleigh processing facility. In order to overcome the pond size a pump capable of dewatering the pond at a rate greater than input from a 1:20 year ARI 24-hour storm event has been incorporated into the redesigned stormwater management system.

Pond Dewatering

During, and following, a significant down pour, an in situ pump installed to the pond will transfer stormwater from this eastern catchment pond to Teys decommissioned waste water treatment lagoons (referring to Figure 2 below). The specifications for this pump have been explicitly developed to cater to the specific limitation of the pond volume – ie. Although the pond is smaller

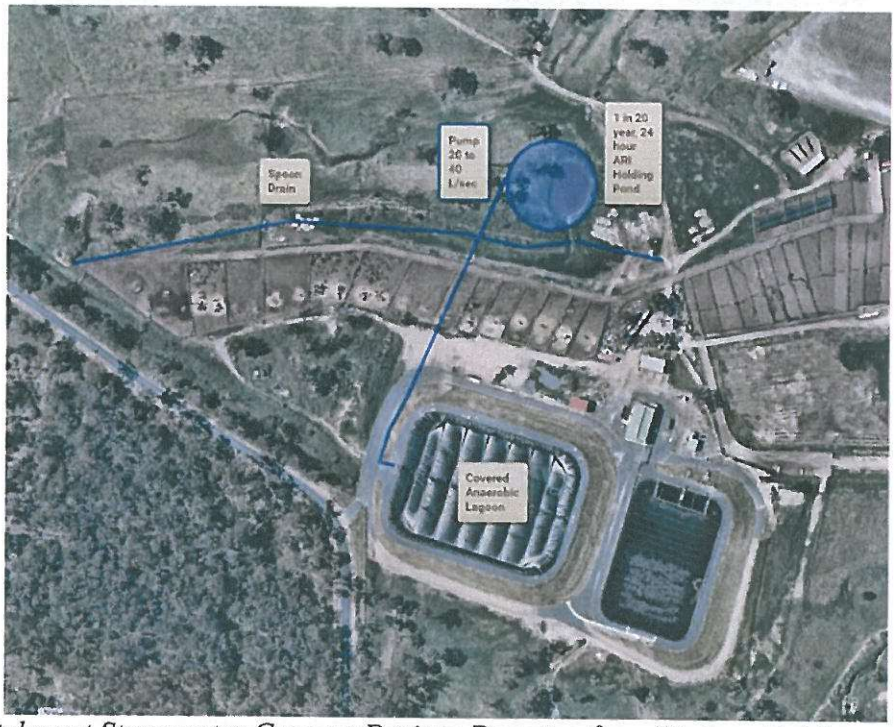
than the required volume the pump will be able to dewater the pond at a rate which ensures it will not overtop in a 1 in 20 year 24-hour event, with consideration for contingency arrangement. Figure 2, below, illustrates the location and specification of the dewatering infrastructure, including pump station and rising main layout.

Figure 2 – Eastern Pond Pump Station and Rising Main

5. Western Stormwater Catchment – Detailed Design

Conceptual design for the western catchment previously reported included:

- The construction of a pond for capture of overland run off from the cattle holding pens on the western side of the property, via spoon drain. This is, designed to capture downpour anticipated of a 1 in 20 year 24-hour ARI; and,
- Ancilliary infrastructure to transfer potentially contaminated run off to Teys existing Covered Anaerobic Lagoon (CAL) at the Waste Water Treatment Plant (WWTP).



Western Catchment Stormwater Concept Design: Pumping from Western Catchment Pond to the CAL

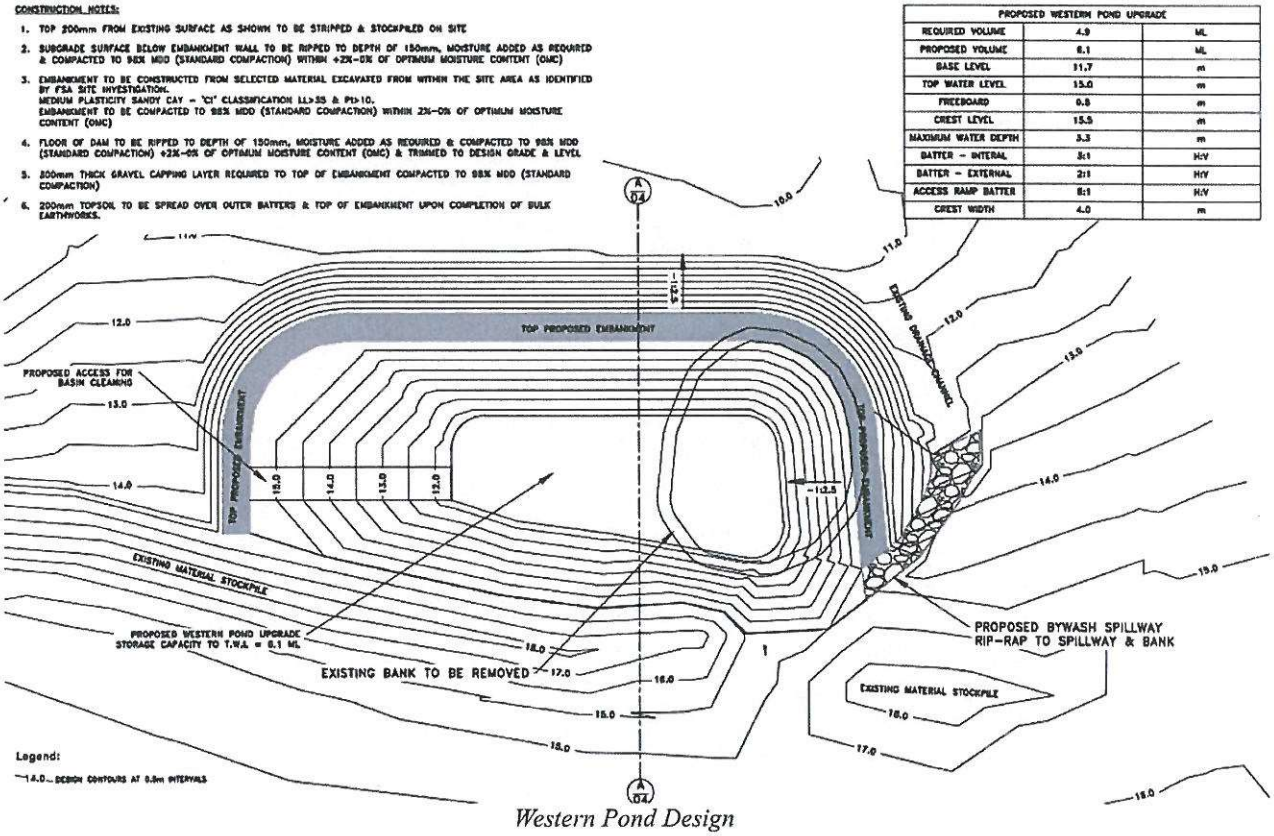
Scope

To progress this concept, Teys engaged FSA to undertake the following detailed design for this eastern catchment:

- Design of a new/modified western stormwater pond to meet the revised operational requirements;
- Design of all drains, traps and hydraulic systems to meet the above mentioned requirements;
- Confirmation of suitability of existing CAL inlet works to meet additional load;
- Pump options assessment (diesel vs electric life cycle assessment). To include feasibility of aerial power connection from WWTP Switchboard;
- Design of underground pipework to Covered Anaerobic Lagoon inlet works; and,
- Ensure integration into the Wastewater Treatment System does not pose a risk to operational performance (advice from Mike Johns based on contaminated stormwater samples).

Pond Design

The existing pond in the Western catchment is not of adequate size to contain the specific volume anticipated during a 1 in 20 year 24-hour rainfall event. The detailed design for this western catchment, specifies an increase in volume, where the anticipated volume is 4.9ML and the built volume will be at least 6.1ML. The anticipated volume was calculated using relative run-off coefficients for hard, and soft ground covering. Like the eastern catchment, diversion banks will be installed in the western catchment area to certainly exclude clean run-off from the collection pond.



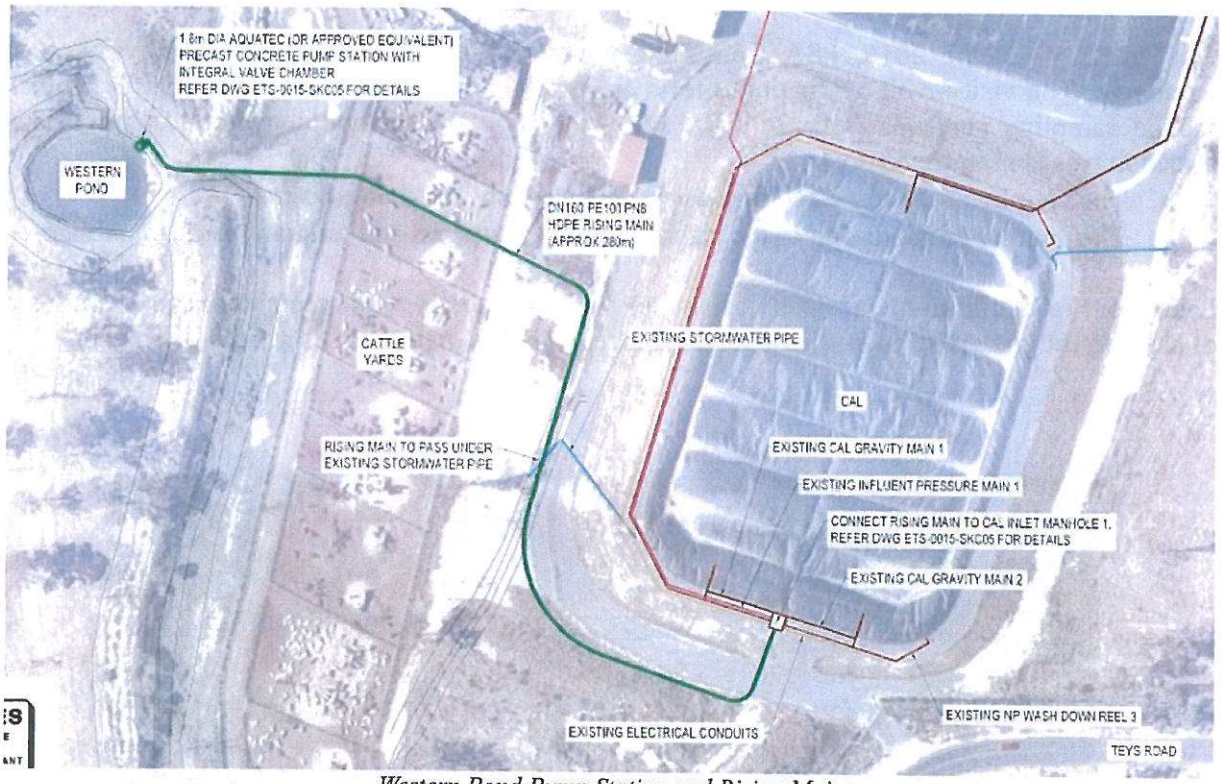
Western Pond Design

Design Limitations

The current western catchment pond is in an ideal location to capture any runoff from the cattle pens as the landscape naturally drains toward the inlet of the current pond. To avoid a mapped stream order, FSA has made use of the topography in the area, and resized and shaped the western pond.

Pond Dewatering

The pump station to be installed on the western catchment lagoon will pump directly into the CAL for wastewater treatment. After consultation with wastewater experts and a review of the existing wastewater infrastructure, the pump rate to the CAL will be limited to reduce the impact of lukewarm, low contaminant stormwater on the anaerobic treatment performance. Introducing a low temperature, low contaminated stormwater stream into Teys' operating CAL system any higher than 20-40 litres per second will significantly impact on the treatment performance of the entire wastewater treatment system and pose a significant risk to assets design limits. Teys will ensure all details of managing the stormwater system will be included in the final stormwater management plan, provided as part of Milestone 11.



Western Pond Pump Station and Rising Main

6. Site Works

To address the scope and requirements covered by the Western Stormwater Catchment and Eastern Stormwater Catchment, FSA has undertaken the following works;

- Complete relevant site inspections (e.g. Geotechnical assessment) to inspect the site and confirm site specific constraints and gain understanding of site operations;
- Review and recommendations for the rehabilitation of the existing eastern holding dam;
- Model the east and west catchments to determine:
    - Catchment Drain sizing (including both upstream diversion and contaminated catchment capture) for the 1 in 20 year ARI peak flood event;

- Wet Weather Storage Requirements for the 1 in 20, 24-hour flood event; and
- Weir and By-wash sizing for the pond outlets (including both the western pond, the eastern pond and the existing wastewater lagoon ponds) for the 50 year ARI peak flood event.

- Design and Documentation for the pump and pipework options for both the east and west systems;
- Life Cycle Costing Assessments;
- Design and Documentation of the future Western Catchment Pond, Eastern Catchment Pond and any necessary retro fit to the decommissioned wastewater lagoons;
- Investigate and recommendation of options for the desludging of the decommissioned wastewater lagoons; and
- Summary Report to include details of the assessments and recommendations undertaken.

Development of this documentation has required four site inspections, by surveyors, engineers and geo-technical experts.

Geotechnical Assessment

On Thursday 2 June 2016, FSA Consulting completed geotechnical works at Teys Australia Beenleigh. The visit involved digging a total of 18 test pits from one to four metres in depth for ground sampling purposes (refer to figures 3, 4 and 5). The methodology for test pit location selection was chosen based on:

- The vicinity of the test pit to the eastern and western storm water dams.
- The vicinity of the test pit to the catchment area of eastern and western storm water dams.

Laboratory results from the geotechnical survey will provide practical recommendations for the use of any current ground samples for future use for remediation opportunities in both catchments.

Figure 3: Location of the 18 Geotech test pits dug on 2 June 2016 by FSA consulting.

Figure 4: Example photo of test pit progress.

Figure 5: Example photo of test pit progress.

7. Performance against Schedule

As recently discussed with the DEHP, both Milestone 4 and Milestone 7 were delayed to allow for better alignment with internal capital project delivery process. Specifically, this amendment meant Milestone 4 completion date changed (from 30 April 2016 to the 30 June 2016) and Milestone 7 completion date changed (from the 30 June 2016 to the 30 September 2016). Justification for these amendments was provided in further detail in *'Teys Australia Beenleigh – Amendment to TEP Milestone 4 and 7 Delivery Schedule (TEP MAN17840)'*.

Phase	Milestones	Milestone Deliverable to DEHP	Due Date	Financial Year
1	Milestone 1	Submit report on the investigation of drainage system **COMPLETE**	28 Feb 15	14/15
	Milestone 2	Submit investigation report detailing preliminary design **COMPLETE**	31 Mar 15	
	Milestone 3	Submit report detailing selected options **COMPLETE**	30 Jun 15	
2	**Milestone 4**	**Submit report on detailed design works.**	**30 June 16**	15/16
	Milestone 5	Submit Draft Stormwater Management Plan **COMPLETE**	30 Dec 15	
	Milestone 6	Submit report on stormwater drainage system works **COMPLETE**	30 Oct 15	
3	Milestone 7	Submit report on Tendering Process completion to DEHP	30 Sept 16	16/17
	Milestone 8	Submit construction report – Stage 1: Begin construction	30 Dec 16	
	Milestone 9	Submit construction report – Stage 2: Complete construction	30 Jun 17	
	Milestone 10	Submit commissioning report (upgraded stormwater system)	30 Aug 17	17/18
	Milestone 11	Submit Final Stormwater Management Plan	30 Sep 17	

Teys wish to provide an update on all incomplete actions within the TEP schedule. At this time, we are pleased to advise that progress against scheduled milestone requirements, outlined in the approved TEP document, is tracking well. In the event that future circumstances or events occur, which obstruct Teys' capability to meet subsequent commitments, this will be notified to DEHP immediately; to outline the implications involved, and to propose any amendments necessary to realise the objectives of the TEP by the final sign off date of 30 September 2017.

8. Previous Actions Update

Building on the findings of Milestone 1, and scope of works submitted in Milestone 6 to direct potentially contaminated stormwater to the wastewater treatment system and 'clean' stormwater directly to surface waters the following updates are provided to DEHP on drain diversion completed to date for the following areas:

- Steriliser Water Tank
- Hard Stand Area
- Covered Cattle Pens, and
- Paunch Room

Steriliser Water Tank

The proposed bunding around the steriliser water tank and drainage point of bund that appeared in Milestone 6 as Figure 12 and Figure 13 has now been complete as shown in before and after images below.

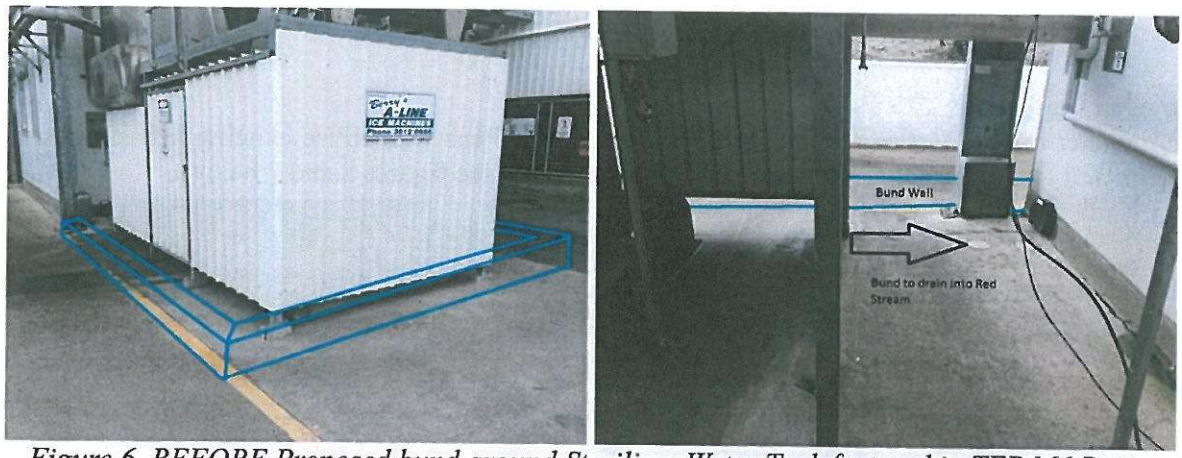


Figure 6. BEFORE Proposed bund around Steriliser Water Tank featured in TEP M6 Report.

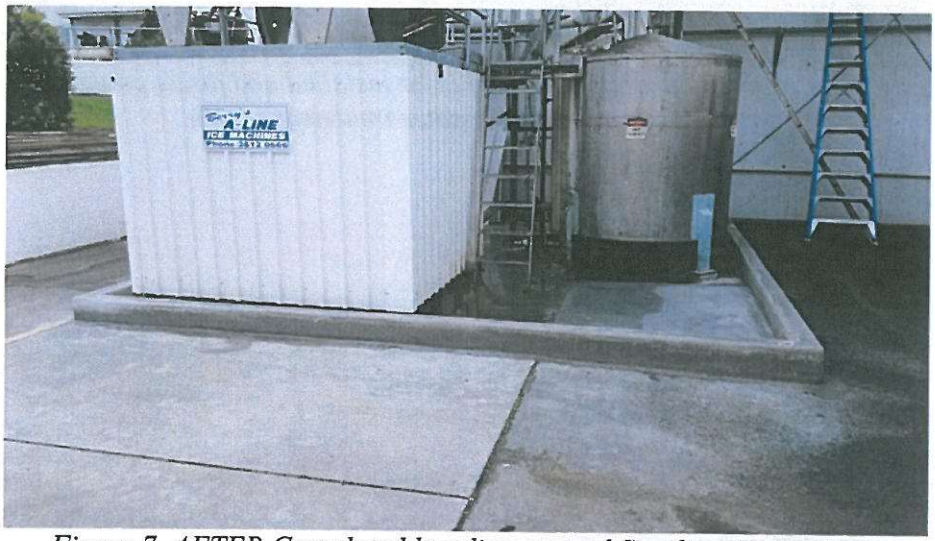


Figure 7. AFTER Completed bunding around Steriliser Water Tank.

Hard Stand Area

Decommissioning of two stormwater drains, as outlined in Teys Australia's M6 submission. These drains have been decommissioned and concrete sealed to prevent potentially contaminated stormwater entering the proposed stormwater system. In addition, a grated drain was installed to capture stormwater from the hard stand area & directed to the WWTP.

BEFORE and AFTER Installation of grated drain in hard stand area to capture potentially

contaminated surface stormwater.

Covered Cattle Pens

Stormwater on the northern side of the Covered Cattle Pens will utilise existing infrastructure and be directed through a concrete drain to the green stream (see figures 8 and 9 below).

Figure 8 BEFORE. Proposed concrete drainage to be installed and direct potentially contaminated streams to the wastewater treatment system.

Figure 9 AFTER. Completion of the bunding on the eastern side of the cattle yard.

A concrete bund wall was also constructed on the western side of the truck wash. This will ensure that potentially contaminated stormwater from the covered holding pens, is directed into the waste water treatment system (refer to figure 10 and 11 below).

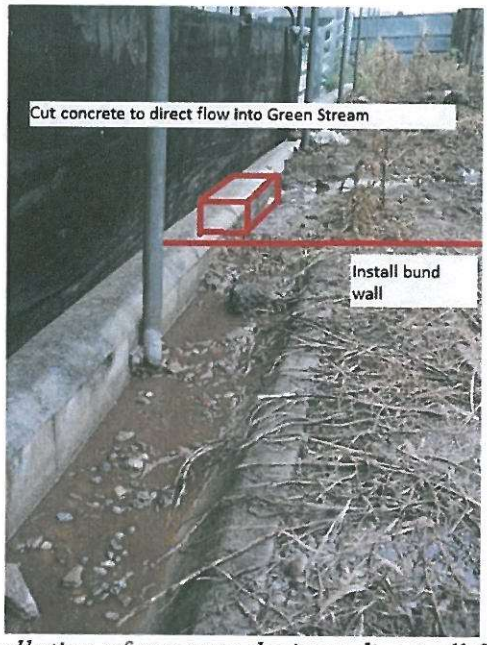


Figure 10. BEFORE Installation of concrete drain to divert all flow to the green stream.

Figure 11. AFTER Western side of the covered yard including bund wall.

Paunch Room

An investigation conducted as part of Milestone 1 identified a minor integration of hot steriliser water into the contaminated stormwater system. At submission of the M4 report, this portion of the overall diversion of stormwater is 50%.

Figure 12. BEFORE Proposed Paunch Room Entry Steriliser Water Drain as featured in Figure 10 of M6 Report and Entry Steriliser Water Drain Diversion Path back to Hasher Room