NSW Department of Commerce

DEPARTMENT OF ENERGY, UTILITIES AND SUSTAINABILITY
NEW SOUTH WALES GOVERNMENT

Brunswick Area Sewerage Augmentation

Environmental Impact Statement

Main Volume

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Summary

Introduction

The proponent of the proposed Brunswick Area Sewerage Augmentation project (the Proposal) is Byron Shire Council. The Proposal would be jointly funded by Byron Shire Council and the Department of Energy, Utilities and Sustainability. The Department of Commerce has provided project management and strategic support to the proponent.

This summary provides a brief description of the key issues and findings detailed in the respective Environmental Impact Statement chapters.

Proposal Description

The Proposal described in Chapter 3 of this Environmental Impact Statement incorporates the following components:

- *construction of a new Mullumbimby-Brunswick Heads STP to meet the projected capacity demands of the Brunswick Area up to the year 2025. The effluent quality produced by the proposed STP would be better than the Department of Environment and Conservation's Accepted Modern Technology Standard;*
- *provision of high levels of disinfection on all effluent produced by the proposed STP which significantly exceed those prescribed by the Accepted Modern Technology Standard to ensure the protection public health and minimise impacts on the oyster industry due to effluent releases on the Brunswick River estuary.*
- *provision of a 10-hectare constructed wetland to further disinfect and remove nutrients for any effluent that cannot be re-used and which would be released to the Brunswick River estuary*
- *provision of an aerobic digestion process at the new Mullumbimby-Brunswick Heads STP to produce stabilised sludge that would meet the Department of Environment and Conservation's Grade B stabilisation category;*
- *development of an effluent re-use scheme to maximise the opportunity for the beneficial re-use of the effluent;*
- *the release of surplus effluent that cannot be stored or re-used would be via a diffuser arrangement located in the Brunswick River. The release would be such that it would occur during ebb-tide conditions in the River;*
- *construction of sewage transfer rising mains from the Mullumbimby and Brunswick Heads sewerage catchments to the new Mullumbimby-Brunswick Heads STP;*
- *construction of effluent transfer rising mains from the new Mullumbimby-Brunswick Heads STP to effluent storage dams located at the Mullumbimby STP and South Mullumbimby;*
- *construction of an effluent rising main from Ocean Shores STP to the effluent storage dam located at the new Mullumbimby-Brunswick Heads STP; and*
- *decommissioning of the Mullumbimby STP and Brunswick Heads STP and the transfer of all sewage flows to the proposed Mullumbimby-Brunswick Heads STP, to be located on a Council-*

owned site at Vallances Road Mullumbimby. The effluent storage dams at Mullumbimby STP would be maintained as part of the effluent re-use scheme.

Statutory Considerations

The Proposal would be assessed in accordance with the framework established by the Environmental Planning and Assessment Act 1979 and the Environmental Planning and Assessment Regulation 2000. The Act contains two parts, which impose requirements for planning approval. Part 4 provides for the control of 'development', which requires development consent. Other activities are assessed under Part 5 of the Act.

Both Part 4 and Part 5 of the Act apply to the Proposal. Part 4 deals with the above-ground works associated with the effluent re-use scheme at South Mullumbimby with Byron Shire Council as the consent authority. Part 5 applies to all other elements of the Proposal with Byron Shire Council, the Department of Energy Utilities and Sustainability, Department of Environment and Conservation, Department of Infrastructure Planning and Natural Resources, Department of Primary Industries and Roads and Traffic Authority as joint Determining Authorities. Byron Shire Council is the Nominated Determining Authority for this proposal.

Parallel approval processes would occur under Part 4 and Part 5 incorporating the following general activities:

- *public exhibition of the Environmental Impact Statement during which members of the public and agencies may make formal submissions;*
- *assessment of responses to exhibition and preparation of a Representations Report;*
- *preparation of assessment reports to the Consent Authority and the Determining Authorities;*
- *preparation of Conditions of Approval; and*
- *consideration of approval for the Proposal.*

Consultation

The community has played an important role in the development of the Proposal. With the formation of the Brunswick River Catchment Wastewater Steering Committee in 1998, Byron Shire Council entered into a decision-making process with the community and relevant government agencies. The Committee established the objectives for the Proposal, provided direction on technical investigations and has played a major role in developing the Proposal presented in this Environmental Impact Statement.

The approach to consultation taken in the preparation of this Environmental Impact Statement has focused on the ongoing liaison and involvement of the Brunswick River Catchment Wastewater Steering Committee and a formal statutory consultation process with relevant government agencies. This consultative process will continue during the approval phase. Following approval, the Brunswick River Catchment Wastewater Steering Committee would continue to assess and monitor the results obtained during the construction and operational phases of the Proposal to ensure they remain consistent with the findings of this Environmental Impact Statement.

Need for the Project

The Proposal consists of the augmentation of the Mullumbimby and Brunswick Heads sewerage systems, the decommissioning of Mullumbimby and Brunswick Heads STPs, construction of a new STP at a site located near Vallances Road, and the establishment of an effluent re-use scheme.

The current and future sewage transfer, treatment, and disposal requirements of the Brunswick Area cannot be met by the existing sewerage system and sewage treatment infrastructure. The key issues which demonstrate the need for the project are as follows:

- *the current effluent discharges into the Brunswick River estuary are adversely impacting the aquatic environment of the estuary through high nutrient loads. This situation is unacceptable;*
- *the current performance of the two existing sewage treatment plants does not meet the Department of Environment and Conservation's Accepted Modern Technology Discharge Standards for certain parameters;*
- *there is a need to meet the Community's expectation to use sewage by-products (effluent and biosolids) as valuable resources;*
- *there is a need to provide for the sustainable development of Mullumbimby and Brunswick Heads in accordance with the approved settlement strategies for each township;*
- *the current capacity of the sewerage system is insufficient to meet the current demand in both catchments.. Mullumbimby STP and Brunswick Heads STP are both operating at or above their maximum design capacity; and*
- *there is a need to ensure that the impacts on the Brunswick River estuary are sustainable.*

The "Do Nothing" case has been examined and has been found to be unacceptable as the existing adverse and unsustainable environmental impacts would worsen over time. In addition, it would prevent Council meeting its statutory obligations under Pollution Reduction Program targets set by the Department of Environment and Conservation for the Mullumbimby and Brunswick Heads STPs.

Options Evaluation

The development of options for the Proposal involved a two-stage process. The first stage was the development and examination of a broad range of options leading to the selection of the preferred option. The second stage involved the refinement of the preferred option by examining each component of the option in greater detail. The preferred option has been developed through a process involving the Brunswick River Catchment Wastewater Steering Committee, Byron Shire Council, Department of Energy Utilities and Sustainability, Department of Commerce and the concept designers Gutteridge Haskins and Davey.

Key Environmental Issues

Surface Water

The existing water quality in the Brunswick River estuary is adversely affected by treated effluent, raw sewage overflows, urban run-off and other catchment sources. Nutrient concentrations often exceed the ANZECC and ARMCANZ guidelines (2000) for the protection of ecological health. There is strong seasonal variation, with higher nutrient and pathogen concentrations during wet seasons, often at levels unsafe for swimming.

The construction of the proposal has the potential for erosion and sediment-related impacts on the Brunswick River estuary. However, careful planning and the use of erosion and sediment controls would minimise the risk of these impacts occurring.

The surface water quality assessment predicted the likely changes in water quality in the Brunswick River estuary as a result of the operation of the proposal. The assessment concluded that the potential impacts associated with effluent releases to the Brunswick River, described in terms of a reduction in nutrient loads, would be significantly reduced by the implementation of the proposal, compared to existing conditions.

The water quality assessment concluded that the operation of the proposal would meet the proposed water quality assessment criteria for dissolved inorganic nitrogen, chlorophyll-a and faecal coliforms for the middle and lower reaches of the estuary during dry and medium river flow conditions. The assessment noted that the proposal may exceed the water quality assessment criteria for chlorophyll-a during drought conditions. However, this situation is unlikely to occur, as the proposed effluent re-use scheme included in the proposal would utilise most of the effluent produced by the proposed Mullumbimby-Brunswick Heads STP during these conditions, so that releases to the Brunswick River estuary would be unlikely to occur during these extreme conditions.

Geology and Soils

Twelve bore holes and eleven test pits were dug at the Mullumbimby-Brunswick Heads STP site, the golf course, and the Council owned land adjacent to the playing fields for the purpose of this Environmental Impact Statement. There is a possibility that construction activities would be conducted in areas that contain potential acid sulfate soils.

The proposed construction and operation of the proposal is unlikely to have an adverse impact on the local geology, as the expected depth to bedrock is greater than the proposed excavation depths.

The potential construction impacts of the proposal on soils are expected to be minor in nature and would be managed through appropriate mitigation measures. Specific measures would be implemented during construction through the preparation of an Erosion and Sediment Control Plan and Acid Sulphate Soils Management Plan.

The operation of the proposed Mullumbimby-Brunswick Heads STP is not expected to adversely affect the local soil conditions of the site, as all biosolids would be transported off-site for re-use purposes.

The operation of the effluent irrigation scheme has the potential to affect local soil and groundwater conditions, mostly through the increased frequency of wetting and the addition of constituents such as nutrients, bacteria and salts from the treated effluent. These particular aspects and soil profiles require that the soil quality at each of the effluent re-use sites be closely monitored to ensure adverse impacts due to effluent irrigation are not experienced. It is proposed that a soil quality monitoring program be developed and implemented at all effluent re-use sites to monitor the long-term trends of nutrients and other parameters and implement appropriate mitigating measures in the event that adverse trends are noted.

Groundwater

A baseline groundwater assessment was conducted in 2004 at each of the proposed effluent re-use sites. The survey included the installation of 12 piezometers: three at the Mullumbimby golf course; three at the sports field site; and six at the proposed STP site.

The proposed construction of the pipelines, effluent storage dams, some process vessels and the constructed wetland have the potential to impact on the local groundwater system during the construction phase, due to the depth of the excavations necessary and the relatively shallow groundwater tables prevalent in the area covered by the Proposal. The proposed development and establishment of appropriate groundwater management measures during the construction phase of the proposal would ensure groundwater flows are not adversely affected during the construction period.

The operation of the proposed effluent irrigation scheme has the potential to affect local groundwater conditions, by locally raising groundwater tables, waterlogging, and altering groundwater quality. The proposed development and implementation of site-specific irrigation management plans and groundwater monitoring programs would ensure that groundwater conditions at these sites are monitored and appropriate measures are implemented to mitigate adverse trends and ensure the long-term sustainability of the effluent re-use scheme.

Terrestrial Ecology

A detailed assessment of the potential impacts of the Proposal on threatened species has been undertaken. The assessment included site surveys, database searches, habitat assessments and impact assessments for species which were recorded in the study area and may be affected by the Proposal.

Impacts to the ecological integrity of the study area have been largely avoided through the pipeline route selection process and proposed mitigation measures. Impact assessments were completed for terrestrial species and communities with the potential to be affected by the proposal. The assessments concluded that the proposal is unlikely to have a significant impact on the threatened species, populations or communities found in the study area.

Aquatic Ecology

A detailed assessment of potential impacts on aquatic species found in the study area has been undertaken. The assessment included a field survey and extensive literature review of the marine and aquatic communities that may be affected by the Proposal. Field observations, site photographs, supported by extensive literature reviews, were used to map the aquatic flora of the region.

The most substantial impact of the proposal on aquatic ecology is likely to be related to the potential decrease in both the growth and frequency of phytoplankton blooms in the River as a result of the expected reduction in nitrogen and phosphorus levels being released into the Brunswick River estuary. This is considered to be a positive impact to the aquatic ecology of the Brunswick River estuary. Decreasing nitrogen input may also result in a decrease in seagrass and mangrove growth, albeit to a more 'natural' condition. Impacts on fish and fisheries are likely to be negligible. The proposal is unlikely to have an adverse impact on protected or threatened aquatic ecological communities/species, or fisheries within the Brunswick River estuary. The implementation of the proposal would also result in the removal of Mullumbimby Weir No. 1, resulting in likely increase in

the tidal flushing of the oxbow lagoons, which would have a substantial positive impact on the ecological health of the lagoons.

Heritage

The Aboriginal heritage assessment consisted of a desk-top study, consultation with the Department of Environment and Conservation and the local Aboriginal community, and a series of field surveys of the proposed pipeline routes, STP location and effluent re-use sites. The database search identified 10 listed Aboriginal sites within an area expanded 10 kilometres (east-west) and six kilometres (north-south) of the study area. No further sites were recorded during the survey.

The non-Aboriginal heritage assessment consisted of a desk-top study and consultation with the NSW Heritage Office and the Heritage Officer at Byron Shire Council. The study identified two items listed in the NSW Heritage Register that are located near one of the pipeline routes. No further sites were recorded during the survey.

The Proposal involves numerous excavations and earthworks and has the potential to interact with both listed and previously undiscovered items of Aboriginal and non-Aboriginal heritage value. It is possible that a number of permits may be required prior to the commencement of these types of work.

The assessment concluded that the proposed implementation of a sub-surface testing/monitoring program for areas of suspected medium to high Aboriginal and Non-Aboriginal archaeological potential and sensitivity, together with ongoing monitoring of all excavations, would prevent, avoid, and/or minimise the extent and severity of any potential impacts on the cultural heritage values of the Brunswick area.

Air Quality

A detailed air quality impact assessment was carried out to determine the potential dust and odour related impacts associated with the construction and operation of the Proposal. The impact assessment was prepared in accordance with guidelines presented in the Approved Methods and Guidance for the Modelling of Air Pollutants in New South Wales.

The assessment of potential dust emissions during the construction phase of the Proposal concluded that impacts from particulate matter emissions would not be excessive and would generally comply with the air quality goals prescribed by the Department of Environment and Conservation at all receptor locations.

The assessment of potential odour impacts associated with the operation of the proposed Mullumbimby-Brunswick Heads STP was conducted using the computer-based odour dispersion modelling program AUSPLUME. The modelled results indicate that compliance with the odour performance criteria prescribed by the Department of Environment and Conservation would be achieved at all receptor locations. The inclusion of the proposed mitigation and safeguard measures into the design and operation of the proposed STP would further reduce perceived odour levels and potential impacts at these receptor locations.

Noise and Vibration

A detailed noise and vibration impact assessment was carried out to determine the potential noise related impacts associated with the construction and operation of the Proposal. The impact

assessment was prepared in accordance with guidelines presented in the Department of Environment and Conservation's Industrial Noise Policy and Environmental Control Manual.

The predicted construction noise levels indicate the potential for short-term exceedances of the proposed construction noise planning goals at the closest residential receivers, without the implementation of suitable noise control measures or construction management practices. The construction activities associated with the proposed sewage and effluent transfer pipelines have the greatest potential for construction noise impacts in residential areas. The implementation of the proposed noise mitigation and safeguard measures would, however, ensure that these impacts are largely avoided or managed within acceptable limits.

The predicted noise levels associated with the operation of the proposed Mullumbimby-Brunswick Heads STP indicate that the adopted operational noise design goals would be achieved at all modelled receiver locations. The operation of the proposed STP is expected to be generally inaudible within the surrounding residential areas for all periods of the day.

Visual

The sewage transfer and effluent return pipelines would be located underground and therefore would not be visible once installed. Modifications to sewage pumping stations would have minor localised effects. Temporary visual impacts would occur during the construction phase, however these would be localised and of short duration.

The new structures at Mullumbimby-Brunswick Heads STP would be distinct from their surrounds, however, there are few unobscured viewpoints around the site, and the remoteness of the site combined with vegetation screening is anticipated to be effective in reducing any adverse visual characteristics of the STP structures.

The constructed wetlands, woodlot, and effluent storage dams are considered to be consistent with surrounding land uses, and with the provision of vegetation screening, are unlikely to adversely affect the visual characteristics of the area.

Land Use and Socio-economic

The assessment of land use impacts concluded that the proposal was unlikely to affect surrounding land uses, nor sterilise any areas from future development.

The assessment of impacts on public amenity concluded that construction noise and increased traffic volumes during construction could potentially affect the community. Given the duration, scale and severity of these impacts, and the effectiveness of impact mitigation measures, it is considered that the proposal is unlikely to have a significant detrimental impact on the public amenity of the townships.

The existing sewage treatment infrastructure serving Mullumbimby and Brunswick Heads is currently a limiting factor to population growth and development within the townships. The proposal meets the needs of planned future growth in accordance with the approved development framework and provides the means by which the current development moratorium in the two townships could be lifted

The major operational impacts of the proposal benefit of the whole community and focus on the provision of appropriate infrastructure to service planned growth and delivery of improved

environmental outcomes associated with protecting the Brunswick River from impacts by significantly improving the quality of the effluent produced and reducing the frequency and volume of effluent discharges.

The assessments concluded that the potential impacts associated with the operation of the proposal would be of a limited scale, severity, and remote from the township, and are unlikely to have a significant effect on the public amenity of the Brunswick Heads and Mullumbimby communities. The proposal would provide a range of social and economic benefits to the area, including improved environmental quality and ecological health, improved safeguards for public health, construction expenditure, improved amenity and recreational values.

Public Health

The Proposal is expected to improve the overall environmental health of the Brunswick River and Simpsons Creek. The inclusion of high performance ultra-violet disinfection and constructed wetland facilities at the proposed STP and tertiary treatment facilities (including chlorine dosing), for all effluent that would be utilised at the effluent re-use sites located within the South Mullumbimby area, would ensure the removal of pathogens from the effluent stream and lower public health risks.

The proposal would not present a significant risk to public health and would likely result in a reduction in public health risks associated with the recreational and commercial uses of the Brunswick River, as a result of the significantly improved sewerage system capacity, reliability, and effluent quality. The proposed design and operation of the effluent re-use scheme at South Mullumbimby would ensure potential health risks generally associated with effluent irrigation on publicly accessible lands are adequately managed and mitigated.

Hazard and Risk

A screening level risk assessment was performed to determine whether SEPP 33 Hazardous and Offensive Development applies to the project. The quantities of dangerous goods and hazardous substances to be stored or handled at the proposed Mullumbimby-Brunswick Heads STP were found to be well below the threshold volumes, such that SEPP 33 does not apply.

A detailed assessment of the potential hazards associated with the proposal would be identified prior to commencement of construction/commissioning activities and any identified hazards would be managed according to the Operation and Maintenance Plan to be developed as part of the Mullumbimby-Brunswick Heads STP. Incidents would be managed according to the Water and Sewerage Services Incident Management Protocol. While there are some hazards associated with the proposal, the proposed mitigating measures would ensure the proposal does not present a significant risk to construction and operation personnel, the local community or the environment.

Traffic

It is expected that potential traffic impacts would primarily occur during the construction phase of the Proposal. Construction employee traffic and truck movements for plant and materials deliveries would be accommodated on the current roads network. Some disruptions are anticipated however, including temporary road closures and diversions, construction vehicles parked along the road and temporary road width restrictions.

A traffic management plan would be prepared and incorporated into the Construction Environmental Management Plan to address potential traffic impacts during construction. Operational traffic levels

would comprise employee vehicles, biosolids transport and materials deliveries. These traffic volumes would remain low and similar to existing levels.

Waste and Resources

A range of wastes and by-products would be generated by the proposal during the construction and operational phases. Measures to re-use or recycle these waste streams would be sought by Council and contractors.

Maximising the re-use of biosolids and effluent is fundamental to the Proposal. In particular, the re-use of treated effluent and its management in a sustainable way is intrinsically linked to the future capacity of the proposed Stage 1 Effluent Re-use Scheme. Biosolids would be distributed for re-use by local farmers. Other wastes would be managed through Council's normal waste service. Recycling would be undertaken where possible. Non-recyclable wastes would be disposed of to a suitably licensed landfill facility.

Cumulative Effects

There are likely to be positive cumulative effects on the health and water quality of the Brunswick River estuary associated with the proposal and the proposed implementation of the effluent transfer and emergency water supply pipeline between Brunswick Heads STP and Mullumbimby STP. The potential reduction of effluent releases to the estuary from Ocean Shores STP during times of high effluent re-use demand in the Mullumbimby area would further improve the positive cumulative effects on the health of the estuary.

The proposal would also facilitate potential future development under the guiding principles of the corresponding Settlement Strategies for Mullumbimby and Brunswick Heads. Although Byron Shire Council is providing sewerage services to meet the requirements of these Settlement Strategies, any future developments would be assessed by Byron Shire Council separately, and with appropriate consultation. Additionally, the beneficial re-use of effluent at the South Mullumbimby re-use sites and potentially other users in future, would improve the immediate re-use scheme area, as well as the beneficial environmental effect of the re-use of resources.

Environmental Management

An Environmental Management framework would be established for the Proposal under an Adaptive Management Model which is designed to promote a continuous cycle of monitoring, verification and corrective action. The elements of this model include a Construction Environmental Management Plan (CEMP), and an Operational Environmental Management Plan (OEMP).

Environmental management actions and monitoring detailed within this framework would be monitored by the Brunswick River Catchment Wastewater Steering Committee on an ongoing basis through regular reporting by Council to the monthly Committee meetings.

The OEMP would be required to refer to and incorporate relevant objectives and actions that may be prescribed by the Brunswick Estuary Management Plan that is currently being developed under the guidance of the Brunswick River Estuary Management Committee.

Justification

The proposal is justified in terms of the above considerations, as it clearly represents the best solution in terms of environmental, social and economic outcomes and meets the requirements and expectations of the Mullumbimby and Brunswick Heads communities for the provision of a reliable, effective and sustainable sewage management system for the Brunswick area