HSEQ MANAGEMENT SYSTEM
Operational Environmental Management Plan (OEMP)

HSEQ5.1.7f
Stormwater Management Sub-Plan
VERSION 03

HUTCHISONPORTS

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- Current version of the document is readily available to all Managers, Employees and Key Stakeholders.

Register of Amendments					
Ver No	Page no	Date	Description of amendments	Prepared by	Approved by
Draft 0	All	12 July 2013	Consultation Draft	John Ieroklis	Trevor Ballantyne
Draft 1	All	15 July 2013	Consultation Draft	John Ieroklis	Trevor Ballantyne
1	All	31 July 2013	Pollutant Concentration Limits Sub-Plan External stakeholder consultation comments incorporated	John Ieroklis	Trevor Ballantyne
2	All	30 August 2013	DP&I comments incorporated Renamed to Stormwater Management Sub-Plan	John Ieroklis	Trevor Ballantyne
3	All	09 March 2017	Review of the Sub-Plan following the updated Risk Assessment 12-Dec-2016	Jennifer Stevenson	Blair Moses

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1 Purpose

This Stormwater Management Sub-Plan (SMSP) has been created as a means by which Hutchison Ports Sydney can comply with:

- the Protection of the Environment Operations Act 1997 (NSW) and regulation;
- the Environmental Planning and Assessment Act 1979 (NSW) and regulation;
- the Environmental Protection Licence #20322 issued to Sydney International Container Terminals Pty Ltd.
- relevant conditions outlined in the Instrument of Development Consent DA-494-11-2003-i listed in Schedule C – Terminal Operations (the Development Consent).

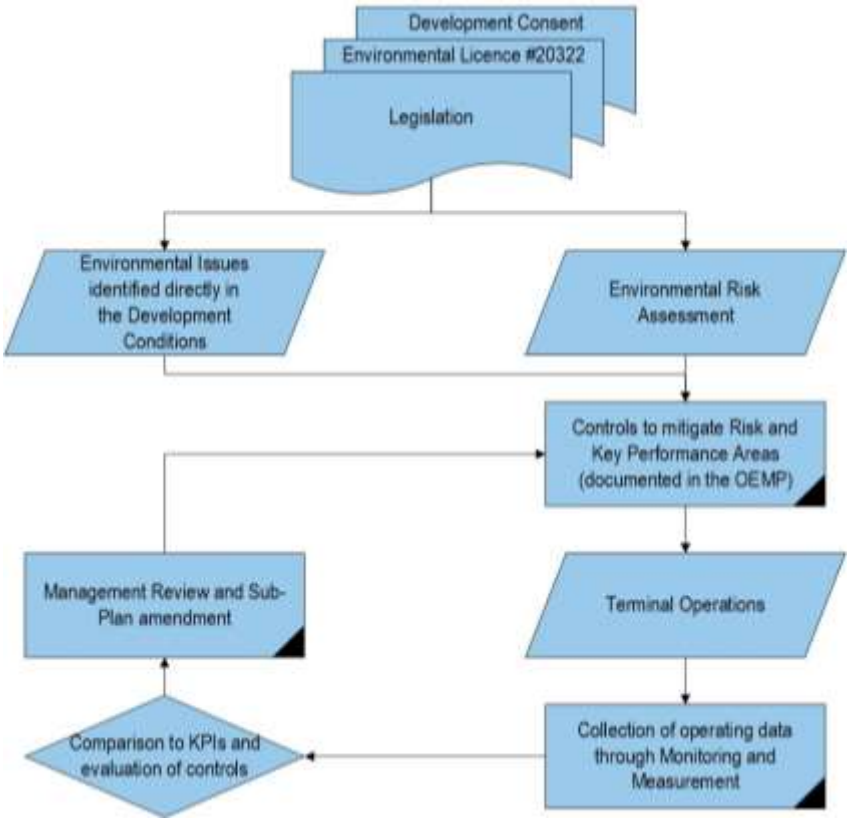
The objective of the SMSP is to guide the direction of operations so that site stormwater can be managed to regulatory standards and minimise off site environmental impacts, in particular the Penrhyn Estuary and Botany Bay. Through this process, Hutchison Ports Sydney can best manage foreseeable impacts successfully. Ultimately, awareness and management of impacts will lead to compliance with legislation, the EPA Licence and Development Consent.

Hutchison Ports Sydney will utilise this SMSP in the following ways:

- as a management instrument so that good performance by the business and its contractors can be assured;
- as a measure of compliance with legislation, the Licence and the Development Consent in the form of a Key Performance Indicator (KPI) target and a KPI goal;
- as a description of what the KPI actually is and its context for measurement;
- as a basis for consultation with relevant stakeholders in regards to eliminating pollution impacts.

The SMSP is a component of the HSEQ5.1.7 Operational Environmental Management Plan (OEMP).

The indicative process of how the OEMP control the operations of the terminal is shown below.



2 Compliance Conditions

Protection of the Environment Operations Act 1997 (NSW)

- section 120 Prohibition of pollution of waters

The ***Environmental Protection Licence #20322*** issued to Sydney International Container Terminals Pty Ltd stipulates under Condition L1 Pollution of waters:

L1.1 Except as may be expressly provided in any other condition of this licence, the licensee must comply with section 120 of the Protection of the Environment Operations Act 1997 (NSW).

The Licence also includes general obligations in accordance with the Protection of the Environment Operations Act 1997 (NSW) and the Regulations made under the Act to manage the environmental risks on the premises including identification, management and prevention of diffuse and point sources of stormwater pollution.

These include obligations to:

- ensure persons associated with the business (employees, agents, contractors or sub-contractors) comply with the conditions of the Licence, as set out in section 64 of the Act;
- control the pollution of waters, as set out in section 120 of the Act;
- report incidents causing or threatening material environmental harm to the environment, as set out in Part 5.7 of the Act.

The Conditions of Development Consent

C2.14 Water and Wastewater Management

Except as may be expressly permitted by a licence under the Protection of the Environment Operations Act 1997 (NSW) in relation to the development, section 120 of that Act (prohibition of the pollution of waters) shall be complied with in connection to the development.

C2.15 Pollutant Concentration Limits

For each monitoring/discharge point or utilisation area, the concentration of any pollutant discharged at that point, or applied to that area, must not exceed concentration limits specified in the relevant environment protection licence.

3 Risk Identification

A detailed Risk Assessment and evaluation of control measures was undertaken by Hutchison Ports Sydney prior to operational commencement on 4 September 2013. A review of the Risk Assessment was undertaken on 5 August 2014, after approximately 10 months of operation activities to ensure that the risks were being controlled and that all of the mitigation measures specified were being followed. The most recent Risk Assessment was undertaken on 12 December 2016 following the receipt of the Notice of Variation of Licence No. 20322.

The risks identified by Hutchison Ports Sydney to be managed by this sub-plan are:

- Pollution of Waterways through:
    - spilled dangerous goods or hazardous substances entering the waterways;
    - undetected leaking dangerous goods containers;
    - the collection of oils and liquids which leak from plant and equipment;
    - improper wash-down of equipment with water/residue escaping into drainage systems or waterways.

The SMSP shall also consider, and (where appropriate and relevant) seek to control risks associated with:

- Increased site throughput scenarios;
- whether there are any chemicals used on site that require further risk management (eg paints, oil dispersants, cleaning chemicals);
- Potential sources of dissolved metals on site (particularly zinc and copper), and potential sources of increased turbidity;
- Risks of dry weather and build-up of contaminants;
- Risks of increased truck traffic in areas of the site; and
- The adequacy of current practical measures such as sweeping, litter removal, spill controls, traffic controls and the frequency of these controls.

3.1 Exclusions to the scope of this SMSP

Unless noted otherwise, this sub-plan does not cover:

- stormwater discharge from on board vessels;
- in Botany Bay beyond the quay line of the Hutchison Ports Sydney terminal;
- outside the lease area of the Hutchison Ports Sydney terminal; and
- beyond the reasonable control or responsibility of Hutchison Ports Sydney.

4 Potential Operational impacts

Hutchison Ports Sydney anticipates the operation of the terminal will impact local water quality in the following ways:

4.1 Leaking or damaged containers

Approximately 7.6%[1] of all containers handled by Hutchison Ports Sydney hold Dangerous Goods. Dangerous Goods are subject to special work practices that govern their movement, separation and handling. For more information on the management of Dangerous Goods spills, please see the HSEQ5.1.7g Handling of Dangerous Goods and Hazardous Substances Sub-Plan.

4.2 Site runoff containing pollutants entering the Penrhyn Estuary or Botany Bay

The terminal's stormwater drainage system captures water from the following sources:

- roadways and marshalling areas for container trucks;
- parking areas for employee's cars;
- internal terminal access roads for container handling equipment and general vehicles;
- quay areas where cargo is landed to and from vessels;
- container stacking areas including the Dangerous Goods stacking areas;
- spill containment area;
- diesel refuelling area;
- rail siding area;
- roof drainage from terminal buildings; and
- other sources of dissolved metals on site, including buildings, fencing and other equipment.

These areas have the potential to introduce pollutants such as silt and heavy metals into the stormwater that will be discharged into the Penrhyn Estuary or Botany Bay.

Any increase in site throughput either through road, rail or water modes, shall have a flow-on increase of the traffic in areas of the site utilised to service that mode.

Dry weather can also lead to a build-up of contaminants which may impact the effectiveness of the pollution controls which have been implemented by Hutchison Ports Sydney.

4.3 Onsite use of chemicals for cleaning and maintenance

Engineering and Maintenance departments at Hutchison Ports Sydney use chemicals for cleaning, as well as oils, lubricants, coolant, grease, fuel (diesel), paint (road-marking and rust protectant), thinners and pest control substances.

[1] Data obtained from 2016 container throughput at Hutchison Ports Sydney.

5 Potential Environmental impacts

Discharging stormwater into a natural waterbody introduces a change in the local water quality because stormwater carries with it many pollutants that may accumulate within urban catchments. Unmitigated, the impacts on the local waters have the potential to:

- alter the pH;
- increase turbidity;
- increase toxicity;
- introduce an excess of nutrients, and/ or
- alter the concentration of dissolved oxygen in the water.

These changes can affect all levels of marine life present in the local waters and may become complex problems affecting bird species and other compounded ecological effects. The waters surrounding the Hutchison Ports Sydney terminal are also heavily used by recreational boaters who will notice the effects of any pollution first hand.

6 Operational Controls

Details of the overall management methods and procedures that will be implemented to control stormwater discharges from the Hutchison Ports Sydney terminal are explained in this section. The controls correspond with the potential operational impacts raised above.

6.1 Hardstand Areas

The construction of the terminal is almost entirely comprised of concrete hardstand areas. Other areas that are not concrete are likely to be gravel or ballast (ASC yard/ rail siding), asphalt (vehicle areas) or sprayed seal. These areas do not erode.

Where future phases are being constructed, disturbed areas will be managed under the Construction Environmental Management Plans relevant to those areas.

6.2 Housekeeping

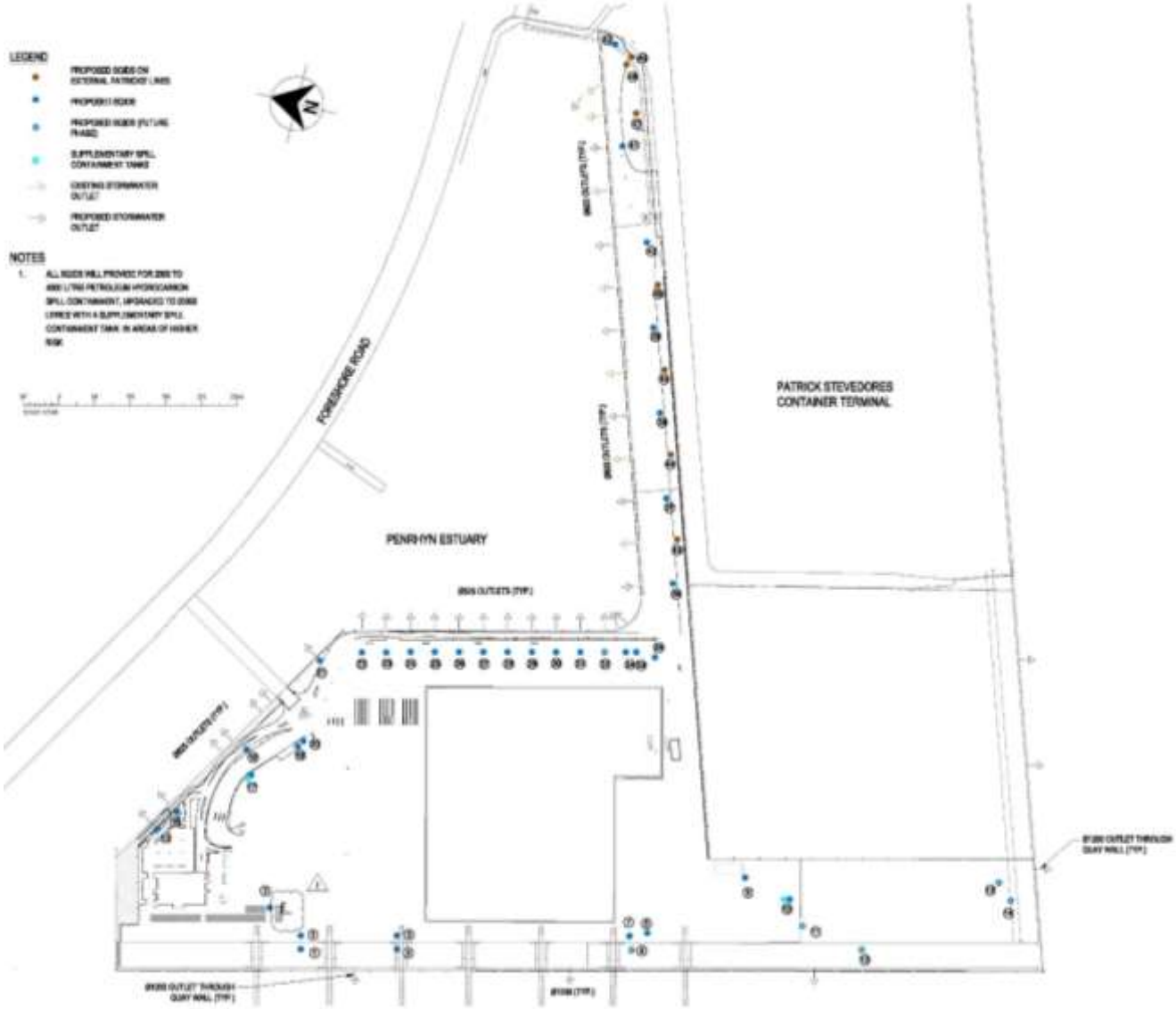
General housekeeping to prevent pollutants from entering the terminal's stormwater system will be managed by Hutchison Ports Sydney through contracted service providers, which include:

- regular cleaning of hardstand areas by sweeper truck to remove dust and debris;
- special sweeper/scrubber services for the Maintenance Workshop, equipment wash-bay and equipment parking areas;
- pump out and removal of catchment waste water occurring in the workshop and equipment wash-bay and Dangerous Goods spill containment traps; and
- waste removal services.

In addition to the above routine housekeeping services, incidents on site shall be managed in accordance with the HSEQ10.1.3 Emergency Response Plan – SICTL, ensuring that the appropriate preventions and cleaning methods are used to prevent any pollutant from entering the waterways and stormwater systems.

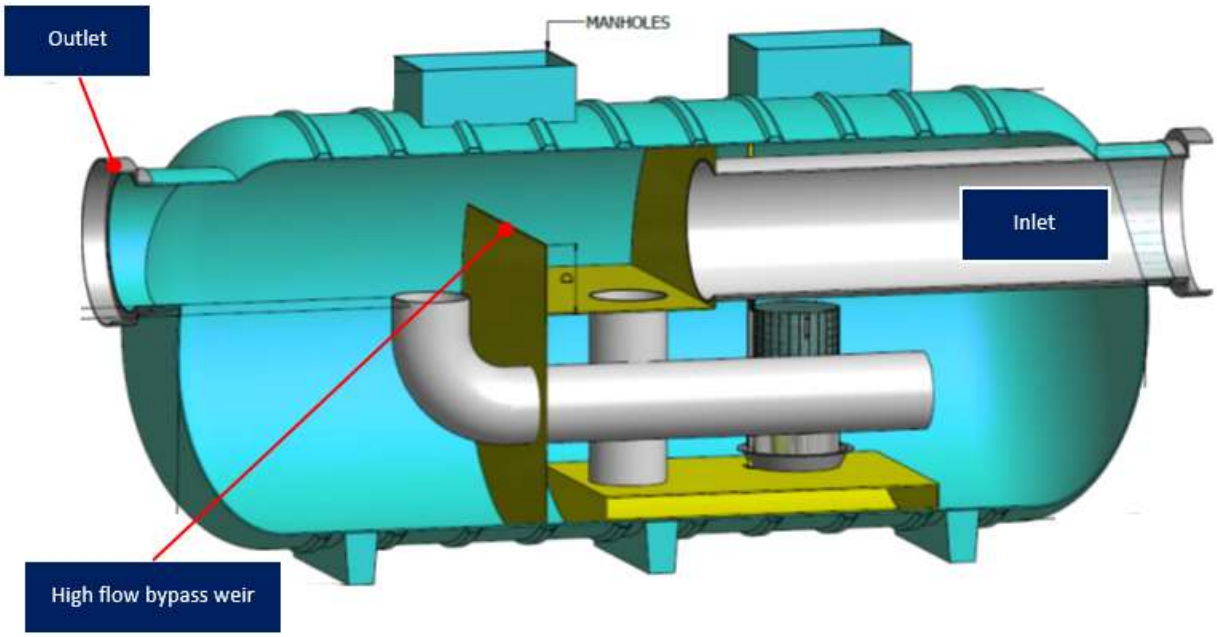
6.3 Stormwater Quality Improvement Devices

The need for distributed treatment of stormwater rather than one end-of-line control (known as Water Sensitive Urban Design) has been satisfied by Hutchison Ports Sydney in the design of the terminal. Forty-nine heavy metals separator units have been incorporated in the design of the terminal, each unit serves a small internal catchment and traps pollutants within the stormwater flow prior to discharge. The locations of the separator units within the terminal are shown below:



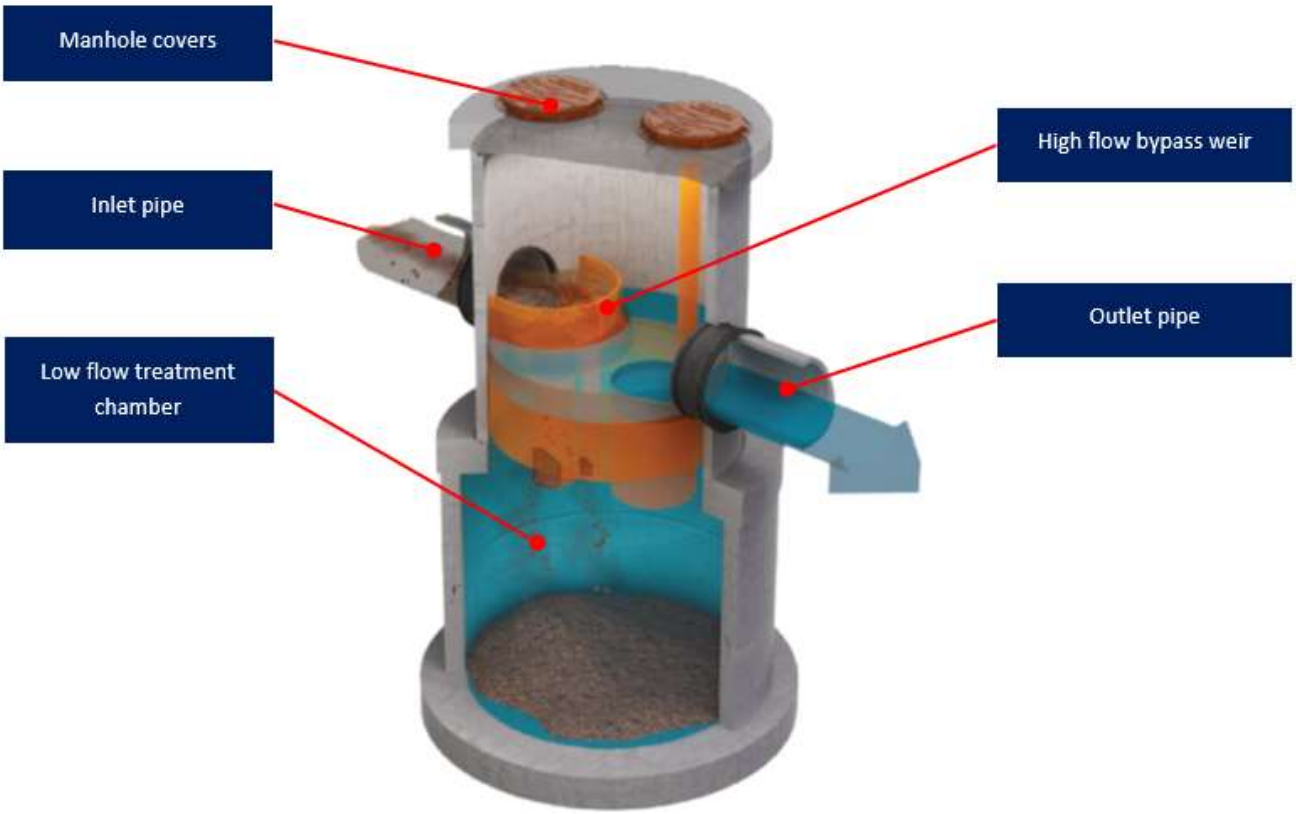
N.B: As part of the construction of the Hutchison Ports Sydney terminal, the existing Gross Pollutant Traps servicing the Patricks terminal (points 43-49 coloured brown, on the Patricks boundary line) were replaced by Humes Separator units. Hutchison Ports Sydney takes no responsibility for the quality of water discharged by these devices. Hutchison Ports Sydney does not control or manage the monitoring, inspection, cleanout, maintenance or sampling for these devices.
These devices will be serviced by contractors to Patricks stevedores.

The design of Hutchison Ports Sydney's drainage system incorporates separator units made by two manufacturers, SPEL and Humes. Diagrams of these units are shown below:



Cut away diagram of the SPEL Environmental 'Stormceptor' separator unit.

A SPEL Environmental 'Stormceptor' separator unit being installed during construction of the terminal in 2013.



Cut away diagram of the Humes 'Aquaceptor' separator unit.

These units continually separate sediments and heavy metals from stormwater flows and trap these pollutants so they are not discharged.

Hutchison Ports Sydney will undertake to monitor the water quality and cleanout these units as per the schedule in **Section 7 Performance Expectations and KPIs**.

6.4 Automated monitoring and shutoff systems (The WaterUp System)

The Hutchison Ports Sydney terminal features six Automated Stacking Crane (ASC) stacks, ultimately increasing to thirteen, used as follows:

- Odd-numbered ASC stacks will handle solid, liquid and gaseous DG cargo, and
- Even numbered ASC stacks will handle solid and gaseous DG Cargo only, not liquid DGs

Each ASC stack contains five lanes of containers across its width. Lane one and lane five in each ASC stack have been reserved for DG cargo as shown in the diagram below:

Details of an ASC stack as viewed from the water side exchange

The stormwater drainage system servicing the odd-numbered ASC stacks (Dangerous Goods liquids) will be fitted with an automatic drainage shutoff system called WaterUp. This system can be operated in two modes as determined by the terminal.

Open Valve: Stormwater is allowed to flow through drainage system and into separator units. Valves close immediately if the sensors detect pollutants entering the stormwater system. Trapped polluted stormwater can be pumped out and treated.

Closed Valve: Valves are usually closed to trap any pollutants entering the stormwater system when during no rain (i.e chemical spill). Trapped pollutants can be pumped out and disposed. Alternatively, the valves open once sensors detect clean stormwater and a rain event (by rain sensor). If sensors detect pollutants entering the stormwater system the valves close immediately. Trapped polluted stormwater can be pumped out and treated.

The WaterUp system continually monitors the stormwater flows in order to detect sediments and heavy metals. If detected, the stormwater tainted with these pollutants will be trapped and not discharged. A notification will be sent from the WaterUp controller to the terminal's Network Control System indicating that the valves are closed and that pollutants have been caught in the system.

Hutchison Ports Sydney can then arrange for the drainage lines to be pumped out, cleaned and pollutants disposed by an approved contractor. The procedure for cleaning and draining any contaminated drainage line after a spill or leak will be determined by assessing the nature and classification of the Dangerous Goods or pollutant. The servicing of the system will be discussed with WaterUp and the sensors will be recalibrated after each event of necessity.

6.5 Non-Automated Stormwater Shutoff Valves (The PolluPlug System)

Additional to the WaterUp system described above, all other drainage outlets at the terminal are also fitted with a manually controlled stop valve in the form of an inflatable bladder within each drainage pipe called 'PolluPlug'. These valves are situated downstream of each separator unit and provide a further safeguard against pollutants from spills entering Botany Bay and Penrhyn Estuary as they can be manually closed (inflated) by terminal staff in the event of a chemical spill in an area of the terminal that is not serviced by the WaterUp system. Closing these valves would ensure that all pollutants are trapped within the drainage lines, SICTL can arrange a contractor to pump out the trapped pollutants and dispose accordingly.

For more information on the management of Dangerous Goods spills, please see the HSEQ5.1.7g Handling of Dangerous Goods and Hazardous Substances Sub-Plan.

7 Performance Expectations and KPIs

7.1 Water Monitoring

Ongoing monitoring of the terminal's separator units shall be undertaken by Hutchison Ports Sydney, in order to ensure that the units operate effectively and to provide ongoing assessment as to the effectiveness of the operational environmental management controls implemented by the terminal.

The following source documents have been used as references:

- ***Botany Bay & Catchment Water Quality Improvement Plan 2011***, prepared by the Sydney Metropolitan Catchment Management Authority
- ***Cooks River Water Quality and River Flow Objectives*** (Estuaries) downloaded from the website at: http://www.environment.nsw.gov.au/ieo/CooksRiver/report-02.htm
- ***Australian and New Zealand Guidelines for Fresh and Marine Water Quality (2000)***, Australian and New Zealand Environment Conservation Council (ANZECC)
- ***Approved Methods for the Sampling and Analysis of Water Pollutants in New South Wales (March 2004)*** downloaded from the Office of Environment & Heritage website at http://www.environment.nsw.gov.au/water/wateranalysis_methods.htm.
- ***Marine Water Quality Objectives for NSW Ocean Waters – Sydney Metropolitan and Hawkesbury-Nepean (October 2005)*** published by Department of Environment and Conservation NSW.

Samples shall be collected at the outlet of the separator units so that it is representative of the stormwater being released from the terminal into Botany Bay and the Penrhyn Estuary. The method shall be consistent with the collection, handling and preservation principles enunciated in ***Standards Association of Australia (1998) AS/NZS 5667.1:1998***, and ***APHA (1998) section 1060***. If there is any inconsistency between these references, Standards Association of Australia (1998) prevails.

The water monitoring program implemented at Hutchison Ports Sydney is designed to test for those key elements which would have the greatest effect on the Penrhyn Estuary and Botany Bay waterways.

- Total Nitrogen (TN)
- Total Phosphorous (TP)
- Turbidity (NTU)
- Total Suspended Solids (TSS)
- pH
- heavy metals – Copper (Cu), Lead (PB), Zinc (Zn)
- Oil and Grease

Hutchison Ports Sydney will ensure that water testing be undertaken by suitable consultants and laboratories accredited by the National Association of Testing Authorities, Australia (NATA) using methods approved in the document ***Approved Methods for the Sampling and Analysis of Water Pollutants in New South Wales (March 2004).***

7.2 Management of Key Performance Areas

7.2.1 Water Monitoring

Key Performance Area	KPI
The effectiveness of the separator units to be assessed through the testing and analysis of outlet sampling on an annual basis.	3 units tested per annum
After every spill event where it is reasonable to assume that pollutants have entered the stormwater system units.	After Spill Event

7.2.2 Water Quality

Key Performance Area	Goal	Acceptable Limit
Total Nitrogen (TN)	120 - 300 µg/L [2]	5 mg/L [3]
Total Phosphorous (TP)	< 30 µg/L [2]	0.1 mg/L [3]
Turbidity (NTU)	2.2 – 3.3 NTU [1]	0.5 – 10 NTU [2]
Total Suspended Solids (TSS)	< 30 mg/L [3]	50 mg/L [3]
pH	7.0 – 8.5 [2]	6.5 – 8.5 [3]
Copper (Cu)	< 1.3 µg/L [2]	10 µg/L [3]
Lead (Pb)	< 4.4 µg/L [2]	< 4.4 µg/L [2]
Zinc (Zn)	< 15 µg/L [2]	< 15 µg/L [2]
Oil & Grease	< 5 mg/L [3]	10 mg/L [3]

[1] **Botany Bay & Catchment Water Quality Improvement Plan 2011**, prepared by the Sydney Metropolitan Catchment Management Authority

[2] **Marine Water Quality Objectives for NSW Ocean Waters – Sydney Metropolitan and Hawkesbury-Nepean (October 2005)** published by Department of Environment and Conservation NSW, and **Australian and New Zealand Guidelines for Fresh and Marine Water Quality (2000)**, Australian and New Zealand Environment Conservation Council (ANZECC)

[3] Developed based on local conditions and previous water quality test results.

7.2.3 Separator Unit Clean-Outs

Key Performance Area	KPI
Cleanout will be undertaken where the water quality results indicate an Acceptable Limit exceedance in three Key Performance Areas.	Cleanout within 6 weeks of Acceptable Limit exceedance.

8 Opportunities for Improvement

Under this sub-plan opportunities for improvement of operational practices and stormwater controls (which affect the achievement of water quality acceptable limits and goals) may be identified by any of the employees or contractors of Hutchison Ports Sydney during general workplace inspections of the terminal, preventative maintenance inspections of the control measures and through consultation with the workforce.

The HSEQ Department will undertake analysis of monitoring data which shall be summarised in the Annual Environmental Management Report (AEMR).

Additionally the Stakeholders or the Port Botany Community Consultative Committee (PBCCC) can raise issues directly with Hutchison Ports Sydney that affect the local water quality.

The HSEQ Department will investigate all complaints or the water quality issues raised by Stakeholders or the PBCCC in accordance with the process outlined in section 4.6.4 of the HSEQ5.1.7 Operational Environmental Management Plan. However, in cases where the findings of the investigation (Step 3) prove that the complaint was caused by a combined effect of the actions by Hutchison Ports Sydney and another Port Botany lessee (for example, activities carried out near the boundary between Hutchison Ports Sydney and Patricks Stevedores on the Southern end of the Terminal known as 'The Knuckle') then Hutchison Ports Sydney will formally notify the complainant with these findings and interface with the other lessee via the HSEQ Department for a collaborative solution that satisfies the complainant and the operational needs of both stevedores.

All such opportunities for improvement will be reported in accordance with the HSEQ2.2 Hazard and Improvement Opportunity Reporting Policy using the HSEQ2.2.1.1 Hazard and Improvement Report Form and registered with the HSEQ Department.

8.1 Review and Auditing of this Sub-Plan

The review and amendment of this sub-plan will be in accordance with sections 5.2 and 5.4 of the HSEQ5.1.7 Operational Environmental Management Plan which emphasises the Environmental Risk Assessment as the 'driver' of the review process. Drawing upon the Environmental Risk Assessment for guidance on the depth of the review will help Hutchison Ports Sydney achieve the following:

- fulfilment of Hutchison Ports Sydney's commitment to continuous improvement as noted in the HSEQ1.1 HSEQ Policy Statement;
- Rectification of operational or system deficiencies identified during workplace inspections through a holistic and thorough approach;
- Transparent and straightforward auditing of Hutchison Ports Sydney's systems and processes;
- changes to operations directed by management upon review of activities, incidents, monitoring data, AEMRs and KPIs can be reflected in this sub-plan, and
- Supporting Hutchison Ports Sydney's competitive market position by implementing beneficial industry trends in environmental best practice.

Detailed provisions for auditing Hutchison Ports Sydney's environmental management system such as audit scope, depth, frequency and distribution of findings are explained in section 5.2 of the HSEQ5.1.7 Operational Environmental Management Plan.

9 Documentation and Record Keeping

Hutchison Ports Sydney will retain all records of:

- water monitoring;
- separator unit clean-outs;
- HSEQ2.2.1.1 Hazard and Improvement Report Forms;
- records of any Stakeholder or Community complaint or water quality issue raised;
- HSEQ8.1.1.1 Incident Report Forms;
- audits – both internal and external.

These documents will be retained for traceability and will be included in the Annual Environmental Management Report (AEMR). They will be administered by the HSEQ Department.

In line with Hutchison Ports Sydney's reporting requirements, incidents and monitoring data will be collated and entered into a database graphing trends over time. Information and trend data will be included in the following reports as relevant:

- in the weekly Management Meetings;
- in the Monthly HSE Performance Report;
- in the Quarterly HSE Performance Report;
- in the Annual Environmental Management Report;
- in the Environmental Protection Licence annual return documents;
- on the Hutchison Ports Sydney website.

10 Responsibility, Accountability and Authority

Hutchison Ports Sydney retains ultimate responsibility for implementing this sub-plan.

10.1 Training of personnel

Hutchison Ports Sydney has adopted a shared responsibility approach where all members of the terminal workforce are expected to meet the requirements of this sub-plan and be aware of the potential effects of their work on local water quality.

The training of personnel on their responsibilities and the requirements of this sub-plan occurs during the Hutchison Ports Sydney Terminal Induction held during the first week of employment, where an outline of water quality management is delivered to all new workers.

Additional training in how to operate the PolluPlug system shall be provided to key positions within the terminal; ensuring that there is always someone on site who is trained to operate the system in case of emergency.

Regular toolbox meetings and prestart talks at the commencement of every shift; the WHS Committee meetings; and the weekly Management Meetings are also used as a forum for discussion and communication of environmental strategies, hazards and risk controls.

The HSEQ Department provides the necessary expertise, guidance and support.

11 Stakeholders

Hutchison Ports Sydney will consult with the various stakeholders in different situations where their involvement is appropriate and will cultivate a pro-active and reactive relationship for dealing with complaints. Complaints from stakeholders will be handled in accordance with section 4.6.4 and 4.6.5 of HSEQ5.1.7 Operational Environmental Management Plan. Under this sub-plan, the primary external stakeholder is the Port Botany Community Consultative Committee which includes representatives from the local community and Botany Bay City Council.

Internal Stakeholders	External Stakeholders

• Executive Management Team
• HSEQ Department
• Managers at the terminal
• Maintenance and Operations personnel
• Contractors
• Customers
  ○ Shipping Lines
  ○ Truck Companies
  ○ Rail Operators
	• the local community
	• Port Botany Community Consultative Committee
	• Randwick City Council
	• City of Botany Bay
	• NSW Ports
	• NSW Roads & Maritime
	• NSW Department of Planning and Environment
	• NSW Office of Environment and Heritage/EPA