Teys Australia Beenleigh Pty Ltd

Transitional Environmental Program (TEP) MAN17840

Stormwater Management

MILESTONE 9 REPORT

30 June 2017

Contents

Executive Summary

As outlined in Transitional Environmental Program (TEP) MAN 17840 Teys are pleased to provide a written report for Performance Indicator 9 – Complete Construction, in accordance with the milestone commitments identified in the approved TEP. This report is a summary of physical works completed under the construction contract.

Introduction

Teys Australia has completed construction of works to upgrade the Stormwater Management System to facilitate capture of contaminated stormwater run-off from the cattle holding yards for a 1 in 20 year, 24 hour rain event. As per Milestone 8, Teys Australia engaged Skerman Civil as the principal contractor to deliver the Stormwater upgrade. The Stormwater project upgrade included:

- Civil and electrical engineering services.
- Electrical infrastructure.
- Earthworks including the construction of two contaminated stormwater ponds, clean water drains, earthen bunding and surface swale drains.
- Installation of pump stations and associated piping infrastructure.

The following is a report of those works completed.

Completed Management Infrastructure

Eastern Containment Pond

When redesigning the eastern pond, the topography, current infrastructure and land use limitations were taken into consideration. This includes the stream order to the south of the pond and the buildings to the east and north. Due to these limitations, the completed Eastern contaminated stormwater catchment pond was constructed to capture 2.1ML of rainfall run-off. A volume of 2.53ML is required to be captured by the pond to meet a 1:20 year, 24 hour storm intensity frequency duration. To ensure the facility can contain a 1:20 year, 24 hour equivalent storm event, a proprietary Flygt precast pump station has been installed at the Eastern Pond containing two 22kW pumps. Each of the installed pumps are designed to be capable of dewatering the eastern stormwater pond at a volume of 3.46ML over a 24 hour period, exceeding the ARI frequency duration volume by 900,000L. Water that enters the eastern pond will be pumped to the decommissioned waste water ponds which have a calculated storage volume in excess of 20ML.

Figure 1: The completed Eastern Contaminated Stormwater Pond

Western Containment Pond

The completed Western Stormwater pond has been constructed to capture and hold a volume of 6.1ML. A volume storage capacity of 4.9ML is required to capture a 1:20 year, 24 hour rainfall event falling on the west section of the cattle holding pens (Refer to Figure 2). Run-off in the western catchment is collected by open surface drainage on the downhill side of the pens and directed to the Western pond. Clean stormwater run-off on the uphill side of the pens is intercepted by surface bunding and swales directed into new 'black brute' HDPE stormwater drains installed under the cattle pens. This clean water is discharged to the local watercourse. A proprietary Flygt precast pump station has been installed at the Western Pond containing two 22kW pumps.

Water that enters the Western pond will be pumped to the Covered Anaerobic Lagoon (CAL) for treatment. Dewatering of the Western pond will generally be during days following a storm event, and will be limited to a maximum discharge flow rate of 30L/S as to not negatively affect the anaerobic treatment performance of the CAL.

Figure 2: The completed Western Contaminated Stormwater Pond.

Separation of Clean/Contaminated Water Run-Off

Dedicated stormwater infrastructure in the form of swales, earthern bunding, and pipework have been installed throughout the eastern and western stormwater catchments to divert and transfer clean and contaminated stormwater.

Clean water run-off in the Western Catchment is intercepted and conveyed via grass swales/bunds and underground pipe infrastructure to outlets flowing to the adjacent creek. The newly constructed swales and bunds have been stabilised with a hydro-mulching emulsion of green dyed wood fibres and a propriety binding mixture. To prevent erosion of the outlet drains, 'rip rap' rock has been installed. Contaminated stormwater from the cattle pens is collected in a dedicated drain and is directed to the western pond.

Clean stormwater run-off in the eastern catchment is intercepted by drains and bunds to divert this run-off around the outside of the new East Pond, The crest height of the constructed East pond has been raised to exclude clean water surface run-off from the plant and maintenance yard area from entering into the pond (Refer to Figure 3). This run-off is collected and directed around the back and sides of the pond via open drainage channels to discharge directly into the local water course.

Figure 3: Clean stormwater is directed along the topside of the eastern contaminated pond to the creek.

Pump Infrastructure

The eastern and western contaminated pump stations have been installed with dual 22kw Variable Speed Drive (VSD) pumps. These pumps operate by automatic activation of a float switch system inside the pump station. Pump speed can be selected by operating a potentiometer control on the local pump station switchboard (Refer to Figure 4).

The pumps at the western contaminated pond will cycle between duty and standby with only one pump operating at any given time during the dam pump out operation as per the functional requirements of the as built design.

The pumps at the eastern contaminated pond shall also cycle between duty and standby but the pump on standby will remain on call if required to handle an excessive rate of inflow to the pond during significant rainfall events exceeding the 1:20 year, 24 hour, design rain event.

Figure 4: Installed control panel at the Eastern Stormwater Pond.

160mm HDPE pipework has been installed on the discharge side of the eastern and western pump stations. The pipework has been sized to deliver the design maximum flow from the pump stations to the discharge outlet points.

Pond Protection

Suspended Sediment Removal – Western Pond

The Western contaminated pond inlet has been installed with a rock gabion weir to assist with capture of suspended sediment directed from the cattle yards into the western stormwater pond via the constructed swale drains (Refer to Figure 5).

Figure 5: Rock gabion installed at the Western Contaminated Pond inlet.

Suspended Sediment Removal – Eastern Pond

The Eastern contaminated pond inlet has been installed with rip rap' rock to assist with capture of suspended sediment being transported into the eastern stormwater pond. Additionally, dedicated sediment traps have been installed upstream of the eastern contaminated pond adjacent to the cattle yards to separate the suspended sediment load as it drains towards the eastern contaminated pond. This will ensure the maximum capacity of the eastern stormwater pond can be utilised during significant rainfall events.

Pond Outlet Design

Both contaminated ponds have been installed with outlet weirs elevated above the base of the ponds. This design ensures the pump stations will not receive sediment which passes through upstream control structures into the stormwater ponds.

Batter Protection – Eastern Pond

Batter protection has been installed on the south-eastern side of the Eastern contaminated pond adjacent to the creek. The batter protection is designed to protect the embankment from potential scour and erosion during major flood events. The velocity of water during major events was identified as having the potential to impact the integrity of the pond embankment. To mitigate this risk, Teys Australia Beenleigh has installed scour protection which consists of rock wire baskets and dump rock 70-300mm in size (Refer to Figure 6).

Figure 6: Installed scour protection on the eastern contaminated pond to maintain wall integrity during significant rainfall events.

Performance against Schedule

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. **COMPLETE**	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 **COMPLETE**	30 Sept 16	16/17
	Milestone 8	Submit construction report – Stage 1: Begin construction **COMPLETE**	30 Dec 16	
	Milestone 9	Submit construction report – Stage 2: Complete construction **COMPLETE**	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.