



Teys Australia Beenleigh Pty Ltd

Draft Transitional Environmental Program

Stormwater Management

MILESTONE 1 REPORT

28 February 2015

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1. Introduction

As outline in Milestone 1 of the approved Transitional Environmental Program (MAN17840), Teys Australia committed to undertaking an investigation and assessment of the current drainage system reporting to the stormwater pond. This investigation would provide Teys with valuable information regarding potential clean and/or routine waste streams currently reporting to the stormwater pond, that should be managed more appropriately e.g. be diverted to the clean water pathways and/or wastewater treatment system.

Milestone 1 and accompanying deliverables from TEP MAN 17840 (page 6), as approved by the Department on 11 November 2014, are included below:

Phase 1

During Phase 1, three reports will be prepared as deliverables for DEHP. The reports will describe activities to be completed under the TEP as follows:

Milestone 1

Action

An investigation and assessment (which may include CCTV) will be performed on the current drainage system reporting to the stormwater pond. This will provide Teys with valuable information regarding potential clean and/or routine waste streams currently reporting to the stormwater pond, that should be managed more appropriately e.g. be diverted to the clean water pathways and/or waste water treatment system.

Deliverable

An investigation report with findings and preliminary planned actions for stream diversion, will be submitted to DEHP by 28 February 2015

This milestone report is intended to satisfy the deliverable for Milestone 1 of TEP MAN 17840.

2. Methodology

Milestone 1 was broken down into 4 steps that identified areas of contamination and drainage paths. Once identified, the site would update drainage plans and plan works to resolve issues around contamination and stormwater drainage.

Step 1. Undertake a preliminary investigation into the drainage of stormwater and run-off during a wet weather event

Step 2. Perform a dye tracing investigation into the underground drainage system reporting to the contaminated stormwater pond.

Step 3. Update site drainage drawing with new information.

Step 4. Determine which streams should be diverted to the clean stormwater pathways (creek) and which streams should be diverted to the wastewater treatment system. Complete diversion works by 30 April 2016 (as outlined in Milestone 6)

3. Step 1: Wet Weather Investigation

The Beenleigh Environmental Officer undertook an investigation into the site run-off reporting to the stormwater pond, during a wet weather event. The Preliminary Investigation for Step 1 will be broken down into four different areas; Stormwater Pond, Roofed Cattle Pens, Uncovered Cattle Yards and site drains.

a) Stormwater Pond

Upon investigation of the stormwater pond during a wet weather event, there was evidence that there was a significant volume of roofed water reporting to the pond as seen in Figure 1. Roofed stormwater could be more appropriately managed by diverting directly to surface waters. By better managing roofed / uncontaminated stormwater run-off and removing it from the stormwater pond, it will significantly reduce the risk of overflowing, as a result of significant rain events (its was expected that this significant flow is coming from roof stormwater on the plant. This was to be investigated in Step 2 of Milestone 1 investigation).



Figure 1 – Significant volume of stormwater entering the contaminated stormwater pond (significant roof stormwater)

b) Roofed Cattle Pens

The Roofed Cattle Pens were inspected to determine roof water drainage paths. It was found that the southern side of the roofed pens reported directly to the stormwater pond on its own dedicated pipeline, and the northern side reported to an open drain which later led to the stormwater pond (roof volume calculated below).

The southern side of the roof pens could be more appropriately managed to reduce volume of roof stormwater reporting to the stormwater pond and therefore coming contaminated with cattle pen run-off. Teys plan to direct this roofed stormwater directly to surface waters once stormwater quality validation is performed.



Figure 2 – Roofed Stormwater drainage system on southern side of roofed cattle pens

Upon closer investigation of the northern side of the roofed yards, it was found that contaminated water from uncovered cattle holding pens was combining with roof stormwater, resulting in total hydraulic contamination, as seen in Figure 3. To avoid the contamination stormwater, the cattle pen run-off from this area will be directed over the concrete wall and into the wastewater treatment system, as seen in Figure 4.



Figure 3 (left) & 4 (right) – Contaminated run-off from holding pens entering roofed stormwater

drain north side of roofed pens. This contaminated stormwater will be directed through the visible concrete wall and into the site wastewater system to prevent the contamination of roof stormwater.

By diverting the roofed/uncontaminated stormwater directly to surface waters, the reduction in hydraulic load to the contaminated stormwater pond equates to approximately 520,000 litres in a 1 in 20 year, 24 hour event rain event (surface area approximately 2050m² by 254mm and 1.0 run-off coefficient).

c) Uncovered Cattle Yards

The uncovered cattle yards demonstrated significant run-off volumes during the rain event, with manure, urine and mud being the contamination sources. This run-off was appropriately directed to the contaminated stormwater pond to be pumped to the primary wastewater treatment system (under current stormwater management system).

d) Site Drain Inspection

With the significant volume of water discharging into the contaminated stormwater pond, local drain covers were inspected for stormwater flow. It was discovered that there were inflow pipes, into the stormwater drainage system, that were discharging significant volumes into the contaminated stormwater pond, as seen in Figure 5. Further investigation took place in Step 2, to determine what stormwater streams were entering the drainage system to the contaminated stormwater pond.



Figure 5 – Significant volume of stormwater entering stormwater drainage system during rain event. Believed to be from roof stormwater which is to be identified later in the report

To conclude the wet weather investigation, a stormwater run-off mud map was developed to summarise the findings of the investigation. The drainage map shown in Figure 6, provides a clear guide to the stormwater drainage evidenced in Step 1 of Milestone 1.

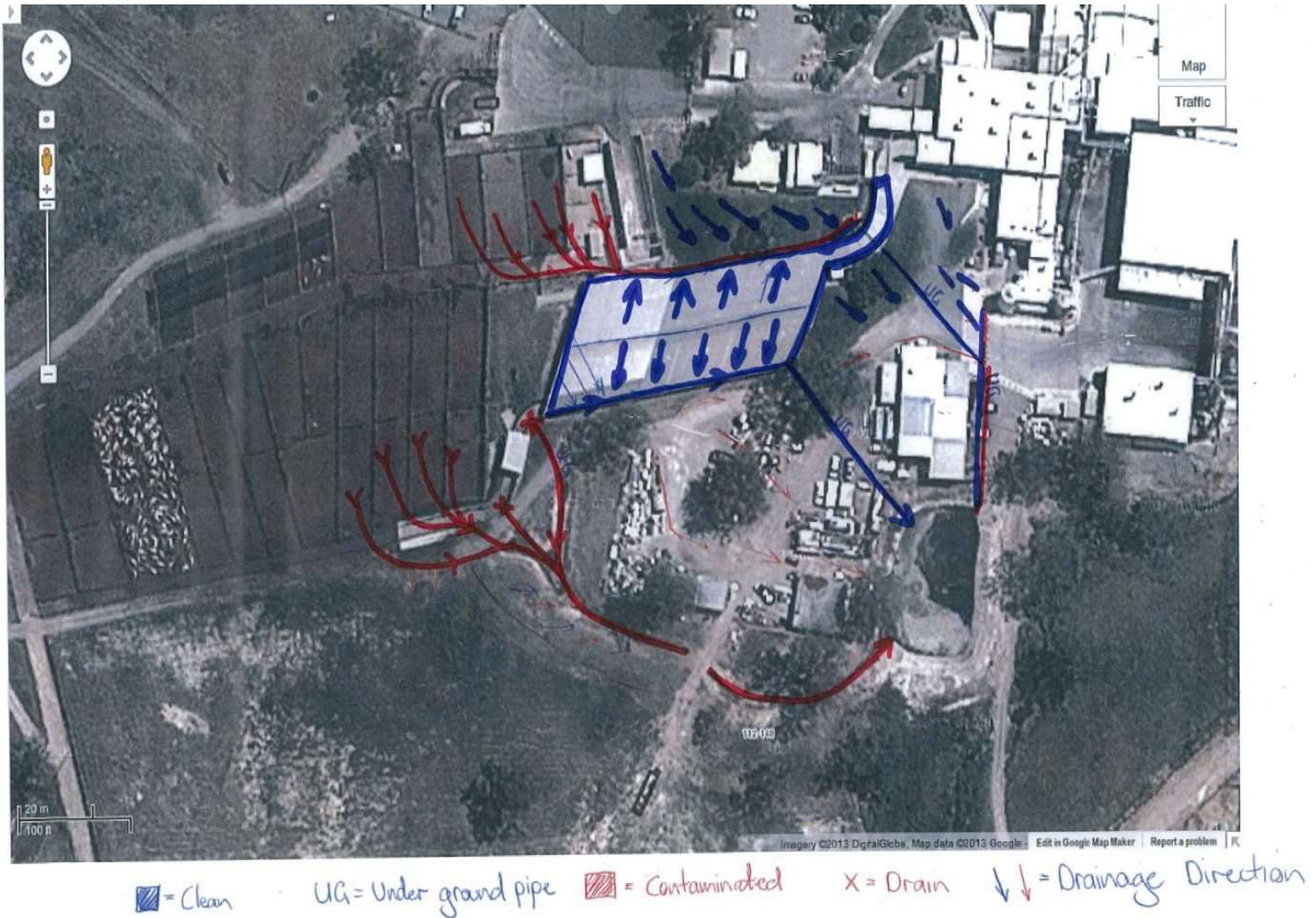


Figure 6 – Wet Weather Investigation Mud Map.

4. Step 2: Dye Tracing Investigation

The next step in the milestone 1 process was to perform a dye tracing investigation to confirm the drainage system reporting to the stormwater pond along with clean roof stormwater drainage paths. The dye tracing investigation excluded the covered cattle yards as the drainage was confirmed in Step 1. A drainage map was developed from this investigation and is displayed below in Figure 7. The highlighted roofed areas have been confirmed as draining to the contaminated stormwater pond., as a result of this investigation.

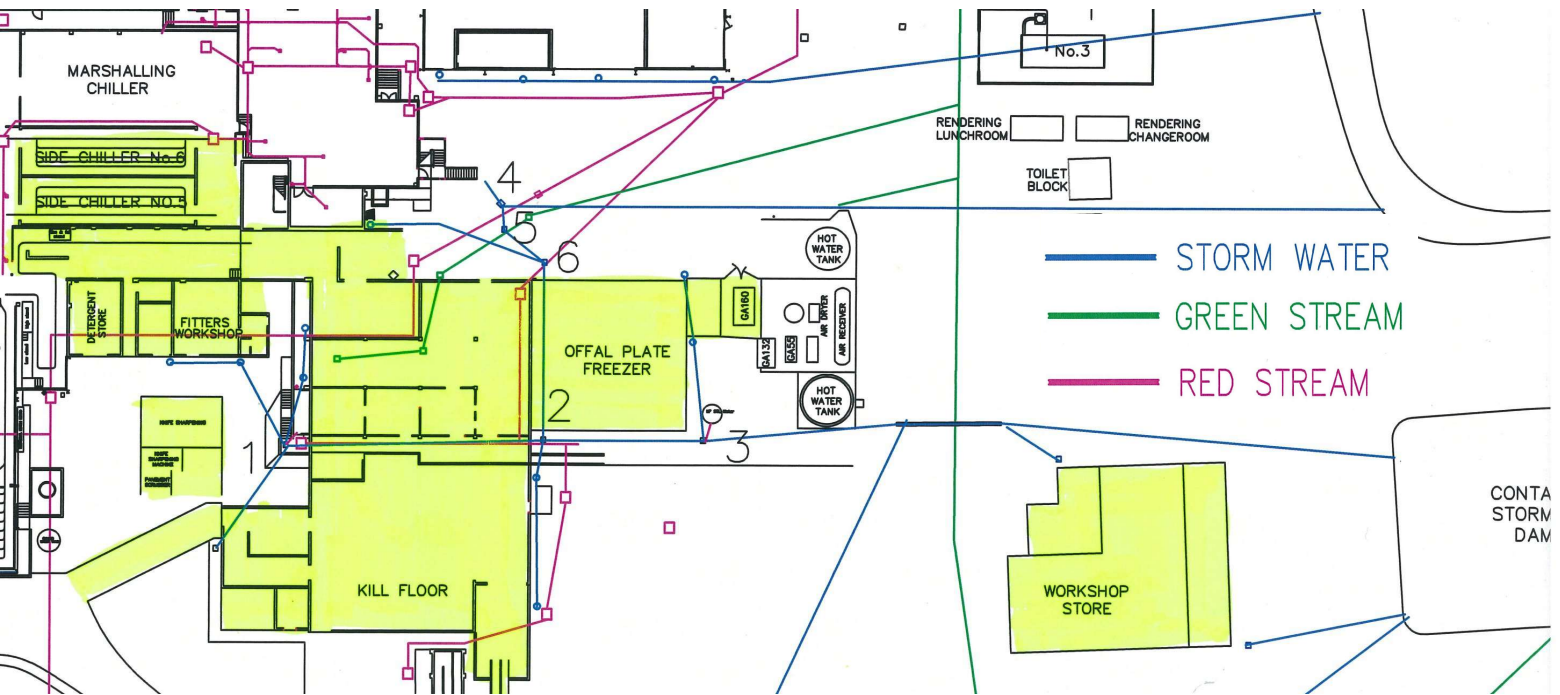


Figure 7 – Dye Tracing Map including drain numbers and highlighted roof areas identifying roofed stormwater draining to contaminated stormwater pond

a) Drain 1

Drain 1 consisted of three entry pipes. Two of the three entry pipes consisted of potentially contaminated hot water that were combining with clean stormwater before draining to the contaminated stormwater pond. The entire contents of drain 1 continued to drain 2.



Figure 8 & 9 – Contaminated Streams entering Drain 1 identified with dye (to be diverted to WWTP)

b) Drain 2

Drain 2 consists of two new entry points, adding to the hydraulic loading of drain 1. One of the entry pipes was identified as the entire stormwater from the Kill Floor roof. The other is coming from two drains from the east (Drains 4 & 5), located between the offal plate freezer and the rendering building. (potential for drains 4 and 5 to be carry some contaminated streams and we are undertaking additional investigations into this.) The hydraulic loading from drains 2, 4 and 5 report to drain 3.



Figure 10 – Roof Stormwater from Kill Floor Roof entering Drain 2.



Figure 11 – Tracing Dye entering Drain 2 from Drain 4, 5 and 6.

c) Drain 3

Drain 3 consists of one underground pipe entry point and a overland flow entry. The underground pipe entry was confirmed as being roof stormwater run-off from the Offal Plate Freezer building roof. The overland flow entry is from a kill floor steriliser water reuse holding tank that sometimes overflows when the reuse water is not being utilised. This hot water then flowing into drain 3 and onwards to the contaminated stormwater pond. Teys will develop a plan to prevent contaminated steriliser water entering the drainage system

d) Drain 4

Drain 4 has one entry pipe and two exit pipes. One exit pipe was confirmed as draining directly south to the creek. The other exit pipe drained to a nearby drain (drain 5) and then onwards to drain 2. The entry pipe to drain 4 is expected to be from the roofed area of the Boning Room however the drain was identified as being collapsed. Appropriate works will be undertaken to address.

e) Drain 5

Drain 5 has two entry pipes and one exit pipe. One of the entry pipes drains directly from Drain 4. The other entry pipe drains directly from a roofed area however the drain has collapsed. All outflow hydraulics from this drain flows directly Drain 6. Teys will plan works to direct this drain into the wastewater treatment system and redirect roof water or remove risk of contamination. Due to the contours in this area, some blood contamination can enter this stream via overland flow (from raw material bin washing).

f) Drain 6

Drain 6 has one entry pipes and exit pipe. Entry pipes drains directly from Drain 5. All outflow hydraulics from this drain flows directly Drain 6. Teys will plan works to direct this drain into the wastewater treatment system and redirect roof water or remove risk of contamination. Due to the contours in this area, some blood contamination can enter this stream via overland flow (from raw material bin washing). Flow from drain 6 is directed under the Offal Room and into Drain 2 and onward to the stormwater pond.



Figure 12 – Drains 6 (left), 5 (middle), 4 (right) and raw material bin causing potential contamination.

5. Summary of Milestone 1 Investigation

The Dye Tracing and wet weather investigations highlighted that significantly more roofed surface area is draining to the contaminated stormwater pond than previously known. After identifying throughout the investigation, it is estimated that the volume of stormwater from roofed areas would contribute over 1 megalitre of hydraulic loading to the contaminated stormwater pond, in a 1 in 20 year 24 hour storm event (surface area of approximately 4367m² during a 254mm rain event with 1.0 run-off coefficient = 1,109,218 L), as seen in figures 13 and 14.



Figure 13 (left) & 14 (right) – Roof Stormwater Catchment Area using State Planning Policy Tools

The other major finding of the investigation was the contaminated streams entering the drainage system to the contaminated stormwater pond. Under the TEP framework, Teys will work to divert these contaminated streams to the wastewater treatment system or remove risk of contamination. Once all the contaminated streams are removed from the roofed stormwater stream and stormwater quality is validated, this drainage line will be diverted to surface waters for clean stormwater discharge.

6. Step 3: Update of Site Drainage Map

Teys updated the site drainage drawing for inclusion into this TEP milestone 1 report. The updated drawing can be seen below in Figure 15. The highlighted area identifies roofed structures that direct roof stormwater to the contaminated stormwater pond, contributing a significant hydraulic loading.

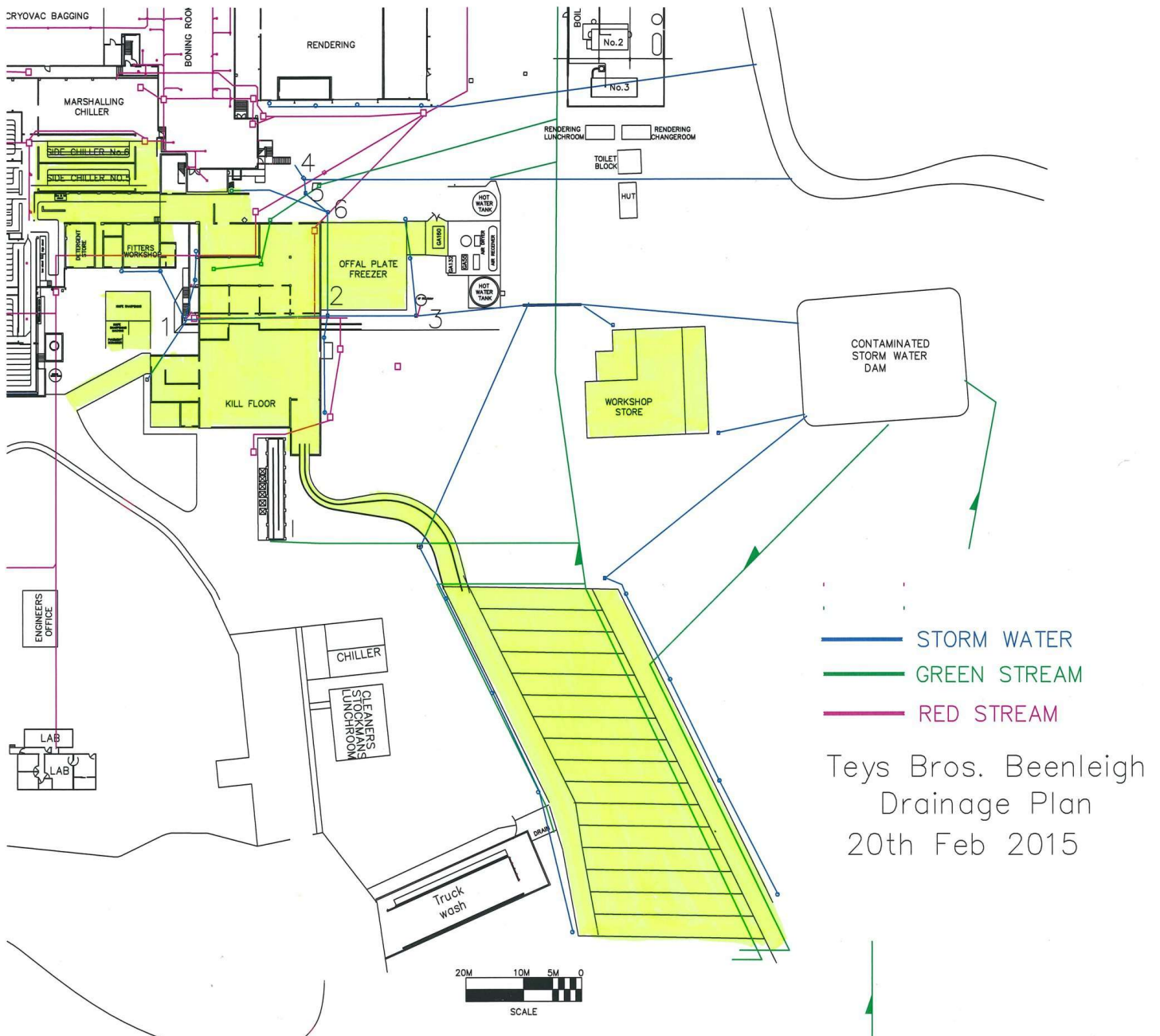


Figure 15 – Updated Stormwater Drainage Map. Highlighted areas identify roofed structures that direct stormwater to the contaminated stormwater pond.

7. Step 4: Streams to be diverted

Teys will work to remove potentially contaminated streams by diverting them to the wastewater treatment system. Upon completion of this task, the stormwater drainage system water quality will be validated at end of pipe, prior to direct discharge to surface waters.

a) Actions

- Prevent contamination of the roofed stormwater on the northern side of the roofed cattle pens by diverting contaminated flow into the wastewater treatment system located under the roofed holding pens.
- Divert roofed cattle pen stormwater directly to surface waters, once end of pipe stormwater quality is validated, to reduced the hydraulic loading on the contaminated stormwater pond.
- Remove contaminated streams from entering drain 1 and 3 and divert to wastewater treatment plant (dates for execution will be provided in later stage of the TEP).
- Divert drains 5 & 6 to wastewater treatment plant or remove risk contamination.
- Repair damaged roof stormwater downpipes.
- Take samples of end of pipe stormwater after contaminated streams are removed.
- Validate end of pipe stormwater samples contain no contamination and can be deemed “clean stormwater”.
- Divert all “clean stormwater” directly to surface water by April 2016 (as per Milestone 6).

8. TEP Progress Update

Teys have engage South East Queensland Catchments to undertake a feasibility study in the application of Wetland Treatment Technology for managing contaminated stormwater from the holding pens, which has the full support of Meat and Livestock Australia. The study will provide a realistic alternative to a hard engineering solution and may make up part of the final stormwater management solution.

Over the next 3 weeks, Teys plan to meet with consultants to develop a preliminary design for the contaminated stormwater management. At this stage Teys see no risk to not meeting all future milestones.

Teys Australia would also like to extend a formal invitation to DEHP representatives, to the hot commissioning of our new state of the art waste water treatment/renewable energy system. Teys will formally invite DEHP representatives when dates are finalised.