APPENDIX P

Soil and Water Management Plan

THE NORTHERN BEACHES HOSPITAL (STAGE 2)

STATE SIGNIFICANT INFRASTRUCTURE APPLICATION SSI_6792 (STAGE 2)

Environmental Impact Statement
Appendix P: Soil and Water Management Plan

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STAGE 2 NORTHERN BEACHES HOSPITAL

State Significant Infrastructure Application SSI_6792 (Stage 2)

Environmental Impact Statement Appendix P: Soil and Water Management Plan

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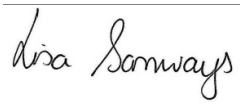
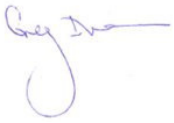
Checker	Lisa Samways	
Approver	Greg Ives	

Report No

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1 EXECUTIVE SUMMARY

The Northern Beaches Hospital Project (NBH Project) aims to establish a partnership between the NSW State Government and a health services provider for the provision of a new hospital facility to service the Northern Beaches community. The proposed NBH is located approximately 15 km north of the Sydney CBD within the suburb of Frenchs Forest.

This report documents a Soil and Water Management Plan (SWMP) that is required by the Stage 2 Director Generals Requirements (DGRs) for the project.

The measures set out in this document address sediment, erosion and dust environmental risks, as well as potential impacts associated with the construction process, in accordance with relevant environmental management guidelines and legislative requirements.

2 INTRODUCTION

This Soil and Water Management Plan (SWMP) has been prepared as a supporting document for the Stage 2 Environmental Impact Statement (EIS) for the proposed Northern Beaches Hospital (NBH) development.

Soil and water management aspects identified during the development of the Stage 1 SWMP are also applicable to this stage, and as such, management principles and site characteristics are similar. The SWMP has been prepared in accordance with the "Blue Book" (*Managing Urban Stormwater – Soils and Construction, 4th Edition by Landcom 2004).*

The plan provides practical measures that shall be implemented to minimise any detrimental impact on the surrounding environment resulting from soil erosion, sediment transport, and/ or chemical spills during construction of the project.

The SWMP addresses the following DGR **-** Sediment, Erosion and Dust Controls

"Prepare a Soil and Water Management Plan that details measures and procedures to minimise and manage the generation and off-site transmission of sediment, dust and fine particles."

This SWMP shall be applied to construction activities associated with site construction works that involve ground disturbance at the hospital development site.

2.1 SITE LOCATION

The site for the proposed NBH is located approximately 15 km north of the Sydney CBD (refer **Figure 2-1**) within the suburb of Frenchs Forest and Warringah Council Local Government Area (LGA).

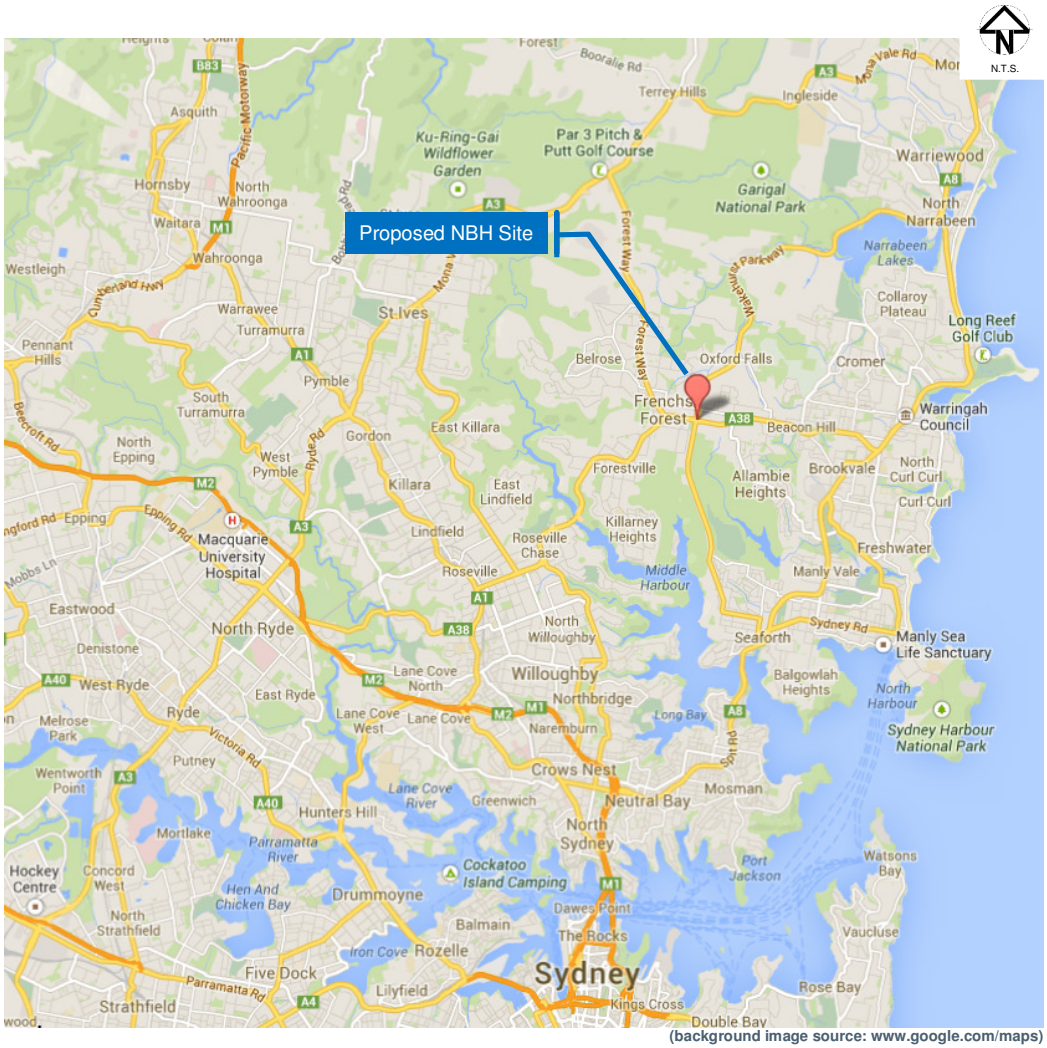

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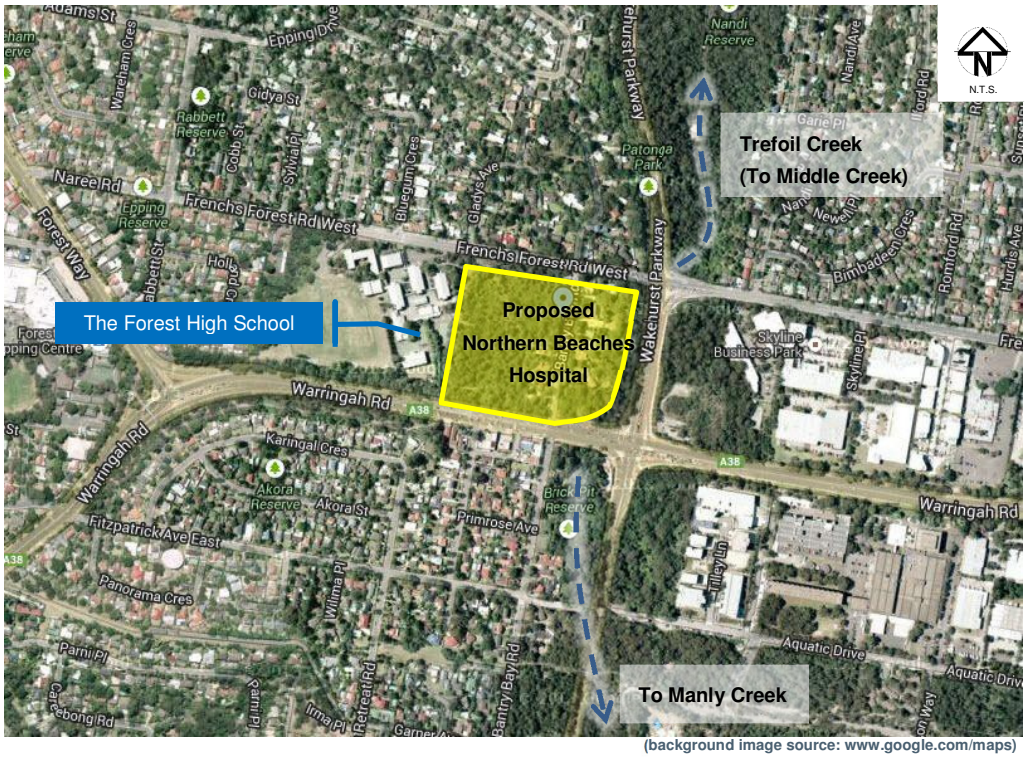
Figure 2-1: Locality Map

The site is bound by Frenchs Forest Road West, Warringah Road, Wakehurst Parkway and The Forest High School (refer **Figure 2-2)** and has a total area of approximately 6.3ha.



(background image source: www.google.com/maps)

Figure 2-2: Site Plan

2.2 PLANNING PATHWAY

In October 2013, a Staged Infrastructure Application (SSI_5982) was lodged by Health Infrastructure (HI) for this project. The application was divided into two parts:

(i) Concept Proposal and Stage 1

- Concept Proposal for the site; and
- Stage 1 - Site clearance and preparatory works.

(ii) The proposed Stage 2 NBH development

- Bulk excavation works
- Construction of a nine storey Hospital building
- Staff, patient and visitor car parking, including construction of an eight storey multi-deck Car Park
- Site works including internal roads, pathways and landscaping
- Utility amplification works

The Director General's Requirements (DGRs) for environmental assessment were issued by Department of Planning and Infrastructure (DP&I) on 19 June 2013 for both parts of the application.

A State Significance Infrastructure Application (SSIA) and Environmental Impact Statement (EIS) was prepared to address the DGRs associated with the Concept Proposal and Stage 1 and submitted in October 2013.

Public exhibition of the SSIA and EIS closed on 28 November 2013 and a significant number of submissions were received. The Stage 1 SSIA and EIS was approved by Department of Planning and Environment (DP&E) on 22 June 2014.

The DP&E advised on 10 November 2014 that the Stage 2 NBH SSIA and EIS should be lodged under project title reference 'SSI 6792'.

2.3 OBJECTIVES AND TARGETS

The Northern Beaches Hospital (NBH) development is located in a green field area bounded by Frenchs Forest Road West to the north, Wakehurst Parkway to the east, Warringah Road to the south and the Forest High School to the west. The proposed earthworks for Stage 2 of the NBH development site will involve land disturbance. Removing the vegetation cover from an area leaves the underlying soil susceptible to erosion by stormwater run-off. Run-off can convey sediment from the construction site and deposit it into the downstream waterways, resulting in a reduction in water quality.

The objectives of the soil water management plan are:

- To effectively manage the risk of soil and water impacts with reference to Section 120 of the *Protection of the Environment Operations Act 1997*;
- To control the erosion of soil from disturbed areas on the site;

- To protect downstream water quality and prevent any sediment laden water from leaving the existing site; and
- To prevent accidental spills and associated drainage to nearby watercourses.

Based on the findings of project risk management processes and the potential impacts to the community, the following targets have been set for managing water quality on the project.

Table 2-3 Soil and Water Management Targets

Metric/Measure	Target	Timeframe	Accountability
Number of non-compliant monitoring results at authorised discharge points and external compliance points	Zero	At all times	Project Manager
Number of enforcement notices / penalties issued by regulators and/or client	Zero	At all times	Project Manager
Number of unauthorised discharges	Zero	At all times	Project Manager
Water use monitored	100 % of water use activities metered	At all times	HSE Manger/ Project Manager

2.4 RELATIONSHIP TO OTHER SITE MANAGEMENT DOCUMENTS

Prior to commencement of construction activities a Construction Environmental Management Plan will be prepared. The CEMP establishes the overarching context for the effective environmental management of the site during all building and construction activities. This SWMP will comprise a component (sub-plan) of the overarching CEMP.

2.5 RESPONSIBILITY

It is the contractor's responsibility to ensure that all sediment and erosion control practices outlined in the SWMP are implemented, and that all reasonable measures are taken to minimise the risk of sediment and other pollutants being carried from the site by stormwater run-off.

2.6 COMPLIANCE

All site personnel will be required to minimise land disturbance to essential construction areas only with the purpose of reducing the soil erosion hazard on site. Appropriate erosion and sediment controls will be included on the detailed design drawings which will be developed as the project evolves. Through appropriate implementation of this SWMP, the impact on the natural and physical environment will be minimised.

3 POTENTIAL IMPACTS

This Plan addresses the use of water on the project and the management of impacts to water quality. Activities conducted during the delivery of the project that have the potential to impact water quality and/or quantity are provided below.

Table 3 Soil and Water Hazards and Risks

Project Activity	Environmental Hazard	Environmental Risk
Clearing and grubbing	Increased sediment load in run-off waters	Downstream impacts on aquatic fauna and flora
Excavation	Damage to watercourse/waterway	Downstream impacts on aquatic fauna and flora
Concreting	Discharge of contaminated water	Water quality negatively impacted
Storage and use of flammable and combustible liquids and solids	Spills	Water quality negatively impacted
Operation of a concrete batching plant	Use of water	Unnecessary load on water resources contributing to resource availability
Dust suppression	Use of water	Unnecessary load on water resources contributing to resource availability

4 SITE CONSTRAINTS AND CHARACTERISTICS

The table summarises the design parameters assessed for the hospital site with respect to management of erosion risk associated with rainfall and runoff, as per the Blue Book. This information has been extracted from the *Northern Beaches Hospital Stage 1: Concept Design, Site Clearance & Preparatory Works Soil and Water Management Plan.*

Table 4 Site Characteristics

(Northern Beaches Hospital Stage 1 Concept Design, Site Clearance & Preparatory Works)	**Value**	**Reference – Blue Book.**
Rainfall erosivity (R-factor)	3500	Appendix B – Map 10
Soil erodibility (K-factor)	0.018 - 0.023	Table C20 – Lucas Heights (lh)
Length/slope gradient factor (LS)	C1[1]* – 0.91 C2 – 0.41 C3 – 0.65 C4 – 0.65 C5 – 1.02	Table A1
Erosion control practice factor (P-factor)	1.3 (compacted and smooth)	Table A2
Cover factor (C-Factor)	1.0 (during site clearing) 0.1 (post site clearing)	Table A3
Calculated soil loss, A (RUSLE equation) t/ha/yr	C1 – 174 C2 – 78 C3 – 124 C4 – 124 C5 – 194	A = R K LS P C
Soil loss class (1 Low to 3 High)	C1 – 2 C2 – 1 C3 – 1 C4 – 1	Table 4.2

[1] C1-5 refers to catchment identified on Figure 2 of the *Northern Beaches Hospital Stage 1: Concept Design, Site Clearance & Preparatory Works Soil and Water Management Plan.*

	C5 – 2	
Soil hydrologic group	Group D	Table C20 – Lucas Heights (lh)
75th percentile 5-day rainfall event	29.0 mm (Mona Vale)	Table 6.3a
Volumetric runoff coefficient (Cv)	0.64 (Group D)	Table F2

Source: ***Northern Beaches Hospital Stage 1: Concept Design, Site Clearance & Preparatory Works Soil and Water Management Plan.***

Based on the above parameters, and preliminary catchment calculations provided, the soil loss figures range from 78–194 t/ha/year. This range is below the best management practice identified sediment basin trigger criterion of less than 200 tonnes per year. As such, provision of dedicated sediment basins can be considered unnecessary and alternate measures shall be employed to protect receiving waters[2].

[2] This information has been extracted from the Northern Beaches Hospital Stage 1: Concept Design, Site Clearance & Preparatory Works Soil and Water Management Plan.

5 CONSTRUCTION SEQUENCE

A construction sequence will be implemented to ensure all sediment control measures are in place before the commencement of any significant work practice on site. A self-auditing program in accordance with Chapter 8 of the “Blue Book” shall be implemented.

Works will in general be carried out in the following sequence:

1. Redirect clean water around areas to be disturbed by construction development;
2. Install sediment fences and diversion channels to meet requirements of the SWMP;
3. Construct stabilised site access(s) where nominated;
4. Install sediment control protection measures at all natural and man-made drainage structures. Maintain until all the disturbed areas are stabilised;
5. Establish dust generation control measures; and
6. Progressively apply permanent stabilisation.

6 MANAGEMENT

6.1 SOIL AND WATER MANAGEMENT

The risk of sediment pollution of the waterways will be minimised in accordance with the requirements of the “Blue Book”: The following controls will be applied to prevent soil and water impacts;

Table 6 Soil and Water Management Controls

Soil and Water Management Controls	Accountability
The project has been designed and is being constructed to divert as much storm water as possible away from the site (i.e. to prevent the water from entering the site)	HSE Manager
Where possible minimising the areas from which vegetation is removed/disturbed, including staging of works	Design Manager
Progressively rehabilitate/revegetate areas as soon as they become available. All stabilisation measures will be undertaken prior to issue of the Certificate of Technical Completion; and all stabilisation works are to be relocated or decommissioned and removed from site.	Site Manager
All materials will be stockpiled away from flow paths. Where stored for a period of greater than one month the stockpiles will be protected from erosion as soon as practicable (e.g. seeded, mulched, hydro-mulched).	Site Manager
Erosion and sediment controls are installed prior to or immediately upon any disturbance to vegetation or soil and remain in place until revegetation or hard-scaping has occurred.	Site Manager/ HSE Manager
All erosion and sediment controls shall be designed by an experienced and competent person to ensure they are: 1. The correct type of control; 2. Adequately sized according to the soil and climatic conditions and catchment areas such that discharged water will meet compliance limits; and 3. Constructed to an engineering standard that complies with the requirements of the relevant regulatory authority.	HSE Manager
All sediment and erosion control devices will be maintained in a satisfactory working order throughout the works or until such earlier time as the area above has been stabilised and suitable for the device to be removed. Inspect the devices after all storm events for structural damage or clogging by silt and other debris and make prompt repairs or replacement.	Site Manager/ HSE Manager
Sediment laden water (dirty water) captured onsite will be preferentially used for dust controls.	Site Manager
Water discharge from site is conducted in strict accordance with the site’s water discharge procedure, which is approved by the HSE Manager.	Site Manager/ HSE Manager
Where necessary to meet water quality discharge compliance limits, water will be chemically treated prior to discharge from site	HSE Manager
All hazardous substances (liquids and solids) are stored and managed according to AS1940.	HSE Manager
All refuelling points, including refuelling/lube trucks, will carry hydrocarbon spill kits.	HSE Manager
The quantity of water consumed on the project from each of the following sources are reported monthly: • Potable water, • Water obtained under an extraction licence or other regulatory authority,	

• Recycled water sourced from outside the project.	
Opportunities to minimise the use of high quality water will be continually sought and adopted as appropriate.	Site Manager
An adequate number of concrete washout pits will be maintained at all times. The washout pits will be isolated from surface water flows with bunds constructed of a suitable material to prevent contamination of clean surface waters and will be lined to prevent contamination of soil and ground water.	Site Manager
In the case of the temporary construction exit, the contractor will undertake daily surface cleaning by drag broom or equivalent, to remove all build-up of foreign material to the satisfaction of the relevant authorities. All works are to be contained wholly within the development site.	Site Manager

Monitoring

The following environmental monitoring shall be implemented;

- Relevant meteorological data (including rainfall) adequate to allow the interpretation of monitoring data to assess compliance and identify potential non-compliances will be collected as necessary.
- The adequacy of sediment and erosion control will be documented daily within the Projects daily Diary.
- Environmental inspections will be conducted weekly.
- Environmental inspections will be carried out after significant rain events.

6.2 AIR QUALITY MANAGEMENT

Prior to the commencement of construction activities, an Air Quality Management Plan will be prepared as part of the Construction Environmental Management Plan. The following management strategies shall be implemented;

- Techniques for managing air quality shall be included in staff and contractor project inductions;
- Plant and equipment emissions shall be monitored to check adherence with relevant regulations and standards;
- Areas of exposed soil shall be minimised and long term stockpiles shall be stabilised;
- Site compound areas and haul roads shall be capped with gravel or kept damp by having a water cart available;
- Mud tracking onto public roads shall be avoided as far as practicable via minimising site access points, and removing any deposited materials regularly;
- All truck movements onto public roads shall be covered and tailgates securely fastened; and
- Burning of materials shall not to be permitted at any time.

7 DEFINITION OF ACRONYMS AND TERMS

Acronym/Term	Definition
SWMP	Soil and Water Management Plan
EIS	Environmental Impact Statement
NBH	The Northern Beaches Hospital
Blue Book	Managing Urban Stormwater, March 2004
Hyder	Hyder Consulting