NSW GOVERNMENT | Planning & Environment

Contact: Emma Barnet
Phone: (02) 9228 6412
Fax: (02) 9228 6466
Email: emma.barnet@planning.nsw.gov.au

Steve McDonald
General Manager
Muswellbrook Shire Council
PO Box 122
Muswellbrook NSW 2333

Dear Mr McDonald

SEARs for the Muswellbrook Waste Management Facility and Landfill (SSD - 6846)

Thank you for your request for the Secretary's Environmental Assessment Requirements (SEARs) for the preparation of an Environmental Impact Statement (EIS) for the above mentioned development proposal. I have attached a copy of these requirements.

The attached SEARs have been prepared in consultation with the relevant government authorities (see **Attachment 2**) and are based on the information you have provided to date. Please note that the Secretary may alter these SEARs at any time and that you must consult further with the Secretary if you do not lodge a development application and EIS for the development within two years of the date of issue of these SEARs. The Department of Planning and Environment (the Department) will review the EIS for the development carefully before publicly exhibiting it, and will require you to submit an amended EIS if it does not adequately address the SEARs.

The Department notes that the proposed landfill would have capacity to operate for 90 years at the current rate of waste input. This time frame raises concerns about whether the design and operational parameters of the landfill might begin to fall significantly behind the community's expectation for such facilities after 20 to 30 years or so; and whether such capacity may slow or disincentivise continued development of waste recovery so that the amount of landfill waste is minimised.

Both waste recovery and best practice landfill design and operation are matters for consideration under clause 123 of the *State Environmental Planning Policy (Infrastructure) 2007*. Consequently, these matters will require comprehensive expert analysis in the EIS. The proposed development of the landfill must be strongly justifiable against the NSW Government's waste policy. Consideration should be given to a staged approach to developing the landfill so that the design and operation of future components can be reviewed in-line with future community's expectations and best practice.

When preparing the landfill proposal and justification, the Department would like to request that Council consult extensively with both the EPA's Waste Strategy Team and the Department's Industry Assessment Team to ensure that the issues surrounding long term best practice and waste recovery are given robust consideration.

The Department also notes that aspects of the existing landfill/waste management facility would continue to operate in conjunction with the new landfill. The EIS should be clear in setting out the upgrades to the existing operation as well as interactions between the existing operation and the proposed facility. Importantly, the Department would expect that the whole combined facility would ultimately be governed by a single approval (with potential surrender of existing consents) and this should be reflected in the proposed management and mitigation measures.

The Department wishes to emphasise the importance of effective and genuine community consultation and the need for proposals to proactively respond to the community's concerns. Accordingly, a comprehensive, detailed and genuine community consultation engagement process must be undertaken during the preparation of the EIS. This process must ensure that the community is both informed of the proposal and actively engaged in issues of concern to them. Sufficient information must be provided to the community so it has a good understanding of what is proposed and any potential impacts.

If your development is likely to have a significant impact on matters of National Environmental Significance, it will require an approval under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). This approval would be in addition to any approvals required under NSW legislation and it is your responsibility to contact the Department of Sustainability, Environment, Water, Population and Communities to determine if an approval under the EPBC Act is required (http://www.environment.gov.au or 6274 1111).

I would appreciate it if you would contact the Department at least two weeks before you propose to submit your EIS. This will enable the department to:

- confirm the applicable fee (see Division 1AA, Part 15 of the *Environmental Planning and Assessment Regulation 2000*); and
- determine the number of copies (hard-copy and CD-ROM) of the EIS that will be required for reviewing purposes.

Your contact officer, Emma Barnet, can be contacted on 9228 6412 or at emma.barnet@planning.nsw.gov.au. Please mark all correspondence regarding the proposal to the attention of the contact officer.

Yours sincerely

C. Ritchie 5/3/15.

Chris Ritchie
Manger, Industry Assessments
as delegate for the Secretary

Secretary's Environmental Assessment Requirements

Section 78A(8A) of the *Environmental Planning and Assessment Act*
Schedule 2 of the *Environmental Planning and Assessment Regulation 2000*

Application Number	SSD-6846

Proposal Name	Muswellbrook Waste Management Facility Landfill which includes:
	• the development of a new landfill and associated infrastructure within an existing mine void. The landfill would provide up to 2.8 million m^3 of capacity which equates to approximately 90 years operational capacity.
	• an upgrade to the existing Muswellbrook Waste and Recycling Facility infrastructure and services including:
	  • an additional weighbridge;
	  • new staff amenities; and
	  • improved facilities for the recovery of e-waste, organics, recyclables and items suitable for resale
	• a new access road between the existing waste management facility and the proposed landfill.

Location	Lot 1 of DP 1149806 and Lots 101 and 102 of DP 1578075 Coal Road Muswellbrook
Applicant	Muswellbrook Shire Council
Date of Issue	February 2015

General Requirements	The Environmental Impact Statement (EIS) must meet the minimum form and content requirements in clauses 6 and 7 of Schedule 2 of the *Environmental Planning and Assessment Regulation 2000*. The EIS must include:
	• a detailed description of the development including:
	  – need for the proposed development;
	  – justification for the proposed development;
	  – likely staging of the development;
	  – likely interactions between the development and existing, approved and proposed developments within the site and in the vicinity; and
	  – plans of any proposed works.
	• consideration of all relevant environmental planning instruments, including identification and justification of any inconsistencies with these instruments;
	• risk assessment of the potential environmental impacts of the development; identifying key issues for further assessment;
	• detailed assessment, where relevant, of the key issues below, and any other potential significant issues identified in the risk assessment, must include:
	  – a description of the existing environment, using adequate baseline data;
	  – consideration of potential cumulative impacts due to other development in the vicinity; and
	  – measures to avoid, minimise and if necessary, offset the predicted impacts, including detailed contingency plans for

	managing any significant risks to the environment. • consolidated summary of all the proposed environmental management and monitoring measures, highlighting commitments included in the EIS. The EIS must also be accompanied by a report from a qualified quantity surveyor providing: • a detailed calculation of the capital investment value (as defined in clause 3 of the *Environmental Planning and Assessment Regulation 2000*) of the proposal, including details of all assumptions and components from which the CIV calculation is derived; • an estimate of the jobs that will be created during the construction and operational phases of the proposed development; and • certification that the information provided is accurate at the date of preparation.
Key issues	The EIS must address the following specific matters: • **Strategic Landuse Planning** – including: – demonstration that the proposal is generally consistent with the aims and objectives of all relevant environmental planning instruments, policies and strategies including, but not limited to, *State Environmental Planning Policy (Infrastructure) 2007*, the *NSW Waste Avoidance and Resource Recovery Strategy 2014-2021*, *NSW State Plan 2021 – Goal 23*, the *Waste Avoidance and Recovery Act 2001*, the *National Waste Policy* and relevant Development Control Plans; – justification for any inconsistency between the proposed development and these plans; – consideration of the NSW government's investment in new technologies and infrastructure to drive recycling and reuse under the Waste Less, Recycle More Initiative; – demonstration that the landfill construction and operation can be staged to ensure that the design remains current and in line with best practice at the time; – consideration of transport options and a demonstration that transport links are optimised to reduce the environmental and social impacts associated with transporting waste to landfill; – an assessment of the potential impacts on any significant mineral resources, including any operating mines, extractive industries or known mineral or petroleum resources, exploration activities in the vicinity of the proposal and access for future exploration in the area; and – details on the suitability of the site for the proposed development. • **Waste Management** – including: – accurate estimates of the quantity, classification and likely sources of the waste stream that would be handled/stored/disposed of at the facility; – a description of how this waste would be treated, stored, used, disposed and handled on site, and transported to the site, and the potential impacts associated with these issues; – a description of all reasonable and feasible measures that have been or would be implemented to maximise resource recovery from the waste stream over time and reduce the disposal of waste to landfill; – details of the landfill cell design and integrity, including details

	of the proposed liner, in accordance with best practice industry standard guidelines such as the EPA's *Environmental Guidelines: Solid Waste Landfills*; – a description of the staged approach to developing the landfill so that the design and operation of future components can be reviewed in-line with future community's expectations and best practice; and – litter and feral animal control. • **Soil, Water and Leachate** – including: – a detailed site water balance, including identification of water requirements for the life of the project, measures that would be implemented to ensure an adequate and secure water supply is available for the proposal and a detailed description of the measures to minimise the water use at the site; – the proposed stormwater/wastewater management system (including any upgrades to the existing system), including the capacity of onsite detention systems, and measures to treat, reuse or dispose of water; – consideration of the *Water Sharing Plan for the Hunter Unregulated and Alluvial Water Source 2009;* – potential impacts on watercourses and groundwater; – a comprehensive geotechnical assessment demonstrating the efficacy of the in-situ material and taking; – the proposed leachate management systems including the capacity of the system to treat and dispose of leachate; – consideration of potential acid sulfate soils, salinity, soil contamination and flooding impacts of the proposal; and – the proposed erosion and sediment controls during construction and operation. • **Mine Subsidence** – including: – a comprehensive geotechnical investigation taking into account the stability of any material that would be placed within the void; and – a demonstration that the landfill can be designed and constructed so that; there is no risk of damage from any uncontrolled material placed within the void and it will remain safe and serviceable for the life of the development. • **Air Quality and Odour** – including: – a quantitative assessment of the potential air quality and odour impacts of the development on surrounding landowners; – a demonstration that the proposal is able to comply with the *Protection of the Environment Operations (POEO) Act 1997* and the POEO (Clean Air) Regulation (2002); and – details of all proposed mitigation, management and monitoring measures. • **Traffic and transport** – including: – details of all traffic types and volumes likely to be generated during construction and operation, including a description of haul routes; – an assessment of the predicted impacts of this traffic on road safety and the capacity of the road network, including the New England Highway and including consideration of cumulative traffic impacts from other developments, using SIDRA or similar traffic model; – a description of the measures that would be implemented to

	upgrade and/or maintain the surrounding road network; – plans of any road upgrade or new roads required for the development; and – an assessment of any proposed new roads' interaction with the Roads and Maritime Service's preferred option for the Muswellbrook Bypass. • **Noise and Vibration** – including: – quantitative assessment of potential construction, operational and transport noise and vibration impacts, including potential impacts on nearby sensitive receivers; and – details of the proposed noise management and monitoring measures. • **Greenhouse Gas** – including: – a quantitative assessment of the scope 1 and 2 greenhouse gas emissions of the project; and – a description of the measures that would be implemented to minimise the energy use of the project including landfill gas capture and electricity generation. • **Rehabilitation** – including: – a detailed description of how the site would be progressively rehabilitated, revegetated, and integrated into the surrounding landscape, including measures to ensure that the final landform is free draining; – a justification for the proposed final landform and use, taking into consideration any relevant strategic land use planning or resource management plans or policies; and – a detailed description of the measures that would be put in place to ensure sufficient resources are available to implement the proposed rehabilitation measures, and the ongoing management of the site following the cessation of landfilling activities. • **Visual** – including an assessment of the potential visual impacts of the project on the amenity of the surrounding area; • **Hazards and Risk** – including fire management • **Heritage** – including an Aboriginal heritage assessment; • **Flora and Fauna** – including an assessment of the proposal under the *Framework for Biodiversity Assessment (Oct 2014).*
Plans and Documents	The EIS must include all relevant plans, architectural drawings, diagrams and relevant documentation required under Schedule 1 of the *Environmental Planning and Assessment Regulation 2000.* These documents should be included as part of the EIS rather than as separate documents.
Consultation	During the preparation of the EIS, you must consult with the relevant local, State or Commonwealth Government authorities, service providers, community groups and affected landowners. In particular you must consult with: • NSW Environment Protection Authority; • Office of Environment and Heritage • Department of Primary Industries; • NSW Roads and Maritime Services; • Mine Subsidence Board; • AGL; and • Surrounding landowners/occupiers that may be affected by the proposal.

	The EIS must describe the consultation process and the issues raised, and identify where the design of the development has been amended in response to these issues. Where amendments have not been made to address an issue, a short explanation should be provided.
Further consultation after 2 years	If you do not lodge an EIS for the development within 2 years of the issue date of these DGRs, you must consult with the Secretary in relation to the requirements for lodgement.
References	The assessment of the key issues listed above must take into account relevant guidelines, policies, and plans as identified. While not exhaustive, the following attachment contains a list of some of the guidelines, policies, and plans that may be relevant to the environmental assessment of this development.

ATTACHMENT 1
Technical and Policy Guidelines

The following guidelines may assist in the preparation of the Environmental Impact Statement. This list is not exhaustive and not all of these guidelines may be relevant to your proposal.

Many of these documents can be found on the following websites:
http://www.planning.nsw.gov.au
http://www.bookshop.nsw.gov.au
http://www.publications.gov.au
http://www.blacktown.nsw.gov.au

Policies, Guidelines and Plans

Aspect	Policy /Methodology
Waste	
	Waste Avoidance and Resource Recovery Strategy 2007 (DECC)
	Waste Classification Guidelines (DECC)
	Environmental Guidelines: Assessment Classification and Management of Non-Liquid and Liquid Waste (NSW EPA)
	Environmental guidelines: Composting and Related Organics Processing Facilities (DEC)
	Environmental guidelines: Use and Disposal of Biosolid Products (NSW EPA)
	Composts, soil conditioners and mulches (Standards Australia, AS 4454)
	EPA's Environmental Guidelines: Solid Waste Landfills
	State Environmental Planning Policy (Infrastructure) 2007
Soil and Water	
	National Water Quality Management Strategy: Water quality management - an outline of the policies (ANZECC/ARMCANZ)
	National Water Quality Management Strategy: Policies and principles - a reference document (ANZECC/ARMCANZ)
	National Water Quality Management Strategy: Implementation guidelines (ANZECC/ARMCANZ)
	National Water Quality Management Strategy: Australian Guidelines for Fresh and Marine Water Quality (ANZECC/ARMCANZ)
	National Water Quality Management Strategy: Australian Guidelines for Water Quality Monitoring and Reporting (ANZECC/ARMCANZ)
	Using the ANZECC Guideline and Water Quality Objectives in NSW (DEC)
	State Water Management Outcomes Plan
Surface Water	NSW Government Water Quality and River Flow Environmental Objectives (DECC)
	Approved Methods for the Sampling and Analysis of Water Pollutants in NSW (DEC)
	Managing Urban Stormwater: Soils & Construction (Landcom)
	Managing Urban Stormwater: Treatment Techniques (DECC)
	Managing Urban Stormwater: Source Control (DECC)
	Technical Guidelines: Bunding & Spill Management (DECC)
	Floodplain Development Manual (DIPNR)
	Floodplain Risk Management Guideline (DECC)
	A Rehabilitation Manual for Australian Streams (LWRRDC and CRCCH)
	Technical Guidelines: Bunding & Spill Management (DECC)

	Environmental Guidelines: Use of Effluent by Irrigation (DECC)
Groundwater	National Water Quality Management Strategy Guidelines for Groundwater Protection in Australia (ARMCANZ/ANZECC)
	NSW State Groundwater Policy Framework Document (DLWC)
	NSW State Groundwater Quality Protection Policy (DLWC)
	NSW State Groundwater Quantity Management Policy (DLWC) Draft
	The NSW State Groundwater Dependent Ecosystem Policy (DLWC)
	Guidelines for the Assessment and Management of Groundwater Contamination (DECC) Draft
Soil	NSW Aquifer Interference Policy (NOW)
	Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites (ANZECC & NHMRC)
	National Environment Protection (Assessment of Site Contamination) Measure 1999 (NEPC)
	Draft Guidelines for the Assessment & Management if Groundwater Contamination (DECC)
	State Environmental Planning Policy No. 55 – Remediation of Land
	Managing Land Contamination – Planning Guidelines SEPP 55 – Remediation of Land (DOP)
	Rural Land Capability Map
Air Quality	
	Protection of the Environment Operations (Clean Air) Regulation 2010
	Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (DEC)
	Approved Methods for the Sampling and Analysis of Air Pollutants in NSW (DEC)
	TRC (2011), Generic Guidance and Optimum Model Settings for the CALPUFF Modelling System for Inclusion into the 'Approved Methods for the Modelling and Assessment of Air Pollutants in NSW, Australia'
Odour	
	Technical Framework: Assessment and Management of Odour from Stationary Sources in NSW (DEC)
	Technical Notes: Assessment and Management of Odour from Stationary Sources in NSW (DEC)
Transport	
	Guide to Traffic Generating Development (RTA)
	Road Design Guide (RTA)
Noise and Vibration	
	Assessing Vibration: a technical guide (DEC)
	NSW Industrial Noise Policy (DECC)
	Environmental Criteria for Road Traffic Noise (NSW EPA)
	Environmental Noise Control Manual (DECC)
	Interim Construction Noise Guideline (DECC)
	Technical basis for guidelines to minimise annoyance due to blasting overpressure and ground vibration (ANZEC)
Greenhouse Gas	
	AGO Factors and Methods Workbook (AGO)
	Guidelines for Energy Savings Action Plans (DEUS, 2005)
Visual	
	Control of Obtrusive Effects of Outdoor Lighting (Standards Australia, AS 4282)
	State Environmental Planning Policy No 64 - Advertising and Signage
Hazard and Risk	

	AS/NZS 4360:2004 Risk Management
	HB 203:2006 Environmental Risk Management – Principals and Process
	State Environmental Planning Policy No 33 – Hazardous and Offensive Development (SEPP 33)
	Planning Advisory Paper No. 6 – Guidelines for Hazardous Analysis (DUAP)
	Planning Advisory Paper No. 4 – Risk Criteria for Land Use Safety Planning (DUAP)
Biodiversity	
	NSW Biodiversity Offsets Policy for Major Projects (2014) and the Framework for Biodiversity Assessment
Land use	
	Agricultural Issues for Landfill Developments

ATTACHMENT 2

Public Authority Responses to Request for Key Issues

NSW GOVERNMENT | Department of Primary Industries

OUT15/1631

Ms Emma Barnet
Environmental Planning Officer
Department of Planning and Environment
GPO Box 39
SYDNEY NSW 2001

emma.barnet@planning.nsw.gov.au

Dear Ms Barnet

Muswellbrook Waste Management Facility and Landfill Development (SSD14_6846)

I refer to your email dated 12 January 2015 requesting advice from the Department of Primary Industries (DPI) in respect to the above matter.

Comment by NSW Office of Water

The NSW Office of Water (Office of Water) has reviewed the supporting documentation accompanying the request for Secretary's Environmental Assessment Requirements (SEARs) and provides the following comments below, and further detail in **Attachment A**.

It is recommended that the EIS be required to include:

- Details of water proposed to be taken (including through inflow and seepage) from each surface and groundwater source as defined by the relevant water sharing plan.
- Assessment of any volumetric water licensing requirements (including those for ongoing water take following completion of the project).
- The identification of an adequate and secure water supply for the life of the project. Confirmation that water can be sourced from an appropriately authorised and reliable supply. This is to include an assessment of the current market depth where water entitlement is required to be purchased.
- A detailed and consolidated site water balance.
- Assessment of impacts on surface and ground water sources (both quality and quantity), related infrastructure, adjacent licensed water users, basic landholder rights, watercourses, riparian land, and groundwater dependent ecosystems, and measures proposed to reduce and mitigate these impacts.
- Full technical details and data of all surface and groundwater modelling.
- Proposed surface and groundwater monitoring activities and methodologies.

- Assessment of any potential cumulative impacts on water resources, and any proposed options to manage the cumulative impacts.
- Consideration of relevant policies and guidelines.
- Detailed Leachate Management Plan
- A statement of where each element of the SEARs is addressed in the EIS (i.e. in the form of a table).

For further information please contact Alison Collaros, Senior Water Regulation Officer on (02) 4904 2527 or at Alison.Collaros@dpi.nsw.gov.au.

Comment by Resource and Energy Division
Will liaise directly with council.

Yours sincerely

Kristian Holz
Policy, Legislation and Innovation

ATTACHMENT A

NSW Office of Water Comments on Secretary's Environmental Assessment Requirements
Muswellbrook Waste Management Facility and Landfill Development (SSD14_6846)

The following detailed assessment requirements are provided to assist in adequately addressing the assessment requirements for this proposal.

For further information visit the NSW Office of Water website, www.water.nsw.gov.au

Key Relevant Legislative Instruments

This section provides a basic summary to aid proponents in the development of an Environmental Impact Statement (EIS), and should not be considered a complete list or comprehensive summary of relevant legislative instruments that may apply to the regulation of water resources for a project.

The EIS should take into account the objects and regulatory requirements of the *Water Act 1912* (WA 1912) and *Water Management Act 2000* (WMA 2000), and associated regulations and instruments, as applicable.

Water Management Act 2000 (WMA 2000)
Key points:

- Volumetric licensing in areas covered by water sharing plans
- Works within 40m of waterfront land
- SSD & SSI projects are exempt from requiring water supply work approvals and controlled activity approvals as a result of the *Environmental Planning & Assessment Act 1979 (EP&A Act)*.
- No exemptions for volumetric licensing apply as a result of the *EP&A Act*.
- Basic landholder rights, including harvestable rights dams
- Aquifer interference activity approval and flood management work approval provisions have not yet commenced and are regulated by the *Water Act 1912*
- Maximum penalties of $2.2 million plus $264,000 for each day an offence continues apply under the *WMA 2000*

Water Act 1912 (WA 1912)
Key points:

- Volumetric licensing in areas where no water sharing plan applies
- Monitoring bores
- Aquifer interference activities that are not regulated as a water supply work under the *WMA 2000*.
- Flood management works
- No exemptions apply to licences or permits under the *WA 1912* as a result of the *EP&A Act*.
- Regulation of water bore driller licensing.

Water Management (General) Regulation 2011
Key points:

- Provides various exemptions for volumetric licensing and activity approvals
- Provides further detail on requirements for dealings and applications.

Water Sharing Plans – these are considered regulations under the *WMA 2000*

Access Licence Dealing Principles Order 2004

Harvestable Rights Orders

Water Sharing Plans

The proposal is located within the area covered by the Water Sharing Plan for the Hunter Unregulated and Alluvial Water Sources (Muswellbrook Water Source).

The EIS is required to:

- Demonstrate how the proposal is consistent with the relevant rules of the Water Sharing Plan including rules for access licences, distance restrictions for water supply works and rules for the management of local impacts in respect of surface water and groundwater sources, ecosystem protection (including groundwater dependent ecosystems), water quality and surface-groundwater connectivity.
- Provide a description of any site water use (amount of water to be taken from each water source) and management including all sediment dams, clear water diversion structures with detail on the location, design specifications and storage capacities for all the existing and proposed water management structures.
- Provide an analysis of the proposed water supply arrangements against the rules for access licences and other applicable requirements of any relevant WSP, including:
    - Sufficient market depth to acquire the necessary entitlements for each water source.
    - Ability to carry out a "dealing" to transfer the water to relevant location under the rules of the WSP.
    - Daily and long-term access rules.
    - Account management and carryover provisions.
- Provide a detailed and consolidated site water balance.
- Further detail on licensing requirements is provided below.

There is currently no Water Sharing Plan in place for the non-alluvial groundwater sources. The Draft Water Sharing Plan for the North Coast Fractured and Porous Rock Groundwater Sources is due for commencement in 2015. In the interim, the water source is managed under the *Water Act 1912*, however upon commencement of the Water Sharing Plan, the fractured and porous rock aquifers will be managed under the *Water Management Act 2000*.

Relevant Policies and Guidelines

The EIS should take into account the following policies (as applicable):

- NSW Guidelines for Controlled Activities on Waterfront Land (NOW, 2012)
- NSW Aquifer Interference Policy (NOW, 2012)
- Risk Assessment Guidelines for Groundwater Dependent Ecosystems (NOW, 2012)
- Australian Groundwater Modelling Guidelines (NWC, 2012)
- NSW State Rivers and Estuary Policy (1993)
- NSW State Groundwater Policy Framework Document (1997)
- NSW State Groundwater Quality Protection Policy (1998)
- NSW State Groundwater Dependent Ecosystems Policy (2002)
- NSW Water Extraction Monitoring Policy (2007)

Office of Water policies can be accessed at the following links:
http://www.water.nsw.gov.au/Water-management/Law-and-policy/Key-policies/default.aspx
http://www.water.nsw.gov.au/Water-licensing/Approvals/Controlled-activities/default.aspx

An assessment framework for the NSW Aquifer Interference Policy can be found online at: http://www.water.nsw.gov.au/Water-management/Law-and-policy/Key-policies/Aquifer-interference.

Licensing Considerations

The EIS is required to provide:

- Identification of water requirements for the life of the project in terms of both volume and timing (including predictions of potential ongoing groundwater take following the cessation of operations at the site – such as evaporative loss from open voids or inflows).
- Details of the water supply source(s) for the proposal including any proposed surface water and groundwater extraction from each water source as defined in the relevant Water Sharing Plan/s and all water supply works to take water.
- Explanation of how the required water entitlements will be obtained (i.e. through a new or existing licence/s, trading on the water market, controlled allocations etc.).
- Information on the purpose, location, construction and expected annual extraction volumes including details on all existing and proposed water supply works which take surface water, (pumps, dams, diversions, etc).
- Details on all bores and excavations for the purpose of investigation, extraction, dewatering, testing and monitoring. All predicted groundwater take must be accounted for through adequate licensing.
- Details on existing dams/storages (including the date of construction, location, purpose, size and capacity) and any proposal to change the purpose of existing dams/storages
- Details on the location, purpose, size and capacity of any new proposed dams/storages.
- Applicability of any exemptions under the *Water Management (General) Regulation 2011* to the project.

Water allocation account management rules, total daily extraction limits and rules governing environmental protection and access licence dealings also need to be considered.

The Harvestable Right gives landholders the right to capture and use for any purpose 10% of the average annual runoff from their property. The Harvestable Right has been defined in terms of an equivalent dam capacity called the Maximum Harvestable Right Dam Capacity (MHRDC). The MHRDC is determined by the area of the property (in hectares) and a site-specific run-off factor. The MHRDC includes the capacity of all existing dams on the property that do not have a current water licence. Storages capturing up to the harvestable right capacity are not required to be licensed but any capacity of the total of all storages/dams on the property greater than the MHRDC may require a licence.

For more information on Harvestable Right dams, including a calculator, visit:
http://www.water.nsw.gov.au/Water-licensing/Basic-water-rights/Harvesting-runoff/Harvesting-runoff

Dam Safety

Where new or modified dams are proposed, or where new development will occur below an existing dam, the NSW Dams Safety Committee should be consulted in relation to any safety issues that may arise. Conditions of approval may be recommended to ensure safety in relation to any new or existing dams.

See www.damsafety.nsw.gov.au for further information.

Surface Water Assessment

The predictive assessment of the impact of the proposed project on surface water sources should include the following:

- Identification of all surface water features including watercourses, wetlands and floodplains transected by or adjacent to the proposed project.
- Identification of all surface water sources as described by the relevant water sharing plan.
- Detailed description of dependent ecosystems and existing surface water users within the area, including basic landholder rights to water and adjacent/downstream licensed water users.
- Description of all works and surface infrastructure that will intercept, store, convey, or otherwise interact with surface water resources.
- Assessment of predicted impacts on the following:
    - flow of surface water, sediment movement, channel stability, and hydraulic regime,
    - water quality,
    - flood regime,
    - dependent ecosystems,
    - existing surface water users, and
    - planned environmental water and water sharing arrangements prescribed in the relevant water sharing plans.

Groundwater Assessment

To ensure the sustainable and integrated management of groundwater sources, the EIS needs to include adequate details to assess the impact of the project on all groundwater sources.

Where it is considered unlikely that groundwater will be intercepted or impacted (for example by infiltration), a brief site assessment and justification for the minimal impacts may be sufficient, accompanied by suitable contingency measures in place in the event that groundwater is intercepted, and appropriate measures to ensure that groundwater is not contaminated.

Where groundwater is expected to be intercepted or impacted, the following requirements should be used to assist the groundwater assessment for the proposal.

- Works likely to intercept, connect with or infiltrate the groundwater sources.
- Any proposed groundwater extraction, including purpose, location and construction details of all proposed bores and expected annual extraction volumes.
- Bore construction information is to be supplied to the Office of Water by submitting a "Form A" template. The Office of Water will supply "GW" registration numbers (and licence/approval numbers if required) which must be used as consistent and unique bore identifiers for all future reporting.
- A description of the watertable and groundwater pressure configuration, flow directions and rates and physical and chemical characteristics of the groundwater source (including connectivity with other groundwater and surface water sources).
- Sufficient baseline monitoring for groundwater quantity and quality for all aquifers and GDEs to establish a baseline incorporating typical temporal and spatial variations.
- The predicted impacts of any final landform on the groundwater regime.
- The existing groundwater users within the area (including the environment), any potential impacts on these users and safeguard measures to mitigate impacts.
- An assessment of groundwater quality, its beneficial use classification and prediction of any impacts on groundwater quality.

- An assessment of the potential for groundwater contamination (considering both the impacts of the proposal on groundwater contamination and the impacts of contamination on the proposal).
- Measures proposed to protect groundwater quality, both in the short and long term.
- Measures for preventing groundwater pollution so that remediation is not required.
- Protective measures for any groundwater dependent ecosystems (GDEs).
- Proposed methods of the disposal of waste water and approval from the relevant authority.
- The results of any models or predictive tools used.

Where potential impact/s are identified the assessment will need to identify limits to the level of impact and contingency measures that would remediate, reduce or manage potential impacts to the existing groundwater resource and any dependent groundwater environment or water users, including information on:

- Any proposed monitoring programs, including water levels and quality data.
- Reporting procedures for any monitoring program including mechanism for transfer of information.
- An assessment of any groundwater source/aquifer that may be sterilised from future use as a water supply as a consequence of the proposal.
- Identification of any nominal thresholds as to the level of impact beyond which remedial measures or contingency plans would be initiated (this may entail water level triggers or a beneficial use category).
- Description of the remedial measures or contingency plans proposed.
- Any funding assurances covering the anticipated post development maintenance cost, for example on-going groundwater monitoring for the nominated period.

Groundwater Dependent Ecosystems

The EIS must consider the potential impacts on any Groundwater Dependent Ecosystems (GDEs) at the site and in the vicinity of the site and:

- Identify any potential impacts on GDEs as a result of the proposal including:
  - the effect of the proposal on the recharge to groundwater systems;
  - the potential to adversely affect the water quality of the underlying groundwater system and adjoining groundwater systems in hydraulic connections; and
  - the effect on the function of GDEs (habitat, groundwater levels, connectivity).
- Provide safeguard measures for any GDEs.

Watercourses, Wetlands and Riparian Land

The EIS should address the potential impacts of the project on all watercourses likely to be affected by the project, existing riparian vegetation and the rehabilitation of riparian land. It is recommended the EIS provides details on all watercourses potentially affected by the proposal, including:

- Scaled plans showing the location of:
  - wetlands/swamps, watercourses and top of bank;
  - riparian corridor widths to be established along the creeks;
  - existing riparian vegetation surrounding the watercourses (identify any areas to be protected and any riparian vegetation proposed to be removed);
  - the site boundary, the footprint of the proposal in relation to the watercourses and riparian areas; and
  - proposed location of any asset protection zones.

- Photographs of the watercourses/wetlands and a map showing the point from which the photos were taken.
- A detailed description of all potential impacts on the watercourses/riparian land.
- A detailed description of all potential impacts on the wetlands, including potential impacts to the wetlands hydrologic regime; groundwater recharge; habitat and any species that depend on the wetlands.
- A description of the design features and measures to be incorporated to mitigate potential impacts.
- Geomorphic and hydrological assessment of water courses including details of stream order (Strahler System), river style and energy regimes both in channel and on adjacent floodplains.

Landform rehabilitation

The Environmental Impact Statement report should include:

- Justification of the proposed final landform with regard to its impact on local and regional surface and groundwater systems;
- A detailed description of how the site would be progressively rehabilitated and integrated into the surrounding landscape;
- Outline of proposed construction and restoration of topography and surface drainage features if affected by the project; and
- An outline of the measures to be put in place to ensure that sufficient resources are available to implement the proposed rehabilitation.

Leachate Management

The Environmental Impact Statement should include a detailed Leachate Management Plan. The plan should describe all leachate management infrastructure and processes, and demonstrate how the proposed system achieves protection of the aquifer from contamination. An appropriate monitoring plan should also be included.

End Attachment

Transport Roads & Maritime Services

10 February 2015

SF2015/002944
CR2015/000148
KM

NSW Department of Planning & Environment
Industry, Key Sites and Social Projects
GPO Box 39
SYDNEY NSW 2001

Attention: Ms Emma Barnet

MUSWELLBROOK WASTE MANAGEMENT FACILITY LANDFILL DEVELOPMENT, LOT 1 DP 1141896 & LOTS 1 & 2 DP 578075, COAL ROAD, MUSWELLBROOK – SSD 16_6846 – REQUEST FOR INPUT FOR SECRETARY'S ENVIRONMENTAL ASSESSMENT REQUIREMENTS

Dear Ms Barnet

I refer to your email dated 12 January 2015 requesting the provision of key issues which Roads and Maritime Services considers should form part of the Secretary's Environmental Assessment Requirements (SEARs) for the subject proposal. I apologise for the delay in responding.

Transport for NSW and Roads and Maritime's primary interests are in the road network, traffic and broader transport issues. In particular, the efficiency and safety of the classified road network, the security of property assets and the integration of land use and transport.

Roads and Maritime has reviewed the preliminary information, prepared by Muswellbrook Shire Council and provides the following comments.

The Environmental Impact Statement (EIS) should refer to the following guidelines with regard to the traffic and transport impacts of the proposed development:

- RTA's *Guide to Traffic Generating Developments 2002*
    - Section 2 Traffic Impact Studies

A traffic and transport study shall be prepared in accordance with the RMS *Guide to Traffic Generating Developments 2002* and is to include, but not be limited to, the following:

- Identification of the relevant vehicular traffic routes and intersections for access to/from the subject site.
- Current traffic counts for the above traffic routes and intersections.

Roads and Maritime Services
59 Darby Street, Newcastle NSW 2300 | Locked Bag 2030 Newcastle NSW 2300 DX7813 Newcastle
T 02 4924 0688 | **F** 02 4924 0347 | **E** Development.Hunter@rms.nsw.gov.au **www.rms.nsw.gov.au | 13 22 13**

- The anticipated additional vehicular traffic generated (both light and heavy vehicles) from the construction and operational stages.

- Consideration of the traffic impacts on the existing intersections and the capacity of the local and classified road network including the New England Highway to safely and efficiently cater for the vehicular traffic generated by the proposed development during the construction and operational stages. The study shall also give consideration to the cumulative traffic impacts of other proposed and approved developments in the area.

- Traffic analysis of any major / relevant intersections, using SIDRA or similar traffic model, including:

    - Current traffic counts and 10 year traffic growth projections, allowing a 2% background growth on the classified road network
    - With and without development scenarios considered
    - 95th percentile back of queue lengths
    - Delays and level of service on all legs for the relevant intersections
    - Use of SIDRA or similar traffic model
    - Electronic input/output data files for RMS review

- Any other impacts on the regional and state road network including consideration of pedestrian, cyclist and public transport facilities and provision for service vehicles.

- Details of any measures proposed to manage and / or mitigate impacts as a result of the proposal identified in traffic and transport study.

This proposal may also be impacted by Roads and Maritimes preferred option for the Muswellbrook Bypass. It is recommended that the proponent discuss the project with Roads and Maritime prior to commencing the traffic and transport study.

If you require any further advice please contact Land Use Hunter on (02) 4924 0688.

Yours sincerely

Tim Browne
Manager Land Use Assessment
Hunter Region

Cc General Manager
Muswellbrook Shire Council

NSW EPA

Our reference: DOC15/10575-02
File: EF13/8892

Department of Planning and Environment
GPO Box 39
SYDNEY NSW 2001

Attention: Ms Emma Barnet

STANDARD MAIL
27 January 2015

Dear Ms Barnet

Secretary's Environment Assessment Requirements –
Proposed Muswellbrook Waste Management Facility and Landfill Development – Muswellbrook LGA

I refer to your request for the Environment Protection Authority's (EPA) requirements for the environmental assessment (EA) in regard to the above proposal received by EPA on 12 January 2015. The EPA has considered the details of the proposal as provided by the Department of Planning and Environment and has identified the information it requires to issue its general terms of approval in Attachment 1. In summary, the EPA's key information requirements for the proposal include an adequate assessment of:

1. Baseline conditions that exist at the site of the proposed development.

2. Potential environmental impacts arising from the proposed development and its ongoing activities including air, odour, noise and water issues.

3. Possible management and mitigation processes that will be implemented to protect the environment from these impacts.

In carrying out the assessment, the proponent should refer to the relevant guidelines as listed in Attachment 2 and any relevant industry codes of practice and best practice management guidelines.

Please note that this response does not cover biodiversity or Aboriginal cultural heritage issues, which are the responsibility of the Office of Environment and Heritage.

The Proponent should be made aware that any commitments made in the EA may be formalised as approval conditions and may also be placed as formal licence conditions.

The Proponent should be made aware that, consistent with provisions under Part 9.4 of the *Protection of the Environment Operations Act 1997* ("the Act") the EPA may require the provision of a financial assurance and/or assurances. The amount and form of the assurance(s) would be determined by the EPA and required as a condition of an Environment Protection Licence ("EPL").

PO Box 488G Newcastle NSW 2300
117 Bull St Newcastle West NSW 2302
Tel: (02) 49086890 Fax: (02) 49086810
ABN 43 692 285 758
www.epa.nsw.gov.

In addition, as a requirement of an EPL, the EPA will require the Proponent to prepare, test and implement a Pollution Incident Response Management Plan and/or Plans in accordance with Section 153A of the Act

The EPA requests **one hard copy of the EIS** for assessment. This document should be provided to the EPA, Unit Head – Waste Compliance, PO Box 488G NEWCASTLE NSW 2300. The EPA also requests an electronic copy be sent to waste.operations@epa.nsw.gov.au.

If you have any questions in relation to this matter please contact Sean Joyce on 02 4908 6897.

Yours sincerely

JENNY LANGE
A/Unit Head Waste Operations
Environment Protection Authority

Encl.: Attachment 1: EPA's Recommended Environmental Assessment Requirements
Attachment 2: General Guidance Material.

To lodge official correspondence electronically on behalf of your business or company, please email the signed correspondence on company/business letterhead to waste.operations@epa.nsw.gov.au . You do not need to provide a hard copy of the emailed correspondence.

ATTACHMENT 1

EPA's Environmental Assessment Requirements

TABLE OF CONTENTS

1. Environmental impacts of the project

Impacts related to the following environmental issues need to be assessed, quantified and reported on:

- Air Quality and Odour
- Noise and vibration
- Wastewater management
- Water and Soils
- Waste

The Environmental Impact Statement (EIS) should address the specific requirements outlined under each heading below and assess impacts in accordance with the relevant guidelines mentioned. A full list of guidelines is provided at **Attachment 2**.

2. General

1. The Proposal

The objectives of the proposal should be clearly stated and refer to:

- the size and type of the operation;
- The nature of the processes and the products, by-products and wastes produced;
- The use, reuse or disposal of products;
- the anticipated level of performance in meeting required environmental standards and cleaner production principles;
- the staging and timing of the proposal; and
- the proposal's relationship to any other industry or facility.

2. The Premises

The EIS will need to fully identify all of the processes and activities intended for the site over the life of the development. This will include details of:

- The location of the proposed modification and details of the surrounding environment;
- The proposed layout of the site;
- Appropriate landuse zoning;
- Ownership details of any residence and/or land likely to be affected by the proposed facility;
- Maps/diagrams showing the location of residences and properties likely to be affected and other industrial developments, conservation areas, wetlands, etc in the locality that may be affected by the facility;
- All equipment proposed for use at the site;
- Chemicals, including fuel, used on the site and proposed methods for their transportation, storage, use and emergency management;
- All plans, procedures and protocols to be implemented to demonstrate compliance with *EPA's Environmental Guidelines: Solid Waste Landfills*;
- Waste generation and disposal;
- Methods to mitigate any expected environmental impacts of the development;
- Site rehabilitation following termination of the development

3. Licensing requirements

Should project modification be granted, the proponent may need to make a separate application to the EPA for a variation(s) to an existing Environment Protection Licence prior to undertaking any on site works. Additional information is available through EPA's *Guide to Licensing* document:
http://www.epa.nsw.gov.au/licensing/licenceguide.htm

General information on license requirements can also be obtained from EPA's Environment Line on 131 555 during office hours, or can be found at the EPA web site at: http://www.epa.nsw.gov.au/licensing/

4. Air and Odour issues

4.1 Air quality

Undertake a detailed quantitative air quality impact assessment in accordance with the Approved Methods for the Modelling and Assessment of Air Pollutants in NSW, including, as a minimum the following components:

Assessment Objective

1. Demonstrate the proposed project will incorporate and apply best management practice emission controls; and
2. Demonstrate that the project will not cause violation of the project adopted air quality impact assessment criteria at any residential dwelling or other sensitive receptor.

Reference and Guidance Documents

- EPA (2005),Approved Methods for the Modelling and Assessment of Air Pollutants in NSW, including appendices and updates.
- EPA (2006), Approved Methods for the Sampling and Analysis of Air Pollutants in NSW, including appendices and updates.
- EPA (2011), Coal Mine Particulate Matter Control Best Practice – Site-specific determination guideline.
- TRC (2011), Generic Guidance and Optimum Model Settings for the CALPUFF Modelling System for Inclusion into the 'Approved Methods for the Modelling and Assessments of Air Pollutants in NSW, Australia'.

Assessment Criteria

- Define applicable assessment criteria for the proposed development referencing EPA (2005).

Existing Environment

- Provide a detailed description of the existing environment within the assessment domain, including:
    - geophysical form and land-uses;
    - location of all sensitive receptors;
    - existing air quality; and
    - local and regional prevailing meteorology.
- Justify all data used in the assessment, specifically including analysis of inter-annual trends (preferably five consecutive years of data), availability of monitoring data, and local topographical features.
- Meteorological modelling must be verified against monitored data. Verification should involve comparative analysis of wind speed, wind direction and temperature, at a minimum (additional guidance is included in TRC, 2011).
- A review of all existing, recently approved and planned developments likely to contribute to cumulative air quality impacts must be completed.

Emissions Inventory

- Provide a detailed description of the project and identify the key stages with regards to the potential for air emissions and impacts on the surrounding environment.
- Identify all sources of air emissions, including mechanically generated, combustion and transport related emissions likely to be associated with the proposed development.
- Estimate emissions of TSP, PM10, PM2.5, NOx, (tonnes per year), at a minimum, for all identified sources during each key development stage. The emissions inventory should:
    - utilise USEPA (1995) (and updates) emission estimation techniques, direct measurement or other method approved in writing by EPA;
    - calculate uncontrolled emissions (with no particulate matter controls in place); and
    - calculate controlled emissions (with proposed particulate matter controls in place).
- The emissions inventory must be explicitly coupled with the project description.
- Provide a detailed summary and justification of all parameters adopted within all emission estimation calculations, including site specific measurements, proponent recommended values or published literature.
- Document, including quantification and justification, all air quality emission control techniques/practices proposed for implementation during the project. As a minimum, consideration must be given to source control techniques, emission control through mine planning and reactive/predictive management techniques.

Best Practice Determination

- Based on the TSP, PM10 and PM2.5 emissions inventories calculated for the proposed development, undertake a site-specific best practice determination, in accordance with EPA (2011).
- Demonstrate that the proposed control techniques/practices are consistent with best management practice.

Dispersion Modelling and Interpretation of Results

- Atmospheric dispersion modelling should be undertaken in accordance with EPA (2005).
- Modelling must implement fit for purpose modelling techniques that:
    - have regard for the most up to date and scientifically accepted dispersion modelling techniques;
    - contextualise all assumptions based on current scientific understanding and available data; and
    - include a thorough validation of adopted methods and model performance.
- Use an appropriate atmospheric dispersion model to predict, at a minimum, incremental ground level concentrations/levels of the following:
    - 24-hour and annual average PM10 concentrations;
    - 24-hour and annual average PM2.5 concentrations; and
    - 1-hour and annual average NO2 concentrations. NO2 concentrations should be assessed using a well justified approach for the transformation of NOx to NO2.
- Ground level concentrations of pollutants should be presented for surrounding privately-owned properties and other sensitive receptors (as applicable).
- Undertake a cumulative assessment of predicted impacts. The contribution of all identified existing and recently approved developments should be accounted for in the cumulative assessment.

- Cumulative 24-hour PM10 and PM2.5 concentrations must be assessed in accordance with EPA (2005) and/or a suitably justified probabilistic methodology.
- Cumulative annual average PM10, PM2.5, and NO2 should be assessed using a sufficiently justified background concentration(s);
- Results of dispersion modelling should be presented as follows:
    - isopleth plots showing the geographic extent of maximum pollutant concentrations (incremental and cumulative);
    - tables presenting the maximum predicted pollutant concentrations (increment and cumulative) and the frequency of any predicted exceedances at each surrounding privately-owned properties, mine-owned properties and other sensitive receptors (as applicable); and
    - time series and frequency distribution plots of pollutant concentrations at each private receptor location at which an exceedance is predicted to occur. Where no exceedances are predicted, the analysis must be performed for the most impacted off site sensitive receptor.

Air Quality Emission Control Measures

- Provide a detailed discussion of all proposed air quality emission control measures, including details of a reactive/predictive management system. The information provided must include:
    - explicit linkage of proposed emission controls to the site specific best practice determination assessment
    - timeframe for implementation of all identified emission controls;
    - key performance indicators for emission controls;
    - monitoring methods (location, frequency, duration);
    - response mechanisms;
    - responsibilities for demonstrating and reporting achievement of KPIs;
    - record keeping and complaints response register; and
    - compliance reporting.

4.2 Greenhouse gas

1. The EIS should include a comprehensive assessment of, and report on, the project's predicted greenhouse gas emissions (tCO2e). Emissions should be reported broken down by:
    a) direct emissions (scope 1 as defined by the Greenhouse Gas Protocol – see reference below),
    b) indirect emissions from electricity (scope 2), and
    c) upstream and downstream emissions (scope 3)

    before and after implementation of the project, including annual emissions for each year of the project (construction, operation and decommissioning).

2. The EIS should include an estimate of the greenhouse emissions intensity (per unit of production). Emissions intensity should be compared with best practice if possible.

3. The emissions should be estimated using an appropriate methodology, in accordance with NSW, Australian and international guidelines (see attached).

4. The proponent should also evaluate and report on the feasibility of measures to reduce greenhouse gas emissions associated with the project. This could include a consideration of energy efficiency opportunities or undertaking an energy use audit for the site.

4.3 Odour

The Project Outline identifies significant increases in the volume of waste material for rendering. The EPA is also aware of potential for odours from the premises "save all" area and associated waste water management systems and wastewater treatment ponds.

The EIS should include an assessment of potential odour sources (including the existing site Dissolved Air Flotation (DAF) system and wastewater management systems in the "save all" area), potential odour impacts and odour management strategies in accordance with the EPA's Technical framework and Technical notes for the Assessment and management of odour from stationary sources in NSW.

5. Noise and vibration

In relation to noise, the following matters should be addressed (where relevant) as part of the Environmental Assessment.

General

1. Construction noise associated with the proposed development should be assessed using the *Interim Construction Noise Guideline* (DECC, 2009). http://www.epa.nsw.gov.au/resources/noise/09265cng.pdf

2. Vibration from all activities (including construction and operation) to be undertaken on the premises should be assessed using the guidelines contained in the *Assessing Vibration: a technical guideline* (DEC, 2006). http://www.epa.nsw.gov.au/noise/vibrationguide.htm

Industry

3. Operational noise from all industrial activities (including private haul roads and private railway lines) to be undertaken on the premises should be assessed using the guidelines contained in the *NSW Industrial Noise Policy* (EPA, 2000) and *Industrial Noise Policy Application Notes.* In particular, the acceptability of residual noise impacts (noise above the Project Specific Noise Levels) should be assessed in accordance with Chapters 8 and 9 of the Industrial Noise Policy. http://www.epa.nsw.gov.au/noise/industrial.htm

Road

4. Noise on public roads from increased road traffic generated by land use developments should be assessed using the guidelines contained in the *Environmental Criteria for Road Traffic Noise* (EPA, 1999). http://www.epa.nsw.gov.au/resources/noise/roadnoise.pdf

5. Noise from new or upgraded public roads should be assessed using the *Environmental Criteria for Road Traffic Noise* (EPA, 1999). http://www.epa.nsw.gov.au/resources/noise/roadnoise.pdf

6. Wastewater Management

The EIS should include a detailed assessment of the wastewater treatment and management proposed for the premises. This should include:

- Details of the volume and expected wastewater quality.
- Details of proposed wastewater treatment methods.

- Details of any upgrades to wastewater treatment processes, including the purpose, location, volumetric capacity and design criteria.
- Details of the construction of any new wastewater treatment infrastructure.
- an assessment of any proposed effluent irrigation in accordance with the EPA's Environmental Guidelines: Use of Treated Effluent by Irrigation.
- Detail of water, salt and nutrient balances for effluent irrigation.
- Details of wet weather storage requirements including wet weather capacity calculations.
- Details of any "other" wastewater management ponds including their designed purpose, volumetric capacity, design criteria and location.
- A map of the location of all wastewater management infrastructure.

7. Water and soils

7.1 Soil

The EIS should include:

1. An assessment of potential impacts on soil and land resources should be undertaken. The nature and extent of any significant impacts should be identified. Particular attention should be given to:
   a. Soil erosion and sediment transport - in accordance with *Managing urban stormwater: soils and construction,* vol. 1 (Landcom 2004) and vol. 2 (E. Mines and quarries) (DECC 2008).
   b. Urban and regional salinity – guidance given in the Local Government Salinity Initiative booklets which includes *Site Investigations for Urban Salinity* (DLWC, 2002).

2. A description of the mitigation and management options that will be used to prevent, control, abate or minimise identified soil and land resource impacts associated with the project. This should include an assessment of the effectiveness and reliability of the measures and any residual impacts after these measures are implemented.

7.2 Water

The EIS must provide sufficient information to demonstrate that the proposed development can be operated whilst complying with the *Protection of the Environment Operations (POEO) Act* 1997, in particular, the protection of water quality, during operations.

The EIS must also demonstrate how the proposed development will comply with *EPA's Environmental Guidelines: Solid Waste Landfills* in respect to surface water, groundwater and leachate management.

Describe Proposal

1. Describe the proposal including position of any intakes and discharges, volumes, water quality and frequency of all water discharges.

2. Demonstrate that all practical options to avoid discharge have been implemented and environmental impact minimised where discharge is necessary.

3. Where relevant include a water balance for the development including water requirements (quantity, quality and source(s)) and proposed storm and wastewater disposal, including type, volumes, proposed treatment and management methods and re-use options.

Background Conditions

4. Describe existing surface and groundwater quality. An assessment needs to be undertaken for any water resource likely to be affected by the proposal.

5. State the Water Quality Objectives for the receiving waters relevant to the proposal. These refer to the community's agreed environmental values and human uses endorsed by the NSW Government as goals for ambient waters (http://www.environment.nsw.gov.au/ieo/index.htm). Where groundwater may be impacted the assessment should identify appropriate groundwater environmental values.

6. State the indicators and associated trigger values or criteria for the identified environmental values. This information should be sourced from the ANZECC (2000) Guidelines for Fresh and Marine Water Quality http://www.environment.gov.au/resource/australian-and-new-zealand-guidelines-fresh-and-marine-water-quality-volume-1-guidelines

7. State any locally specific objectives, criteria or targets which have been endorsed by the NSW Government.

Impact Assessment

8. Describe the nature and degree of impact that any proposed discharges will have on the receiving environment.

9. Assess impacts against the relevant ambient water quality outcomes. Demonstrate how the proposal will be designed and operated to:
    - protect the Water Quality Objectives for receiving waters where they are currently being achieved; and
    - contribute towards achievement of the Water Quality Objectives over time where they are not currently being achieved.

10. Where a discharge is proposed that includes a mixing zone, the proposal should demonstrate how wastewater discharged to waterways will ensure the ANZECC (2000) water quality criteria for relevant chemical and non-chemical parameters are met at the edge of the initial mixing zone of the discharge, and that any impacts in the initial mixing zone are demonstrated to be reversible.

11. Assess impacts on groundwater and groundwater dependent ecosystems.

12. Describe how stormwater will be managed both during and after construction.

13. Describe in detail any water storage ponds, or basins, proposed to be constructed during the whole operational life. Provide location of the proposed storage(s), estimated volume capacities and expected water quality.

14. Describe under exactly what circumstances, if any, these storages would be discharged or allowed to overtop, and what the receiving environment for any discharges would be.

Monitoring

15. Describe how predicted impacts will be monitored and assessed over time. Including a Trigger Action Response Plan, or similar response management plan, that will be implemented in response to any adverse impacts identified from the activity. This plan is to identify appropriate trigger values for the site and provide appropriate response actions to be implemented if adverse impacts are identified through the monitoring program.

16. Water quality monitoring should be undertaken in accordance with the *Approved Methods for the Sampling and Analysis of Water Pollutant in NSW* (2004) http://www.epa.nsw.gov.au/resources/legislation/approvedmethods-water.pdf

8 Waste

In relation to waste the EIS should:

1. Identify, characterise and classify all waste that will be received at the facility including proposed quantities of the waste.
   Note: All waste must be classified in accordance with *EPA's Waste Classification Guidelines.*

2. Describe all plans, procedures and protocols to be implemented to demonstrate compliance with *EPA's Environmental Guidelines: Solid Waste Landfills.*

3. Identify, characterise and classify all waste that is proposed to be disposed of to an offsite location, including proposed quantities of the waste and the disposal locations for the waste. This includes waste that is intended for re-use or recycling.
   Note: All waste must be classified in accordance with *EPA's Classification Guidelines.*

4. Include a commitment to retaining all sampling and classification results for the life of the project to demonstrate compliance with *EPA's Waste Classification Guidelines.*

6. Provide details of how waste will be handled and managed onsite to minimise pollution.

7. Provide details of how any waste proposed to be transported from the site will be handled and managed during transport to a lawful facility. If the waste possesses hazardous characteristics, the Proponent must provide details of how the waste will be treated or immobilised to render it suitable for transport and disposal.

8. Include details of all procedures and protocols to be implemented to ensure that any waste leaving the site is transported and disposed of lawfully and does not pose a risk to human health or the environment.

9. Include a statement demonstrating that the Proponent is aware of EPA's requirements with respect to notification and tracking of waste.

10. Include a statement demonstrating that the Proponent is aware of the relevant legislative requirements for disposal of the waste, including any relevant Resource Recovery Exemptions, as gazetted by EPA from time to time.

9 Monitoring Programs

The EIS should include a detailed assessment of any noise, air quality, water quality or waste monitoring required during the construction/development phase and on-going operation of the site to ensure that the development achieves a satisfactory level of environmental performance. The evaluation should include a detailed description of the monitoring locations, sample analysis methods and the level of reporting proposed.

ATTACHMENT 2

Guidance Material

Title	Web address
Relevant Legislation	
Environmental Planning and Assessment Act 1979	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+203+1979+cd+0+N
Protection of the Environment Operations Act 1997	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+156+1997+cd+0+N
Licensing	
Guide to Licensing	www.environment.nsw.gov.au/licensing/licenceguide.htm
Landfilling	
EPA's Environmental Guidelines: Solid Waste Landfills	http://www.environment.nsw.gov.au/resources/waste/envguidlns/solidlandfill.pdf
Air Issues	
Air Quality	
Approved methods for modelling and assessment of air pollutants in NSW (2005)	http://www.epa.nsw.gov.au/resources/air/ammodelling05361.pdf
POEO (Clean Air) Regulation 2010	http://www.legislation.nsw.gov.au/maintop/view/inforce/subordleg+428+2010+cd+0+N
Odour	
Technical framework: Assessment and management of odour from stationary sources in NSW (DEC, 2006)	http://www.epa.nsw.gov.au/resources/air/20060440framework.pdf
Technical notes: Assessment and management of odour from stationary sources in NSW (DEC, 2006)	http://www.epa.nsw.gov.au/resources/air/20060441notes.pdf
Greenhouse Gas	
The Greenhouse Gas Protocol: Corporate Standard, World Council for Sustainable Business Development & World Resources Institute	http://www.ghgprotocol.org/standards/corporate-standard
National Greenhouse Accounts (NGA) Factors, Australian Department of Climate Change (Latest release),	http://www.climatechange.gov.au/publications/greenhouse-acctg/national-greenhouse-factors.aspx
National Greenhouse and Energy Reporting System, Technical Guidelines (latest release)	http://www.climatechange.gov.au/climate-change/greenhouse-gas-measurement-and-reporting/company-emissions-measurement/technical
Australian Greenhouse Emissions Information System (AGEIS)	http://ageis.climatechange.gov.au/

Title	Web address
Noise and Vibration	
Interim Construction Noise Guideline (DECC, 2009)	http://www.epa.nsw.gov.au/resources/noise/09265cng.pdf
Assessing Vibration: a technical guideline (DEC, 2006)	http://www.epa.nsw.gov.au/noise/vibrationguide.htm
Australian and New Zealand Environment Council – Technical basis for guidelines to minimise annoyance due to blasting overpressure and ground vibration (ANZEC, 1990)	http://www.epa.nsw.gov.au/resources/noise/ANZECBlasting.pdf
Industrial Noise Policy Application Notes	http://www.epa.nsw.gov.au/noise/industrial.htm
Environmental Criteria for Road Traffic Noise (EPA, 1999)	http://www.epa.nsw.gov.au/resources/noise/roadnoise.pdf
Rail Infrastructure Noise Guideline (EPA, 2013)	http://www.epa.nsw.gov.au/resources/noise/20130018eparing.pdf
Environmental assessment requirements for rail traffic-generating developments	http://www.epa.nsw.gov.au/noise/railnoise.htm
Wastewater	
DEC (2004) Environmental Guidelines: Use of Treated Effluent by Irrigation. NSW Department of Environment and Conservation, Sydney.	http://www.environment.nsw.gov.au/water/effluent.htm
EPHC, NRMMC and AHMC, 2006, Australian guidelines for water recycling: Managing health and environmental risks (Phase1), Doc. 21, NWQMS. Environment Protection and Heritage Council, Natural Resource Management Ministerial Council and Australian Health Ministers' Conference Canberra Act,	http://www.environment.gov.au/water/publications#quality
Waste, Chemicals and Hazardous Materials and Radiation	
Waste	
Waste Classification Guidelines (DECC, 2008)	http://www.epa.nsw.gov.au/waste/classification.htm
Resource recovery exemption	http://www.epa.nsw.gov.au/waste/RRecoveryExemptions.htm
NSW Energy from Waste Policy Statement	http://www.epa.nsw.gov.au/resources/waste/140056enfromwasteps.pdf
Water and Soils	
Soils	
Managing urban stormwater: soils and construction, vol. 1 (Landcom 2004) and vol. 2 (E. Mines and quarries) (DECC 2008)	Vol 1 - Available for purchase at http://www.landcom.com.au/whats-new/publications-reports/the-blue-book.aspx Vol 2 - http://www.environment.nsw.gov.au/stormwater/publications.htm
Landslide risk management guidelines	http://www.australiangeomechanics.org/resources/downloads/

Title	Web address
Site Investigations for Urban Salinity (DLWC, 2002)	http://www.environment.nsw.gov.au/resources/salinity/booklet3siteinvestigationsforurbansalinity.pdf
Local Government Salinity Initiative Booklets	http://www.environment.nsw.gov.au/salinity/solutions/urban.htm
Water	
Water Quality Objectives	http://www.environment.nsw.gov.au/ieo/index.htm
ANZECC (2000) Guidelines for Fresh and Marine Water Quality	http://www.environment.gov.au/resource/australian-and-new-zealand-guidelines-fresh-and-marine-water-quality-volume-1-guidelines
Approved Methods for the Sampling and Analysis of Water Pollutant in NSW (2004)	http://www.epa.nsw.gov.au/resources/legislation/approvedmethods-water.pdf

Trade & Investment
Resources & Energy

27th January 2015

Emma Barnet
Environmental Planning Officer
Infrastructure and Industry Assessments
Department of Planning & Environment
GPO Box 39
Sydney NSW 2001

Your Reference: SSD 14_6846
Our Reference: OUT15/1676

Emailed: Emma.Barnett@planning.nsw.gov.au

Dear Ms Barnet

Re: Request for Secretary's Environmental Assessment Requirements (SSD14_6846)
Muswellbrook Waste Management Facility and Landfill Development

I refer to your letter of 12th January 2015 requesting advice on issues concerning the preparation of Secretary's Environmental Assessment Requirements for the above project. Thank you for the opportunity to provide advice on the above matter. This is a response from the NSW Trade & Investment – Geological Survey of NSW (GSNSW).

Mineral Resources Requirements

Identification and assessment of impacts on other land users is required as a critical component of the Environmental Assessment (EA) process. Specifically, the EA must consider the potential for the project to impact upon any significant mineral resources, including metallic minerals, industrial and extractive minerals, petroleum, gas and coal resources. A significant aspect of mineral resource evaluation and development in regards to land use planning is that the locations of mineable deposits cannot always be predicted. This makes it imperative that known resources are protected from sterilisation by inappropriate zoning or development, and that access to land for mineral exploration should be maintained over as much of the project area as possible.

As such, the GSNSW requires the proponent to conduct an assessment as part of the EA, regarding the potential impacts of the project on any significant mineral resources, including:

- **Any operating mines, extractive industries or known mineral or petroleum resources.**
- **Exploration activities in the vicinity of the proposed development.**
- **Access for future exploration in the area.**

Specific Issues

The GSNSW previously provided advice to Muswellbrook Council on 29th January 2014 (OUT14/3411) regarding amendments to the Muswellbrook LEP to allow provision for the use of an open cut mining void, owned by Muswellbrook Coal Company, for use as a future landfill site. GSNSW notes that a Memorandum of Understanding was signed in 2010 between Muswellbrook Shire Council and Muswellbrook Coal Company in regard to the site.

The subject area is covered by Muswellbrook Coal mining titles ML 1562 and CCL713. GSNSW notes that a letter of consent from the manager of Muswellbrook Coal Company Limited, dated 3rd June 2014, has also been included within Appendix 2 of the SEARs application.

Petroleum Exploration License (PEL) 4 held by AGL Upstream Investments Pty Ltd exists over a broad regional area including the subject site. The titleholder should be consulted regarding active exploration in the vicinity of the proposed development, with a record of consultation included in the EIS.

The contact details (that GSNSW currently has on record) for the above title holders are as follows:

Coal Titles - CCL 713 & ML 1562 (MUSWELLBROOK COAL COMPANY LTD)
Contact: John Furner
P: 02 6543 2300
E: john.furner@muscoal.com.au

Petroleum Title – PEL4 (AGL Pty Ltd)
Contact: Mike Moraza
P: 02 9921 2999
E: mmoraza@agl.com.au

Mine Subsidence
As the subject area is covered by the Muswellbrook Mine Subsidence District, the Mine Subsidence Board should be consulted in regards to the proposal.

Geoscience Information Services

The GSNSW has a range of online data available on line through the following website address:
http://www.resources.nsw.gov.au/titles/online-services

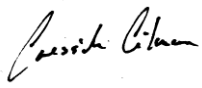
This site hosts a range of data to enable research into exploration, land use and general geoscience topics. Additionally, the location of exploration and mining titles in NSW may be accessed by the general public using the following online utilities:

1. **NSW Titles** enables the public to access and view frequently updated titles mapping information across NSW. This online service is available at:
   http://nswtitles.minerals.nsw.gov.au/nswtitles/

2. **MinView** allows on-line interactive display and query of exploration tenement information and geoscience data. It allows spatial selection, display and download of geological coverages, mineral deposits and mine locations, geophysical survey boundaries, drillhole locations, historical and current exploration title boundaries and other spatial datasets of New South Wales. This online service is available at:
   http://www.resources.nsw.gov.au/geological/online-services/minview

Queries regarding the above information, and future requests for advice in relation to this matter, should be directed to the GSNSW Land Use team at landuse.minerals@trade.nsw.gov.au.

Yours sincerely



Cressida Gilmore
Team Leader - Land Use

From:	Mary Kovac
To:	Emma Barnet
Cc:	Cathy Kelly; Wayne McDonald
Subject:	Request for Environmental Assessment Requirements (SSD14-6846) Muswellbrook waste management facility and landfill development
Date:	Friday, 23 January 2015 2:24:33 PM

Hi Emma

Thank you for referring the above proposal and the opportunity to submit any requirements from the Department Of Primary Industries (Agriculture). On reviewing the Preliminary Environmental Assessment the Department has no specific requests to be formalised in the SEARS due to the location and land uses that are occupied by the proposal. The only recommendation is that the the publication (Primefact) - Agricultural Issues for Landfill Developments may be a useful resource when dealing with neighbouring land uses that have some commercial agricultural operations in the proposal area. This can be used as a reference as part of the SEARS requirements. It is available at http://www.dpi.nsw.gov.au/__data/assets/pdf_file/0011/358985/Agricultural-issues-for-landfill-developments.pdf

Please contact me if you require further information.

Mary

--
Mary Kovac/ Resource Management Officer
Land Use Planning Team
Cnr Hampden and Cobra Sts (PO Box 865) DUBBO NSW 2830
T: 02 68811250 M 0427949987
E: mary.kovac@dpi.nsw.gov.au
W: www.trade.nsw.gov.au

.dd

WWW.INDUSTRY.NSW.GOV.AU

primefacts

FOR PROFITABLE, ADAPTIVE AND SUSTAINABLE PRIMARY INDUSTRIES

NOVEMBER 2010 | PRIMEFACT 1065 | RURAL DEVELOPMENT GUIDELINES

Agricultural issues for landfill developments

Mary Kovac and Wendy Goodburn

Resources Planning and Development Unit

The purpose of this Primefact is to help consent authorities plan for and assess landfill facilities in rural areas.

Landfill developments are defined in the Standard Instrument (Local Environmental Plan) Order 2006 as waste disposal facilities and waste or resource management facilities. Waste resource transfer stations are not specifically addressed in this Primefact.

This guide is part of a series aimed at streamlining the Development Application (DA) process, by setting out the key agricultural issues, impacts and recommendations for consent authorities to consider.

The guideline may additionally help applicants, developers, consultants and the general public identify important design considerations to avoid adverse impacts on agricultural resources and land use.

This guideline focuses on agricultural issues rather than the full range of issues that consent authorities must address.

Proposals which trigger integrated development under the *Environmental Planning and Assessment Act 1979*, the provisions of the *Fisheries Management Act 1994,* the *Mining Act 1992* or the *Plantations and Reafforestation (Code) Regulation 2001* should continue to be referred to the relevant section of Industry and Investment NSW (I&I NSW).

Planning for landfill developments

Councils are encouraged to develop strategic plans that identify desired planning outcomes for rural lands. These plans should consider local and regional primary industry resources, sustainable development opportunities for primary industries, the need for waste facilities and the minimisation of land use conflict.

Development assessment guiding principles:

☑ Landfills are consistent with strategic planning policies and zone objectives.

☑ Landfills are designed and sustainably managed to minimise environmental impacts, including biosecurity risks.

☑ Landfills are clearly justified in a regional context with the merits and community benefits and opportunity costs clearly identified.

The impact of landfills on adjoining farm land should be carefully considered. Photo: A. Cullen-Ward, Bathurst Regional Council.

☑ Land use conflicts are minimised, amenity values are protected and the expectations of local communities are managed.

☑ DAs identify suitable mitigatory and monitoring responses that address the following issues:

- Agricultural land and operational Impacts
- Water resources and fisheries Impacts
- Rehabilitation and soil management
- Biosecurity, pests and weeds
- DrumMUSTER, livestock welfare, and emergency management.
- Community consultation and project justification.

NSW GOVERNMENT Industry & Investment

Development assessment guidelines

Agricultural land and operational impacts

Consent authorities should verify that development proposals for landfill sites on rural resource lands comprehensively document:

- ☑ Agricultural operations in the surrounding locality (grazing or cropping enterprises, intensive agriculture or horticulture) including groundwater usage and relevant agricultural improvements such as houses, sheds, cropping areas, irrigation systems, improved pastures.
- ☑ The predominant landuse of the site and the total area that would be removed from agricultural use during landfill operations.
- ☑ The location and total area of the property in addition to the specific location of the proposed landfill and the area to be disturbed.
- ☑ Soil landscapes and soil types on the site including depth to bedrock, or impervious clays and the suitability and volume of available top soil to rehabilitate the site. See suggested websites in the Addition Information section.
- ☑ The potential impacts on agricultural enterprises and rural landholders, possible cumulative effects, the relative risks associated with those impacts and effective mitigation strategies.

Specific issues to consider include:

- Current land uses in the area and any loss of agricultural lands. Include land removed from agricultural use in order to ensure a safe working environment or to prevent injury to livestock and wildlife.
- Predicted operating life span of the facility, proposed hours of operation (including construction periods)
- Opportunities for the safe disposal of dead animals / birds from local agricultural operations or veterinary surgeries.
- Proposed access routes and arrangements and associated noise and traffic impacts on farm residences and farming operations.
- Dust and windblown litter impacts on nearby farm residences, pastures, crops and livestock.
- Visual and lighting impacts on nearby farm residences and farming operations.
- Opportunities for the productive re-use of organic material and methane.

Impacts on Biosecurity, Water Resources and the management of Emergency incidents should also be considered (see subsequent sections).

Vegetative screening improves the amenity of landfills and can capture debris. Photo: W Goodburn.

Water resource and fisheries impacts

Water is a critical resource for sustainable farming enterprises and the environment in which they operate.

Applications for landfill developments should:

- ☑ Identify catchment boundaries and current ground and surface water resources, water management arrangements and water quality.
- ☑ Describe current / historic water quality and usage for irrigation, stock requirements and other uses.
- ☑ Identify and map existing drainage patterns water storages (including farm dams), local water bores or pumping sites and potential impacts or threats to these. Describe and map proposed water diversions or other drainage structures, including measures to divert and hold clean run off.
- ☑ Describe predicted leachate volumes and quality and seepage pathways including the lateral movement of leachate.
- ☑ Develop a water balance model to document the volume of run on and run off water and leachates, on site water requirements (eg to manage dust levels) and any water deficit or surplus.
- ☑ Develop a nutrient budget for leachate and related soil and pasture management plans. An accumulation of nutrients and salts may lead to pasture failure, weed growth and soil erosion.
- ☑ Design and model any potential impact of the landfill development on local flooding that could impact on agricultural operations and farm access.
- ☑ Describe mitigating and monitoring proposals to prevent the contamination of ground or surface

waters and protect water resources and existing water use opportunities.

Pay particular attention to leachate management, including the size and location of leachate irrigation areas and/or leachate evaporation ponds.

☑ Document any proposals for the productive re-use of water captured on site or the requirement to purchase water entitlements

Additional fisheries issues

Landfills could impact fish habitats and fish populations if they leach substances into nearby or downstream waterbodies. Access roads to Waste facilities that cross streams or waterways may also affect fish passage.

When reviewing or planning for a new or expanded landfills,, consent authorities should check the Key Fish Habitat mapping available from I&I NSW (Fisheries) Regional Conservation Managers to identify potential fish habitats in close proximity to the proposed facility or downstream.

Specific measures to avoid potential impacts upon fish habitats and populations include:

☑ Locating landfills away from waterways and associated floodplains to the greatest extent possible

☑ Developing appropriate leachate collection and disposal infrastructure

☑ Incorporating liners to prevent leachate transmission to the watertable and subsequently into downstream waterways

☑ Utilising access routes that avoid crossing streams or waterways or incorporate appropriate design structures.

Rehabilitation and soil management

Rehabilitation is important to curtail erosion, limit weed germination and restore productive land use options

I&I NSW recommends that proponents commit to preparing a comprehensive rehabilitation management plan that:

☑ Clearly documents environmental policies and rehabilitation objectives.

☑ Comprehensively reviews the relevant issues and risks

☑ Identifies mitigation measures to prevent excessive dust, soil erosion and the sedimentation of waterways

☑ Documents monitoring proposals

☑ Describes the proposed future land use options and justifies any permanent impacts on agricultural or other primary industries.

In particular rehabilitation plans should document:

- Vegetation re-establishment goals and strategies, including the predominant species to be used.
- Final landforms and revegetation proposals and future land uses for the site.
- Likely staging and timeframes for site rehabilitation.
- Opportunities to support sustainable agricultural production (eg separation and productive re-use of organic wastes).
- Measures to strip and maintain the viability of topsoil over time and subsequently use this resource for site rehabilitation.
- Proposed sources of interim land fill cover and management proposals. Timing of revegetation efforts to fit with seasonal conditions.
- Weed and pest management proposals and ensure they are in accordance with existing State, regional or local management plans or strategies.
- Monitoring proposals to assess the effectiveness of rehabilitation efforts and repair as required.
- The responsible body for site management and ongoing remediation when landfill operations cease.

Rehabilitation practices supported by I&I NSW include:

☑ The removal of topsoil and its immediate reuse before disturbing sub-soils or erecting permanent structures.

If this is not possible, topsoils should be temporarily stored in accord with best practices to maintain soil health and the vigour of native seed, limit weed germination, avoid soil loss and catchment impacts.

☑ Frequent and preferable daily covering of deposited waste to limit water infiltration, litter problems, fire risk and odour generation. Regular cover also reduces biosecurity risks.

☑ Reforming the landscape to blend with surrounding landforms and land uses. Plans should allow for soil settling and make provision to refill disturbed sites.

☑ Appropriate and enduring water diversion and erosion structures and practices.

☑ The de-compaction of areas traversed by heavy machinery to encourage plant growth and minimise run off.

☑ Progressive site rehabilitation,

☑ Sowing of cover crops or pastures to stabilise disturbed sites and reduce weed growth.

☑ Use of species suitable for the locality and clean seed with a low risk of contributing to weed problems.

Active tip face, Whylandra Waste Disposal Depot, Dubbo Photo: Ian Bailey, Dubbo City Council

Biosecurity, pests and weeds

Landfills receive organic material from diverse sources. The deposited material can harbour and nurture potential diseases, and cause pest or weed infestations. Such impacts can increases the cost of control actions on surrounding farms and threaten agricultural enterprises in the locality or region.

Vehicles travelling to and from landfill sites can additionally contribute to the spread or build up of disease, weeds and pests.

Landfills pose a particular risk for viticultural, organic and apiary industries.

Appropriately managed landfills can also provide for the secure disposal of animal carcasses. This is important for the sustainable operation of most agricultural and veterinary businesses.

To ensure appropriate consideration of Biosecurity risks the Environmental Assessment should:

☑ Identify what materials will be accepted at the facility and how they will be managed. For instance:

- will dead poultry or animal carcasses be accepted and how will they be managed?
- where will organic or other material be sourced from and how will this be controlled?

☑ Include a biosecurity risk assessment outlining the likely plant and animal disease risks. The risks will depend on the source and type of material to be deposited, as well as local issues such as flies or feral animals accessing deposited waste.

☑ Develop a risk management matrix. This should identify:

- Risks to current and potential animal and plant products and other land uses in the locality and region against the types of waste to be deposited in the landfill facility.
- Impacts on landholders and the risks of disease spread associated with the collection and movement of waste to the waste disposal site.
- Any stock movement corridors in the vicinity of the waste management facility.

  The critical distance to producers or stock movement corridors will vary according to site security, terrain, water movement, locality (in relation to airflows and different disease risks), and species of livestock, but should extend for at least 3 kilometres.

☑ Develop a response plan to deal with identified risks as well as contingency plans for any failures.

  Risk management plans should include a consideration of agricultural risks during emergency situations such as flooding, fire, disease outbreaks and other possible catastrophic events.

  See also the reference on Environmental Risk Assessment Mitigation Package for Small Waste Facilities under the Additional Information section.

Diseases and pests requiring specific consideration include Phylloxera, Queensland fruit fly, potato cyst nematode and *American foulbrood* disease. Additional information on these is provided in the following below.

Phylloxera

Phylloxera (*Daktulosphaira vitifolii*) is the world's worst grapevine pest and is a proclaimed plant disease with significant implications for the Australian viticultural industry. [1]

The *NSW Plant Diseases Act 1924* identifies Phylloxera Infested, Exclusion and Risk Zones. Phylloxera Infested Zones include the Sydney Basin and the Albury-Corowa regions. All other regions in NSW are Phylloxera exclusion zones.

[1] NSW DPI website - Phylloxera leaflet

The *NSW Plant Diseases Act 1924* also imposes restrictions on the movement of grape material (eg grapevine prunings, grape bunches or live plants) between these zones (Proclamation P157)[2].

I&I NSW recommends that landfill proposals:

- ☑ Identify the relevant Phylloxera zone.
- ☑ Proposals must assess the risk of Phylloxera and develop suitable prevention measures that comply with legislative requirements and protocols.
- ☑ The movement of waste from or within a Phylloxera Infested Zone requires comprehensive consideration of the Phylloxera risks and the adoption of specific management procedures as set out in National Phylloxera Management Protocol.
- ☑ Green waste sourced from Phylloxera Exclusion zones can be composted and processed for reuse within that zone.

Queensland fruit fly

Queensland Fruit Fly is endemic in much of NSW, but not in Proclaimed fruit fly zones. The risk of breeding Queensland Fruit Fly will be negligible provided green waste and fruit which might be a host for Queensland fruit fly is processed at the facility and buried within a few days or composted with other green waste material (and subjected to temperatures normally above 55 degrees Celsius).

Potato cyst nematode

NSW is currently free of Potato cyst nematode; consequently potato waste originating from an interstate potato cyst nematode infested area must not be dumped into landfill, subsequently composted or distributed as a garden/farm product.

At this time only two companies within NSW are importing potatoes from Victoria under an I&I NSW movement approval (Sydney metropolitan area) and there are requirements for their waste to be disposed of by burial at Eastern Creek.

It is important to ensure that no companies importing Victorian potatoes dump potato waste at the landfill facility.

Sugarcane smut

Sugarcane smut is deemed as an established disease and there are no quarantine or movement control measures likely to affect landfills within sugarcane Pest Quarantine Areas. However, the movement of sugarcane planting material and machinery between sugarcane quarantine areas is still restricted and requires an Inspector's Approval.

Apiary considerations

Bees will source food (particularly protein) from a waste or compost facility and encourage other bees to gather at the food source. Hence landfills are a potential biosecurity risk to the apiary industry.

The risks are associated with disease transmission and the impact on Industry Quality Assurance Certification and the status of an organic business.

The main biosecurity risk is the contamination of local honey and commercial colonies with disease, most particularly the *American foulbrood* disease which is a notifiable disease under the NSW *Apiaries Act 1985*.

American foulbrood is the most serious brood disease of honey bees in New South Wales (NSW)[3]. It can be transferred in honey and is viable for up to 70 years.

Bee swarms can also pose an occupational health and safety (OH&S) risks for employees and visitors to landfills..

To minimise apiary biosecurity risks and employee injury the following practices are recommended:

- ☑ Identify the location of apiaries and potential landfills and assess the risk for the apiary industry.
- ☑ Develop measures to minimise risks, such as covering waste material on a daily basis.
- ☑ In the event of a bee swarm inhabiting the site, engage a suitably qualified apiarist to remove the bees.

Pest management

Landfill sites can also provide food sources and refuge for feral animals such as cats, foxes, pigs and dogs. As well as threatening biodiversity, this can also lead to the spread of endemic and exotic diseases for local and regional agriculture.

Food waste that can be accessed by feral pigs presents a significant foot and mouth disease risk.

Consent conditions for landfill proposals mandates the development of a Pest and Feral animal management strategy and plan, in consultation with the relevant Livestock Health and Pest Authority.

A pest animal plan should identify:

- ☑ Likely feral animals and their management.

[2] National Phylloxera Management Protocol

[3] American Foulbrood – Tracing the source, NSW DPI

☑ Measures to limit domestic, feral animals and birds from accessing disposed material.

☑ Potential impacts on birds or other wildlife and appropriate safeguards to be implemented.

☑ Potential impacts of species that may be introduced from other states (eg fire ants).

☑ Monitoring and mitigating measures to manage feral animals. The compaction and covering of waste material with adequate drainage is an effective management tool for pest and feral animal management.

Weed management

Consent conditions for landfill proposals require the development of a Weed management strategy and plan in consultation with relevant local council Weed Authorities.

A weed management plan should identify:

☑ Noxious and problematic environmental weeds on site and for those likely to be transported to the facility from source areas.

☑ Weed suppression, management and containment strategies for all disturbed areas. For instance soil stockpiles, roadsides leading to the landfill site and disturbed areas. Weed germination and invasion is stimulated by disturbance. This should include measures:

- to limit the off site spread of weeds via vehicles (eg segregation, wash down or monitoring provisions)
- targeting soil stockpiles, roadsides within and leading to the landfill site and any other disturbed areas (weed germination and invasion is stimulated by disturbance).

☑ Monitoring and mitigating measures to manage noxious and problematic weeds on site and in immediately adjoining areas.

☑ Green waste composting needs to be undertaken in accord with Australian Standards. That includes green waste that is to be composted for re-use off site.

Additional agricultural issues

Chemical drum recycling

DrumMUSTER is a National program for the collection and recycling of cleaned eligible non returnable crop production and on-farm animal health chemical containers.

The responsible collection and recycling of used chemical drums by landfill facilities supports agricultural industries and the environment.

I&I NSW recommend that landfills:

☑ Include a drum muster depot for the collection of chemical drums.

Composting organic material is an effective way to reuse waste and reduce landfill. Photo: Tamworth Regional Council.

Livestock welfare

To ensure the health and welfare of livestock located near the landfill, consent authorities should verify that the development application identifies:

☑ How stock would be excluded from the landfill and associated infrastructure (roads, weighbridge, leachate ponds, stormwater dams etc)..

☑ The standard of any exclusion fencing, maintenance schedules and proposals to remove when the site is stabilised.

☑ Measures to avoid stock health risks on adjoining lands such as the ingestion of windblown plastic bags or other items and contamination of water.

Emergency management

Landfills contain large quantities of combustible materials which if ignited may threaten adjoining landholdings. Landfill gas can also contain corrosive and toxic substances. These can be explosive and cause fires.

Landfill gas also contributes to greenhouse gases and climate change which impacts on agricultural sustainability.

Development Applications for landfills should document strategies to effectively:

☑ Minimise and manage the production of methane and other gases.

☑ Prevent and respond to fires.

☑ Train staff in relevant emergency management procedures.

Consultation and project justification

Industry and Investment NSW recommends that consent authorities ensure that landfill proponents:

☑ Consult with relevant agencies such as local weed and pest and catchment management authorities on the design, construction and operation of the proposed infrastructure.

I&I NSW particularly recommends consultation with the Livestock Health and Pest Authority in regard to the management of pests and disease control measures such as quarantine period for decontamination of sites under the *Stock Diseases Act 1923* and accompanying regulations.

☑ Consult with the owners / managers of affected and adjoining agricultural operations in a timely and appropriate manner about; the proposal, the likely impacts and suitable mitigation measures or compensation.

☑ Provide sufficient documentation to demonstrate that all significant impacts on current and future agricultural developments and resources have been identified and can be reasonably avoided or adequately mitigated.

☑ Establish a complaints register and response protocol.

Additional information

I&I NSW website (www.industry.nsw.gov.au) has additional information on:

- Recycling and waste management including the use of biosolids and effluent and other recycled organics (eg composted wastes) and related I&I NSW research.
- Protecting and mapping aquatic species and habitat
- Biosecurity prevention measures and responses
- Phylloxera disease risks and management
- American Foulbrood – Tracing the source
- Living and Working in Rural Areas. A Handbook for Managing Land Use Conflict Issues on the North Coast
- Weeds
- Pasture establishment

Other websites with relevant information include:

- Environmental Risk Assessment Mitigation Package for Small Waste Facilities
- Environmental Guidelines for Solid Waste facilities
- Natural Resources Atlas
- Landscape and Soils Data on line
- The NSW Department of Environment and Climate Change and Water (DECCW) and the Australian Department of Environment, Water, Heritage and the Arts (DEWH&A) for comprehensive information on managing wastes. This includes a comprehensive list of publications.

Acknowledgement

The authors thank the following people for their contribution and editorial review of this Primefact: Allan Lugg and Marcus Riches (I&I NSW Fisheries), Glenda Briggs (I&I NSW), Marilyn Evers (I&I NSW), Cecily Hancock (Bega Valley Shire Council) and Mark Porta (NSW DECCW).

Thanks also to; A. Cullen-Ward (Bathurst Regional Council), Ian Bailey (Dubbo City Council), Kate Newlan and John Davis (on behalf of Tamworth Regional Council) for permission to use photographs.

ISSN 1832-6668

Check for updates of this Primefact at:
www.dpi.nsw.gov.au/primefacts

Job number 10348.PUB10/131

NSW GOVERNMENT | Office of Environment & Heritage

Your reference: SSD 14_6846
Our reference: DOC15/9531-01
Contact: Ziggy Andersons, 4908 6820

Ms Emma Barnet
Environmental Planning Officer – Infrastructure and Industry Assessments
Department of Planning and Environment
GPO Box 39
SYDNEY NSW 2001

Dear Ms Barnet

RE: OEH INPUT INTO SECRETARY'S ENVIRONMENTAL ASSESSMENT REQUIREMENTS FOR AN ENVIRONMENTAL IMPACT STATEMENT FOR THE MUSWELLBROOK WASTE MANAGEMENT FACILITY AND LANDFILL DEVELOPMENT (SSD 14_6846) – MUSWELLBROOK LGA

I refer to your email dated 12 January 2015 inviting the Office of Environment and Heritage (OEH) to provide input into the Secretary's Environmental Assessment Requirements (SEARs) for the proposed Muswellbrook Waste Management Facility and Landfill Development located at Muswellbrook in the Muswellbrook local government area. OEH understands that the proposal is a State Significant Development under the *Environmental Planning and Assessment Act 1979*.

OEH understands that Muswellbrook Shire Council proposes to develop a new Muswellbrook Waste Management Facility comprising an upgrade to the existing waste management facility integrated with a new landfill development encompassed by the Facility. The proposal will be utilising a Muswellbrook Coal Company (MCC) former coal mine void (*known as Open Cut No 1 Void 3).* As owner of the subject properties, MCC has authorised Council to lodge an application seeking approval for the new landfill development consistent with a Memorandum of Understanding between Muswellbrook Coal Company and Muswellbrook Shire Council.

OEH has reviewed the Preliminary Environmental Assessment (PEA) for this proposal and from this has prepared Standard SEARs which are presented in **Attachment A**. It should be noted that the Framework for Biodiversity Assessment was released on 1 October 2014 as such this project is to be assessed under this policy. Regarding the Framework for Biodiversity Assessment, the assessment must be conducted by a person accredited in accordance with s142B(1)(c) of the *Threatened Species Conservation Act 1995*. The Framework for Biodiversity Assessment is a new state wide policy, as such, the consultant is welcome to contact OEH (see contact officer below) with any questions they may have regarding the methodology.

PO Box 488G Newcastle NSW 2300
117 Bull Street, Newcastle West NSW 2302
Tel: (02) 4908 6800 Fax: (02) 4908 6810
ABN 30 841 387 271
www.environment.nsw.gov.au

If you have any further questions in relation to this matter, please contact Ziggy Andersons, Conservation Planning Officer, on 4908 6820.

Yours sincerely

20 JAN 2015

ZIGGY ANDERSONS
Acting Senior Team Leader Planning, Hunter Central Coast Region
Regional Operations

Enclosures:

Attachment A – Standard Environmental Assessment Requirements
Attachment B – Guidance Material

Attachment A – Standard Environmental Assessment Requirements

Biodiversity

1. Biodiversity impacts related to the proposed development are to be assessed and documented in accordance with the Framework for Biodiversity Assessment,
2. Unless otherwise agreed by OEH, by a person accredited in accordance with s142B(1)(c) of the *Threatened Species Conservation Act 1995.*

Aboriginal cultural heritage

3. The EIS must identify and describe the tangible and intangible Aboriginal cultural heritage values that exist across the whole area that will be affected by the development and document these in the EIS. This may include the need for surface survey and test excavation. The identification of cultural heritage values should be guided by the *Guide to investigating, assessing and reporting on Aboriginal Cultural Heritage in NSW* (DECCW, 2011) and consultation with OEH regional officers.
4. Where Aboriginal cultural heritage values are identified, consultation with Aboriginal people must be undertaken and documented in accordance with the *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW). The significance of cultural heritage values for Aboriginal people who have a cultural association with the land must be documented in the EIS.
5. Impacts on Aboriginal cultural heritage values are to be assessed and documented in the [EIS/EA]. The [EIS/EA] must demonstrate attempts to avoid impact upon cultural heritage values and identify any conservation outcomes. Where impacts are unavoidable, the [EIS/EA] must outline measures proposed to mitigate impacts. Any objects recorded as part of the assessment must be documented and notified to OEH.

Historic heritage

6. The [EIS/EA] must provide a heritage assessment including but not limited to an assessment of impacts to *State and local heritage* including conservation areas, natural heritage areas, places of Aboriginal heritage value, buildings, works, relics, gardens, landscapes, views, trees should be assessed. Where impacts to State or locally significant heritage items are identified, the assessment shall:
   a. outline the proposed mitigation and management measures (including measures to avoid significant impacts and an evaluation of the effectiveness of the mitigation measures) generally consistent with the NSW Heritage Manual (1996),
   b. be undertaken by a suitably qualified heritage consultant(s) (note: where archaeological excavations are proposed the relevant consultant must meet the NSW Heritage Council's Excavation Director criteria),
   c. include a statement of heritage impact for all heritage items (including significance assessment),
   d. consider impacts including, but not limited to, vibration, demolition, archaeological disturbance, altered historical arrangements and access, landscape and vistas, and architectural noise treatment (as relevant), and
   e. where potential archaeological impacts have been identified develop an appropriate archaeological assessment methodology, including research design, to guide physical

archaeological test excavations (terrestrial and maritime as relevant) and include the results of these test excavations.

Water and soils

7. The EIS must map the following features relevant to water and soils including:
   a. Acid sulfate soils (Class 1, 2, 3 or 4 on the Acid Sulfate Soil Planning Map).
   b. Rivers, streams, wetlands, estuaries (as described in Appendix 2 of the Framework for Biodiversity Assessment.
   c. Groundwater.
   d. Groundwater dependent ecosystems.
   e. Proposed intake and discharge locations.

8. The EIS must describe background conditions for any water resource likely to be affected by the development, including:
   a. Existing surface and groundwater.
   b. Hydrology, including volume, frequency and quality of discharges at proposed intake and discharge locations.
   c. Water Quality Objectives (as endorsed by the NSW Government www.environment.nsw.gov.au/ieo/index.htm) including groundwater as appropriate that represent the community's uses and values for the receiving waters.
   d. Indicators and trigger values/criteria for the environmental values identified at (c) in accordance with the ANZECC (2000) Guidelines for Fresh and Marine Water Quality and/or local objectives, criteria or targets endorsed by the NSW Government.

9. The EIS must assess the impacts of the development on water quality, including:
   a. The nature and degree of impact on receiving waters for both surface and groundwater, demonstrating how the development protects the Water Quality Objectives where they are currently being achieved, and contributes towards achievement of the Water Quality Objectives over time where they are currently not being achieved. This should include an assessment of the mitigating effects of proposed stormwater and wastewater management during and after construction.
   b. Identification of proposed monitoring of water quality.

10. The EIS must assess the impact of the development on hydrology, including:
   a. Water balance including quantity, quality and source.
   b. Effects to downstream rivers, wetlands, estuaries, marine waters and floodplain areas.
   c. Effects to downstream water-dependent fauna and flora including groundwater dependent ecosystems.
   d. Impacts to natural processes and functions within rivers, wetlands, estuaries and floodplains that affect river system and landscape health such as nutrient flow, aquatic connectivity and access to habitat for spawning and refuge (e.g. river benches).
   e. Changes to environmental water availability, both regulated/licensed and unregulated/rules-based sources of such water.
   f. Mitigating effects of proposed stormwater and wastewater management during and after

construction on hydrological attributes such as volumes, flow rates, management methods and re-use options.

g. Identification of proposed monitoring of hydrological attributes.

Flooding and coastal erosion

11. The EIS must map the following features relevant to flooding as described in the Floodplain Development Manual 2005 (NSW Government 2005) including:
    a. Flood prone land
    b. Flood planning area, the area below the flood planning level.
    c. Hydraulic categorisation (floodways and flood storage areas).
12. The EIS must describe flood assessment and modelling undertaken in determining the design flood levels for events, including a minimum of the 1 in 10 year, 1 in 100 year flood levels and the probable maximum flood, or an equivalent extreme event.
13. The EIS must model the effect of the proposed development (including fill) on the flood behaviour under the following scenarios:
    a. Current flood behaviour for a range of design events as identified in 8) above. The 1 in 200 and 1 in 500 year flood events as proxies for assessing sensitivity to an increase in rainfall intensity of flood producing rainfall events due to climate change.
14. Modelling in the EIS must consider and document:
    a. The impact on existing flood behaviour for a full range of flood events including up to the probable maximum flood.
    b. Impacts of the development on flood behaviour resulting in detrimental changes in potential flood affection of other developments or land. This may include redirection of flow, flow velocities, flood levels, hazards and hydraulic categories.
    c. Relevant provisions of the NSW Floodplain Development Manual 2005.
15. The EIS must assess the impacts on the proposed development on flood behaviour, including:
    a. Whether there will be detrimental increases in the potential flood affectation of other properties, assets and infrastructure.
    b. Consistency with Council floodplain risk management plans.
    c. Compatibility with the flood hazard of the land.
    d. Compatibility with the hydraulic functions of flow conveyance in floodways and storage in flood storage areas of the land.
    e. Whether there will be adverse effect to beneficial inundation of the floodplain environment, on, adjacent to or downstream of the site.
    f. Whether there will be direct or indirect increase in erosion, siltation, destruction of riparian vegetation or a reduction in the stability of river banks or watercourses.
    g. Any impacts the development may have upon existing community emergency management arrangements for flooding. These matters are to be discussed with the SES and Council.
    h. Whether the proposal incorporates specific measures to manage risk to life from flood. These matters are to be discussed with the SES and Council.
    i. Emergency management, evacuation and access, and contingency measures for the development considering the full range or flood risk (based upon the probable maximum

flood or an equivalent extreme flood event). These matters are to be discussed with and have the support of Council and the SES.

j. Any impacts the development may have on the social and economic costs to the community as consequence of flooding.

Attachment B – Guidance material

Title	Web address
Relevant Legislation	
Coastal Protection Act 1979	www.legislation.nsw.gov.au/maintop/view/inforce/act+13+1979+cd+0+N
Commonwealth Environment Protection and Biodiversity Conservation Act 1999	www.austlii.edu.au/au/legis/cth/consol_act/epabca1999588/
Environmental Planning and Assessment Act 1979	www.legislation.nsw.gov.au/maintop/view/inforce/act+203+1979+cd+0+N
Fisheries Management Act 1994	www.legislation.nsw.gov.au/maintop/view/inforce/act+38+1994+cd+0+N
Marine Parks Act 1997	www.legislation.nsw.gov.au/maintop/view/inforce/act+64+1997+cd+0+N
National Parks and Wildlife Act 1974	www.legislation.nsw.gov.au/maintop/view/inforce/act+80+1974+cd+0+N
Protection of the Environment Operations Act 1997	www.legislation.nsw.gov.au/maintop/view/inforce/act+156+1997+cd+0+N
Threatened Species Conservation Act 1995	www.legislation.nsw.gov.au/maintop/view/inforce/act+101+1995+cd+0+N
Water Management Act 2000	www.legislation.nsw.gov.au/maintop/view/inforce/act+92+2000+cd+0+N
Wilderness Act 1987	www.legislation.nsw.gov.au/viewtop/inforce/act+196+1987+FIRST+0+N
Biodiversity	
NSW Biodiversity Offsets Policy for Major Projects (OEH, 2013)	www.environment.nsw.gov.au/biodivoffsets/bioffsetspol.htm
Framework for Biodiversity Assessment (OEH, 2013)	www.environment.nsw.gov.au/resources/biodiversity/140675fba.pdf
Fisheries NSW policies and guidelines	www.dpi.nsw.gov.au/fisheries/habitat/publications/policies,-guidelines-and-manuals/fish-habitat-conservation
List of national parks	www.environment.nsw.gov.au/NationalParks/parksearchatoz.aspx
Revocation, re-categorisation and road adjustment policy (OEH, 2012)	www.environment.nsw.gov.au/policies/RevocationOfLandPolicy.htm
Guidelines for developments adjoining land and water managed by the Department of Environment, Climate Change and Water (DECCW, 2010)	www.environment.nsw.gov.au/resources/protectedareas/10509devadjdeccw.pdf
Heritage	
The Burra Charter (The Australia ICOMOS charter for places of cultural significance)	http://australia.icomos.org/wp-content/uploads/The-Burra-Charter-2013-Adopted-31.10.2013.pdf
Statements of Heritage Impact 2002 (HO & DUAP)	www.environment.nsw.gov.au/resources/heritagebranch/heritage/hmstatementsofhi.pdf

Title	Web address
NSW Heritage Manual (DUAP) 1996: Located on OEH publications website – scroll to "N" on the link.	www.environment.nsw.gov.au/Heritage/publications/index.htm#G-I
Aboriginal Cultural Heritage	
Aboriginal Cultural Heritage Consultation Requirements for Proponents (DECCW, 2010)	www.environment.nsw.gov.au/resources/cultureheritage/commconsultation/09781ACHconsultreq.pdf
Code of Practice for the Archaeological Investigation of Aboriginal Objects in New South Wales (DECCW, 2010)	www.environment.nsw.gov.au/resources/cultureheritage/10783FinalArchCoP.pdf
Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW (OEH 2011)	www.environment.nsw.gov.au/resources/cultureheritage/20110263ACHguide.pdf
Aboriginal Site Recording Form	www.environment.nsw.gov.au/resources/parks/SiteCardMainV1_1.pdf
Aboriginal Site Impact Recording Form	www.environment.nsw.gov.au/resources/cultureheritage/120558asirf.pdf
Aboriginal Heritage Information Management System (AHIMS) Registrar	www.environment.nsw.gov.au/contact/AHIMSRegistrar.htm
Care Agreement Application form	www.environment.nsw.gov.au/resources/cultureheritage/20110914TransferObject.pdf
Water and Soils	
Acid sulphate soils	
Acid Sulfate Soils Planning Maps via 'The NSW Natural Resource Atlas'	www.nratlas.nsw.gov.au/
Acid Sulfate Soils Manual (Stone et al. 1998)	www.planning.nsw.gov.au/rdaguidelines/documents/NSW%20Acid%20Sulfate%20Soils%20Planning%20Guidelines.pdf
Acid Sulfate Soils Laboratory Methods Guidelines (Ahern et al. 2004)	http://www.advancedenvironmentalmanagement.com/Reports/Savannah/Appendix%2015.pdf This replaces Chapter 4 of the Acid Sulfate Soils Manual above.
Flooding and Coastal Erosion	
Reforms to coastal erosion management	www.environment.nsw.gov.au/coasts/coastalerosionmgmt.htm
Floodplain development manual	http://www.environment.nsw.gov.au/floodplains/manual.htm
Guidelines for Preparing Coastal Zone Management Plans	Guidelines for Preparing Coastal Zone Management Plans http://www.environment.nsw.gov.au/resources/coasts/130224CZMPGuide.pdf
NSW Climate Impact Profile	NSW Climate Impact Profile
Climate Change Impacts and Risk Management	Climate Change Impacts and Risk Management: A Guide for Business and Government. AGIC Guidelines for Climate Change Adaptation
Water	
Water Quality Objectives	www.environment.nsw.gov.au/ieo/index.htm
ANZECC (2000) Guidelines for Fresh and Marine Water Quality	www.environment.gov.au/water/publications/quality/australian-and-new-zealand-guidelines-fresh-marine-water-quality-volume-1
Applying Goals for Ambient Water	http://deccnet/water/resources/AWQGuidance7.pdf

Title	Web address
Quality Guidance for Operations Officers – Mixing Zones	
Approved Methods for the Sampling and Analysis of Water Pollutant in NSW (2004)	www.environment.nsw.gov.au/resources/legislation/approvedmethods-water.pdf