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RESOURCE CENTRE

SOIL AND WATER MANAGEMENT PLAN

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FAIRFIELD SUSTAINABLE RESOURCE CENTRE

REF: SWMP-001 Rev D

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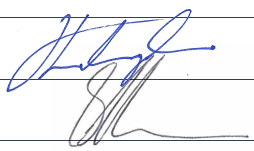
Reviewed by:	John Lutwyche	24th August 2020	
Approved by:	Steve Novak	24th August 2020	

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1 INTRODUCTION

Fairfield City Council (Council) covers 102 km^2 in the south-western Sydney metropolitan area and serves approximately 205,000 residents. The Fairfield Sustainable Resource Centre (SRC) is a Council-operated recycling centre which accepts waste building material comprising terracotta, brick, concrete and asphalt and supplies aggregate, sand, topsoil and crushed concrete for construction and landscaping. The SRC has been in operation since 1997 and processes in excess of 180,000 tonnes of material per year.

Council intends to expand the existing SRC into an area covering an additional 2.8 hectares (ha) to the east of the currently operating SRC area, including filling in a gully within a former road reservation (Canal Road) between the current facility and the proposed expansion area. The project will also include expanding a paved carpark area, construction of a flood compensation area to the north east of the expansion area and creation of two new sedimentation basins in the north and east of the facility. A site layout plan is presented as Figure 2 in section 4.2 of this report.

Council engaged WSP Australia Pty Ltd (WSP) to undertake a detailed site investigation (DSI) for the expansion area as part of the planning approvals process and to prepare and soils and water management plan (SWMP) for the operation of the site and support of the development application and Environmental Impact Statement for the expansion of the SRC. This report covers the scope of works as outlined in the original project proposal and subsequent communication with the SRC, including:

- Canal Road filling works
- Soil and Water Management Plan including site water balance

Our report meets the following State Secretary's Environment Assessment Requirements (SEARs), reference number SSD 8184, in relation to water management:

- An assessment of potential impacts to soil and water resources, topography, hydrology, drainage lines, watercourses and riparian lands on or nearby to the site
- A detailed site water balance, including identification of water requirements for the life of the project, measures that would be implemented to ensure an adequate and secure water supply is available for the proposal and a detailed description of the measures to minimise the water use at the site
- Details of stormwater/wastewater/leachate management systems including the capacity of onsite detention systems, and measures to treat, reuse or dispose of water
- A description of erosion and sediment controls and their corresponding maintenance

2 GUIDING DOCUMENTS

2.1 LEGISLATION, POLICY AND GUIDELINES

- Environmental Protection Act 1994;
- International Erosion Control Association (IECA) Best Practice Erosion and Sediment Control Guidelines 2008;
- Landcom: Soils and Construction - Volume 1 - 4th Edition March 2004
- Fairfield City Council Development Control Plan Development Control plan 2013 Amendment 20
- Fairfield City Council Specification for Roadworks and Drainage associated with subdivision or other development – Policy No 4-515- 13 September 2011

2.2 SITE SPECIFIC DOCUMENTS

- WSP Detailed Site Investigation 2271108A-CLM-REP-001 Rev B Dated 06 November 2018
- WSP Detailed Site Investigation 2271108A-CLM-REP-001 Rev C Dated 27 July 2020
- WSP Leachate Assessment, Fairfield Sustainable Resource Centre PS102981-CLM-LEACH Rev002 dated 17 July 2020
- Fairfield SRC Site Suitability Assessment (Flood Compensation Area) Dated 16 July 2020
- WSP State Environmental Policy Planning (SEPP33_ Screening Memo – Rev A Dated 19 October 2017) Reference no 2271108A-SEPP 33 Screening-MEM-001 Rev A
- State Significant Development Revised Planning Secretary's Environmental Assessment Requirements (SEAR) Fairfield Sustainable Resource Centre Expansion (SSD8184)
- Survey by Mepstead and Associates – Ref 5593 Dated 11 February 2020
- Survey by Mepstead and Associates – Ref 5593 Dated 28 July 2020 Rev C

3 PROJECT BACKGROUND

3.1 SITE LOCATION

The general site identification details are provided in Table 2.1.

Table 1: Site details

Site address	Corner of Hassall Street and Widemere Road, Wetherill Park
Site identification	Expansion area: — Lots 1 and 2, Deposited Plan (DP) 620755 — part Lot 1, DP 368374 — part Lot 37, DP 3082 Proposed Canal Road: — Lot 100 in DP 1220637 — part Lot 1, DP 620755 — part Lot 37, DP 3082 — part Lot 35, DP 657040.
Site area	Expansion area – approximately 2.8 ha Proposed Canal Road – approximately 6,000 m^2
Current site use	Material storage for SRC
Surrounding land uses	Commercial and light industrial properties are present to the south, beyond Hassall Street, and west, beyond the remainder of the SRC. To the north and east is Prospect Creek, with recreational sporting facilities beyond.
Local government area and zoning	Fairfield City Council, zoned IN1, general Industrial, under *Fairfield Local Environmental Plan 2013* (Fairfield LEP)
Proposed site use	Recycling centre and internal roadway

3.2 HISTORICAL AERIAL PHOTOGRAPH REVIEW

Historical aerial photographs of the site and vicinity were reviewed for the years 1965, 1978, 1991 and 2004 along with the 2016 aerial. Aerial photographs are included in Appendix B. The details of the site and surrounding area in each photograph are summarised in Table 2.

Table 2: Historical aerial photograph review

YEAR	SITE CONDITIONS	SURROUNDING CONDITIONS
1965	The site and the remainder of the SRC are rural agricultural properties. A small group of buildings which may be rural farm buildings is present in the southern portion of the site.	The surrounding sites are rural residential and agricultural. Widemere Road, Hassall Street and Redfern Street are present. Prospect Creek is generally in its current alignment, although vegetation clearing is apparent along the banks.
1978	The western portion of the site appears to still be agricultural, although the use is unclear based on the quality of the photograph. The eastern portion has been cleared and appears to be in use as a land fill. One small building is present on the eastern portion and a group of structures is present in the south of the western portion.	Sites to the south appears to remain generally agricultural, although residential development has progressed to the south-east. Additional roadways have been constructed to the south. To the north and east, beyond Prospect Creek, a quarry operation is present.
1991	The site appears to have been filled and capped, and the gully in the west is apparent. The western portion of the SRC has large stockpiles of material present.	Properties to the south and west have been redeveloped for commercial or industrial uses. The Road layout is in its current configuration. The quarry to the north and east of Prospect Creek appears to have been largely filled and sport fields are being constructed.
2004	The site is in its current layout, with the SRC facilities present.	Density of commercial/industrial development to the west and south has increased. Vegetation around Prospect Creek is increased.
2016	No changes	No changes

Figure 1: Site aerial (source: Nearmap, 2020) UPDATE TO NEW AREA

3.3 PROPOSED DEVELOPMENT

The Council intends to expand the SRC into an area covering approximately 2.8 hectares (ha) to the east of the currently operating SRC area, including filling in a gully within a former road reservation (Canal Road) between the current facility and the proposed expansion. The project will also include associated Erosion and Sediment controls including but not limited to the creation of two additional sedimentation ponds, the retrofitting of the two large sediment ponds on site to increase efficiency.

The expansion area is located at approximately 40 m in Australian Height Datum and is raised 5 m to10 m above the surrounding area by engineered fill above a former landfill cell. The area is generally flat with slopes down in all directions at the edges of the filled portion. To the west of the expansion area is a gully where Canal Road is proposed to be constructed. The general area around the SRC slopes to the north-east toward Prospect Creek.

The proposed development is for an expansion of the SRC to increase its processing capacity to up to 550,000 tonnes of recyclable construction material per year. The proposal is also seeking to fill a gully running north-south through the centre of the site, known locally as ‘Canal Road’ and fill a small area of land to the south east of the gully, fronting Hassall Street.

The following is proposed:

- A processing capacity of up to 550,000 tonnes of recycled construction materials per year for the entire facility.
- Importation of approximately 35, 280m^3 of Virgin Excavated Natural Material (VENM) for site fill.
- Site earthworks and grading to establish a level site, including the construction of batters.
- Decommission of one stormwater sediment basin and construction of two additional stormwater sediment basins.
- Retrofitting two existing sedimentation basins to have a forebay and chemical dosing system.
  - Receiving, processing, recycling and storage of the following waste material, consistent with existing operations and EPA licensing:
    - VENM;
    - Building and demolition waste including roof tiles, clay bricks, concrete;
    - Asphalt waste (including asphalt resulting from road construction and waterproofing);
    - Spoil and Soils.
- Change to the site operating hours to the following:
  - Receiving and loading of trucks – 24hrs/7 days;
  - Crushing operations 5.00am – 6.00pm (Monday to Friday);
  - Pug Mill operations 3.00am – 4.00pm (Monday to Friday).
- Vegetation and tree removal to facilitate the proposed works and replacement tree planting.
- Flood compensation area limited to regarding the existing vegetated area to the north east of the expansion area.
- Oil, fuel and chemical storage facilities. The expansion area is approved to store 10,000L of Diesel fuel. As documented in the WSP State Environmental Policy Planning (SEPP33_ Screening Memo – Rev A Dated 19 October 2017) Reference no 2271108A-SEPP 33 Screening-MEM-001 Rev A
- Associated erosion and sediment control devices.

3.4 CIVIL WORKS

To accommodate the proposed expansion of the SRC, filling of the existing Canal Road gully is required. As part of the filling works and to facilitate improved stormwater management and reuse ability, two new sedimentation basins have been proposed. Earthworks plans have been prepared (refer to Appendix A) which detail the following scope of works:

- Site regrading
- Extent of battering
- Proposed levels
- Filling of the existing sediment basin

- Proposed locations of new sediment basins
- Stormwater drainage augmentation

The design has been prepared in conjunction with all other studies and to accommodate site constraints such as flood storage capacity of the area, contamination issues due to the previous use of the site, erosion and sediment control and site access.

Based on previous flood modelling (Bewsher 2010, Prospect Creek Floodplain Management Plan Review) any filling in the floodplain above RL 30.90 would need to be compensated, therefore the design must maintain the flood storage of the site. This is provided in the form of the flood compensation area to the north east of the expansion area. This area serves only to store as flood storage volume and does not require maintenance exceeding its current requirements.

Battering of the proposed filling work shown in Appendix A maintains similar slopes as the existing site and maintains clearance to site boundaries and major services linking the sewer and gas mains which pass across the northern portion of the site.

4 SITE STORMWATER MANAGEMENT AND WATER BALALNCE

4.1 SURFACE FLOW ASSESSMENT

WSP have assessed the effectiveness of water quality management practices of the SRC as part of the works to respond to the 2017/18 EPA investigation. This involved the mapping of all surface flows to gain a better understanding of site runoff.

Surface flow mapping was undertaken for the entire site and comprised of reviewing and assessing the:

- Survey provided by Mepstead surveyors dated Feb 2020
- Deposited plans
- EIS, 1995 by Woodward-Clyde for the original approval of the SRC
- Review of Flooding Constraints report, 2012 by FloodMit
- Council's flood information
- Water licence #10CA103730 issued by the NSW Department of Primary Industries
- Site inspections and correspondence with centre managers
- Desktop review of available data, including LiDAR, DBYD, title searches etc.

Note that surface flow plans in Appendix A display the following information:

- Overland flow directions and paths
- Formal and informal drainage channels
- Roof water drainage including gutters and down pipes
- Below ground stormwater piping, pits and other infrastructure
- Clean and/or contaminated water storage areas (such as above or below ground tanks, stormwater detention basins, sedimentation basins etc
- The location of any water quality treatment devices
- The location and spread of any diffuse discharges from the Premises
- The location of any point discharges from the Premises
- Where any water is discharging to (including its flow path)

4.2 SITE WATER BALANCE

A site water balance for the facility has been prepared and details usage and generation for water storage, if there is sufficient water storage on site and how much top up from other sources (creek pumping and water trucks) is required to meet the site's demands.

As shown in Figure 2 below, the site contains three sediment basins (total capacity 3,063KL), 30 above ground water tanks (total capacity 785KL) and a creek off-take pump (licence no. 10CA103730).

Figure 2: Site Erosion and sediment control measures (source: Nearmap)

At present, water requirements for dust suppression are met by water cart trucks transporting water from the various above ground water storage tanks. These tanks are filled from the three sediment basins located on site. No on-site mains water is used for dust suppression operations. Water is stored in the sediment basins and used for dust suppression including the operation of the pug mill and crushing plant. Roof runoff is also captured from the office and work-shed and reused at the toilet facilities of the site. The demand volumes for water reuse are negligible relative to the demands for dust suppression.

Based on correspondence with the site manager, there is a constant shortage of water for dust suppression, so basins are consistently topped up from Prospect Creek off-take pump. The site has a licence from the NSW Department of Primary Industries to draw 192 KL per day of water from Prospect Creek . This water is pumped from Prospect creek to Existing Sediment Basin 1. Refer to Sections 4.2.3 and 4.2.4 for the current usage and demand requirements.

4.2.1 WATER BALANCE MODELLING

A site water balance was undertaken as per the SEARS requirements utilising MUSIC water quality and quantity engineering software in accordance with Fairfield city council requirements.

Fluctuations of stored water were modelled taking into account rainfall-runoff after initial losses and demands. It is assumed that excess runoff would spill at the emergency overflow locations of the basins as identified in the civil plans in Appendix A.

4.2.2 RAINFALL AND EVAPORATION

Historical daily rainfall was obtained from the Australian Bureau of Meteorology (BoM) weather station at the Abbotsbury (Fairfield (City Farm)) (67114). As per the EPA's instructions, daily rainfall data from 1996-2020 was used to simulate the water balance. The mean annual average depth of rainfall over this time period was found to be 699.7 mm/annum. The annual maximum depth of rainfall over this time period was found to be 937 mm/annum.

4.2.3 WATER DEMANDS

The daily demands were estimated based on the following assumptions and anecdotal evidence from the site's operations manager:

- Site hours of operation:
  - Monday – Friday: 8:30am to 4:30pm
- Office – 2 toilets and 1 urinal
- Work-shed – 7 toilets and 1 urinal
- Wheel-wash – 1 truck every 2 minutes during hours of operation (water is treated and reused and was excluded from the water balance due to insignificant volume of water)
- Total Dust suppression including water tucks and Pug mill and Crushing Plant:
  - Summer Months: Peak usage confirmed to be 200 KL/day
  - Winter Months: Peak usage confirmed to be 50 KL/day
- Creek take-off pump:
  - Summer Months: 192 KL/day
  - Winter Months: 48 KL/day

Based on the figures above, the following demands were utilised in the model:

Table 3: Water usage demands for the facility

Usage Area	Water Usage	
	KL/day	Percentage of Total Consumption (Summer/Winter)
Office	0.5	0.2% / 1%
Work-shed	1	0.5% / 1.9%
Total Dust Suppression including Water Trucks, Pug Mill and Crushing Plant (Summer/Winter)	200 / 50	99.3% / 97.1%

4.2.4 WATER STORAGE INVENTORY

The proposed storage arrangement on the facility will comprise of four sediment basins and the existing 30 above ground tanks. Additional tanks can be placed adjacent to the proposed sediment basins if desired. The water storage devices are summarised in the table below:

Table 4: Water Storage Breakdown

Storage Device	Current Capacity (KL)	Required Capacity (KL)
Existing Sedimentation Basin 1 (to be retrofitted with forebay and chemical dosing)	2,000	1658 (ESC) + 166 (Forebay) = 1824
Existing Sedimentation Basin 2 (to be retrofitted with forebay and chemical dosing)	868	809 (ESC) + 81 (Forebay) = 890
Existing Sedimentation Basin 3 (to be decommissioned)	195	N/A
Proposed Sedimentation Basin 4 (Type A – High efficiency)	N/A	1061 (ESC) + 106 (Forebay) = 1167
Proposed Sedimentation Basin 5 (Type A – High Efficiency)	N/A	901 (ESC) + 90 (Forebay) = 1824
Ex Sediment Basin 1 - Tanks	429	
Ex Sediment Basin 2 - Tanks	162	
Crushing Plant - Tanks	81	
Wheel-wash Tank	5	
Pug Mill Tank	8	
Office Tanks	30	
Work-shed Tanks	70	
Sedimentation Basin Subtotal	**3066**	**5705**
Storage Tank Subtotal	**785**	**785**
Total	**3851**	**4995**

** *Note:*

- *ESC = Erosion and Sediment Control Requirement*
- *Forebay = Forebay sizing based of 10% of total basin volume guidance in IECA (2008)*

4.2.5 CONTRIBUTING CATCHMENTS AND LOSSES

Roof areas and Contributing catchments of sediment basins are determined based on the are based on supplied survey by Mepstead Surveyors dated Feb 2020. It is assumed that roof water would be collected by the gutter system and drained to the adjacent storage tanks.

Table 5: Contributing catchments and losses.

Catchment	Area (m²)	Runoff Coefficient*	Soil Storage (mm)
Office	158	1	1
Work-shed	542	1	1
Pug Mill and Crushing Plant	N/A	N/A	N/A
Existing Sedimentation Basin 1	34,800	0.7	5
Existing Sedimentation Basin 2	17,400	0.7	5
Proposed Sedimentation Basin 4	22,700	0.7	5
Proposed Sedimentation Basin 5	3,500	0.7	5

*Refer to Industrial Areas surface type in Fairfield Council's engineering design guidelines.

A runoff coefficient of 0.70 was used for the contributing catchments draining to the sediment basins. This is a conservative approach, as the existing catchment is made up of stockpiles and haul roads that are compacted, but still provide higher infiltration rates than concreted/hard surface areas.

4.2.6 MODELLING RESULTS

The figure below outlines the configuration of the modelling completed in MUSIC.

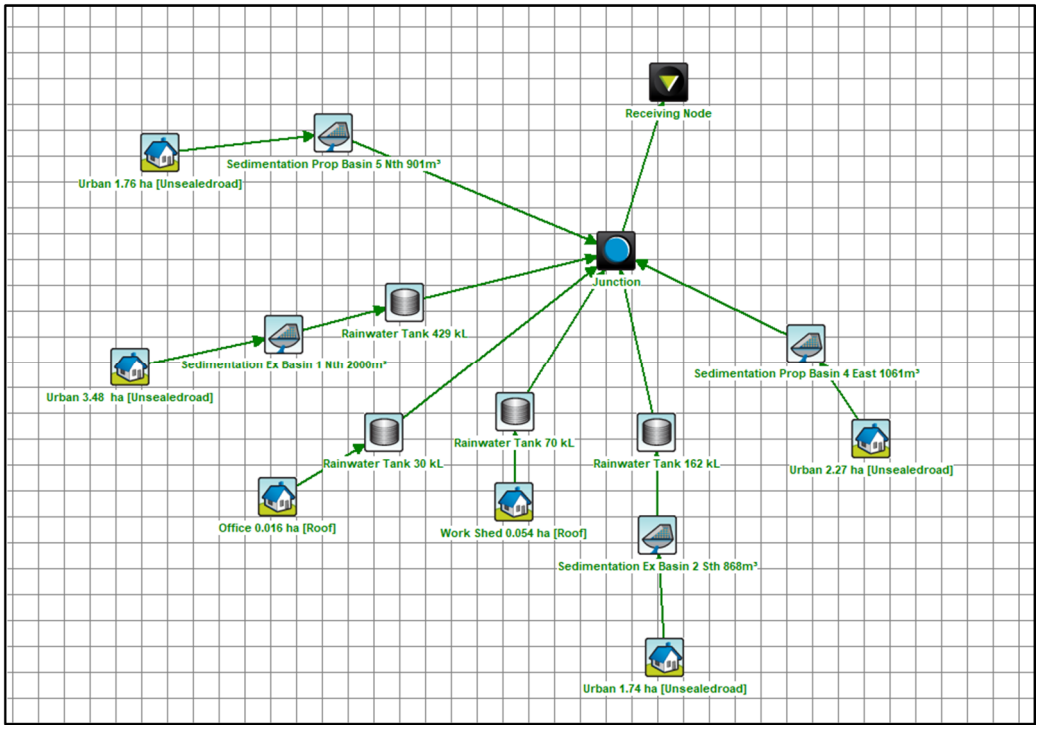


Figure 3: MUSIC modelling configuration

Treatment Train Effectiveness - Receiving Node

	Sources	Residual Load	% Reduction
Flow (ML/yr)	51.4	30.8	40
Total Suspended Solids (kg/yr)	44900	894	98
Total Phosphorus (kg/yr)	19.7	4.16	78.9
Total Nitrogen (kg/yr)	104	50.3	51.9
Gross Pollutants (kg/yr)	418	0	100

Figure 4: Water Quality outcomes

Node Water Balance - Rainwater Tank 792 kL

	Flow (ML/yr)	TSS (kg/yr)	TP (kg/yr)	TN (kg/yr)	GP (kg/yr)
Flow In	44.35	1292.38	5.98	71.11	22.84
ET Loss	0.00	0.00	0.00	0.00	0.00
Infiltration Loss	0.00	0.00	0.00	0.00	0.00
Low Flow Bypass Out	0.00	0.00	0.00	0.00	0.00
High Flow Bypass Out	0.00	0.00	0.00	0.00	0.00
Pipe Out	14.77	533.87	2.05	25.76	0.00
Weir Out	2.59	116.63	0.37	4.67	0.00
Transfer Function Out	0.00	0.00	0.00	0.00	0.00
Reuse Supplied	19.65	326.35	2.58	29.75	0.00
Reuse Requested	73.00	0.00	0.00	0.00	0.00
% Reuse Demand Met	26.92	0.00	0.00	0.00	0.00
% Load Reduction	60.87	49.67	59.63	57.22	100.00

Figure 5: MUSIC Water Balance

The table below summarises the results of the water balance modelling:

Table 6: Water Storage Modelling results.

Total Runoff	44,350 KL/year
Total Demands	45,600 KL/year
Rainwater Supplied	19,600 KL/year
Percentage Demands Met	43%
Total Tank Top-up from Creek Off-take	26,000 KL/year

Based on our water balance modelling for the year, the site's stormwater harvesting yield is approximately 43%.Any overflows during a large storm event would sheet flow over approximately 100m of grass and vegetation buffer zone which treats flows before they enter Prospect Creek. This is determined to be adequate water quality treatment regarding the downstream waterbodies.

4.3 STORMWATER MANAGEMENT STRATEGY

The site of the proposed development lies on the southern side of Prospect Creek. Prior to the current SRC facility, the site was used as a landfill which was has been capped. As documented, the capping layer was constructed in the 1980's is documented as being at a minimum of approximately 3m thick and comprised of clay.

4.3.1 EXISTING WATER MANAGEMENT SYSTEMS

The main management system is a water quality monitoring program along Prospect Creek. Golder Associates is engaged to collect the following information:

- Monthly monitoring of dust deposition at five separate locations
- Quarterly monitoring of surface water at two locations and ground water conditions at three locations
- Preparation of an annual report summarising the works performed, as well as providing a data quality assessment of the laboratory analytical results.

Figure 6: Golder's environmental monitoring locations.

Council has a water pumping program which is used to top up the water levels in the sediment basins by pumping from the creek. Refer to Water licence #10CA103730 issued by the NSW Department of Primary Industries

As part of the proposed development, WSP has prepared a detailed site investigation of the of the existing facility and expansion area (reference no. 2271108A-CLM-REP-001 Rev B) to determine any contamination issues.

The results of the investigation showed some contamination in the groundwater beneath the expansion area which was likely a result of the landfill leachate. No human health risks related to the proposed redevelopment of the site were identified from soil or groundwater.

Refer to section 5.2.1 below for the summary of the detailed site investigation regarding contaminants.

4.3.2 STORMWATER MANAGEMENT

Water supply requirements for dust suppression, water reuse and operational uses are currently met by three sediment basins and approximately 30 tanks (as detailed in Section 4.2.4). Upon completion of the proposed expansion works, existing Sediment Basin 3 will be decommissioned and proposed Sediment Basins 4 and 5 are to be constructed. Existing Sediment Basins 1 and 2 will be retrofitted to have a forebay and chemical dosing facilities to facilitate the sedimentation and removal of particulates, in accordance with the High efficiency Type A High Efficiency sediment requirements. An outline on the Type A High Efficiency Sediment Basins and chemical dosing is attached in Appendix C.

A water licence (Water licence #10CA103730) issued by the NSW Department of Primary Industries is available to allow the SRC is extract water from Prospect Creek to fill the sediment basins as required to a nominated limit of 192KL/day.

Stormwater runoff from the site is managed by a berm which runs along the entire perimeter of the site and diverts surface runoff to nearby sediment basins. The entrance driveway is designed to divert runoff to a vegetated buffer zone to the north where it is filtered prior to reaching the downstream waterway to the north. Runoff that bypasses the berm or overtops the sediment basins, sheet flows down the site's vegetated batters and vegetation buffer zones prior to reaching the downstream waterway of Prospect Creek.

This current arrangement will be maintained upon the expansion of the facility and is deemed adequate to manage stormwater runoff from a site of this nature.

4.3.3 PROPOSED CREEK PUMPING STRATEGY

In order to achieve SEARS outcomes and the successful utilisation of the sedimentation basins, it is essential that water is no longer stored in the sedimentation basins. This is particularly important prior to any storm events to ensure sediment basins are used to manage sediment control.

The proposed creek water pumping strategy is listed below:

- Ideally pumped creek water should be pumped directly to the water storage tanks.
- If the above is not feasible then pumped creek water can be stored temporarily in the sedimentation ponds but must be pumped from the ponds to the storage tanks as soon as possible.

As noted in the tank inventory supplies, there is 785 KL of capacity in the existing water storage tanks on site. This equated to 3.9 days of water storage during summer, and 15.2 days of storage during winter.

This new strategy of using the proposed sedimentation ponds exclusively for sediment capture and not for water re-use storage will no doubt require more frequent pumping than is currently undertaken on site.

Additional tanks may be provided at the discretion of the facility operations manager on site adjacent to the proposed sedimentation ponds 4 and 5 in order to increase total tank storage capacity, if additional dust suppression water capacity desired. Note that this is a decision to be made regarding the operations of the facility, and does not have an impact of the water quality and the SEARS conditions.

4.3.4 FLOOD LIABILITY

The site is located within the Prospect Creek flood plan. Previous flood studies undertaken have determined that any filling in the floodplain above RL 30.90 would need to be compensated. Based on the Mepstead survey data, levels along the SRC are approximately 10m above the 1% AEP flood level, however, the proposed works encroach into the flood storage area.

We have documented a flood volume compensation (approx. 1500m³) area to the north east of the expansion area to compensate for this flood storage loss. Refer to the Flood Risk Management Report (Bonacci Group, reference no. 10073) and the plans in Appendix A for further details.

The flood compensation area works comprise of regrading the existing land below RL 30.90 to achieve the approx. 1500m³ storage requirement. The proposed works are to recontour the land and drain by gravity into the existing overland flow path. The flood compensation area is not to store water for any extended period, and not to act as a basin. The flood compensation area is to be mulched and planted according to the Landscape Architecture design by SLR Consulting design post construction, and no long-term maintenance is required aside from the occasional mowing which occurs as part of the normal operations of the facility.

Refer to Appendix E for the Fairfield SRC Site Suitability Assessment (Flood Compensation Area), a summary of which is stated below:

- **Underground Asset Limitations**

During the Dial Before You Dig desktop search and subsequent field inspection and on-site service location two underground assets were identified which present a limitation to the location of the FCA:

— Jemena Eastern Gas Pipeline

— Sydney Water sewer main.

The general locations of these assets in relation to the FCA are presented in Figure 1 of Appendix E.

The Eastern Gas Pipeline is a nationally important asset which requires no works to be undertaken within 10 metres of either side of the pipe. Figure 1 presents an indicative 10 metre offset within which no works relating to the FCA can be undertaken (note that prior to works commencing this offset should be formally demarcated by a surveyor). During the site inspection, the Jemena asset manager provided the following additional information relating to conducting works close to the pipeline:

— All works need to consider how changes to runoff during and after construction will affect the pipeline. Jemena engineers should be consulted prior to commencement of work.

— In order to ensure the 10 metre standoff during works, consider temporary fencing to demarcate the extent of the exclusion zone.

— No vehicles are allowed to cross the pipeline. This exclusion should be factored into construction management plans and implemented during construction works.

— If batter excavations are required as part of the construction of the FCA, this is not to encroach upon the 10 metre exclusion zone.

— Jemena requires unimpeded access to the pipeline 24 hours a day, seven days a week.

In addition to the Eastern Gas Pipeline, the Sydney Water sewer main to the immediate south of the FCA area should be considered. The design should ensure that the FCA can be constructed in such a way that meets Sydney Water requirements for asset protection. It is recommended that Sydney Water be consulted prior to commencement of works so that the asset can be adequately protected during and following construction.

- **Historic Filling**

During the field inspection, the WSP field consultant and the Fairfield City Council excavator excavated a total of nine test pits in the general vicinity of the FCA. The intent was to log sub-surface conditions and highlight any potential limitations associated with those conditions regarding the construction and ongoing viability of the FCA.

The logs from each of the nine test pits (refer to Appendix B), indicate variable fill thickness and composition across the investigation extent. Test pits were excavated to depths ranging from 1.5 to 3.6 metres below ground level with fill extending to the full extent in three test pits (TP01, TP02 and TP03). In the remaining test pits, fill thickness ranged from 0.6 to 2.5 metres. Fill was generally underlain by either reworked natural or natural materials comprising silty clays.

Fill generally comprised silty clay which was intermixed with a range of wastes predominantly comprising construction and demolition wastes, slag, cloth, plastic and occasional putrescibles. While distribution of waste types was highly variable and not indicative of significant segregation during emplacement, the test pits indicated that materials in the south-west of the investigation area (as denoted by TP03, TP04 and TP06) generally comprised more soil waste than in the centre and north which held a higher proportion of general refuse and construction and demolition waste.

During test pitting it was evident that many parts of the investigation area were poorly compacted. This was identified during tracking of the excavator which showed scarring of the surface as the plant moved between investigation locations as well as collapse of test pits (e.g. TP01 and TP02).

The test pitting indicates that the waste identified beneath the investigation area generally comprised non-putrescible wastes with only minimal identifiable putrescibles. Therefore, the observed waste type is not considered to substantially contribute to differential settlement. However, differential settlement is still likely to present a hazard which is required to be factored into design due to the evidence of poor compaction during test pitting works.

- **Ecological Considerations**

During the field inspection on 17 June 2020, the SLR project ecologist identified the extent of vegetation to be retained. The approximate location of this vegetation is presented in Figure 1 of Appendix E.

4.3.5 LEACHATE MANAGEMENT

There are no current leachate management systems in place for the SRC for the leachate from the landfill cells beneath the facility. However as noted in section 4.3.1, Council does procure a regular sampling program or the upstream and downstream waterway to make sure that both the current premises and previously capped landfill is not leaching and exceeding the water quality guidelines.

As well as the current water monitoring program, the landfill was investigated in August 1994 (Woodward-Clyde, 1994). The investigation found no evidence of leachate discharging from the landfill area underlying the SRC and reported that the batters were well vegetated and show no evidence of discharge or scouring. The landfill cap was well compacted in the vicinity of the centre and there was no evidence of cell collapse. It is not deemed that the proposed expansion works will alter the existing landfill leachate management of the site. The leachate within the landfill cell is approximately 7 m below the surface of the pad where the facility is located, and does not interact with the surface water at the SRC.

Leachate generated by the SRC, in the form of surface water that interacts with the waste stockpiled and/or processed at the site, is collected in the sedimentation basins, as described in Section 4.3.2. This system is considered adequate for the facility, although the leachate assessment undertaken by WSP for this project provided recommendations for the preparation of an operational environmental management plan (EMP) to implement inspection and monitoring protocols related to the management of leachate/runoff and installation of additional water diversions around stockpile processing areas to minimise overland flow through material stockpiles.

Refer to section 5.2.1 below for the summary of the detailed site investigation regarding contaminants.

4.4 EROSION AND SEDIMENT CONTROL DURING CONSTRUCTION

Earthworks will be carried out in such a manner as to minimise erosion through the use of appropriate soil and water management techniques, refer to the plans attached in Appendix A.

Temporary vegetative stabilisation will be carried out in accordance with Council guidelines and the Managing Urban Stormwater: Soils and Construction guidelines (Landcom). Any disturbed vegetation will be re-established, and proposed batters planted according to the Landscape Architecture design by SLR Consulting with suitable ground cover. Sedimentation basins will be utilised during construction and the regular operation of the facility to treat runoff from the exposed areas to a suitable quality before being dewatered either to the tanks available on site used for dust suppression or discharged overland to the creek. The existing vegetated buffer strip of approximately 100m will be maintained between the site and Prospect Creek to act as a further water treatment measure.

Appropriate care will be exercised during constructing of the proposed earthworks and such that the sediment basin will function correctly and are maintained for their design intent for the integrity of the clay capping over the underlying landfill. This will involve the excavating up to two meters into the capping material, which is documented as being at least 3m thick. The basin will not extend past the capping layer into the landfill below.

5 EROSION HAZARD ASSESSMENT

5.1 DURATION OF DISTURBANCE

As the sediment control devices are be implemented for the long-term use of the facility climate risks are to be considered for all seasons.

5.2 TOPOGRAPHY

The expansion area is located at approximately 40 m in Australian Height Datum and is raised 5 m to10 m above the surrounding area by engineered fill above a former landfill cell. The area is generally flat with slopes down in all directions at the edges of the filled portion. To the west of the expansion area is a gully being the Canal Road reserve. The general area around the SRC slopes to the north-east toward Prospect Creek. Surface water is expected to drain down from the raised area into the gully and other adjacent drainage lines. For the surrounding area surface water is expected to drain to Prospect Creek.

5.2.1 DETAILED SITE INVESTIGATION

WSP has prepared a Detailed Site Investigation Rev A Dated 23 June 2020 regarding the contamination and leachate from the existing landfill. A summary of the borehole results which encountered potential dispersive soils can be found below:

- The results of the investigation showed some contamination in the groundwater beneath the expansion area, likely a result of the landfill leachate. No human health risks related to the proposed redevelopment of the site were identified from soil or groundwater. The standing water in the gully and the samples of Prospect Creek found metals and hydrocarbons present. Hydrocarbons detected did not exceed any adopted assessment criteria and metals were considered to represent ambient conditions.
- The soil and groundwater in the gully were unable to be assessed due to the vegetation present. However, test pits and soil bores were undertaken adjacent to the gully and a sample of the surface water outflow was collected. The outflow sample contained hydrocarbons, although no risks were identified.
- Based on the results of the DSI neither the current operation of the facility or the proposed redevelopment of the site, including the expansion of the SRC and the filling of Canal Road, is considered to represent a risk to human health or the environment. During the construction phase controls to limit dust generation and manage water runoff would be included in a construction environmental management plan. The presence of the landfill material is not expected to impact the proposed redevelopment due to the thickness of the capping material.
- The soil in the gully was unable to be sampled due to access restrictions. When it is cleared prior to construction of Canal Road additional soil sampling can be arranged. However, no indications of contamination were identified.
- The expansion of the carpark and creation of the new sediment basin in the north of the site were not considered during this investigation as the fieldwork was completed before they were included in the scope. However, only limited potential risks are associated with these works, comprising management of spoil, dust generation and water runoff, which can be adequately managed during the construction phase under the construction environmental management plan. Soil sampling for waste classification should be undertaken on any spoil material created during these works.

- The site is considered suitable for the proposed future use, with no remediation recommended based on the findings of this investigation.

Figure 7 WSP Test Location Plan extract from Detailed Site Investigation 2271108A-CLM-REP-001Rev A Dated 23 June 2020. Source: WSP (2020)

5.3 CLIMATE

As the sediment control devices are be implemented for the long-term use of the facility, rain and wind data for all seasons will need to be accounted for and managed. The average monthly data for rainfall and wind at the site is outlined below. The following data has been taken from the Bureau of Meteorology (BOM) website).

Note that rainfall hazard, wind speed and wind rose data is selected based on the proximity of the observation station to the site. One site which records one form of data may not record others.

5.3.1 RAINFALL HAZARD

Table 7: Mean rainfall for years 1887 to 2020 at Prospect Reservoir AMO 67019

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL MONTHLY AVERAGE
Mean Rainfall (mm)	95.1	98.8	98.8	75.5	69.0	77.0	55.4	50.2	46.5	58.8	72.6	75.5	72.7
Erosion Risk Level	Med	Med	Med	Med	Med	Low	Low	Low	Low	Low	Med	Med	Med

Source: Bureau of Meteorology (2020)

5.3.2 WIND HAZARD

WIND SPEEDS

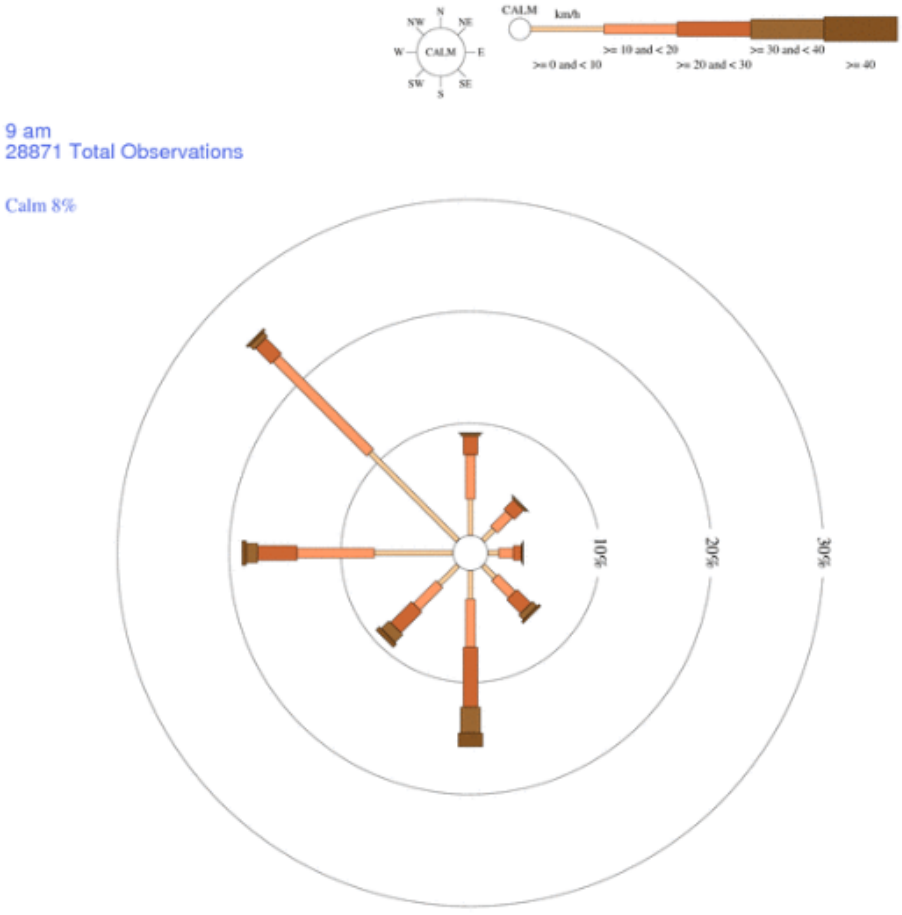
Table 8: Mean windspeed for years 1995 to 2010 at CANTERBURY RACECOURSE AWS 066194

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL MONTHLY AVERAGE
9 am wind speed (km/h)	11.4	10.9	9.8	10.4	10.6	9.9	10.2	12.0	12.8	12.6	13.0	12.2	11.3
3 pm wind speed (km/h)	22.3	20.7	19.2	17.3	15.1	13.7	15.0	17.8	19.8	21.1	22.0	22.2	18.8

Source: *Bureau of Meteorology (2019)*

5.3.2.1 WIND DIRECTION

Figure 8 9 am wind direction versus wind speed in km/h (1939 to 2019) at Sydney Airport AMO Site no 066037



Source: *Bureau of Meteorology (2020)*

6 EROSION RISK ASSESSMENT

6.1 REVISED UNIVERSAL SOIL LOSS EQUATION (RUSLE)

Erosion risk assessments have been carried out using the Revised Universal Soil Loss Equation (RUSLE) for the project and is shown in the subsequent sections of this report. The RUSLE method will provide a predicted soil loss value which is then used to determine the type of sediment control required.

$$A = R * K * LS * C * P$$

Where:

A = annual soil loss due to erosion (t/ha/yr)

R = rainfall erosivity factor

K = soil erodibility factor

LS = topographic factor derived from slope length and slope gradient

C = cover and management factor

P = erosion control practice factor

RAINFALL EROSIVITY FACTOR

The rainfall erosivity (R-Factor) is constant for the site and therefore used for the calculation of the project, it is calculated based on the Bureau of Meteorology (BOM) Intensity-Frequency-Duration (IFD) tables for the Sydney Observatory Hill (Site 066062) and Section 6 of Landcom: Soils and Construction - Volume 1 - 4th Edition March 2004 . An annual erosivity factor of **1950** has been calculated for the site using the following equation.

$$R = 164.74 * 1.1177^{S} * S^{0.6444}$$

Where:

S = 2-year ARI, 6-hour rainfall event (5.94 mm/h)

6.1.1 TOTAL SITE STRIPPING WORKS

An annual soil loss of **111 t/ha/year** due to erosion for the site stripping of all stages has been calculated based on the site R-Factor and the following inputs. This is calculated immediately upon stripping the existing surface (start of works).

SOIL ERODIBILITY FACTOR

WSP has prepared a Detailed Site Investigation Rev A Dated 23 June 2020. A summary of the bores which encountered potential dispersive soils can be found stated below:

The test pits and soil bores in the expansion area generally encountered fill material used to achieve the current site level and shape. The fill material generally consisted of a predominantly low to medium plasticity clay with asphalt and gravel inclusions overlayed by the compacted gravel road base.

Using the results of the DSI finding and given that the final surface of the site will be compacted sand a and gravel haul roads, Sands and gravels are low dispersion soils and do not have high erosion potential was not provided geotechnical laboratory data for the soil on site, we have adopted, in accordance with IECA (2008) Table F3, an assumed soil

erodibility (K-Factor) of 0.044 for clayey sands, poorly graded sand-clay mixtures have been adopted. This was then checked against Landcom: Soils and Construction - Volume 1 - 4th Edition March 2004 Appendix A3 Figure A3 which determined a K-Factor of 0.37.

The more conservative Soil Erodibility K-Factor of 0.44 was then adopted from IECA (2008), determined from the fill currently on site and the anticipated final surface of sand and gravel haul roads, as well as the lack of laboratory data on the current fill surface on site.

TOPOGRAPHIC FACTOR AREA - EXISTING SEDIMENT POND 1

The existing surface water sheet flow maximum run will be limited to 260 m at a grade of 1 % (1 in 100), the topographic factor (LS-Factor) of 0.26 in accordance with Appendix A4 of Landcom: Soils and Construction - Volume 1 - 4th Edition March 2004.

TOPOGRAPHIC FACTOR AREA - EXISTING SEDIMENT POND 2

The existing surface water sheet flow maximum run will be limited to 216 m at a grade of 1 % (1 in 100), the topographic factor (LS-Factor) of 0.25 in accordance with Appendix A4 of Landcom: Soils and Construction - Volume 1 - 4th Edition March 2004.

TOPOGRAPHIC FACTOR AREA - PROPOSED SEDIMENT POND 4

The existing surface water sheet flow maximum run will be limited to 200 m at a grade of 1 % (1 in 100), the topographic factor (LS-Factor) of 0.24 in accordance with Appendix A4 of Landcom: Soils and Construction - Volume 1 - 4th Edition March 2004.

TOPOGRAPHIC FACTOR AREA - PROPOSED SEDIMENT POND 5

The existing surface water sheet flow maximum run will be limited to 200 m at a grade of 1 % (1 in 100), the topographic factor (LS-Factor) of 0.24 in accordance with Appendix A4 of Landcom: Soils and Construction - Volume 1 - 4th Edition March 2004.

COVER AND MANAGEMENT FACTOR

The maximum cover and management factor (C-Factor) of 1.00 has been used as the site will be totally exposed with no ground cover in accordance with Appendix A6 of Landcom: Soils and Construction - Volume 1 - 4th Edition March 2004. This is conservative given that the final surface of the site will be compacted sand and gravel haul roads.

EROSION CONTROL PRACTICE FACTOR

The default construction phase condition erosion control practice factor (P-Factor) of 1.3 has been adopted in accordance with in accordance with Appendix A5 of Landcom: Soils and Construction - Volume 1 - 4th Edition March 2004.

6.2 SEDIMENT CONTROL STANDARD

Landcom: Soils and Construction - Volume 1 - 4th Edition March 2004 section 6.3.2 d) states that “Some small and/or flat sites might not warrant construction of a sediment basin, including those for which an ESCP (rather than a SWMP) is required (<2,500 square metres disturbed area). If in doubt, the average annual soil loss from the total area of land disturbance can be estimated (Appendix A). Where this is less than 150 cubic metres per year, the building of a sediment retention basin can be considered unnecessary. In such circumstances, alternate measures may be employed to protect the receiving waters.”

The above rates of annual sol loss equates to an upper limit of 270 t/year over the whole site based on 150 m^3/year multiplied by the standard soil density of 1.8 t/m^3).

However, given that the site is currently not meeting the erosion and sediment control targets in the SEAR conditions we have decided to adopt the more conservative IECA (2208) standards, which are outlined below:

The sediment control standard is determined in accordance with Table 5.1 of IECA (2008) below, which defines the sediment control standard based on catchment area and soil loss rate.

Table 9: Sediment Control Standard

AREA LIMIT (M^2)	SOIL LOSS RATE (T/HA/YR)		
	TYPE 1	TYPE 2	TYPE 3
1,000	NA	NA	ALL CASES
2,500	NA	>75	75
>2,500	>150	150	75
>10,000	>75	75	75

Source: IECA (2008)

The soil loss class is determined in accordance with Table 10 below, as documented in IECA (2008)

Table 10: Soil Loss Classes

SOIL LOSS CLASS	SOIL LOSS (T/HA/YR)	EROSION RISK
1	0 to 150	Very low
2	151 to 225	Low
3	226 to 350	Low-moderate
4	351 to 500	Moderate
5	501 to 750	High
6	751 to 1500	Very high
7	>1500	Extreme

Source: IECA (2008)

As all sub catchment areas are greater than 2,500 m^2: the maximum soil loss before Type 1 measures are required to achieve best practice is 150 t/ha/yr. The rationalised soil loss sediment control standard area breakdown is outlined in Table 11.

Table 11: Site Specific Rationalised Soil Loss Sedimentation Control Standard.

SITE ELEMENT	AREA	SEDIMENT CONTROL STANDARD	CALCULATED SEDIMENT LOSS PER CATCHMENT AREA
TOTAL SITE AREA	7.84 ha	150 t/ha/year	111 t/ha/year
EXISTING SEDIMENT POND 1	3.48 ha	150 t/ha/year	28 t/ha/year
EXISTING SEDIMENT POND 2	1.74 ha	150 t/ha/year	29 t/ha/year
PROPOSED SEDIMENT POND 4	2.27 ha	150 t/ha/year	27 t/ha/year

SITE ELEMENT	AREA	SEDIMENT CONTROL STANDARD	CALCULATED SEDIMENT LOSS PER CATCHMENT AREA
PROPOSED SEDIMENT POND 5	1.74 ha	150 t/ha/year	27 t/ha/year

7 EROSION AND SEDIMENT CONTROL MEASURES

The following fundamental concepts shall form the foundation of the site's erosion and sediment control and should be reflected by the implemented measures:

- Any exposed surfaces shall be stabilised as soon as practicable using sand and gravel compacted haul road surfaces
- Sediment control devices are favoured
- Divert all stormwater runoff around the site and disturbed areas using the currently existing and proposed sedimentation basins.
- Sedimentation basins to be designed and constructed as Type A High Efficiency in accordance with the IECA guidelines.

7.1 CLEAN WATER DIVERSION

All 'clean' water from undisturbed areas that has the potential to flow into the site is to be cut off and directed around the site using the existing concrete barriers surrounding the site. Cut off drains and diversion mounds/berms are to be utilised where required. Stormwater quantity measures are to be in place to ensure non-worsening of the downstream drainage system while diversions are in use.

7.2 SEDIMENTATION BASINS

7.2.1 TYPE A HIGH EFFICIENCY SEDIMENTION BASINS

As the sedimentation basins are a long-term measure for erosion control, Type A High Efficiency Bains are recommended in accordance with the IECA Best Practice guidelines, Table B7 - Appendix B – IECA (2008) - Revision June 2018. The Landcom blue book does not address Type A High efficiency sediment basins therefore we have utilised IECA (2008) standards in lieu.

This type of sediment basin is a purpose built dam designed to collect and settle sediment laden water. It usually consists of an inlet chamber, a primary settling pond, a decanting system, and a high flow emergency spillway.

It performs two main functions: First the rapid settlement of course grained sediment particles during all storm events that flow through the basin. This includes storms that exceed the nominated design storm. The second is the settlement of fine-grained particles from waters that are allowed to pass through the basin under controlled, design flow, conditions.

An outline for Type A High Efficiency basins from a design and operation point of view is below:

- Type A High Efficiency basins are considered the most effective sediment traps
- Pond size is governed by both the minimum volume and the minimum surface area
- Operation of the Type A High Efficiency basin relies of the installation of an automatic chemical dosing system
- Forebay is sized as 10% of the total basin volume
- A floating decant system collects water from the top of the water column during a storm event

- The settling pond is required to be de-watered to the nominated static level prior to a rain event that is likely to produce runoff
- Permanent basins (>12month durations) are required to be sized for the 5-year ARI, 24-hour storm event
- A long section of the Type A High Efficiency basin is shown below:

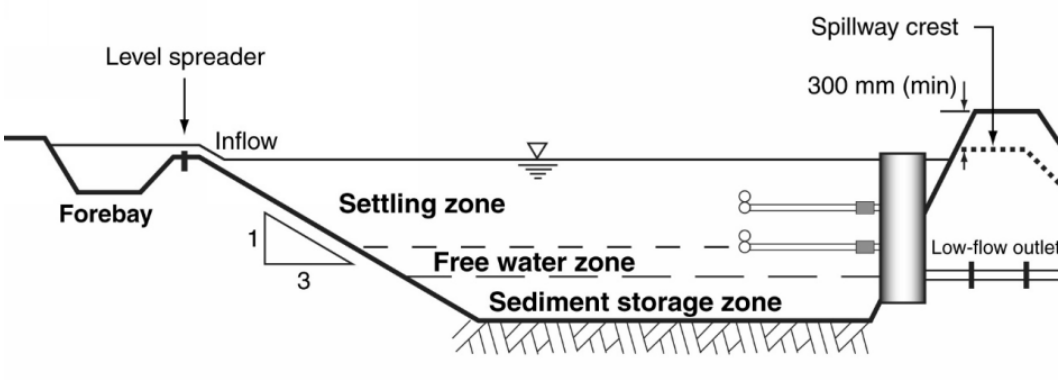


Figure 9: Type A High Efficiency Sedimentation basin long section

7.3 SITE ENTRY AND EXIT CONTROLS

A clearly defined stabilised site entry/exit point shall be constructed at a location agreed by the Principal's Representative. All vehicles departing from the site shall ensure, as reasonably practicable, no sediment is being carried or transported off site. This is to be achieved using a wheel wash and shaker pad. Regular inspection of public roads adjacent to the site shall be conducted and if any sediment deposits are observed, they are to be removed and reported as a non-conformance.

7.4 SEDIMENT FENCING

Generally, sediment fences are to be installed downstream of batter slopes and around stockpile sites. Sediment fences are to only be placed where sheet flow is present and are not to be constructed in concentrated flow paths.

7.5 STOCKPILED MATERIAL

Stockpile sites are to be confirmed on site by the Principal's Representative but will generally be located within the existing area and the expansion area, No stockpiling of materials will occur outside of these areas. Soil Stockpiles are to be located in appropriate locations. Progressive management to be undertaken as each stage is completed.

Soil Stockpiles are to have sediment fences positioned around the external batters to control runoff as necessary. If it is necessary for the soil stockpile to be located directly down stream of an overland flow path or external catchment, a diversion device is to direct surface flows around soil stockpiles is required. If required, separate stockpiles are required for topsoil and subsoil materials.

Crushed concrete crushed asphaltic concrete, and other granular Stockpiles may be managed on site as the currently are. There is minimal erosion potential of these kinds of stockpiles. Given the fluid and ever-changing arrangement of these kinds of stockpiles on site, if required they are to have sediment fences positioned around the external batters to control runoff as necessary and a diversion device is to direct surface flows to around soil stockpiles is required. These stockpiles are not to be located adjacent to sedimentation basins or water diversions so as not to interfere with the surface runoff paths,

7.6 DUST MANAGEMENT DURING CONSTRUCTION

Dust management of exposed excavation and filling operations will be by the application of temporary stabilisation products on haul roads/exposed areas (such as Vital Bon-Matt HR, or approved equivalent), use of water cart to dampen exposed areas, limiting speed limits on internal haul roads, minimising traffic movements and surface roughening. Stabilising and cover of exposed areas as soon as practical is recommended. The contractor is to provide details of intended dust management measures for approval by the Principal's Representative.

7.7 WASTE MANAGEMENT

All site waste including general rubbish is to have suitable bins available for disposal, all site areas are to be maintained free construction waste and deleterious material. Disposal of waste material is to be in accordance with the WSP Waste Management Plan.

7.8 MULCHING AND PLANTING

All earthworks batters are to be mulched and planted according to the Landscape Architecture design by SLR Consulting as soon as possible post construction, this is particularly relevant to the batter at the Canal Street gully fill in and the flood compensation area.

8 EROSION AND SEDIMENT CONTROL IMPLEMENTATION

All erosion and sediment control measures are required to be installed and functional prior to works commencing. The following implementation sequence should be adopted as a minimum where practicable with the construction program.

8.1 PRIOR TO CONSTRUCTION WORKS

- Prior to any demolition, stripping or bulk earthworks on site, all erosion and sediment control measures should be installed and operational;
  - Note: this applies to Proposed Sediment Basin 4 and 5, Canal Road and the flood compensation area vegetation removal.
- Provide a stabilised site access, either wash down area or shake down device, at the construction site exit to minimise the amount of sediment being tracked off the site. Only a single site access point is to be provided unless specific circumstances warrant and is approved by the local authority;
  - Note: already provided as part of the facility's operation procedure. Additional stabilised site access, either wash down area or shake down device to be implemented at the entry/exit of additional earthwork areas.
- Sediment fences (or appropriate barrier fencing) are to be installed adjacent to the access point to confine ingress and egress from the site to the established stabilised point;
- The wash down area/shake down device is to be drained to the perimeter channel with sediment filter rock berm protection at the existing inlets;
  - Note: already provided as part of the facility's operation procedure. Additional stabilised site access, either wash down area or shake down device to be implemented at the entry/exit of additional earthwork areas.
- All 'clean' upstream water is to be diverted around disturbed areas and stockpiles to minimise the amount of water flowing through the site, the amount of sediment mobilised and the amount of water requiring treatment;
- Sediment fences are to be installed downstream of all works areas, including along the property boundaries, downstream of batters and stockpiles, prior to stripping and throughout earthworks operations. All sediment fences are to be monitored and maintained throughout the duration of works.

8.2 DURATION OF CONSTRUCTION WORKS

- External areas to be silt fenced;
- Earthwork batters are to be mulched as soon as reasonably practical;
- Surface Material is to be stripped and stockpiled for later use onsite. Sediment fences should be established downstream of all topsoil stockpiles;
- Native vegetation if required and approved for clearing should be mulched and stockpiled for later use in landscaping, stabilisation and/or site rehabilitation works;
- Any stockpiles remaining on site for more than 20 days must be stabilised. Additionally, all disturbed areas are to be progressively grass seeded and stabilised using mulch, hydroseeding or hardstand to achieve 70% ground coverage

within 20 days of inactivity or completion of works (even if works may continue later) for protection against both wind and water erosion;

  - Note: already provided as part of the facility's operation procedure

- During windy and dry weather, any unprotected areas are to have sufficient dust control measures implemented including watering, roughening or wind barrier fencing;

  - Note: already provided as part of the facility's operation procedure

- Acceptable receptors and appropriate waste disposal practices should be used for concrete and mortar slurries, paints, acid washers, litter and general waste materials;

  - Note: already provided as part of the facility's operation procedure

- All vehicles departing from the site shall ensure no sediment is being carried or transported off site. Regular inspection of public roads adjacent to the site shall be conducted and any sediment deposits manually removed (not washed down); and

  - Note: already provided as part of the facility's operation procedure

- Any vehicle or equipment washing and/or refuelling conducted onsite should be conducted in specific bunded areas away from concentrated flow paths and the stormwater system.

  - Note: already provided as part of the facility's operation procedure

- Sediment basin dewatering to be completed in accordance with IECA (2008() Guidelines, also refer to Appendix D TP90 for further instructions, also refer to section 6.3.5 of the Landcom: Soils and Construction - Volume 1 - 4th Edition March 2004

8.3 DEWATERING OF SEDIMENTATION BASINS

- In order for the sedimentation basins to be effective it is critical that they are dewatered prior to or post each storm event. For further information refer to Appendix D.
- Their continued efficiency is contingent upon them being utilised solely for sediment and erosion control.
- Sedimentation basins are not to be utilised for the storage of water for use as dust suppression.
- See above section 4.3.3 for outline of proposed creek pumping strategy to be utilised in conjunction with the dewatering of sedimentation ponds.

8.4 SEDIMENTATION BASINS CHEMICAL DOSING

- Sedimentation basins must utilise the appropriate chemical dosing anti-coagulant. Given the presence of clays WSP recommend Powdered Activated Carbons (PAC) automatic dosing. There are many proprietary systems which may be obtained as a solution. For further information refer to Appendix C.
- The flocculant or coagulant is used to physically bind clay and colloidal particles together or destabilise the charge on clay or colloidal particles respectively. Appropriate forebay sizing (10% of main pond) is required on all ponds. This requires that Existing ponds 1 and 2 be retrofitted with appropriately sized forebays and automatic dosing devices.

8.5 FINISHING WORKS AND DEFECTS LIABILITY PERIOD

- All erosion and sediment control measures, including sediment fences and inlet traps shall be maintained until completion of surface finishing on the site is stabilised; and
- Final site ground cover application is to be completed within 20 days of construction completion.

9 SITE INSPECTION AND MONITORING

Erosion and sediment control site inspections and monitoring is to be undertaken in accordance with Section 6.17, 7.4, Appendix B of the IECA (2008) guidelines and Section 8.2 of the Landcom: Soils and Construction - Volume 1 - 4th Edition March 2004.

Best practice management requires all erosion and sediment control measures to be inspected at the following frequencies and include the following checks as a minimum:

9.1 DAILY SITE INSPECTIONS

During periods of runoff producing rainfall the contractor must check:

- All drainage, erosion and sediment control measures;
- Occurrences of excessive sediment deposition (whether on-site or off-site); and
- All site discharge points, including dewatering activities as appropriate.

9.2 WEEKLY SITE INSPECTIONS

Even if work is not occurring on site the contractor must check:

- All drainage, erosion and sediment control measures;
- Occurrences of excessive sediment deposition (whether on-site or off-site);
- Occurrences of construction materials, litter or sediment placed, deposited, washed or blown from the site, including deposition by vehicular movements;
- Litter and waste receptors; and
- Oil, fuel and chemical storage facilities.
  - Note: The expansion is area is approved to store 10,000L of Diesel fuel. As documented in the WSP State Environmental Policy Planning (SEPP33_ Screening Memo – Rev A Dated 19 October 2017) Reference no 2271108A-SEPP 33 Screening-MEM-001 Rev A.

9.3 WITHIN 24 HOURS PRIOR TO EXPECTED RAINFALL

Site inspections are required immediately prior to anticipated runoff-producing rainfall to check:

- All drainage, erosion and sediment control measures; and
- All temporary flow diversion and drainage works.

9.4 WITHIN 18 HOURS FOLLOWING RAINFALL EVENT

Site inspections immediately following runoff-producing rainfall must check:

- Sediment deposition within sediment filter rock berms and the need for its removal;
- All drainage, erosion and sediment control measures;

- Occurrences of excessive sediment deposition (whether on-site or off-site);
- Occurrences of construction materials, litter or sediment placed, deposited, washed or blown from the site, including deposition by vehicular movements; and
- Occurrences of excessive erosion, sedimentation, or mud generation around the site office, car park and/or material storage areas.

9.5 MONTHLY SITE INSPECTIONS

In addition to the above, monthly site inspections must check:

- Surface coverage of finished surfaces (both area and percentage cover);
- Health of recently established vegetation; and
- Proposed staging of future land clearing, earthworks, and site/soil stabilisation.

9.6 TYPE A HIGH EFFICIENCY SEDIMENTATION BASIN INSPECTION, MONITORING AND MAINTENANCE

See below:

1. Inspect the sediment basin during the following periods:
    a. During construction to determine whether machinery, falling trees, or construction activity has damaged any components of the sediment basin If damage has occurred, make the necessary repairs immediately.
    b. After each runoff event. Inspect the erosion damage at flow entry and exit points. If damage has occurred, make the necessary repairs.
    c. At least weekly during the wet season, otherwise fortnightly
    d. Prior to or immediately after periods of 'stop work' or suite 'shutdown'
2. Clean out accumulated sediment when it reaches the marker board/post and restore the original storage volume. Place sediment in a disposal area, or if appropriate mix with soils on site.
3. Do not dispose of sediment in a manner that will create an erosion or pollution hazard.
4. Check all visible pipe connections for leaks, and repair as necessary.
5. Check fill material in the forebay and basin for excessive settlement, slumping of the slopes of piping between the conduit and the embankment, make necessary repairs.
6. Remove all trash and other debris from the basin and riser.
7. Submerged inflow pipes must be inspected and desilted as required after each inflow event

Note: For further information regarding high efficiency sedimentation ponds refer to TP90 in Append D for design, construction, and maintenance information.

10 CONCLUSION

All erosion and sediment control measures should be carried out in accordance with the Managing Urban Stormwater: Soils and Construction, Landcom 2004, the International Erosion Control Association (IECA) Best Practice Erosion and Sediment Control Guidelines 2008; and Fairfield Council requirements under the Environmental Protection Act 1994. All erosion and sediment control devices implemented onsite should represent current Best Management Practices and all practical measures applicable to the site. These Best Management Practices must be applied to all stages of the project including installation, operation, and management of the control measures including maintenance and monitoring of the devices.

An erosion and sediment hazard assessment has been carried out on the proposed construction stages of the early works for the future development at the Fairfield Sustainable Resource Centre. A RUSLE calculation has shown that the site has a rationalised soil loss class of 1, with 111 t/ha/yr soil losses, over the whole site. According to IECA (2008), this puts the site as a Very Low erosion risk for soil losses. According to Managing Urban Stormwater: Soils and Construction, Landcom 2004 the site is also low erosion risk

The RUSLE calculation was used to assess the requirement for erosion and sediment control measures on site. Type A High Efficiency Sediment Basins are considered best practice solution considering the current issues on site, and the long-term operations of the facility in conjunction with the proposed creek pumping strategy and the removal of the practice of using the sedimentation ponds as water storage for facility's water usage.

No landfill leachate interacts with the surface drainage runoff generated at the SRC as it is approximately 7 m below the surface. Currently there are no leachate management systems are in place for the SRC for the landfill cells beneath the facility. However, Council does procure regular samples of the upstream and downstream waterways to ensure water quality objectives are exceeding the prescribed guidelines.

The leachate generated from the SRC facility from surface water runoff will be collected in the sedimentation basins, pumped into holding tanks and reused on site. This system is considered adequate for the facility, with a leachate assessment undertaken by WSP to provide recommendations to inspect, monitor and minimalise the extent of overland flow through material stockpiles.

This SWMP is to be read in conjunction with the erosion and sediment control drawings, which can be found in Appendix A.

APPENDIX A

CIVIL PLANS

APPENDIX B

EROSION AND SEDIMENT CONTROL CALCULATIONS

APPENDIX C

TYPE A HIGH EFFICIENCY SEDIMENT BASIN OUTLINE

AND

CHEMICAL COAGULANTS AND FLUOCCULANTS FACT SHEET

APPENDIX D

TP90 – SEDIMENT RETENTION POND REFERENCE INFORMATION

APPENDIX E

FAIRFIELD SRC SITE SUITABILITY ASSESSMENT (FLOOD COMPENSATION AREA)