North West Growth Centre water related services for first release precincts

Modification Assessment Report – Emergency Storage Tank for SPS1107

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Report Endorsement

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Glossary and abbreviations

AHIMS	Aboriginal Heritage Information Management System
AHMS	Archaeological and Heritage Management Solutions
CEMP	Construction Environmental Management Plan
EA	Environment Assessment
EEC	Endangered Ecological Community
EP&A Act	*Environmental Planning and Assessment Act 1979*
EPBC Act	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*
EPL	Environmental Protection Licence
EST	Emergency storage tank
FFMP	Flora and Fauna Management Plan
ICNG	EPA's Interim Construction Noise Guidelines
MCoA	Minister's Conditions of Approval
NVMP	Noise and Vibration Management Plan
NWGC1	North West Growth Centre First Release Precincts
OEH (formerly DECCW and DECC)	NSW Office of Environment and Heritage (formerly the NSW Department of Environment, Climate Change and Water and prior to that the NSW Department of Environment and Climate Change)
P&I	Planning and Infrastructure (formerly NSW Department of Planning and Infrastructure and prior to the NSW Department of Planning, DOP)
PPR	Preferred Project Report
Project	The project as approved by DP&I – North West Growth Centre water related services for first release precincts (MP07_0125)
RAP	Registered Aboriginal Party
RWP	Recycled Water Plant
SEPP	State Environmental Planning Policy
SSTF	Shale Sandstone Transition Forest
SPS	Sewage Pumping Station
TSC Act	Threatened Species Conservation Act 1995

1 Introduction

1.1 Background

The North West and South West Growth Centres are to contain approximately 66,000 and 115,000 new dwellings respectively, to cater for 30 to 40 per cent of Sydney's growth over the next 30 years. Sydney's Growth Centres play a key role in Sydney's Metropolitan Strategy.

The North West Growth Centre first release precincts (NWGC1) involves the construction and operation of drinking water and wastewater infrastructure to service the Riverstone, Alex Avenue, Area 20, North Kellyville, Riverstone West and Colebee precincts.

The wastewater infrastructure required to service the North Kellyville Precinct includes two new wastewater pipelines, including the Cattai Creek wastewater carrier. This report outlines the requirement for additional infrastructure to support the operation of the new Cattai Creek wastewater carrier and assesses the potential environmental impacts of this new infrastructure.

1.2 Existing approval

Sydney Water's Project to provide water related services for NWGC1 was granted approval by the then Minister for Planning in November 2008 under the now repealed Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

The Environmental Assessment (EA) for the Project was prepared in line with the requirements of the Director-General of the former NSW Department of Planning (DOP) issued on 17 October 2007. In March 2008, the DOP placed the EA for the Project on public display. Community and government stakeholders were also notified and invited to make submissions on the Project as described in the EA.

The Preferred Project Report (PPR) responded to issues raised in the submissions received. Responses to the submissions drew on the findings of the EA, new information gained since the preparation of the EA and changes in response to public inputs. The PPR was submitted to DOP on 16 July 2008.

The Minister for Planning granted approval for the Project on 18 November 2008 subject to a number of conditions (the Minister's Conditions of Approval). In accordance with transitional arrangements, following Part 3A's repeal, modifications to the Project will continue to be assessed under Part 3A and the Minister for Planning and Infrastructure remains the approval authority.

There have been three modifications to the Project Approval for NWGC1 to date for the following:

- MOD 1 (approved 8 June 2009) for amendments to CoA 2.9 regarding the A7 archaeological site
- MOD 2 (approved 19 May 2010) for realignment of a drinking water pipeline near Stanhope Gardens
- MOD 3 (approved 10 September 2012) for a change to wastewater and water pipelines, relocation of the SPS1154 site and changes to the Statement of Commitments.

1.3 Status of current Project works

On 5 December 2012, Lend Lease contractors (formerly Abigroup) were awarded Sydney Water's contract for 'Package 2 and 3A works', which includes the design and construction of the Cattai Creek wastewater carrier (part of NWGC1).

A Project Construction Environmental Management Plan (CEMP) including a Flora and Fauna Management Plan, Construction Noise and Vibration Management Plan, Traffic Management Plan, Heritage Management Plan and Soil and Water Management Plan were developed in accordance with the CoA 6.1 and 6.2 of the

NWGC1 Project Approval. The CEMP and Management Plans were approved by the Director-General on 31 July 2013.

Lend Lease commenced work on Package 2 and 3A works in August 2013, with construction of the Cattai Creek carrier recently commencing in February 2014. The current construction program indicates that construction of all Package 2 and 3A works would be completed in November 2014.

1.4 Scope of modification

The Cattai Creek wastewater carrier will connect into SPS1107 and transport flows from the North Kellyville Precinct to the Rouse Hill Recycled Water Plant (RWP).

This application for modification seeks approval for construction and operation of an emergency offline storage tank (EST) for SPS1107 located at the end of Mile End Road, Rouse Hill.

1.5 Current modification and consistency assessment

Section 75W of the EP&A Act caters for proposed changes and modifications to approved projects under the former provisions of Part 3A and Part 5 Division 4. Section 75W(2) provides that a proponent may request the Minister to modify the Minister's approval for a project but also provides that 'approval for a modification is not required if the infrastructure as modified will be consistent with the existing approval'. Section 75W(4) provides that the Minister may modify the approval, with or without conditions.

A preliminary consistency assessment indicated that the proposed change is not consistent with the existing Project approval as described in the EA and PPR. As a result, this Modification Assessment Report (MAR) that assesses the potential environmental impacts has been prepared to support the modification application. The requested amendment to the relevant CoA is contained in **Appendix A**.

1.6 Structure of this report

The application for modification has been prepared to seek approval of the proposed change to the Project compared with those described in the EA, PPR and Minister's Conditions of Approval, assess potential environmental impacts and identify any additional mitigation measures.

This report:

- describes the proposed change to the Project and the justification for change (section 2);
- identifies the environmental issues and assesses the potential environmental impacts of the change relative to those of the approved Project (section 3);
- summarises mitigation measures for the proposed change (section 3.10); and
- outlines consultation that has occurred and future consultation for the proposed change (section 4).

This report considers whether the proposed change is anticipated to result in any material changes to environmental impacts by considering the same key issues that were addressed in the EA and the PPR, and whether any additional key issues are raised as a result of these proposed changes.

Chapter 5 of the EA outlines the legislative and planning framework for the NWGC1 project and this still applies to the proposed modification, however, Section 2.7 of this document provides a brief summary of the specific legislative considerations relevant to the proposed EST.

2 Project description and rationale for change

2.1 Description of approved project

Section 3.2.4 of the EA outlines the approved wastewater infrastructure within the North Kellyville Precinct:

"The wastewater infrastructure to service the North Kellyville Precinct would be limited to new wastewater pipelines. Wastewater from the North Kellyville Precinct would be transported to the existing Rouse Hill STP and RWP…

Two new wastewater pipelines would be constructed:

- *The Cattai Creek Carrier, which would follow Cattai Creek*
- *The North Kellyville Carrier, which would follow Smalls Creek, a tributary of Cattai Creek…*

The Cattai Creek carrier would begin at the south eastern corner of the new Precinct at Glenhaven Bridge. It would follow the western side of Cattai Creek northwards for approximately 5.5 km to its confluence with Second Ponds Creek. It would then follow the southern side of Second Ponds Creek for approximately 600m, cross underneath Smalls Creek and then continue for a further 100m to an existing collection maintenance hole for SPS1107. From SPS 1107, the wastewater from North Kellyville would be pumped along an existing rising pipeline to Rouse Hill STP."

In relation to the construction and upgrade of existing pumping stations, Section 3.2.4 of the EA includes construction of a new SPS 1154 and upgrade of an existing SPS 564. Section 3.3.4 of the EA states that these SPSs constructed and upgraded as part of the Project would have an emergency storage capacity of four hours to be used in the event of pump or power failure.

The requirement for any changes or upgrade to SPS1107 was not identified in the EA.

2.2 Description of the proposed modification

The emergency storage tank (EST) would be approximately 19m x 13m x 9m deep and constructed on Sydney Water owned trunk drainage land to the west of the existing pump station SPS1107. The EST would be constructed within a vegetated area and would be partially above ground on the northern side.

The works would also involve embankments, connecting pipework to SPS1107, a re-grade of the existing road pavement, traffic barriers and handrails, and a minor re-alignment of the existing cycleway in the area. The detailed design drawings for the EST are included in **Appendix F**.

In order to safely construct the EST, additional clearing for temporary hard stand areas would be required to the south east and south west of the structure. These hardstand areas would be for a crane pad, materials laydown, site sheds and amenities. In addition, a permanent embankment would need to be created on the northern side of the EST.

Figure 1 shows the regional location of the proposed EST and **Figure 2** shows provides more detail of the EST and construction footprint required to build it.

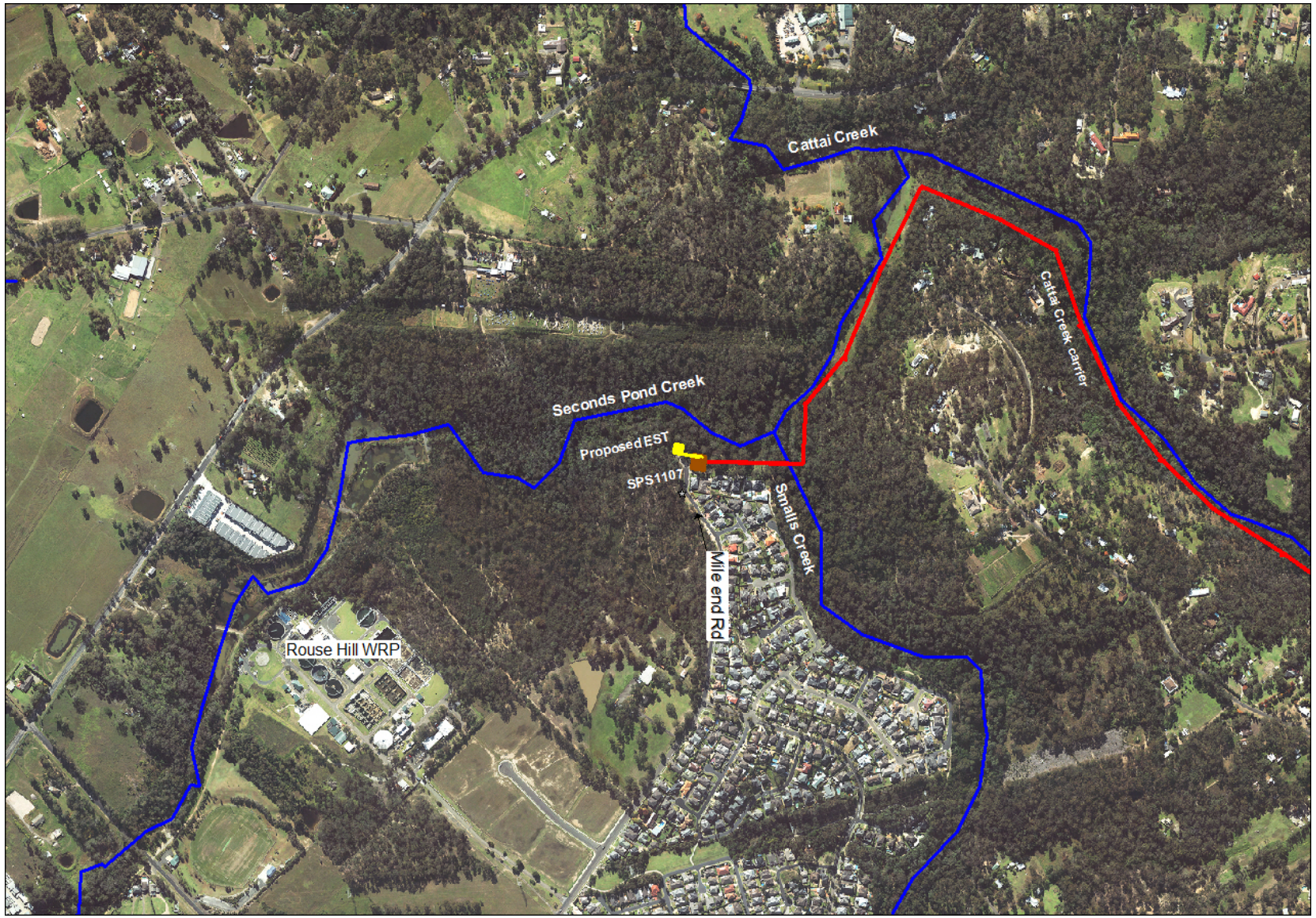


Figure 1 Regional location of proposed EST

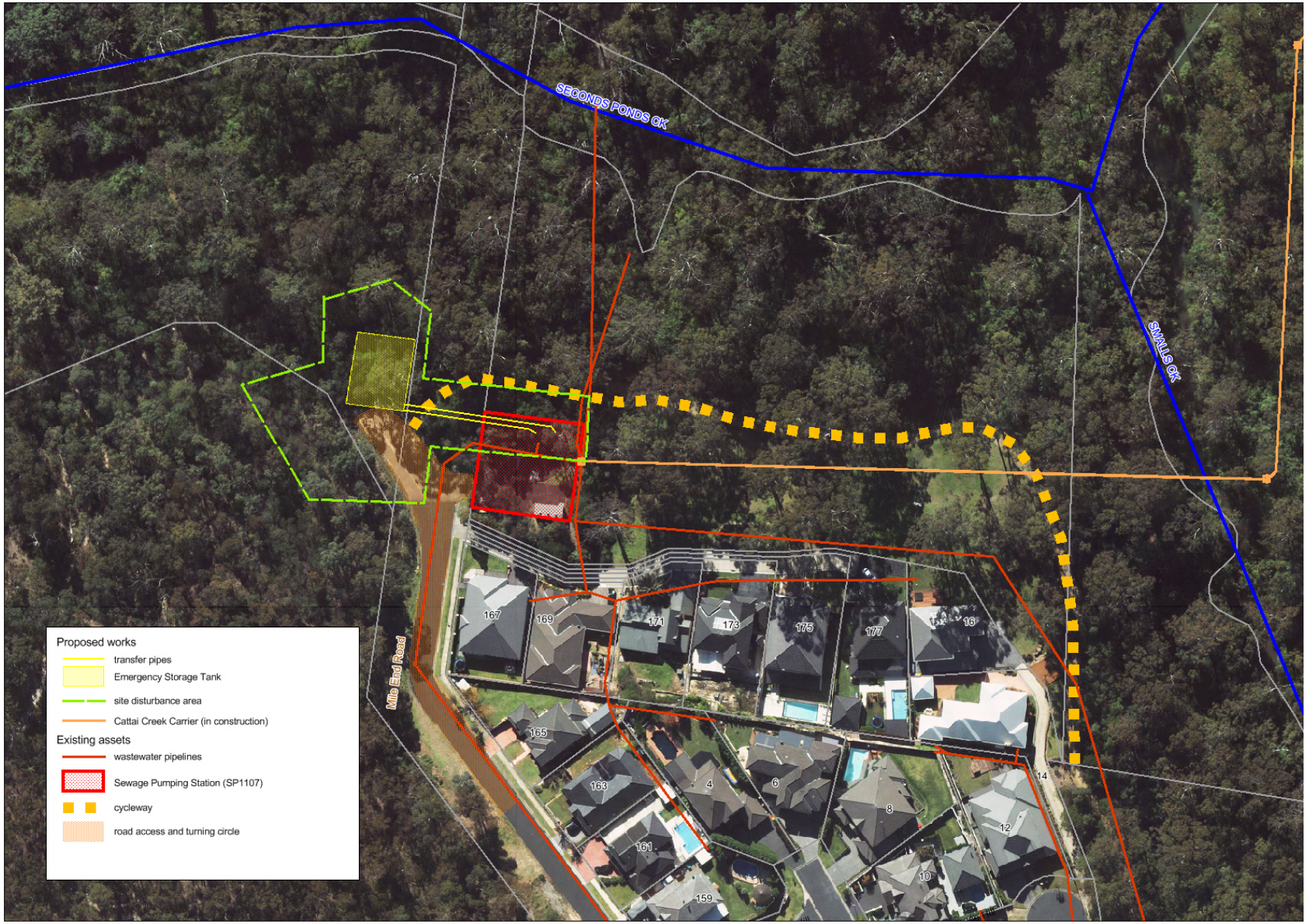


Figure 2 Site Layout Plan – existing SPS1107 and proposed EST

2.3 Requirement for the EST

During detailed design of the Cattai Creek wastewater carrier, modelling was undertaken to understand the impact of additional flows from this carrier on the existing Rouse Hill wastewater system for a 10 year time series and at ultimate capacity (2036). The results of this modelling indicated that, with the addition of the flows from the Cattai Creek carrier as development progresses, an off-line storage would be required in the Rouse Hill wastewater system to meet overflow licence conditions. This would achieve compliance with the NSW EPA system licence (EPL # 4965) by limiting the number of the wet weather overflows to 12 in 10 years within the Rouse Hill wastewater system.

The preferred solution is to have an off-line passive storage structure connected to the existing SPS1107. The wastewater modelling indicated that a storage capacity of 1575m^3 would be required for the emergency storage tank in order to meet the above EPL requirements into the future.

2.4 Options for location of EST

There were three options considered for the location of the proposed storage tank for SPS1107 as shown on **Figure 3** and described below:

2.4.1 Option 1 – northeast side of SPS1107 in open reserve area opposite residents

This option entailed locating a long rectangular shaped storage tank to the north east of the SPS1107 site in the open reserve area opposite the residents at the end of Mile End Road.

Advantages:

- less excavation than other options
- less space constraints and less native vegetation clearing

Disadvantages:

- very visible to residents being half above ground – construction and operational impacts
- visual amenity impacts due to loss of large feature trees and impact on open parkland area

2.4.2 Option 2 – west side of SPS1107 under vehicle turning area

This option had the storage tank located in a road reserve under the turning area for the existing pumping station site.

Advantages:

- structure would be completely buried beneath the road/ turning area
- easy access for maintenance

Disadvantages:

- structure would be in road reserve, conflicting with potential future road upgrades planned by Council
- temporary loss of turning area for the SPS during construction
- top of roof slab would need to be trafficable (minor additional cost)
- deep excavation and removal of a large amount of spoil

2.4.3 Option 3 – approximately 8m to the northwest of SPS1107 in vegetated area

This option investigated locating the storage tank outside of the Council road reserve, within Sydney Water trunk drainage land.

Advantages:

- structure would be partially buried beneath the ground
- easy access for maintenance
- outside of future road easement and not being impacted by Council future road or bridge works
- less residential or community impact during construction
- less impact on large feature trees
- elimination of need to import fill to site
- top of roof slab can be design as non- trafficable

Disadvantages:

- deep excavation in rock
- clearing of native vegetation

Figure 3 Options considered for location of EST

2.5 Construction methodology and timing

The following activities would be required for construction of the EST for SPS1107:

- Installation of environmental controls – sediment fencing, delineation of vegetation to be cleared with paraweb fencing
- Clearing and grading – removing weeds, mulching native vegetation and stockpiling topsoil
- Site set up – placement of office/ sheds/ amenities, temporary fencing
- Relocation of cycleway
- Connecting pipework – excavation of pipework to connect storage tank to existing SPS1107
- Excavation of the EST – including pre-drilling of the outside excavated face, rock hammering using 2 x 35T excavators
- Spoil removal and movement – excavated material would be removed by long-reach excavator and trucked offsite
- Rock anchors and grouting to stabilise excavation followed by permanent rock anchors in the base
- Installation of steel reinforcement for base and walls of storage tank – including lifting by crane
- Pouring concrete to form base and walls and roof slab of storage tank using concrete trucks/ pumps
- Installation of pipework between storage tank and pump station
- Epoxy coating works
- Backfilling around storage structure, including battering of northern embankment
- Electrical and mechanical works for instrumentation and control
- Reinstatement of pavement for turning area and cycleway
- Placement of handrails on the northern side, traffic barriers on the southern side and landscaping of the construction disturbance and embankment area with locally native grass and shrub species.

The construction works are scheduled to commence in May 2014 (subject to approval) and be complete and commissioned by March 2015.

Construction would be undertaken during normal working hours of 7am to 6pm (Monday to Friday) and 8am to 1pm (Saturday).

Out of hours works may be required for the pouring of concrete or emergency works; however the community would be notified in advance of these works wherever possible. Any out of hours works would be undertaken as per the procedure in the Project's Noise and Vibration Management Plan (NVMP), with approval by the Project's Environmental Representative where permitted in the NVMP.

2.6 Operation of the EST

The EST is expected to fill on average once per year once ultimate capacity is reached. It has been designed to be self-draining (back to SPS1107) and would only need to be accessed and cleaned by Sydney Water following peak wet weather events. Maintenance vehicles would use the existing SPS1107 parking on-site and no additional parking would be required for the EST.

2.7 Legislative framework

Clauses 106 of the Infrastructure SEPP apply to the Proposal by identifying development for sewerage systems that are permitted without consent. All the wastewater infrastructure in the Proposal falls within the definition of a 'sewage reticulation system' under clause 106, which means the proposed works are permissible without consent on any land, except land reserved under *National Parks and Wildlife Act 1974* (where it must be authorised under the Act). The Proposal will not impact on any land currently reserved under the *National Parks and Wildlife Act 1974*.

The EST would be located just north-west of the North Kellyville Precinct boundary and outside the land subject to the Sydney Growth Centre's SEPP. The Biodiversity Certification which has been granted for the Growth Centre's SEPP under Section 126 of the *Threatened Species Conservation Act 1995* does therefore not apply to the proposal.

The Proposal is located within The Hills Shire Council local government areas (LGA), to which The Hills Shire Local Environment Plan (2012) applies. The permissibility provisions of the Infrastructure SEPP override the provisions of the LEPs where there is an inconsistency. As a result the Proposal and all its components are permissible without consent under the EP&A Act.

3 Environmental Issues

This section assesses environmental impacts of the EST for the environmental issues as identified in the Project's EA. Some of the environmental impacts of the EST are substantially the same as those assessed in the EA and PPR for the Project. In these instances, no additional site specific assessment was undertaken and the mitigation measures contained in the Project's CEMP (Abigroup, July 2013) will effectively manage the environmental impacts. These issues are aquatic ecology, non-indigenous heritage, hazards and risks and energy and greenhouse gas emissions. In addition, human health is not a relevant issue as there are no recycled water components. These issues will not be discussed further in this section.

The key issues for the EST are assessed in the section below. This section also compares the impacts of the EST with those of the approved Project. Generally the impacts identified for the EST can be effectively managed by the mitigation measures contained in the Project's CEMP and Management Plans (Abigroup, July 2013). The CEMP and Management Plans were prepared in accordance with the Conditions of Approval and approved by the Director-General on 31 July 2013.

3.1 Water quality and hydrology

3.1.1 Existing environment

The Cattai Creek catchment drains significant areas of existing and proposed urban development in the North West Growth Centre. Cattai Creek has three main tributaries, First Ponds, Second Ponds and Caddies Creeks. The proposed EST would be located approximately 50m south of Second Ponds Creek.

Section 6.2.1 of the EA outlines the existing water quality and hydrology of Seconds Ponds Creek. The primary source of dry weather flow in Second Ponds creek is tertiary treated wastewater. Under natural conditions, the creek would only flow intermittently. Effluent from Rouse Hill WRP is discharged into Second Ponds Creek and water quality data collected by Sydney Water (Sydney Water 2005b) indicates that Second Ponds Creek has elevated levels of total nitrogen and ammonia that exceed relevant guidelines. Salvinia, Alligator Weed and Water Hyacinth have also been identified in Second Ponds Creek indicating its high eutrophic status.

3.1.2 Construction impacts and mitigation measures

The construction of the EST has the potential to impact water quality and hydrology as a result of:

- increased erosion and sedimentation from the construction site
- discharge of dirty or contaminated water from the construction site
- effects of flooding on construction activities

Disturbance, excavation and stockpiling of soils will be required for the construction of the EST. If not properly managed, disturbed soils can be eroded by runoff from the construction site into surrounding waterways causing changes to water quality such as sedimentation and eutrophication.

Due to the proximity of the EST to Second Ponds Creek, flooding could potentially impact on construction activities. The main potential impacts of flooding during construction are increased erosion of soils from disturbed areas and sedimentation of waterways. Some impacts on construction materials and equipment may also occur, but only in severe flooding events. It is considered unlikely that the EST will affect flooding behaviour in the area. Control and mitigation measures for soils and groundwater are to be implemented as per the EA, with the requirement for any additional measures detailed in section 3.4.

The potential impacts to water quality and hydrology associated with construction of the EST are unlikely to be significant given that they can be effectively managed by implementing the Project's CEMP, developed

and approved by the Director-General in accordance with CoA 6.1 on 31 July 2013. Sydney Water considers that no additional mitigation measures are required.

3.1.3 Operational impacts and mitigation measures

The operational impacts of overflows from the wastewater transport system are discussed in detail in the EA. Sydney Water has agreed acceptable wet weather overflow frequencies for each of its wastewater systems as specified in the Environmental Protection Licences granted under the *Protection of the Environment Operations Act 1997*. The construction of the storage tank for SPS1107 is required to ensure the EPL requirements for the Rouse Hill wastewater system are met in the future. Sydney Water will operate and maintain the wastewater system, including the new EST, to ensure that this acceptable frequency of overflows is not exceeded.

The EST is located close to Seconds Ponds Creek which would periodically experience flooding. The storage tank will be located in flood prone land, but the infrastructure would be water tight and not impacted by flooding should it occur. During operation, the EST will have negligible impact on existing flooding.

3.2 Terrestrial flora and fauna

3.2.1 Existing environment

Cumberland Ecology undertook a flora and fauna assessment of the proposed emergency storage tank, including the disturbance area required to build it (**Appendix B**). The survey was undertaken on 17th February 2014 and 12th March 2014 to determine the vegetation communities to be impacted and presence of any threatened flora or fauna species. Shale-Sandstone Transition Forest (SSTF) was the only vegetation community identified on the subject site. This community is listed as an endangered ecological community (EEC) under both the *Threatened Species Conservation Act 1995* and the *Environmental Protection and Biodiversity Conservation Act 1999.* The site provides potential habitat for a number of threatened flora and fauna species, however, none were detected onsite during the ecological surveys. The vegetation to the south-east and east surrounding the SPS was re-planted following construction of SPS1107 in 1999.

3.2.2 Construction Impacts and mitigation measures

Construction of the proposed EST would include the removal of approximately 0.2ha of disturbed Shale-Sandstone Transition Forest (**Figure 4**). An assessment of significance was undertaken under section 5a of the *Environmental Planning and Assessment Act 1979* which indicated that owing to the disturbed state of this community at the site, no significant impact on this community is likely as a result of the proposed activity. The patch of SSTF within the subject site is considered unviable in the long term owing to the high number of weed species in the subject land (Cumberland Ecology, 2014). The LGA contains much larger portions of the EEC adjacent to riparian areas along Smalls Creek and Cattai Creek.

There is potential for several threatened fauna species to occur within surrounding vegetation of the subject site including the Powerful Owl, Grey-headed flying fox and several microchiropteran bat species. Assessments of significance were prepared for these species which indicated that no significant impacts are likely to occur.

On completion of construction, the site will be replanted with SSTF native species (except for the area occupied by the EST) and continue to be managed under the existing vegetation and land management contract for Rouse Hill Trunk Drainage Land (land which is surrounding the EST site and owned by Sydney Water).

Implementation of the Projects' Flora and Fauna Management Plan (FFMP) would occur to minimise impacts to the greatest extent possible, including pre-clearing ecological surveys. No additional mitigation measures above those already contained in the FFMP are considered necessary.

Figure 4 Vegetation mapping for EST area

Figure 2.1. Vegetation Communities and Surveys at the Subject Site

3.3 Indigenous (Aboriginal) heritage

3.3.1 Existing environment

A search of the Aboriginal Heritage Information System (AHIMS) database, maintained by OEH was carried out on 19 February 2014. No registered sites were located within the study area, however there were 3 listed sites within 500m of the study area (#45-5-0967, 45-5-0976 and 45-5-0763). Of these sites, two have been destroyed through previous development (#45-5-0976 and 45-5-0763) and the other site (#45-5-0967) is a rock shelter some distance (approximately 300m) from the EST.

The study area contains two of the landform features specified by OEH as having potential to contain Aboriginal objects; one being within 200m of a waterway (Seconds Pond Creek) and the other being within areas with outcropping rock which may contain caves or rock shelters.

A site known as RH/SP9 SPOP 8 'Potential Archaeological Deposit and Artefact Scatter with Deposit' was not recorded in AHIMS. Despite not being recorded in AHIMS, the site has been broadly captured in the Bobbie Oakley (2007) assessment of the Cattai Creek carrier as part of the NWGC1 EA. This site was originally recorded in 1993 by JMCHM as RH/SP 9, it was subsequently test excavated in 1999 before the construction of the existing SPS1107.

The test excavations of RH/SP9 SPOP 8 revealed that the site contained significant artefact densities in some areas, with over 1000 artefacts being recovered from 18 test pits, and was considered by JMCHM to be of moderate-high significance. The site encompasses the lower slopes and terraces adjacent to the creek and an overlay of the sites curtilage based on a mud map in the report indicates it encompasses much of the proposed storage tank area (refer to **Figure 5**).

JMCHM recommended that RH/SP9 was worthy of salvage excavation before the SPS 1107 was constructed and the remaining majority (92%) of the site should be considered worthy of conservation.

A site inspection was conducted by AHMS archaeologists in March 2014 to verify the results of the background research and determine the presence or absence of Aboriginal objects, archaeologically sensitive landforms and existing disturbance within the study area. Ground surface visibility was relatively low throughout the study area (<10%) due do vegetation regrowth. The area has been subject to previous ground disturbance associated with the construction of civil infrastructure (roads, cycle path and drainage) and a considerable amount of rubbish dumping.

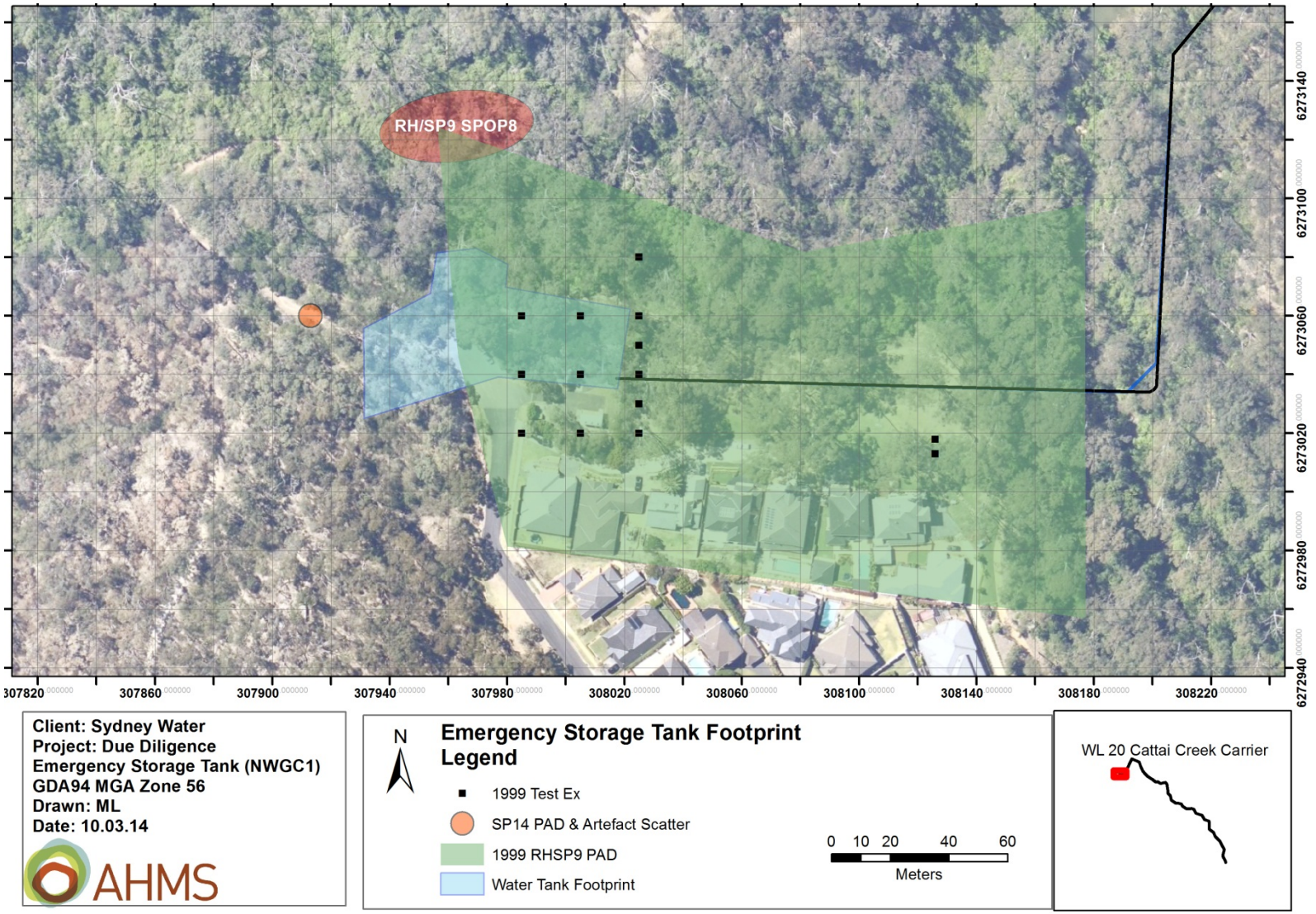
Two Aboriginal objects were identified during the site visit, one yellow silcrete proximal flake and one red silcrete proximal flake. The objects had been exposed in a white-yellow sand body at the edge of a dirt walking track approximately 20m away from the proposed development footprint (**Figure 5**). The full extent of the RH/SP9 SPOP8 site could not be relocated during the site inspection due to the dense regrowth vegetation, but it is considered highly likely that the finds above reflect its western edge.

3.3.2 Construction impacts and mitigation measures

Archaeological and Heritage Management Systems (AHMS) undertook an Aboriginal heritage due diligence assessment and site inspection for the proposed EST (AHMS, March 2014), which is included in **Appendix D**. This advice was provided to meet the Office of Environment and Heritage's (2010) *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* and determine whether any further archaeological assessment is required.

The results of the desktop assessment and visual inspection, indicated that the proposed emergency storage tank area contained a landform of archaeological interest (within 200m of waters), and is within a site of

Figure 5 Location of Aboriginal heritage sites and EST



moderate-high significance (evident through the recovery of 1,234 Aboriginal objects).

In summary, the results of the desktop due diligence assessment and visual inspection indicate that the proposed EST has the potential to impact Aboriginal objects/ sites with moderate-high significance. The artefacts located to the west of the storage tank (refer to 'SP14 & PAD on **Figure 5**) during the visual inspection in March 2014 are considered likely to indicate the western edge of the same site RH/SP 9 SPOP 8. Therefore given the extent of the PAD, it is considered very unlikely the EST could avoid disturbing the site altogether.

Further archaeological work will be undertaken prior to any construction, in accordance with the Project's Heritage Management Plan (Abigroup, July 2013), more specifically:

- An AHIMS site card for RH/SP9 SPOP 8 will be prepared and lodged with OEH (completed in March 2014)
- Information on this site and the proposed storage tank will be provided to the registered Aboriginal parties and OEH at the earliest opportunity (commencing April 2014)
- A methodology for test excavation and potential salvage prior to construction is developed and sent to the RAPs for comment
- Test excavation and salvage is conducted under the guidance of the Project's archaeologist with the RAPs prior to commencement of construction.

3.3.3 Operational impacts and mitigation measures

The EST will require routine maintenance and repair during operation, which will require access to maintenance structures. As these areas would have been disturbed during construction, any further impacts on Aboriginal heritage are considered unlikely. Where maintenance occurs in areas of low disturbance or in the vicinity of identified objects, sites and places, due diligence measures will be satisfied prior to undertaking the works.

3.4 Soils and groundwater

3.4.1 Existing environment

Reference to the Sydney 1:100 000 Geological Series Sheet indicates that the EST is underlain by Hawkesbury Sandstone formation. This formation generally consists of medium to very coarse-grained quartz sandstone, minor laminated mudstone and siltstone lenses. Overlying soils are typically clayey, moderately reactive and have low permeability.

A geotechnical investigation was undertaken of the proposed EST location and the results indicate the following ground conditions:

- A thin surficial covering of pavement, topsoil filling, filling and clay soils to depths of 0.1m to 0.7m that is typically poorly to moderately compacted or stiff;
- Weathered sandstone bedrock that is generally moderately weathered and typically of medium to high strength.

The boreholes were drilled to a depth of 10m and no free groundwater was encountered during the investigation. Although it is considered possible that groundwater could lie at relatively shallow depth at or near the rock surface particularly following periods of heavy rainfall (Douglas Partners, 2014).

3.4.2 Construction impacts and mitigation measures

It is not anticipated that groundwater will be encountered during bulk excavation of the EST. However, should groundwater (or collected rainwater) need to be pumped out of the excavation, it will be tested (and

treated if required) within the excavation prior to re-use, appropriate discharge or disposal as per the Project's Soil and Water Management Plan (Abigroup, July 2013). The large grassed area to the east of the EST area may be suitable for discharge of water if required during construction.

Excavation of a large amount of sandstone will be required to build the EST, however, no long-term stockpiles would be created onsite and any short-term ones would be appropriately contained with erosion and sedimentation controls as per the management measures in the Project's Soil and Water Management Plan. Some of the spoil may be temporarily stored at another facility until required to create embankments in final site restoration.

An embankment will need to be created on the northern side of the EST as the structure sits approximately 1.5m above the ground at the northern end. Appropriate sediment controls and stabilisation of the embankment would occur during construction and landscaping carried out as soon as practicable following construction.

Therefore, providing mitigation measures are implemented and maintained as per the Project's CEMP, soil and groundwater impacts associated with the construction of the EST are expected to be minimal.

3.4.3 Operational impacts and mitigation measures

There are not expected to be any operational impacts to soil and groundwater as a result of operation of the EST as the tank will be sealed and self-draining back to SPS1107.

3.5 Traffic, transportation and access

3.5.1 Existing environment

The northern end of Mile End Road (north of Withers Road) is a single lane road carrying local traffic to and from the northern area of Rouse Hill. It would generally have relatively low volumes of traffic due to the fact that residential development is only located on the eastern side of the road, with some heavy truck movements associated with industrial landuse (including the Rouse Hill RWP) on the western side of the road.

There is a private road to the south east of the existing SPS1107, which is used by local residents at the end of Mile End Road to access their properties.

The Smalls Creek cycleway begins at Mile End Road and continues eastward.

3.5.2 Construction impacts and mitigation measures

During peak construction, an estimated 10 heavy truck movements per day will be required to transport excess spoil away from the site for a period of approximately 6 weeks. These would travel to/ from the site via Windsor Road then onto Mile End Road and would not be allowed to queue along Mile End Road.

In addition, during concrete pours, approximately 30 trucks per day will be required for a period of approximately 1-2 weeks.

Access to the private road for Mile End residents overlooking SPS1107 would be maintained at all times during construction.

A temporary adjustment to the Smalls Creek cycleway will be required to maintain access throughout the construction period. This will be a north/south temporary path connecting to the private laneway opposite 171 and 173 Mile End Road. The area will be reinstated on completion.

A small amount of construction parking will be provided in the worksite, however, the main construction parking is likely to be provided in the industrial area further south on Mile End Road, with car-pooling provided to/ from the site.

Overall there will be short-term impacts for local residents of Mile End Road during construction associated with heavy truck movements and construction vehicles. Mitigation measures contained within the approved Traffic Management Plan (Abigroup, July 2013) would be implemented including:

- Construction speed limits will be implemented
- Residential access will be maintained at all times during construction
- No heavy truck queuing along Mile End Road.
- The Smalls Creek cycleway would be reinstated at the end of construction.
- Site specific Traffic Control Plan prepared and implemented for the works.

3.5.3 Operational impacts and mitigation measures

Sydney Water access to the EST would only be required periodically following wet weather events during operation. There is adequate parking within the existing SPS1107 for Sydney Water maintenance vehicles accessing the EST. No further operational traffic impacts or mitigation measures are required.

3.6 Waste generation and management

3.6.1 Construction impacts and mitigation measures

The main waste produced as a result of construction of the EST would be approximately 2,800m^3 of excavated sandstone, in additional to some topsoil/ fill and general construction waste. This material will be used for backfilling around the structure and the creation of embankments where required. The remainder of the material will be transported off-site for reuse and/ or disposal. Mitigation measures contained in Annexure A5 (Waste and Resource Control Measures) of the Project's CEMP (Abigroup, 2013) will be implemented.

3.6.2 Operational impacts and mitigation measures

There will be no additional operational waste impacts or mitigation measures required for the EST.

3.7 Air quality / odour

3.7.1 Existing environment

The existing environment for air quality and odour within the Project area, which includes the EST area, is described in section 6.11 of the EA.

3.7.2 Construction impacts and mitigation measures

Excavation, construction traffic, and wind erosion of cleared areas and stockpiles may impact air quality through dust generation.

The construction of the storage tank has the potential to cause dust generation through:

- site clearing
- rock-breaking to excavate the storage tank in sandstone
- spoil loading and transport.

The closest residences are located approximately 30m to the south east of the proposed EST at the end of Mile End Road. There are potential short-term dust impacts to these residents, mainly during excavation of the storage tank. However, these potential impacts can be adequately managed through typical dust

suppression measures as identified in the Project's CEMP (Abigroup, July 2013) including water suppression, covering of vehicle loads and minimising ground disturbance where possible.

No odour impacts are expected during construction.

3.7.3 Operational impacts and mitigation measures

The storage tank is not expected to produce any odour during operation as it is a sealed structure and only fills around once per year (under ultimate capacity conditions) and is self-draining. A new vent stack will be built at the SPS1107 site and this would be used to ventilate the new EST as well. There is an existing vent stack at SPS1107 site and this will be decommissioned once the new vent stack is built.

Any odour complaints received during maintenance activities associated with the structure would be handled in accordance with Sydney Water's existing procedures.

3.8 Noise and Vibration

3.8.1 Existing environment

Existing background noise levels in the area are currently characterised by the natural bushland environment. The site is bounded by residential receivers to the south, open grassed area to the east and bushland to the north and west. The nearest residential receivers are located on Mile End Road approximately 30 metres to the south of the site.

A noise and vibration assessment of the proposed emergency storage tank was undertaken by AAJV in March 2014 (**Appendix D**). A noise logger was placed in a bushland area on the western side of Mile End Road in line with the nearest residential receiver (167 Mile End Road) to record background noise levels over a 7 day period in February 2014. This location was selected as representative as it provided an accurate measurement of the existing noise environment at all residences in the vicinity in the absence of noise from sources such as pool pumps and air conditioning units specific to a single residence (AAJV, 2014). Some of the background noise data during this 7 day period was excluded as it was affected by inclement weather. However, the remaining data is consistent and therefore considered representative of the existing noise environment.

The results of this background noise monitoring indicate that the Rating Background Level L_{A90} dB(A) is 37dB(A) for the daytime period (7am to 6pm, Monday to Saturday).

3.8.2 Construction impacts and mitigation measures

Noise criteria

The EPA's *Interim Construction Noise Guideline (ICNG)* provides the basis for construction noise assessments in NSW. The rating background level (RBL) is used when determining the noise management level (NML). **Table 1** below sets out management levels for noise at residences and how they are to be applied according to the EPA's ICNG. The NML for the construction of the EST will be 47dB(A).

Table 1 Noise Management Level as per EPA guidelines for construction of EST

Setting and Applying Noise Management Levels (NMLs) at residences		
Time of Day	**NML, $LA_{eq,\ 15\ min}$, dB(A)**	**How to apply**
Recommended standard hours: • M to F, 7am to 6pm	Noise affected RBL + 10dB(A) = 37dB(A) + 10dB(A)	The noise affected level represents the point above which there may be some community reaction to the noise. • Where the predicted or measured $LA_{eq,\ (15\ min)}$ is greater

• Sat, 8am to 1pm • No work Sundays or Public Holidays	**= 47dB(A) for this project**	than the noise affected level, the proposed should apply all reasonable and feasible work practices to meet the noise affected level. • The proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels, duration and contact details.
	Highly noise affected 75dB(A)	The highly noise affected level represents the point above which there may be strong community reaction to noise. • Where noise is above this level, the relevant authority (determining, consent or regulatory) may require respite periods by restricting the hours that the very noisy activities can occur, taking into account: times when the community are less sensitive to noise during the day and whether the community is prepared to accept a longer period of construction in exchange for restrictions on construction hours.

Noise impacts

The proposed construction works will involve the use of equipment such as chipper, chainsaw, grader, excavator with rock hammer, concrete truck and pump, grader, rock drill, direction drill, compactor and hand tools.

Receivers will be affected by construction noise and vibration associated with the following activities:

- Clearing and grading
- Excavation – rock breaking and loading of spoil
- Thrust boring of connecting pipework
- Construction of emergency storage tank – base, walls, backfill, roof slab
- Finishing works.

Construction noise levels were predicted by AAJV at nearby residences using SoundPLAN noise modelling software. The modelling accounts for topography, any building/ structures which may provide noise shielding and representative equipment list (noise sources) to construct the EST.

The proximity of properties to the work sites and low ambient noise levels in the immediate surrounding area means that construction noise levels are predicted to exceed the noise management level of 47dB(A) outlined in **Table 1** above as follows:

- Clearing and grading – maximum 37 dB(A) exceedance at the nearest affected receivers
- Excavation – maximum 37 dB(A) exceedance at the nearest affected receivers
- Thrust bore – maximum 18 dB(A) exceedance at the nearest affected receivers
- Emergency storage tank base and walls – maximum 23 dB(A) exceedances at the nearest affected receivers
- Backfill – maximum 12 dB(A) exceedance at the nearest affected receivers
- Roof slab – maximum 19 dB(A) exceedance at the nearest affected receiver
- Finishing – maximum 22 dB(A) exceedance at the nearest affected receiver

These predicted construction noise levels and exceedances are based upon worst case scenarios of all plant operating simultaneously for a continuous 15 minute period for each work activity/ stage. For the majority of construction period, noise levels would be considerably lower.

The predicted noise levels exceed the highly noise affected residential criteria of 75 dB(A) during clearing and grading and excavation stages for the four residences closest to the works (167, 169, 171 & 173 Mile End Road) (refer to **Figure 6**).

The worst case exceedances for clearing and grading occur during operation of the chainsaw and chipper which would only occur for 1-2 days.

Excavation of the EST will take approximately 5-6 weeks, although noise levels will reduce as the depth of excavation progresses. This is because the excavators would be sitting inside the excavation after the initial 1-2 weeks of surface excavation and noise shielding would be provided by the rock walls of the excavation.

Vibration criteria and impacts

Vibration intensive activities such as use of hydraulic hammers would be operated so as to minimise disturbance to the occupants of buildings and avoid the risk of damage to buildings and other structures.

In relation to preventing structural damage, the German Standard DIN 4150-Part 3 'Structural vibration in buildings – Effects on Structures' provides recommended maximum levels of vibration that reduce the likelihood of building damage caused by vibration.

In relation to human comfort levels, the NSW EPA has published a document 'Assessing Vibration: a technical guideline'. This document is based on guidelines contained in BS6472: 1992 – Evaluation of human exposure to vibration in buildings.

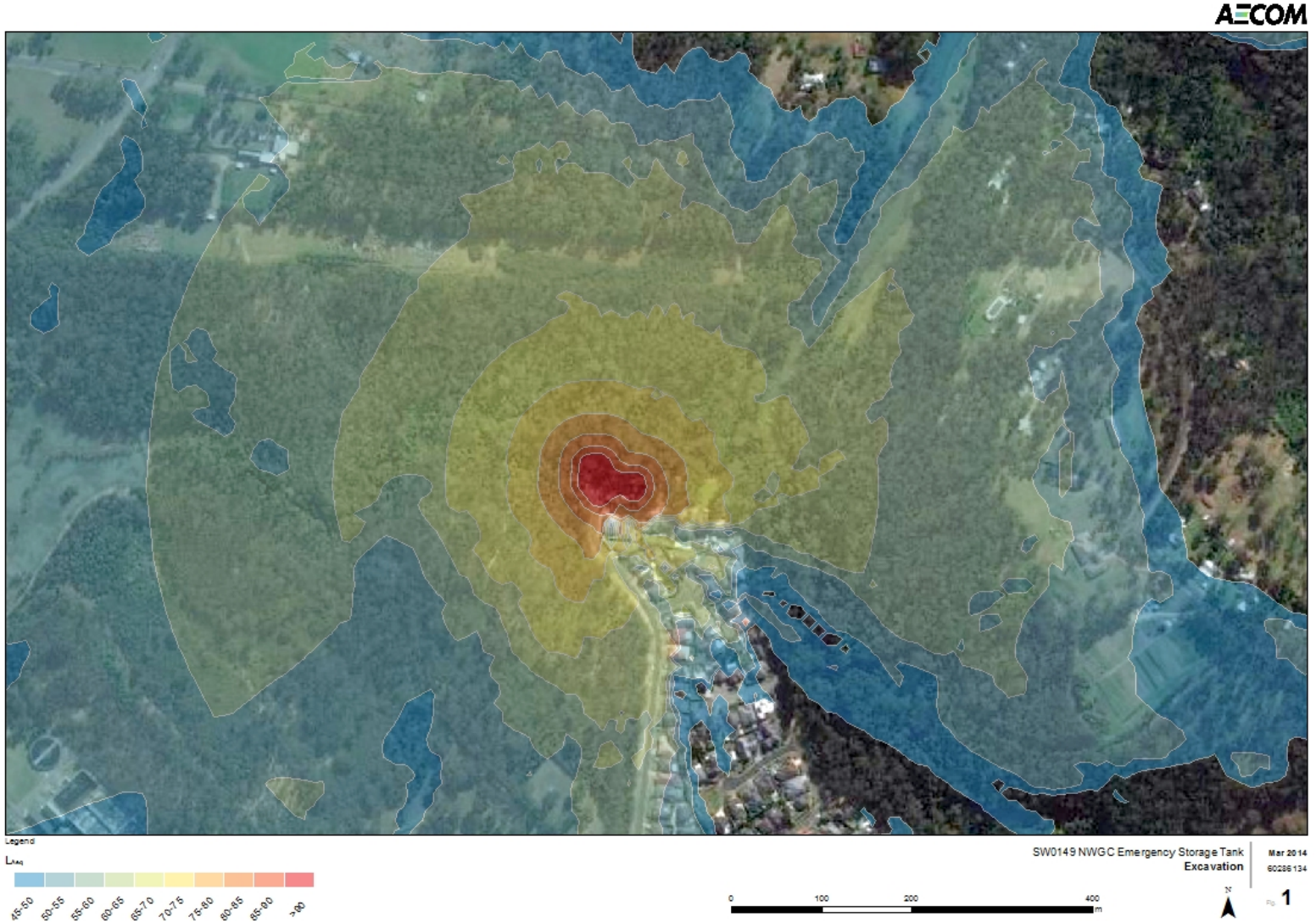
The criteria in these two standards have been applied to calculate the safe working distances applicable to this project for vibration inducing plant to be used for construction of the EST and are listed below in **Table 2**:

Table 2 Recommended safe working distance for vibration inducing plant

Recommended safe working distances for vibration inducing plant			
Plant	**Rating/ description**	**Safe Working Distance**	
		Cosmetic Damage	**Human Comfort**
Large Hydraulic Hammer	1600kg – 18 to 35t excavator	22m	73m

The residence directly to the south of the project site (167 Mile End Road) is the nearest receiver and is located approximately 40m from where the rockbreaking for the EST would occur. At this distance, structural damage is unlikely to occur whilst using a 35t excavator with hammer, however, exceedances of the human comfort level may occur, should the residents be home during the daytime when works are occurring. Consultation with the nearest residents would occur prior to construction which would assist in construction planning and determining whether respite periods are required during the rock-breaking activities.

Figure 6 Noise contours showing predicted construction noise levels during clearing/ grading and excavation activities (as per Appendix D)



Noise and vibration mitigation measures

The Project's NVMP would be reviewed and updated to ensure all of the following reasonable and feasible mitigation measures are implemented for the EST works:

- Non-tonal reversing alarms would be fitted on all construction plant and equipment where possible
- The offset distance between noisy plant items and closest receivers would be maximised where possible
- Trucks would travel via major roads and routes and not be allowed to queue near residential dwellings
- Consultation (door knocks) would be undertaken of the closest residences identified as being highly noise affected to understand whether any respite periods are needed during the noisiest activities.
- Notification (letterbox drops) would be undertaken of all other nearby receivers to inform them of the upcoming construction works and potential noise impacts
- The Projects' community complaints process would continue to be implemented for these works and amending work practices wherever possible would be considered in the event of noise or vibration complaints being received.
- Pre-construction dilapidation surveys of the most affected receivers would be undertaken.
- Vibration monitoring would be undertaken during the initial rock breaking activities to confirm levels at the nearest receiver.
- Any out of hours works would be undertaken in accordance with the procedure approved in the Project's Noise and Vibration Management Plan.

3.8.3 Operational impacts and mitigation measures

The EST would not generate any operational noise as no mechanical equipment/ pumps are required to operate the EST. The EST is self-draining (ie. by gravity) via a non-return valve on the low level line back to the SPS1107 after it has filled. There would be no additional pumps/ mechanical equipment installed at the existing SPS1107.

3.9 Visual amenity

3.9.1 Existing environment

The proposed EST is located at the end of Mile End Road, approximately 8m north-west of the existing SPS1107 site. The visual amenity for the residents located at the end of Mile End Road is considered high due to their elevation and outlook over the bushland surrounding Second Ponds Creek. In addition, there is an open grassed area with mature native trees, opposite the residents. This open grassed area is owned by Sydney Water and not a formal park, however, contributes to the visual amenity of the local area. The existing SPS1107 site is part of the existing visual landscape for these residents.

3.9.2 Construction impacts and mitigation measures

A construction area would need to be established to the west of the proposed storage tank for operation of a crane and material storage. This area will be used for around 9 months and would cause a short-term visual impact to the local residents opposite the area. Temporary hoardings/ screening will be erected on the site fencing to decrease visual impact where appropriate. Good housekeeping practices will be employed on site

to minimise visual impacts. This area will be restored at the completion of construction activities with removal of all equipment and re-planting of native species.

The construction of the EST will involve clearing an area of approximately 0.2 ha native vegetation, which may also cause a temporary visual impact to the residents at the end of Mile End Road. Impacts will be minimised through the implementation of the general mitigation measures as detailed in the Project's CEMP, including the use of suitable screening, good housekeeping at all times and landscaping/ restoration at the completion of works.

3.9.3 Operational impacts and mitigation measures

The EST will be located partially above ground on the northern side (approximately 1.5m above the existing ground level) and generally at ground level on the southern side. A safety handrail will be required around part of the structure on the northern side where it is elevated more than 300mm above ground level. This handrail will be painted environmental green. Vehicle barriers (galvanised steel colour) would be installed on the southern side of the EST to prevent vehicular access from Mile End Road. Replanting of the areas that were cleared during construction for temporary hardstands will be undertaken; however, the actual area occupied by the storage tank will not be able to be replanted with native species and so will cause a permanent visual change in the landscape.

There is only one potentially affected residence (167 Mile End Road) which currently has a view of the proposed emergency storage tank area (refer to **Figure 7**). The other residences do not have a direct view of the proposed emergency storage tank area due to existing planting along the boundary of the SPS1107 site (refer to **Figure 8**). Given there is an existing SPS adjacent to the works and the minor nature of the change in relation to the remaining bushland areas, the additional visual impact of a storage tank is not considered to be a significant impact.

Visual impacts of the site will be minimised through appropriate battering on the northern side and re-landscaping with native species.

Stakeholder consultation will also continue with affected residents as detailed in section 4 of this report.

Figure 7 View of proposed EST area from 167 Mile End Road

Figure 8 Established screening of existing SPS1107 site to remaining residents in private road

3.10 Environmental Impact Gap Analysis and Mitigation Measures

This section outlines the potential additional impacts of the EST compared to those identified for the approved Project. The comparison includes the key potential environmental aspects assessed in the EA and PPR that were deemed to be relevant to the EST. **Table 3** summarises the relative change in environmental impacts associated with the EST that were identified in section 3.

The environmental impacts identified, can be effectively managed consistent with the mitigation measures listed in the EA, PPR and MCoA and those approved in the Project's CEMP and associated Management Plans.

Table 3 Change in environmental impact due to the proposed amendments

Aspect	Relative change in environmental impact	Mitigation measures required
Water quality and hydrology	No additional impacts	No additional mitigation measures. Implement Project's Soil and Water Management Plan.
Terrestrial flora and fauna	Additional clearing of up to 0.2 ha of highly degraded endangered ecological community Shale-Sandstone Transition Forest.	Implement Project's Flora and Fauna Management Plan, including pre-construction ecologist inspection and restoration with SSTF native species and ongoing maintenance.

Aspect	Relative change in environmental impact	Mitigation measures required
Indigenous (Aboriginal) heritage	Impact to RH/SP9 SPOP 8 site, considered to be moderate-high significance	Further archaeological work for the EST area and an update to the Project's Heritage Management Plan (Abigroup, July 2013) would be required, more specifically: • An AHIMS site card for RH/SP9 SPOP 8 is prepared and lodged with OEH (complete March 2014) • Consultation with RAPs and OEH regarding this this site and the proposed EST (starting April 2014) • A methodology for test excavation and potential salvage prior to construction is developed and sent to the RAPs for comment • Test excavation and salvage is conducted under the guidance of the Project's archaeologist with the RAPs prior to commencement of construction.
Non-indigenous heritage	There are no listed non-indigenous heritage items in the vicinity of the EST.	Implement Heritage Management Plan (Abigroup, July 2013) if required for an unexpected heritage find during construction.
Soils and groundwater	No additional impacts	No additional mitigation measures. Implement Project's Soil and Water Management Plan.
Air quality / odour	There is the potential for dust generation during rock-breaking works for the EST. No odour impacts are likely during operation.	No additional mitigation measures. Implement Project's CEMP to ensure dust emissions are minimised.
Noise and vibration	Noise exceedances are predicted during clearing and rock excavation works for the nearest residences. Vibration impacts may also occur during rock-breaking works for the closest residents.	An update to the Project's Noise and Vibration Management Plan would be required, including noise/ vibration monitoring during rock-excavation. Complete dilapidation surveys for the closest residences prior to construction. Consult with local residents to ensure noise/ vibration impacts are minimised (eg. through implementation of respite periods for rock hammering if needed).
Visual amenity	Some visual impact during construction and a permanent loss of some vegetation due to construction of the EST for the closest resident.	Restore and replant at the completion of construction works.

Aspect	Relative change in environmental impact	Mitigation measures required
Aquatic ecology	No additional impacts	No additional mitigation measures
Hazards and risks	No additional impacts	No additional mitigation measures
Human Health	No additional impacts – does not involve use of recycled water.	No additional mitigation measures
Energy and greenhouse gas emissions	Minor increase in energy use and greenhouse gas emissions would be required to construct the storage tank. Storage tank has been designed to be self-draining to minimise need for pumping and associated energy use..	No additional mitigation measures
Social impacts	Addressed in Noise, Traffic and Visual amenity and Air Quality sections through Section 3 of this document.	Ongoing consultation throughout the pre-construction and construction period in accordance with the Project's Community Communications Strategy. Continue to maintain the Project's Complaints handling procedure to ensure prompt response to any construction complaints.

4 Stakeholder engagement and consultation

4.1 Consultation during preparation of the modification

4.1.1 Council consultation

Sydney Water has consulted The Hills Shire Council during detailed design for the EST to ensure that the location of infrastructure is compatible with other infrastructure services and future landuse planning. One of the main reasons why Option 3 was selected as the preferred option is to ensure the EST is not located in the road reserve of a future extension to Mile End Road. Council's comments on the proposed EST and how these were addressed in the design are detailed in **Table 4** below.

Table 4 Council comments on proposed EST and how these were addressed in the design

Council comment – email dated 7/03/14	Lend Lease/ Sydney Water response – 10/03/14
The section of Crown road is proposed to be taken over by Council. It is anticipated that a turning head will be constructed adjacent to the proposed tank. Please confirm the tank will be constructed at natural ground level on the southern side where Council intends to construct a turning head to service the adjoining private residences.	The southern edge of the tank is generally at ground level, with a small battering (<0.5m) to the existing ground level from the top of the tank.
There are two conduits running along the Crown Road reserve. Council requested details of these conduits to avoid any conflict with future road construction/ extension.	'Work as Executed' drawings will be issued to Council to confirm details of these conduits, following construction.
Councils' engineering standards for discharging stormwater to an open culvert is generally 1-2%. The plans show 0.5% grade which may cause sedimentation problems.	The final design drawings show an extension to the existing stormwater drain with a minimum 1% grade (refer to Drawing SU0175/02 in **Appendix F**).
Council has no concerns with the location of the cycleway.	N/A

Sydney Water will continue to consult with The Hills Shire Council prior to and during construction.

4.1.2 Community information night

In February 2014, letters were sent to approximately 50 local residents closest to the EST site inviting them to a Community information night regarding the proposed storage tank. Two local residents attended the Community information night on 19th February. They had no major concerns with the proposal, but requested a copy of the presentation slides for their reference. A copy of the letterbox drop invite, distribution map, attendance sheet and presentation slides are provided in **Appendix E**.

4.1.3 One on one consultation with residents

In March 2014, all residents located on the private road at the end of Mile End Road were doorknocked as these are the closest receivers to the EST site.

There were three residents home at the time (167, 171 & 175 Mile End Road), with letters being left at the remaining five residents (169, 173, 177 Mile End Road and 14 & 16 Berkeley Grove), who were not home at the time.

The issues raised by residents which were home at the time of the doorknock included potential traffic impacts and site security, as there had been a recent break-in at one of the houses. It was explained that the construction site would be securely fenced/ locked after hours and that traffic would be managed to avoid queuing and school drop off/ pick up times would also be avoided wherever possible. They were also advised that ongoing community liaison will occur to mitigate any impacts, especially if noise became excessive and they needed respite from rock-hammering.

4.2 Future consultation

A Project Community Communications Strategy has been prepared and approved by the Director-General on 30 April 2013. The following will be implemented in accordance with the Strategy:

- the local residents will continue to be provided information about construction work and potential impacts, this will include door-knocking and letterbox drops
- access to properties will be maintained at all times
- local residents will be made aware of the complaints procedure and any complaints will be responded to promptly
- areas are appropriately restored.

5 Conclusion

This application for modification seeks approval for additional water related services for the North West Growth Centre first release precincts, specifically the construction and operation of an emergency storage tank adjacent to SPS1107, located at Mile End Road, Rouse Hill.

The proposed EST is required as part of the overall servicing strategy of the North West Growth Centre first release precincts and will ensure compliance with the Environmental Protection Licence for the Rouse Hill wastewater system into the future. The change is considered consistent with the objectives of the approved Project.

Under the former Part 3A, section 75W of the EP&A Act provides for the Minister for Planning and Infrastructure to modify a project approval, with or without conditions.

Sydney Water has assessed the proposed change and concluded that ecological, indigenous heritage and noise would be main impacts associated with the construction of the EST. An update to the Project's Noise and Vibration Management Plan and Heritage Management Plan will be required to incorporate additional mitigation measures for the construction of the EST. All other potential environmental impacts can be adequately mitigated by implementing the Project's CEMP and other associated Management Plans, approved by the Director-General on 31 July 2013.

The changes to the Project are not considered significant modifications to the nature of the Project. The types of activities and the impacts that would occur during the construction and operation of the Project with the proposed modification would be substantially the same as the approved Project as described in the EA and PPR. It is considered that the proposed modifications to the approved Project will not substantially increase the overall impact of the Project.

The Modification Proposal is consistent and can be carried out in accordance with the requirements of the Minister's Conditions of Approval. However, Sydney Water has identified that condition 1.1 should be updated to include a reference to this modification.

6 References

Abigroup, July 2013. *North West Growth Centre First and Second Release Precincts Package 2 and 3A Construction Environmental Management Plan, Flora and Fauna Management Plan, Construction Noise and Vibration Management Plan, Traffic Management Plan, Heritage Management Plan and Soil and Water Management Plan*

AECOM and Aurecon Joint Venture (AAJV), 2014. *NWGC Emergency Storage Tank Construction Noise and Vibration Impact Statement.*

Archaeological and Heritage Management Solutions (AHMS), 2014. *Aboriginal Heritage Due Diligence Advice – Emergency Storage Tank, Cattai Creek Carrier, Mile End Road, Rouse Hill, NSW.*

Cumberland Ecology, 2014. *NWGC1 Emergency Storage Tank Flora and Fauna Assessment for Sydney Water.*

Douglas Partners, 2014. *Report on Geotechnical Investigation No. 3 North West Growth Centre – Main WL20 First and Second Precincts, Package 2 and 3A.*

NSW Office of Environment and Heritage (OEH), 2010. *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales.*

Sydney Water, 2008a. *North West Growth Centre water related services for first release precincts – Environment Assessment*.

Sydney Water, 2008b. *North West Growth Centre water related services for first release precincts – Preferred Project Report*.

APPENDIX A Requested modification to CoAs

1. ADMINSTRATIVE CONDITIONS

Terms of Approval

1.1 The Proponent shall carry out the project generally in accordance with:

(a) Major Project Application 07_0125

(b) The EA;

(c) The Preferred Project Report

(d) The letter from Sydney Water Corporation to the Department of Planning, dated 15 March, 2010, title Project Number 07_0125 Modification to North West Growth Centre….

(e) North West Growth Centre Water Related Services for First Release Precincts Modification Assessment Report Apirl 2012:

(f) North West Growth Centre Water Related Services for First Release Precincts Modification Assessment Report Response to Submissions July 2012; and

(g) North West Growth Centre Water Related Services for First Release Precincts Modification Assessment Report, Emergency Storage Tank for SPS1107, March 2014; and

(h) The conditions of this approval.

APPENDIX B Ecological assessment, emergency storage tank, Cattai Creek carrier, Mile End Road, Rouse Hill (Ecological, 2014)

APPENDIX C Noise and vibration assessment, emergency storage Tank, Cattai Creek Carrier, Mile End Road, Rouse Hill (AAJV, 2014)

APPENDIX D Aboriginal due diligence advice – emergency storage tank, Cattai Creek carrier, Mile End Road, Rouse Hill, NSW

APPENDIX E Community information night details, 19 February 2014

APPENDIX F Design Drawings, March 2014, Site Layout Plan and Sections

CO-ORDINATE TABLE		
POINT	EASTING	NORTHING
1	307959.744	6273073.394
2	307972.912	6273071.524
3	307957.002	6273054.087
4	307970.170	6273052.218
5	308009.313	6273049.025
6	307998.743	6273049.315
7	307995.121	6273049.829
8	307997.494	6273046.602

NOTES

1. HYDRANT. INSTALL DN100 DICL FLUSHING/WASHOUT BEND WITH THRUST BLOCK AND DN100 x DN80 DICL TAPER RISER HYDRANT AND SURROUND TO WAT-1205.
2. SUBJECT TO SITE INVESTIGATION NEW CONDUIT MAY NEED TO BE INSTALLED DIRECTLY FROM SWITCHROOM SUBJECT TO SPACE AVAILABILITY IN ELECTRICAL PIT. SEAL NEW CONDUIT WITH NON SETTING COMPOUND TO EXCLUDE GAS AND VERMIN EACH END.
3. COMPONENTS OF THE EXISTING VENTSHAFT CAN BE REUSED IF INTEGRITY OF SHAFT IS MAINTAINED
4. VEHICLE CRASH BARRIER 'RAILGARD' TYPE WITH 'STUBBY NOSE' ENDS. (ARMCO BARRIERS OR EQUIVALENT). BARRIERS 1000 APART WITH 1000 OVERLAP AND ENDS EXTEND 500 PAST TANK ON EACH SIDE. INSTALL BARRIER SYSTEM WITH FOUNDATION SUPPORTS TO MANUFACTURERS REQUIREMENTS.

PROVIDE HANDRAILS (GMS) WITH KICK PLATE TO AS1657 ACROSS NORTH OF STORAGE TANK AND DOWN EACH SIDE WHERE TOP OF TANK IS GREATER THAN 300 ABOVE TOP OF BATTER

LANDSCAPE BATTERS

REINSTATE CYCLE WAY PAVEMENT ON EVEN GRADE (1:8 MAXIMUM) FROM TOP OF BATTER.

NEW GRASS SWALE TO DIRECT STORMWATER ALONG SIDE OF CYCLE WAY RAMP

TOP OF BATTER RL30.55

TOP OF BATTER RL30.35

SP1

SP2

LOT 2 DP835727

ACCESS HATCH. FOR DETAILS SEE DRAWING No DTC/3300 SHEET 1 TO 4

ACCESS HATCH

EMERGENCY STORAGE No 2 (SU0175) FOR DETAILS SEE DRAWING No SU0175/05

CYCLE WAY

EXISTING CYCLE WAY

SMH

BOTTOM OF BANK

FORM NEW GRASS DISH DRAIN 150 DEEP TO EXTEND EXISTING DRAIN AT A MIN. OF 1% GRADE TO DISCHARGE PAST STRUCTURE

B.H. WL20-SF7

B.H. WL20-SF8

REFORM EXISTING BATTER

HIGH LEVEL LINE ACCESS HATCH

B.H. WL20-SF6

I.L. 30.050

B.H. WL20-SF5

ACCESS HATCH

LOW LEVEL LINE ACCESS HATCH

TOP OF BANK

REINSTATE FENCE ON COMPLETION OF TRENCHING

EXISTING DN300 UPVC VENT PIPE, VENT SHAFT AND BASE TO BE REMOVED

DN600 GRP HIGH LEVEL LINE (0.5% MIN FALL FROM EMERGENCY STORAGE No 2)

SP7

SP6

SP5

TOP OF BANK

WIRE

CYCLONE FENCE

FOR PENETRATION DETAILS SEE DRAWING No 29/524

DN450 GRP LOW LEVEL LINE (0.5% MIN FALL TO EMERGENCY STORAGE No 1)

PROPERTY BOUNDARY

SP3

SP4

I.L. 23.30

HYDRANT NOTE 1

EXISTING TREES TO REMAIN

DN300 UPVC RRJ VENT LINE LAY ON 0.5% FALL TO STORAGE No 1

NEW VENT SHAFT 18m HIGH SEE STANDARD DRAWINGS 115-117/524 FOR DETAILS AND NOTE 3

SP8

DN450 FLAP VALVE

I.L. 22.80

I.L. 29.950

SEAL OPENING WITH EPOXY MORTAR

EXISTING EMERGENCY RELIEF STRUCTURE

B.H. WL20-SF4

ELECTRICAL TURRET

VEHICLE BARRIERS 1000 CLEAR OF TANK. SEE NOTE 4

REINSTATE PAVEMENT AND SEAL ON COMPLETION OF WORKS

B.H. WL20-SF3

B.H. WL20-SF2

B.H. WL20-SF1

RE-ROUTE CYCLE WAY AND REINSTATE

BORE HOLE WL20-2A

I.L. 29.380

DN525 CATTAI CREEK CARRIER

EXISTING INLET MAINTENANCE HOLE

CONNECT NEW DN600 HIGH LEVEL LINE INTO INLET MAINTENANCE HOLE SEE DRAWING No 29/524 FOR DETAILS

EXISTING PUMP STATION SPS1107 AND EMERGENCY STORAGE No 1

LOT 2 DP839874

MILE ROAD EASEMENT

DN100 DICL RECYCLED WATER LINE TO HYDRANT

NEW DN80 ELECTRICAL CONDUIT

EXISTING DRAIN

BORE HOLE WL20-1A

MILE END ROAD

GATE

CONNECT INTO EXISTING RECYCLED WATER MAIN. FOR DETAILS SEE DRAWING No SU0175/03

SEE NOTE 2

EXISTING ELECTRICAL SWITCHROOM

PLAN
1:200

1:200 0 2000 4000 6000 8000 10000mm
2000 A3

3	100% DESIGN ISSUE	G.F.	07.03.14
2	90% DESIGN ISSUE	G.F.	12.02.14
1	PRELIMINARY	G.F.	17.12.14
LETTER	DETAILS OF AMENDMENT	APP'D	DATE

Abigroup Constructing Australia's Future

SKM

SINCLAIR KNIGHT MERZ
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DESIGNED G.FISHER
DRAWN T.McALLISTER
VERIFIED K.FUNG
APPROVED

RECOMMENDED S.KEMPTON
ACCEPTED J.PALMER

Sydney WATER
CONTRACT No. 26617

WORK LOT NUMBER: 20-ES2

NORTH WEST GROWTH CENTRE PACKAGE 2 AND 3A

ROUSE HILL SEWERAGE
SU0175 - MILE END ROAD

SITE LAYOUT

DRAWING No. SU0175 02

PROJECT No. 20026081

SCALE AS SHOWN

DRAFT 3

DRAWING STATUS PRELIMINARY FOR REVIEW

PLOT DATE: 3/14/2014 8:42:17 AM
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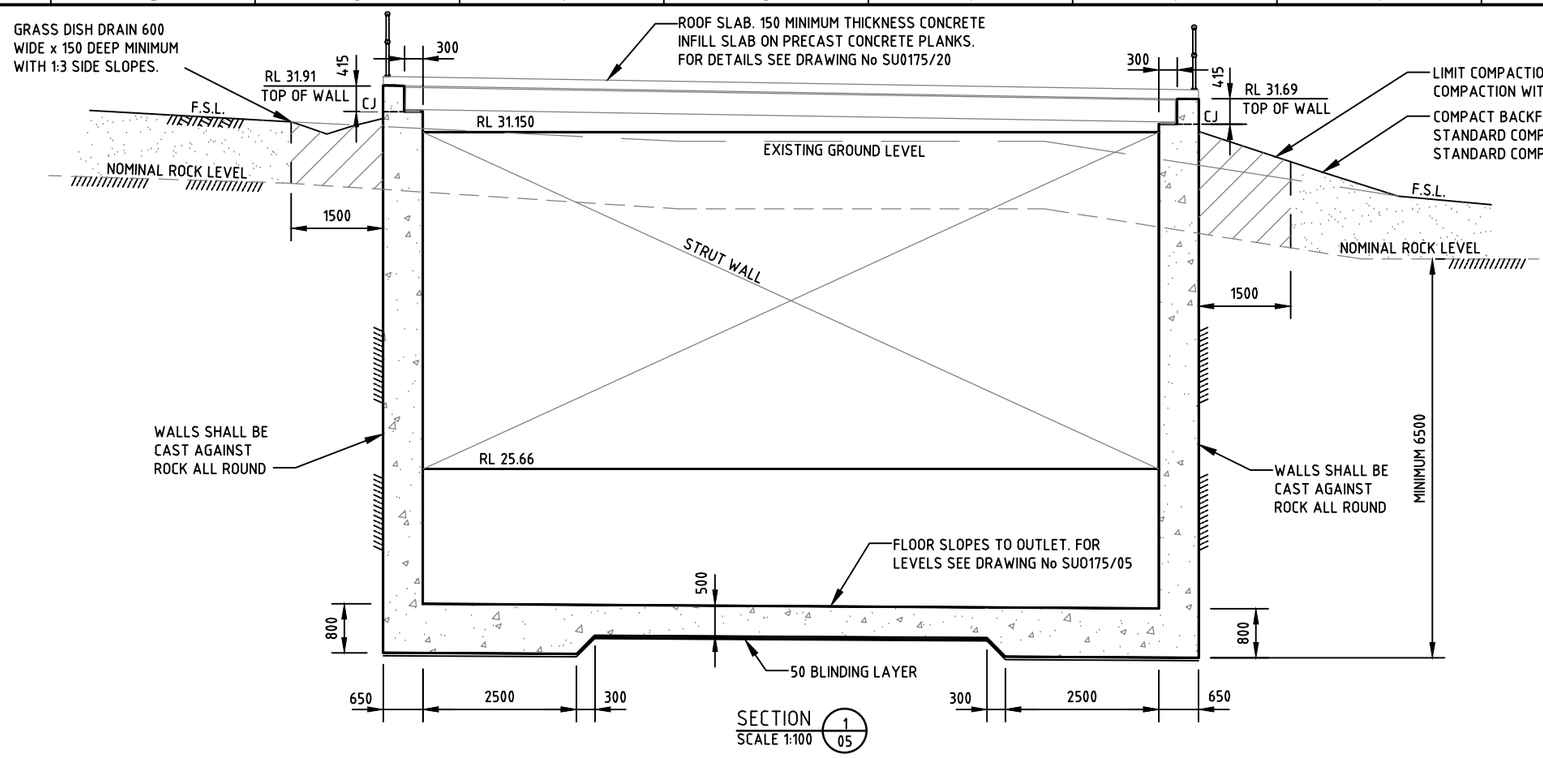
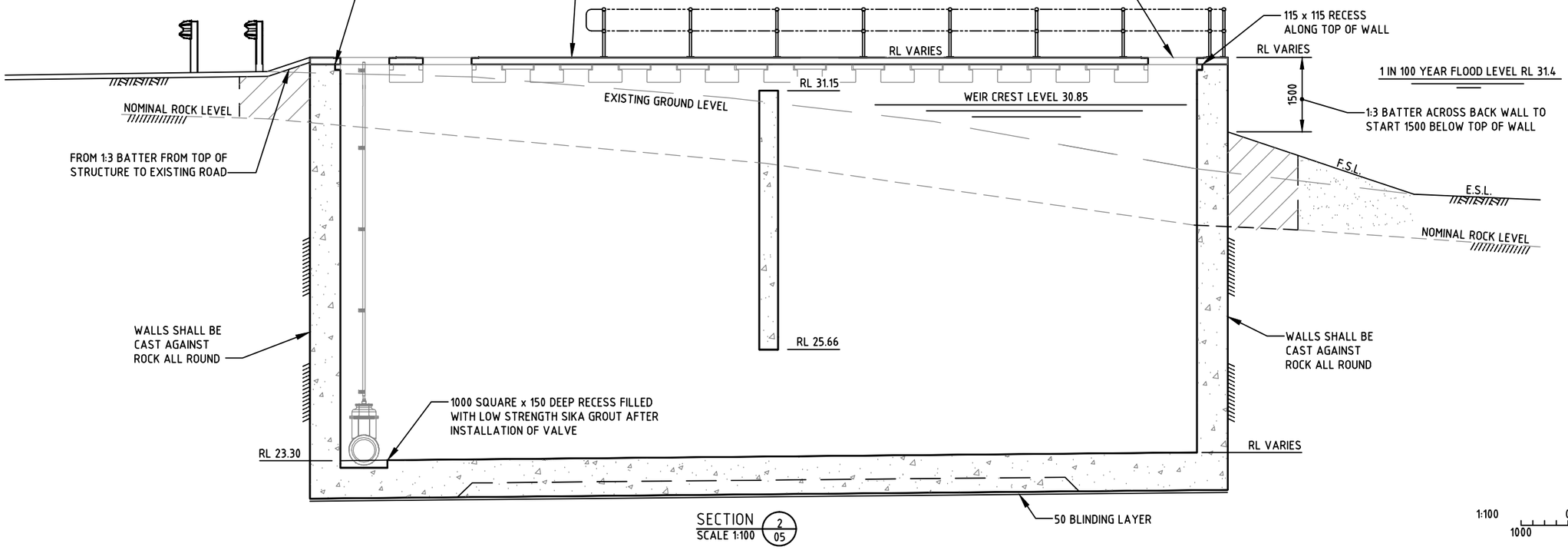


SECTION 1 / 05
SCALE 1:100



SECTION 2 / 05
SCALE 1:100

1:100 — 0 — 1000 — 2000 — 3000 — 4000 — 5000mm (1000) — A3

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SKM

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APPROVED

LETTER	DETAILS OF AMENDMENT	APP'D	DATE
2	100% DESIGN ISSUE	G.F.	14.03.14
1	90% DESIGN ISSUE	G.F.	12.02.14

RECOMMENDED S.KEMPTON
ACCEPTED J.PALMER

Sydney WATER
CONTRACT No. 26617

ROUSE HILL SEWERAGE
SU0175 - MILE END ROAD
CONCRETE SECTIONS AND DETAILS

DRAWING No. SU0175 / 06
DRAFT 2
DRAWING STATUS PRELIMINARY FOR REVIEW

PROJECT No. 20026081
SCALE AS SHOWN

WORK LOT NUMBER: 20-ES2
NORTH WEST GROWTH CENTRE PACKAGE 2 AND 3A

PLOT DATE: 3/14/2014 11:45:01 AM
DWG FILE: SU017506.DWG

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