

Soil and Water Management Procedure

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|-----------------|--|----------|------------------|
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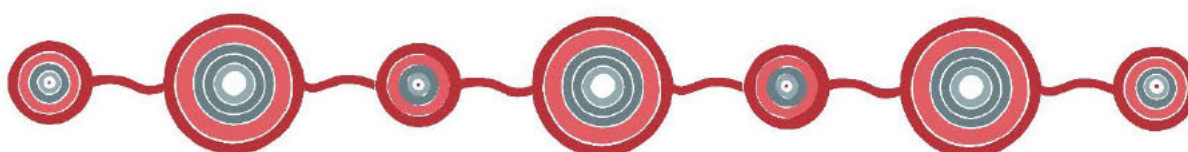
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We pay our respect to Aboriginal and Torres Strait Islander people and culture, and to their Elders past and present.

"COMMUNITY"
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1 BACKGROUND

The Sydney Metro City & Southwest is a 30 kilometre metro rail between Chatswood and Bankstown, including; 17 kilometres of new tunnel from Chatswood, under the harbour to Sydenham connecting seven new underground stations at Crows Nest, Victoria Cross (North Sydney), Barangaroo, Pitt Street, Martin Place, Central and Waterloo. Upgrading 13 kilometres of the Bankstown line, including 11 existing stations; Sydenham, Marrickville, Dulwich Hill, Hurlstone Park, Canterbury, Campsie, Belmore, Lakemba, Wiley Park, Punchbowl and Bankstown plus southern service facilities.

1.1 SYDNEY METRO CITY & SOUTHWEST – CHATSWOOD TO SYDENHAM

The application for Sydney Metro City & Southwest – Chatswood to Sydenham was lodged by Sydney Metro as a Critical State Significant Infrastructure project (reference CSSI-7400) and was approved by the Minister in January 2017. The project is described in the approval (hereafter referred to as the CSSI Approval) as:

Construction and operation of a metro rail line, approximately 16.5 kilometres long (of which approximately 15.5 kilometres is located in underground rail tunnels) between Chatswood and Sydenham.

The new metro stations identified in the CSSI Approval are at Crows Nest, Victoria Cross, Barangaroo, Martin Place, Pitt Street and Waterloo. In addition to this, new metro platforms are proposed at Central Station and Sydenham Station.

A W Edwards has been awarded the tender to construct Crows Nest Metro Integrated Station Development (the ISD project).

1.2 SYDNEY METRO CROWS NEST OVER STATION DEVELOPMENT – SITE C

The application for the Sydney Metro Crows Nest Over Station Development for Site C, on the north-western corner of Hume Street and Clarke Street, was lodged by Sydney Metro as a State Significant Development on 10 June 2021 (reference SSD- 13852803) and was approved by the Minister in December 2021. The project is described in the approval (hereafter referred to as the SSD Approval) as:

Construction of an eight (8) storey commercial office building above the metro station.

A W Edwards has been awarded the tender to construct Crows Nest Metro Over Station Development Site C (the OSD project)

2 DOCUMENT PURPOSE

This soil and water management procedure has been prepared to minimise potential soil and water quality impacts during construction.

3 CONSTRUCTION OVERVIEW

Construction activities which have the potential to soil and water quality include:

- Structure;
- Fit out;
- Services;
- External works;
- Landscaping; and
- Over station development enabling works
- Over station works (SSD 13852803); and
- Testing and commissioning (SSD 13852803).

4 POTENTIAL IMPACTS

The following adverse impacts to soil and water resources may arise during construction activities:

- Soil erosion;
- Soil and water contamination;
- Surface water quality; and
- Changes to existing stormwater flows from:
 - the introduction of new impervious surfaces,
 - alterations to existing infrastructure (drainage) and.
 - dewatering activities

5 ROLES AND RESPONSIBILITIES

A summary of the specific responsibilities for soil and water quality management specific to each role are specified in Table 4.1

Table 4.1 Summary of Roles and Responsibilities

| Action | Responsibility |
|---|--|
| - Performance and compliance with the CEMP, ERSED, spills and soil and water management procedure | Construction Manager Planning & Environment Manager |
| - Daily weather monitoring | |
| - Visual inspections to determine if mitigation measures are needed or successful | |
| - Implementation of environmental mitigation measures | Site Supervisor |
| - Recording implementation of mitigation measures | |
| - Environmental monitoring and visual inspections | |
| - Recording and reporting on effectiveness of mitigation measures | Environmental Coordinator |

6 SOIL AND WATER MANAGEMENT OBJECTIVES

The following soil and water management objectives will be applied to construction:

- Minimisation pollution of surface water through appropriate erosion and sediment control.
- Existing water quality of surrounding surface watercourses will be maintained.
- Construction water will be sourced from non-potable sources, where feasible and reasonable.

7 SOIL MANAGEMENT

7.1 PROGRESSIVE EROSION AND SEDIMENT CONTROL (PESCP)

Progressive erosion and sediment control plans (PESCP) will be developed in accordance with Managing Urban Stormwater: Soils and Construction Volume 1 (Landcom, 2004) and Managing Urban Stormwater: Soils and Construction Volume 2 (Department of Environment and Climate Change, 2008). Measures would be designed as a minimum for the 80th percentile; 5-day rainfall event. The PESCP will:

- Present the required erosion and sediment control measures for the site;
- Provide an overview of construction activities and locations if there is the potential to impact stormwater flows and groundwater;
- Illustrate the location of water treatment facilities and discharge points; and
- Provide details of temporary stockpile locations and management.

PESCP will be updated to reflect current site conditions. All reviews and updates to the plans will be undertaken by the Construction Manager, Site Supervisor and Planning & Environment Manager.

7.2 EROSION AND SEDIMENT CONTROL PRINCIPLES

- Implementation of progressive temporary erosion and sediment controls.
- Design and location of sediment control measures as close as possible to the potential source of sediment.
- Appropriate controls to prevent tracking dirt and mud onto roads.
- Minimise exposed surfaces during construction and remediating the site as soon as possible after completion of construction.
- Diversion of clean water away from the site and stockpile, preventing water runoff from entering the work area.
- Installation of sediment controls downstream of works, stockpiles and other disturbed areas.
- Inspection of erosion and sediment controls (ERSED) after rainfall events (>20mm in 24hrs).
- If contaminated material or suspected contaminated material is found, work must stop and the Sydney Metro Unexpected Finds Procedure for Contamination is to be followed.

7.3 MONITORING PESCP

Environmental site inspections include a review of erosion and sediment controls onsite, ensuring all controls are undamaged, functional, adequate and installed as per the PESCP. Reviews are to be conducted:

- Weekly (minimum).

Soil and Water Management Procedure

- Prior and post site shutdown.
- Prior and post a significant rainfall event, (>20mm/24hr).
- New or changes to existing work activities to conform with the PESCP and reduce the risk of erosion.

7.4 UNEXPECTED CONTAMINATED MATERIAL

As outlined in Section 6.3 of the Construction Spoil Management Plan, the potential to encounter contaminated material during construction is low.

If contamination is identified or suspected, all work in the vicinity of the find shall cease and the area isolated appropriately. A specialist consultant experienced in the identification, sampling and testing of contamination would be engaged to undertake an assessment of site conditions prior to re-commencement of works. The consultant should:

- Sample and analysis of soil to determine the potential existence of contaminants. Analysis must be undertaken by a NATA accredited laboratory;
- Sample, analyse and determine classification of material to be disposed and/or confirm for re-use as backfill or transportation to another development suitably licensed to accept the material; and
- Report and provide advice on management options, re-use onsite and disposal criteria.

Once waste has been classified, appropriate management options would be considered and implemented in accordance with legislated requirements.

8 WATER MANAGEMENT

8.1 WATER RESOURCE MANAGEMENT

The following water resources management objectives will be applied to the construction of the project:

- Demand for and use of potable water will be minimised.
- Opportunities for water re-use from captured stormwater, wastewater and groundwater will be maximised.
- Water generated in tunnelling operations and concrete batching and casting facility processes will be collected, treated and reused.
- Recycled water or treated water from onsite sources will be used in the formulation of concrete.
- Rainwater from roofs of temporary facilities will be harvested and reused.
- Water from recycled water networks will be used.
- Groundwater and stormwater will be collected, treated and used.
- Water efficient construction methods and equipment will be used.
- Designated sealed areas for equipment wash down will be provided.

8.2 WATER MANAGEMENT PRINCIPLES

8.2.1 SSI

- Dewatering systems must be planned and monitored to avoid spills, overflows and pollution.
- The WTP is to be maintained appropriately and discharge monitored in accordance with the Construction Groundwater Management Plan (CGWMP).
- Where possible, water required for use on site should be sourced from non-potable sources.
- All discharge from the WTP would be monitored to ensure compliance with the discharge criteria outlined in Section 4.3 of the CGWMP.
- Incorporation of water efficient controls, fixtures and fittings in temporary facilities.
- Using water efficient construction methods and equipment.

Providing designated sealed areas for equipment wash down and concrete washout areas. These areas must be outlined in the Environmental Control Map (ECM).

8.2.2 SSD

- Dewatering systems must be planned and monitored to avoid spills, overflows and pollution.
- The settling tanks are to be appropriately maintained and discharged in accordance with the Sydney Metro Water Discharge & Reuse Procedure (Version 3.0), hereinafter referred to as the 'discharge procedure' and included as Attachment 1 to this document.
- Where possible, water required for use on site should be sourced from non-potable sources.
- All discharge from the settling tanks would be monitored to ensure compliance with the discharge criteria set out in the discharge procedure and outlined in Section 8.4 below.
- Incorporation of water efficient controls, fixtures and fittings in temporary facilities.
- Using water efficient construction methods and equipment.

- Providing designated sealed areas for equipment wash down and concrete washout areas. These areas must be outlined in the Environmental Control Map (ECM).

8.3 SURFACE WATER COLLECTION

8.3.1 SSI

As outlined in Section 3.2.3 of the CGWMP, any rainwater or surface water which flows into the site will be directed to designated sumps for collection before being pumped to the water treatment plant (WTP) in Site C, or settling tanks on the surface for subsequent treatment, re-use or discharge.

8.3.2 SSD

All rainwater and surface water which flows into the site will be directed to designated sumps located for collection. This water will then be pumped to settling tanks. Here, the water will be tested and treated for re-use or discharge in accordance with the discharge procedure.

8.4 SURFACE WATER TREATMENT, REUSE AND DISCHARGE

8.4.1 SSI

As outlined in Section 4.1 of the CGWMP, all surface water collected within designated sumps would be pumped to the WTP or settling tanks for analysis and treatment if required.

Water sampling and testing of the water will be undertaken to determine the most suitable treatment processes to meet the required water quality standards for re-use of the water (as outlined in Table 4.1 of the CGWMP).

The TfNSW Water Reuse and Discharge Guideline (April 2016) regulates both onsite reuse and offsite point source discharge. Prior to any discharge off the premises, or reuse within the premises, the water is to be tested in accordance with Section 4.3 of the CGWMP and the Planning and Environment Manager is to sign off that the water is suitable for reuse or discharge.

All feasible and reasonable opportunities for water reuse for construction purposes will be utilised in the first instance. Should water inflows and required treatment volumes be surplus to onsite construction purposes, the treated water product would be discharged into stormwater drainage as per the process outlined in Section 4.3 of the CGWMP. All accumulated water shall be treated to ensure that NSW water quality objectives are met, prior to re-use or discharge.

Condition E107 requires the project to meet the NSW water quality objectives where they are being achieved at the date of the approval, and contribute towards achievement of the NSW Water Quality Objectives over time where they are not being achieved.

Typical water quality parameters to be measured, sampled and/or analysed prior to discharge are identified in Table 4.2 of the CGWMP. These parameters have been determined to meet the NSW water quality objectives and form the discharge criteria for the project and all water to be discharged to the stormwater network must meet these criteria, with evidence documented prior to discharge.

8.4.2 SSD

As described above, all surface water collected within designated sumps would be pumped to the settling tanks for analysis and treatment if required.

Water sampling and testing of the water will be undertaken to determine the most suitable treatment processes to meet the required water quality standards for re-use of the water (as outlined in the discharge procedure).

The discharge procedure regulates both onsite reuse and offsite point source discharge. Prior to any discharge off the premises, or reuse within the premises, the water is to be tested in accordance with Section 4.4 of the discharge procedure and the Planning and Environment Manager is to sign off on the 'Water Discharge or Reuse Approval Form' and confirm that the water is suitable for reuse or discharge.

All feasible and reasonable opportunities for water reuse for construction purposes will be utilised in the first instance. Should water inflows and required treatment volumes be surplus to onsite construction purposes, the treated water product would be discharged into stormwater drainage as per the process outlined in Section 4.3 of the discharge procedure. All accumulated water shall be treated to ensure that NSW water quality objectives are met, prior to re-use or discharge.

The project should meet the NSW water quality objectives where they are being achieved at the date of the approval, and contribute towards achievement of the NSW Water Quality Objectives over time where they are not being achieved.

The NSW Water Quality Objectives are the agreed environmental values and long-term goals for NSW's surface waters. The Objectives are consistent with the agreed national framework for assessing water quality set out in the ANZECC 2000 Guidelines. These guidelines provide an agreed framework to assess water quality in terms of suitability for a range of environmental values (including human uses).

The Water Quality Objectives provide environmental values for NSW waters and the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC 2000) Guidelines provide the technical guidance to assess the water quality needed to protect those values. To determine the receiving water quality criteria, the ANZECC 2000 guidelines provide standardised criteria relevant to achieving the public health and environmental water quality for that water body (Sydney Harbour). Despite the ultimate receiving waters being a marine environment, the immediate receiving environment would be creeks and drainage lines following discharge to the stormwater network. As such the trigger values for lowland rivers have been adopted under ANZECC 2000.

Typical water quality parameters to be measured, sampled and/or analysed prior to discharge are identified in Table 8.1 below, these are consistent with the criteria established in the discharge procedure. Additional parameters to be analysed at the settling tanks are outlined in Table 8.2. These parameters have been formulated to be consistent with the EIS and water quality objectives. These parameters outlined in Table 8.1 will be sampled at the settling tanks prior to any discharge, the parameters outlined in Table 8.2 will be sampled from the settling tanks on a monthly basis to ensure the NSW water quality objectives are being achieved.

Table 8.1: Settling Tank water quality criteria

| PARAMETER | CRITERIA | SAMPLING METHOD | ANALYTICAL METHOD |
|-----------|-----------|----------------------|--|
| pH | 6.5 – 8.5 | Probe or grab sample | Field analysis, with confirmation via NATA accredited laboratory assessment as required. |

| PARAMETER | CRITERIA | SAMPLING METHOD | ANALYTICAL METHOD |
|-------------------------------|--|-----------------|---|
| Turbidity | 50 Nephelometric Turbidity Units (NTU) (visibly clean) | Grab sample | Field analysis using either a portable probe or turbidity tube. A portable probe is preferred to a turbidity tube as the results obtained from using a turbidity tube may be limited by the variability of the eyesight of users and may not be highly accurate. Confirmation of turbidity would be supported via NATA accredited laboratory assessment as required. |
| Total suspended solids (TSS)* | 50 mg/L | Grab sample | NATA accredited laboratory analysis Turbidity measurements may be substituted for TSS analysis provided a correlation has been established between the two parameters on a site-specific basis for the project |
| Oil and grease* | No visible oil or fuel (hydrocarbon) sheen | Grab sample | If oils and grease are visually evident, a sample will be forwarded to a NATA accredited laboratory for analysis |
| Odour, slime and scum | Free from unusual odour, coloured slime or other foamy scum | Grab sample | If odours are observed or other slime or scum visible, a sample will be forwarded to a NATA accredited laboratory for analysis |

*ANZECC & ARMCANZ. 2000. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. Australian and New Zealand Environment and Conservation Council, and Agriculture and Resource Management Council of Australia and New Zealand, Canberra.

Table 8.2 Additional Discharge water quality criteria

| PARAMETER | WATER QUALITY OBJECTIVE TRIGGER VALUE |
|-------------------------|---------------------------------------|
| Total phosphorus | 25 ug/L |
| Total nitrogen | 350 ug/L |
| Dissolved oxygen | 85 – 110% |
| Electrical conductivity | 125 - 2200 μ S/cm |
| Chlorophyll-a | 5 ug/L |

9 SPILL RESPONSE

9.1 SPILL PREVENTION

- Dangerous goods and hazardous materials to be stored within bunded areas with a capacity of 110 % of the maximum single stored volume.
- Chemicals and fuel to be labelled and stored in bunded areas in accordance with the safety data sheet (SDS).
- Appendix B prescribes the spill response management process for the construction phase.
- Spill kit and fire response equipment to be located where chemicals and fuelled plant or equipment is being stored, operated or maintained and outlined in the Environmental Control Map (ECM).
- All hazardous substances to be stored and managed in accordance with the Storage and Handling of Dangerous Goods Code of Practice (WorkCover NSW, 2005) and Hazardous and Offensive Development Application Guidelines.

9.2 STORAGE AND HANDLING

Dangerous goods, as defined by the Australian Dangerous Goods Code, will be stored and handled strictly in accordance with:

- all relevant Australian Standards;
- for liquids, a minimum bund volume requirement of 110% of the volume of the largest single stored volume within the bund;
- Storing and Handling Liquids: Environmental Protection – Participants Manual (Department of Environment and Climate Change, May 2007); and
- the Environmental Compliance Report: Liquid Chemical Storage, Handling and Spill Management – Part B Review of Best Practice and Regulation (Department of Environment and Conservation (NSW), 2005).

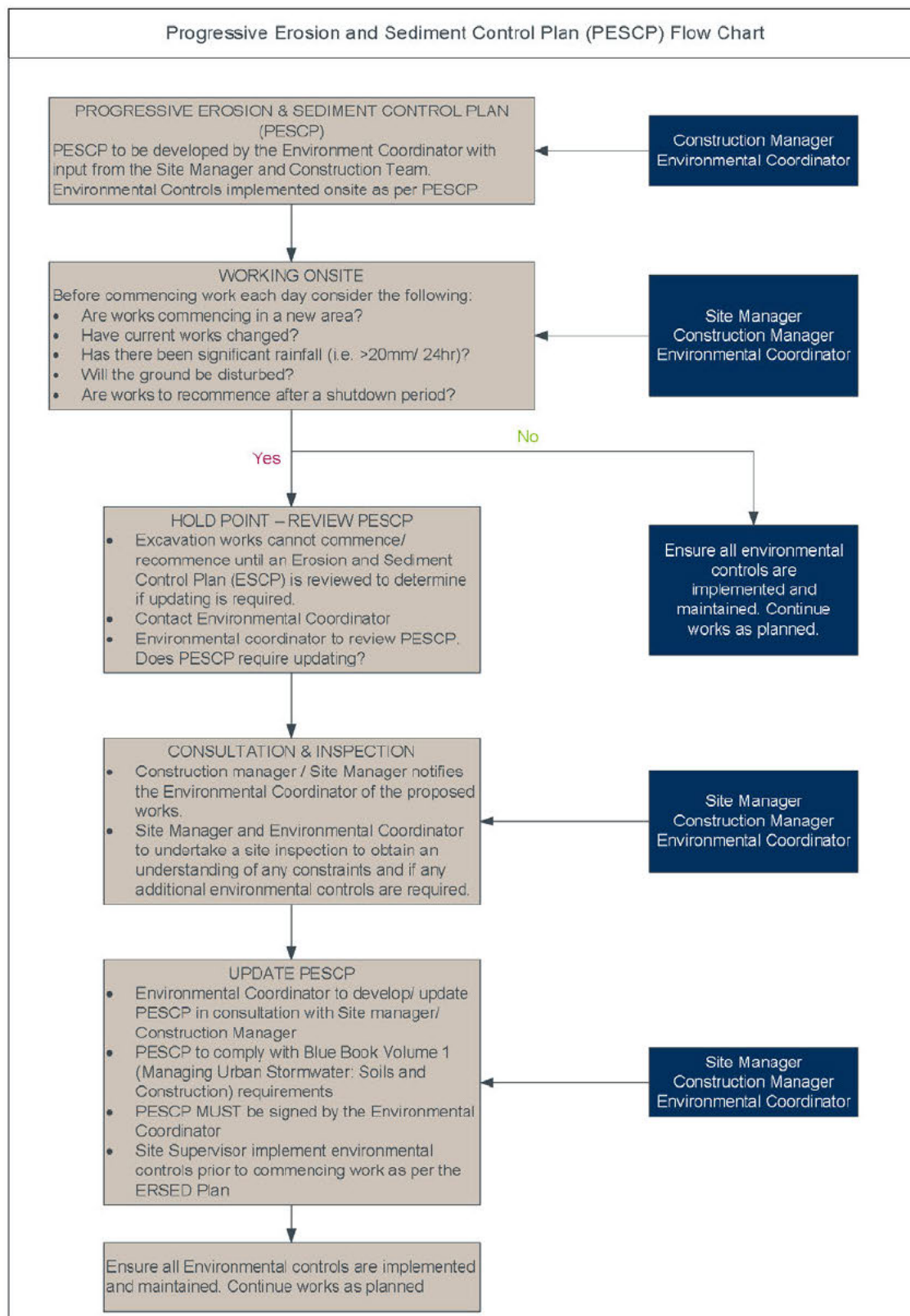
In the event of an inconsistency between the requirements listed above, the most stringent requirement shall prevail to the extent of the inconsistency.

10 RECORD MANAGEMENT

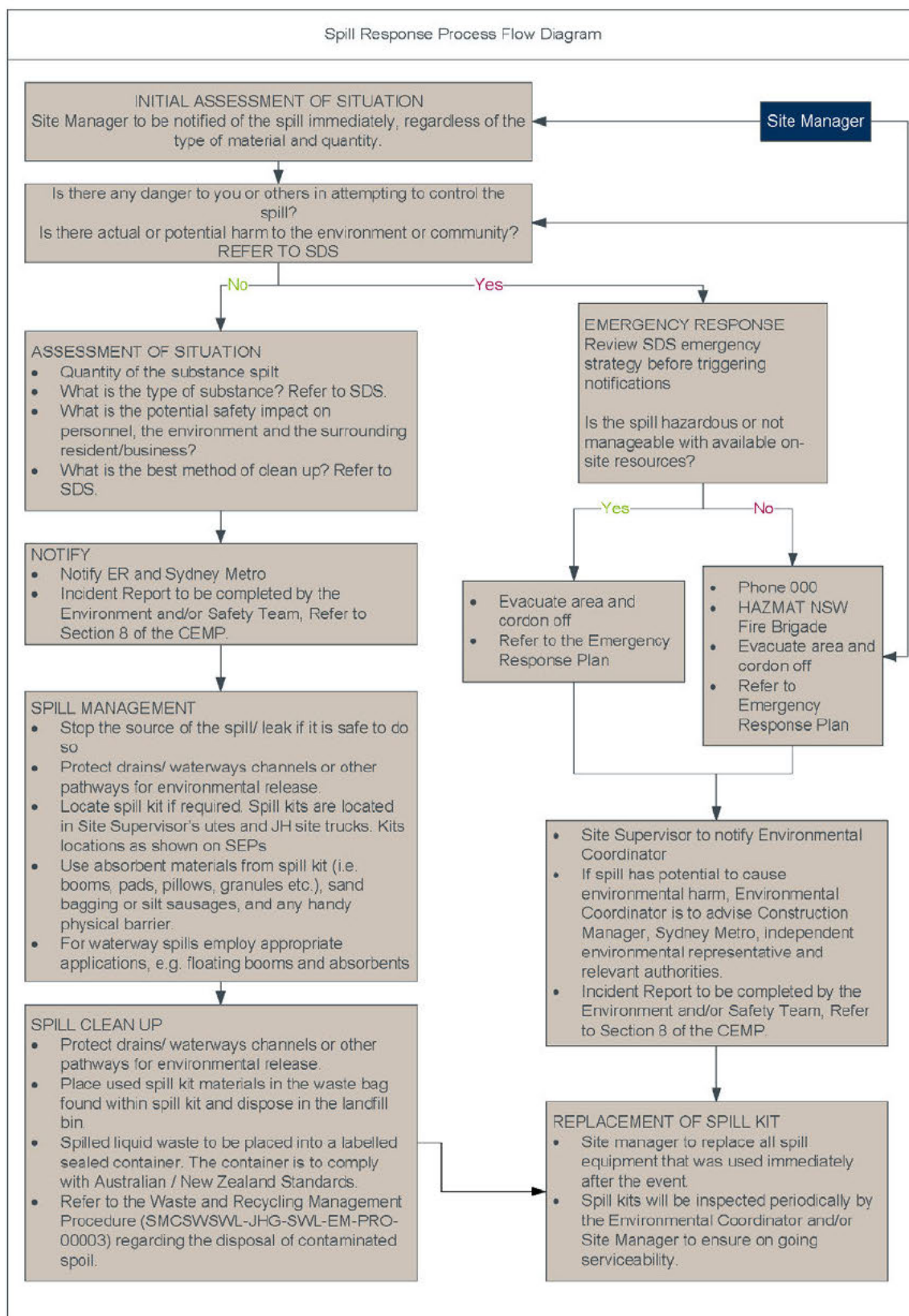
The following compliance records will be kept by the Environment Coordinator:

- Copies of current PESCPs for all active construction areas;
- Records of soil and water inspections undertaken;
- Records of testing of any water prior to discharge; and
- Records of the release of the hold point to discharge water from the construction site to the receiving environment.

APPENDIX A: PROGRESSIVE EROSION AND SEDIMENT CONTROL MANAGEMENT DIAGRAM



APPENDIX B: SPILL RESPONSE MANAGEMENT DIAGRAM



**APPENDIX C: WATER DISCHARGE & REUSE PROCEDURE FOR SSD-
13852803**



Water Discharge & Reuse Procedure

SM 17 00000098

Metro Body of Knowledge (MBoK)

| | |
|---------------------|--|
| Applicable to: | Sydney Metro |
| Document Owner: | Manager, Environment |
| System Owner: | Executive Director, Safety, Sustainability & Environment |
| Status: | FINAL |
| Version: | 3.0 |
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1. Purpose and scope

The purpose of this Procedure is to provide guidance to site personnel for managing, discharging and reusing excess water on Sydney Metro construction sites. This Procedure includes references to relevant industry guidelines but is not intended to replace them, nor does it override the relevant legislative and regulatory requirements.

Principle Contractors may be required to develop their own procedure that is consistent with this document via clause 3.1(f) of the Construction Environmental Management Framework (CEMF).

2. Accountabilities

The Executive Director, Safety, Sustainability & Environment is accountable for this Procedure. Accountability includes authorising the document, monitoring its effectiveness and performing a formal document review.

Direct Reports to the Chief Executive are accountable for ensuring the requirements of this document are implemented within their area of responsibility.

The Direct Reports to the Chief Executive who are accountable for specific projects/programs are accountable for ensuring associated contractors comply with the requirements of this document.

3. Definitions

All terminology in this Procedure is taken to mean the generally accepted or dictionary definition. Terms and jargon specific to this Procedure are defined within [SM-17-00000203 Sydney Metro Glossary](#), or are listed below.

| | Definitions |
|----------------------------|--|
| The Blue Book | <i>Managing Urban Stormwater: Soils & Construction</i> 2004, Landcom. |
| CEMP | <i>Construction Environmental management plan</i> |
| Environment Manager | Contractor Environment Manager. |
| EPA | NSW Environment Protection Authority |
| EPL | Environment protection licence issues in accordance with the POEO Act by the EPA |
| pH | The measure of the acidity or alkalinity of a solution. |
| POEO Act | Protection of the Environment Operations Act 1997. |
| NATA | National Association of Testing Authorities, Australia |
| NTUs | Nephelometric turbidity units |
| TSS | Total Suspended Solids. |
| Waters | (as defined in the POEO Act) means the whole or any part of: a) any river, stream, lake, lagoon, swamp, wetlands, unconfined surface water, natural or artificial watercourse, dam or tidal waters (including the sea), or b) any water stored in artificial works, any water in water mains, water pipes or water channels, or any underground or artesian water. |

| | Definitions |
|---|--|
| Water pollution or Pollution of waters | <p>As defined in the POEO Act water pollution or pollution of waters means:</p> <ul style="list-style-type: none"> a) placing in or on, or otherwise introducing into or onto, waters (whether through an act or omission) any matter, whether solid, liquid or gaseous, so that the physical, chemical or biological condition of the waters is changed, or b) placing in or on, or otherwise introducing into or onto, the waters (whether through an act or omission) any refuse, litter, debris or other matter, whether solid or liquid or gaseous, so that the change in the condition of the waters or the refuse, litter, debris or other matter, either alone or together with any other refuse, litter, debris or matter present in the waters makes, or is likely to make, the waters unclean, noxious, poisonous or impure, detrimental to the health, safety, welfare or property of persons, undrinkable for farm animals, poisonous or harmful to aquatic life, animals, birds or fish in or around the waters or unsuitable for use in irrigation, or obstructs or interferes with, or is likely to obstruct or interfere with persons in the exercise or enjoyment of any right in relation to the waters, or c) placing in or on, or otherwise introducing into or onto, the waters (whether through an act or omission) any matter, whether solid, liquid or gaseous, that is of a prescribed nature, description or class or that does not comply with any standard prescribed in respect of that matter, <p>and, without affecting the generality of the foregoing, includes:</p> <ul style="list-style-type: none"> d) placing any matter (whether solid, liquid or gaseous) in a position where: <ul style="list-style-type: none"> i. it falls, descends, is washed, is blown or percolates, or ii. it is likely to fall, descend, be washed, be blown or percolate, into in to any waters, onto the dry bed of any waters, or into any drain, channel or gutter used or designed to receive or pass rainwater, floodwater or any water that is not polluted, or e) placing any such matter on the dry bed of any waters, or in any drain, channel or gutter used or designed to receive or pass rainwater, floodwater or any water that is not polluted, <p>if the matter would, had it been placed in any waters, have polluted or have been likely to pollute those waters.</p> |

4. Water Discharge and Reuse Procedure

4.1. Water Management

During construction there is the potential for sediment laden water to be generated on construction sites. In particular in areas where there is no ground cover, where earthworks have been carried out and in low lying points on the site. It is essential that this sediment laden water is contained and managed on site through suitable erosion and sediment controls and only discharged once it has been treated and tested to ensure there is no harm caused to surrounding waterways and ecosystems.

4.2. Legislative Requirements

The Protection of the Environment Operations Act 1997 (POEO Act) is the key piece of environmental legislation in NSW administered by the Environment Protection Authority (EPA). Offences under this Act are classified into three tiers, with Tier 1 offences being the most serious – attracting up to \$5 million in the case of a corporation and \$1 million for an individual and seven years imprisonment for wilful or negligent harm to the environment.

Table 1: POEO classification of offences

| Classification of offence | Description |
|---------------------------|---|
| Tier 1 | These offences are the offences under Part 5.2 of the POEO Act 1997 and, include the wilful or negligent disposal of waste causing or likely to cause harm to the environment (section 115), wilfully or negligently causing a substance to leak, spill or otherwise escape in a manner that harms or is likely to harm the environment (section 116), and the wilful or negligent emission of an ozone-depleting substance in breach of the Ozone Protection Regulations in a manner that harms or is likely to harm the environment (section 117). |
| Tier 2 | Tier 2 offences are all other offences under this Act or the regulations. This includes carrying out a scheduled activity without an environment protection licence (EPL) (section 49(2)), failing to comply with a condition of an EPL (section 64(1)), pollution of waters (section 120) and failing to notify a pollution incident (section 152). The maximum penalties for the Tier 2 offence of failing to notify a pollution incident are \$2 million in the case of a corporation and \$500,000 in the case of an individual. The maximum penalties for Tier 2 offences other than failure to notify pollution incidents are \$1 million in the case of a corporation and \$250,000 in the case of an individual. Further daily penalties apply to continuing offences. |
| Tier 3 | Tier 3 offences are tier 2 offences that may be dealt with under Part 8.2 by way of penalty notice |

Under section 120 of this Act, any unlicensed water pollution event, no matter how minor, is illegal. It is a defence against prosecution under section 120 of the POEO Act if the pollution was regulated by an Environment Protection Licence (EPL) and the conditions of that EPL relating to pollution of waters were not contravened. In the absence of any specific EPL provision, however, to avoid causing pollution and breaches of Section 120, any water discharged from site must be of the same quality, or better, than the quality of the receiving waters at the time of discharge.

Offences attracting special executive liability are dealt with under Section 169 of the POEO Act. Section 169 specifically states that if a corporation wilfully or negligently causes any substance to leak, spill or otherwise escape (whether or not from a container) in a manner that harms or is likely to harm the environment or pollutes any waters each person who is a director of the corporation or who is concerned in the management of the corporation is taken to have contravened the same provision, unless the person satisfies the court that the person, if in such a position, used all Due Diligence to prevent the contravention by the corporation.

4.3. Water Management and Discharge

It is essential that the quality of the receiving waters is established through background monitoring and sampling, prior to any discharge from site, so that the potential impact of discharge water can be determined. Monitoring of the receiving waters must be undertaken prior to any land disturbance works (to establish a baseline) as well as during construction.

It is also essential that water management standards, and particularly erosion and sediment controls, are implemented to control and treat water. Landcom's Managing Urban Stormwater: Soils & Construction 2004 (The Blue Book) is considered a best practice guideline for erosion and sediment control on construction sites in NSW. If implemented, The Blue Book will help mitigate the impacts of land disturbance activities on soils, landforms and receiving waters and minimise the potential for water pollution events to occur.

The Water quality criteria and testing and treatment techniques in this procedure are based on The Blue Book. However, compliance with The Blue Book does not, of itself, provide any defence to an alleged breach of section 120 of the POEO Act. Examples of situations where compliance with The Blue Book could still lead to a breach of section 120 are as follows:

- Water discharged with TSS below 50mg/L may still cause pollution and breach section 120, if the receiving waters have a TSS less than 50mg/L at the time the discharge occurs.
- Appropriate erosion and sediment controls are in place, but a rainfall event occurs beyond the design capacity of those controls.
- Should a water pollution incident occur, being able to demonstrate due diligence in the implementation of environmental controls, and particularly erosion and sediment controls, may provide a defence against prosecution. Due diligence may be recognised if the proponent is able to demonstrate that erosion & sediment controls have been implemented in accordance with the requirements of The Blue Book. The Contractor must satisfy itself that appropriate management controls have been developed, implemented, maintained and documented to establish a due diligence defence.

All water discharges must be documented using [SM-17-00000109 Water Discharge or Reuse Approval Form](#) or site-specific equivalent. Discharge is not permitted until the Contractor Environment Manager or nominated representative has signed the discharge form. Note that in some cases the Sydney Metro Manager Environment or the Environmental Representative may be required to sign off the discharge form.

This procedure is not used for discharging water where the activity is covered by an EPL. The licence holder will have their own procedure covering the process for discharging water that addresses any site specific environmental conditions.

4.4. Requirements for Discharge to Waters

Water to be discharged must be tested and, if required, treated to ensure that it meets water quality criteria and that pollution of the receiving waters does not occur. Results of testing and details of any treatment undertaken must be noted on [SM-17-00000109 Water Discharge or Reuse Approval Form](#).

Note that an EPL may authorise discharge of water from specific locations or premises, and establish criteria that differ from those given in this Procedure. In such circumstances the EPL, and any conditions and criteria of that EPL, take precedence over this Procedure. Before water can be discharged to any receiving waters (whether on or off site), it must as a minimum meet the following criteria.

Table 2: Criteria for Discharge to Waters

| Parameter | Criterion | Method | Time prior to discharge |
|------------------------------|-----------------------|--------------------------------|-------------------------|
| Oil and grease | No visible | Visual inspection | < 1 hour |
| pH | 6.5-8.5 | Probe/meter ¹ | < 1 hour |
| Total Suspended Solids (TSS) | < 50mg/L ² | Meter/grab sample ³ | < 1 hour/< 24 hours |

If the criteria above are not met, the water will have to be treated and retested prior to discharge (see [Water Management and Discharge](#)). If all criteria above are met then the water may be authorised for discharge by the Manager Environment (refer to [Calibration](#)).

Table 3: Salinity and TSS

| | |
|---|--|
| 1. Salinity | <p>Salinity is determined by measuring the electrical conductivity (EC) of the water, using a meter. Setting an acceptable criteria range for salinity of discharge water is dependent on the salinity of the receiving waters and must be determined and applied on a site-specific basis following background water quality monitoring. Measuring discharge waters for salinity shall only be undertaken if required by:</p> <ul style="list-style-type: none"> the Conditions of Approval; an EPL; or the particular conditions of the site (soil or geology) or the receiving waters. |
| 2. Correlating Total Suspended Solid (TSS) with Turbidity | <ul style="list-style-type: none"> Consideration may be given to establishing a site-specific relationship between total suspended solids concentration (TSS) and turbidity, measured in nephelometric turbidity units (NTU). This allows the TSS to be inferred from an NTU reading. The benefit of using NTU is that it can be quickly measured on site with a hand-held meter, whereas water quality meters that measure TSS are expensive and the results from samples sent for laboratory analysis will not be available immediately. However, the relationship between TSS and NTU is highly dependent on soil type and site activities (i.e. earthmoving, extractive works, rock cutting or grinding) and NTU is affected by factors other than suspended solids, such as colour (e.g. tannins may alter the NTU reading). As such, a correlation curve (i.e. across a range of readings) must be determined between TSS and NTU that is specific to the site and cannot be applied to other sites. The correlation must be determined via laboratory analysis, by a NATA-accredited laboratory. Thorough records of the site-specific correlation must be kept, and any recommendations and/or limitations should be documented as part of the CEMP (For further information and guidance on correlating TSS with NTU refer to Appendix E of <i>The Blue Book</i>.). |

¹ Litmus paper and pool testing kits are not to be used.

² As discussed in Section 4, a more stringent TSS criterion may need to be adopted in certain situations.

³ Samples must be analysed at a NATA accredited laboratory.

4.5. Calibration

The goal of calibration is to minimise any measurement uncertainty by ensuring the accuracy of testing equipment which may drift over time. To be confident in the results being measured there is an ongoing need to service and maintain the calibration of equipment for reliable, accurate and repeatable measurements.

Due to the variety of water quality instruments available, it is not practical to provide instrument specific advice on storage, calibration and maintenance in this procedure. Before taking an instrument into the field, the operator should be familiar with the contents of the operating manual for that specific instrument, and ensure that it is stored, calibrated, maintained and used as per manufacturer's instructions. Detailed records of calibration and maintenance must be kept.

4.5.1. Treating Water Prior to Discharge

In order to meet EPA guidelines, TSS, pH levels and oil and grease must meet the required levels listed in table 4 below. Further water treatment may be required for other impurities not listed which may exist due to soil contamination or other factors. Based on the volume of water output and levels of contamination, methods used to treat water can vary in complexity and should be risk assessed and implemented by a competent person.

Best practice methods for water treatment of stormwater for construction sites can be found in Managing Urban Stormwater Soils and Construction Volume 1 (the Blue Book). The method for water treatment selected by the contractor must be documented in a procedure which includes any relevant Safety Data Sheets and safe handling and storage requirements for the substances used. All hazardous substances and contaminants must be subject to a health risk assessment. For further details please refer to the Principal Contractor Health and Safety Standard for occupational health and hygiene requirements.

Table 4: Treating water to discharge

| | |
|---------------------------------|--|
| 1. Oil and grease | <ul style="list-style-type: none"> Examine surface of water immediately prior to discharge for evidence of oil and grease (e.g. sheen, discolouration). |
| 2. pH Levels | <ul style="list-style-type: none"> If pH is outside the range 6.5-8.5 the water will need to be neutralised. Re-test the water pH following treatment – repeat as necessary, until the acceptable pH 6.5 – 8.5 range is reached. |
| 3. Total Suspended Solids (TSS) | <ul style="list-style-type: none"> If TSS are greater than 50mg/L, the sediments need to settle to the bottom or be removed. This can be achieved via the following methods: <ul style="list-style-type: none"> Natural settlement – this could take a long time or not occur at all (e.g. with dispersible clay soils). dependent on soil type and other characteristics, (refer to <i>The Blue Book</i>, Chapter 3 for further information). Flocculation – chemical treatment with a flocculant (e.g. gypsum). If the flocculant is being applied manually, an even application over the surface of the water is essential. If an automated dosing basin is used other flocculants such as Polyaluminium Chloride (PAC) and alum (aluminium sulphate) might also be suitable for use in this system. Only environmentally safe flocculants are to be used, based on the Environment Manager's review of Safety Data Sheet (SDS) information. Filtration – pumping or gravity feeding the water through a filter medium (e.g. geofabric) to another storage area (e.g. container or sediment basin) to remove sediment. The filter medium should be disposed of to a suitable facility. Re-testing of water is required once treatment has been undertaken to ensure criterion for TSS is met. |

Following treatment and retesting to ensure compliance with the criteria the water may be authorised for discharge by the Environment Manager (see section 4.5).

4.6. Requirements for Discharge to Land

The objective of discharging water to land (within the site boundary) is to allow the water to infiltrate into the ground, thus avoiding direct discharge to, or pollution of, waters. Any suspended solids in the water are deposited either on the surface or retained in underlying soil layers, so the TSS criterion does not apply. However, to avoid impacts to vegetation or soil contamination pH testing and a visual inspection for oil or grease must be undertaken (refer to [Criteria for Discharge to Waters](#) for criteria and testing methods).

4.6.1. Determining a Suitable Discharge Location

Consideration must be given to the following factors when determining a suitable offsite location:

- (a) Direction of groundwater flow – recharging groundwater that will subsequently flow either back onto site, into excavations or low lying areas should be avoided. This information should be available in the contamination site investigation reports and groundwater monitoring data if undertaken as part of planning approval.
- (b) Erosion – the receiving area must have complete groundcover (e.g. grass) and established vegetation to minimise the risk of erosion. Guidance on best practice for reducing the risk of erosion can be found in [Managing Urban Stormwater](#).
- (c) Flora and fauna – water must not be discharged to areas where there is potential to have an adverse effect on any flora or fauna species. Information on ecological surveys for flora and fauna can be found in the Environmental Impact Statement and the Fauna and Flora Management Plan.
- (d) Flooding – the receiving area must have the infiltration capacity to receive the volume of water to be discharged, without causing flooding or significantly increasing the risk of flooding should subsequent rainfall occur. This information can be found in the Flood Modelling undertaken for the Environmental Impact Statement.

4.6.2. Criteria for Discharge to Land

Discharge to land within the site boundary shall only occur if:

- (a) There is no visible oil or grease (otherwise treat in accordance with [Treating Water Prior to Discharge](#)).
- (b) The pH levels are between 6.5 and 8.5 (otherwise treat in accordance with [Treating Water Prior to Discharge](#)).
- (c) No surface runoff will be generated from the discharge and there is no potential for discharged water to reach any watercourse (within or outside the site).
- (d) No erosion is caused from the discharge and appropriate erosion and sediment control are installed in accordance with *The Blue Book*.

- (e) All discharge water can be wholly contained within the site boundary.

If all criteria above are met then the water may be authorised for discharge to land by the Environment Manager – go to [Reuse on Site](#).

4.7. Reuse on Site

Water may be reused on site, for example, for dust suppression, to assist with compaction or for watering landscape/bush regeneration areas. As with discharges to land, the TSS criterion does not apply as water will not be discharged to any watercourse. However, pH testing and a visual inspection for oil or grease must be undertaken (refer to [Criteria for Discharge to Waters](#) see section 4.4.1.1 for criteria and testing methods).

4.7.1. Criteria for Reuse on Site

Reuse on site shall only occur if:

- (a) There is no visible oil or grease (otherwise treat in accordance with [Treating Water Prior to Discharge](#)).
- (b) The pH levels are between 6.5 and 8.5 (otherwise treat in accordance with [Treating Water Prior to Discharge](#)).
- (c) No erosion is caused from the discharge.
- (d) Any runoff generated by the reuse is controlled entirely within the site boundary and appropriate sediment controls are installed and maintained in accordance with *The Blue Book*.

If all criteria above are met then the water may be authorised for reuse by the Environment Manager – go to [Reuse on Site](#).

4.8. Discharging Water

Once water has been tested and meets all the criteria for discharge to either waters or land, or for reuse on site, the Nominated Representative must authorise the discharge by signing [SM-17-00000109 Water Discharge or Reuse Approval Form](#). If required, the Sydney Metro Manager Environment or the Environmental Representative may also sign off the form prior to commencing the discharge.

Discharge can use a siphon system or a pump, with a priority on delivering low energy flows to downstream drainage lines, watercourses or land. The flow from the outlet must be directed onto a non-erodible surface or material and, for discharges to waters, sufficient energy must be dissipated before the flow enters the natural watercourse to ensure no erosion shall occur.

The pump inlet must be placed so that it will not disturb or take in any sediment or sediment laden water. The discharge must be monitored throughout to ensure that the water being syphoned or pumped:

- Complies with the discharge criteria.
- Does not come into contact with any soil or exposed surfaces before discharging.

- Does not mix with any sediment laden/untested water at either the inlet or outlet.

Water must never be discharged or reused onsite in a manner that exceeds the capacity of sediment controls and/or generates runoff with the potential to discharge from site.

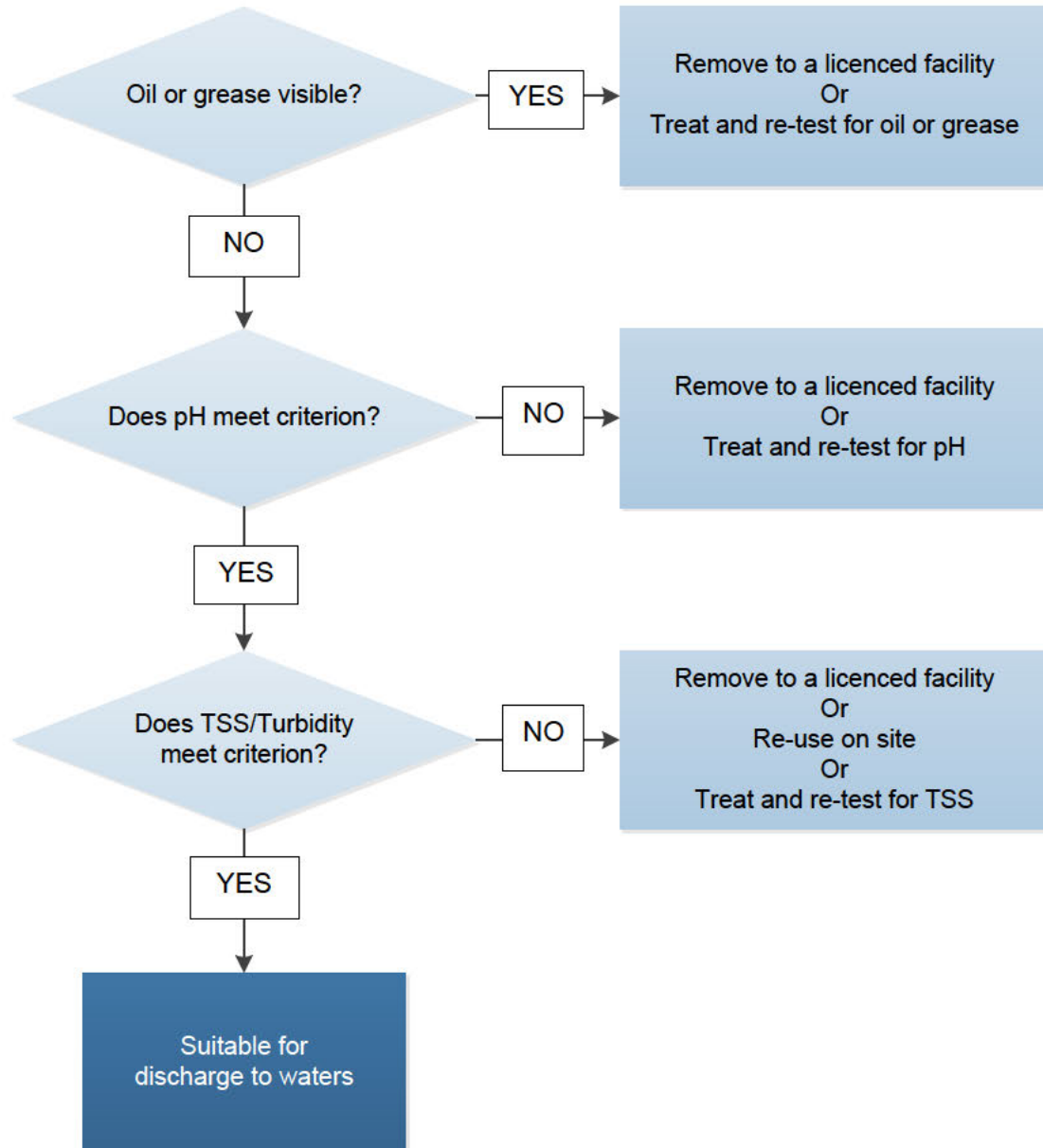


Figure 1: Process for testing water to determine options for removal, reuse, treatment or discharge

4.8.1. Monitoring and Maintenance

All sediment controls or areas that store water must be inspected to assess their integrity and capacity, as a minimum at the following times:

- Weekly during dry weather;
- Prior to forecast rainfall events; and
- During rainfall events (as often as possible), within 24 hours or as soon as possible following a rainfall event when the site is unattended (e.g. on weekends).

During any offsite or onsite discharge, regular monitoring must occur to ensure compliance with the requirements specified in this Procedure.

All rain event data shall be recorded for the site, including rainfall quantities from each rain event. Rainfall data should be gathered from the nearest monitoring station to the project.

4.8.2. Record Keeping

Records of all water discharges must be documented using [SM-17-00000109 Water Discharge or Reuse Approval Form](#) or site-specific equivalent. Records of all monitoring and maintenance measures must also be kept, on the site-specific environmental inspection checklist and other relevant document(s) (e.g. Site Foreman's diary).

5. Related documents and references

Related documents and references

- [SM-17-00000023 Sydney Metro Environment and Sustainability Statement of Commitment](#)
- [SM-20-00092643 Construction Environmental Management Framework \(CEMF\)](#)
- [SM-17-00000109 Water Discharge or Reuse Approval Form](#)
- [SM-18-00096434 Environmental Due Diligence Annual Self-assessment Procedure](#)

6. Superseded documents

Superseded documents

There are no documents superseded as a result of this document.

7. Document history

| Version | Date of approval | Notes |
|---------|------------------|---------------|
| 1.0 | 31 March 2015 | New document. |
| 2.0 | 7 July 2016 | IMS Review. |
| 3.0 | 27 March 2019 | IMS Review. |