ATTACHMENT B

SCHEDULE OF PROPOSED AMENDMENTS TO THE FINAL MASTER PLAN

SCHEDULE OF PROPOSED AMENDMENTS TO THE FINAL MASTER PLAN

The amended version of the Advanced Waste Treatment Master Plan is provided in Attachment D.
Additional text is shown by an underline, and deleted text shown by a ~~strikethrough~~.

Page no. **(previous version)**	**Page no.** **(updated version)**	**Reference**	**Amendment**
Page 15	15	Section: LANDFILL: RISING COSTS AND FALLING CAPACITY, Column 2	Added: together with Deleted: ~~and the impact of the Carbon Tax on emissions from landfills~~
Page 16	16	Previous section: A PRICE ON CARBON ON WASTE	Deleted: ~~A PRICE ON CARBON ON WASTE~~ ~~From 1st July 2012, there is a price on carbon in the form of a tax started at $23 per tonne of carbon on Australia's 500 largest polluters. This includes over 50 utilities and more than 30 landfill operations.~~ Added: REPEAL OF A PRICE ON CARBON FROM WASTE The price on carbon that had been imposed on Australia's 500 largest carbon polluters has been repealed. The City's Master Plan had modelled its proposals on the cost of abatement of carbon rather than rely on the ongoing carbon tax to incentivise its planning. Deleted: ~~A price on carbon~~ Added: The City continues to audit the levels of carbon arising from its activities to ensure it maintains its status as a "carbon neutral" city. The audit of carbon arising from waste Deleted: ~~will contribute towards the development of a market for renewable gas, including~~ Added: encourages solutions using Deleted: ~~However, the avoided waste levy which currently represents 36% of the total cost of waste disposal will have a far greater impact in developing a viable renewable energy from waste sector than a price on carbon.~~ ~~All landfills accessible by the City are impacted, and further capital investment will be needed by operators to mitigate greenhouse gas emissions and carbon tax liability.~~

Page no. (previous version)	Page no. (updated version)	Reference	Amendment
			Deleted: ~~The carbon pricing mechanism currently represents about 3.25% of the total cost of disposal so should the carbon pricing mechanism be repealed by Parliament it~~ Added: The repeal of the carbon pricing mechanism by Federal Parliament Added: New opportunities to reduce carbon pollution under the Emissions Reduction Fund program using Advanced Waste Treatment are being investigated.
Page 18	18	Section: WHY TREAT WASTE? Column 1	Added: The City remains fully committed to improving its recycling levels above current levels. The City will continue its programs and strategies to improve waste avoidance, reuse and recycling first, then seek the best treatment and recovery option for non-recycled waste that achieves multiple sustainability objectives. Further detail is provided in the City's Interim Waste Management Strategy that is soon to be updated.
Page 24	24	Section: EVALUATING THE TREATMENT OPTIONS, Column 4	Added: The first three analyses were undertaken to establish the basis for a future business case for an energy from waste facility. This process could not sufficiently isolate a technology for a full analysis. The City chose to then comprehensively review the identified preferred gasification technologies, and this determined a preference within those technologies for processes which could recover additional resources such as melted ash (waste diversion) and deliver a refined syngas capable of and suitable for being converted to a substitute natural gas (suitability for end use energy supply). The diversion of waste from landfill and the possibility for energy supply are both important factors in choosing a preferred technology group. The City was seeking the best option under both criteria. The inclusion of Energy Recovery as a tier in the waste hierarchy does not preclude the requirement to ensure from an environmental perspective that the energy recovery is optimised for the waste type treated. The City was seeking a sustainability solution for waste that integrated with its full complement of Green Infrastructure Master Plans, and delivered the highest efficiencies for recovering energy in terms of return of net energy delivered with lowest pollution impacts.

Page no. (previous version)	Page no. (updated version)	Reference	Amendment
Page 40	40	Figure 39	Regional Councils in long term processing contracts identified in new column of the table.
Page 44	44	Figure 42	Alterations to Low temperature scenario summary based on new information. Energy recovery values at lower heating value removed and reported as a Higher Heating Value.
Page 45	45	Section: THERMAL CONVERSION SCENARIOS, column 2	Deleted: ~~Measured as Cold Gas Efficiency (lower heating value)~~ Added: Measured as Cold Gas Efficiency (higher heating value).
Page 45	45	Section: THERMAL CONVERSION SCENARIOS, column 3	Delete ~~The preferred technologies are those within the high temperature plus ash melting scenario.~~ Added The preferred technologies are those that can achieve both high diversion rates and a high yield of syngas with properties suitable for conversion to substitute natural gas and other secondary energy uses and products. For descriptive purposes, this is best exemplified within the High Temperature plus ash melting scenario. While the use of secondary ash melting components is available for other gasification technologies, for comparative purposes only, the scenarios were principally derived from the ability of some conversion technologies to reach ash melting temperatures within the primary reactor, and in the differences in syngas quality available for conversion to substitute natural gas. The use of secondary ash melting components to achieve high diversion results means that the market could deliver a facility to achieve a set of preferred specified outcomes, rather than limit options to a specific gasification scenario. Noting this, the Master Plan describes the preferred gasification plus ash melting scenario as comparative results against criteria being achieved in the primary reactor. This should not be considered as negating the potential for other gasification scenarios to achieve similar outcomes using alternative processes.
Page 46	46	Figure 43	Adjustment of value for Low Temperature Conversion
Page 46	46	Figure 44	Adjustment of value for Low Temperature Conversion

Page no. (previous version)	Page no. (updated version)	Reference	Amendment
Page 47	47	Previously section CARBON PRICING MECHANISM	Deleted: ~~CARBON PRICING MECHANISM~~ ~~Should the carbon pricing mechanism be repealed by Parliament the City's renewable energy target will only be met by 2030 with higher subsidies, unless an alternative climate change mitigation policy framework provides similar benefits and incentives. However, the carbon pricing mechanism currently represents only 3.25% of the total cost of waste disposal so should the carbon pricing mechanism be repealed it will have little impact on the cost of waste disposal compared with the NSW Waste Levy which currently represents 36% of the total cost of waste disposal.~~ ~~However, it should be noted that advanced economies such as Germany, UK, Denmark, California and others have achieved far higher levels of renewable energy penetration than Australia on the back of energy policy not carbon pricing or emissions trading.~~
Page 47	47	Section: COST OF CARBON ABATEMENT, column 2	Deleted: ~~and carbon pricing compensation.~~
Page 47	47	Section: COST OF CARBON ABATEMENT, column 3	Added: <u>However, it should be noted that advanced economies such as Germany, UK, Denmark, California and others have achieved far higher levels of renewable energy penetration than Australia on the back of energy policy not carbon pricing or emissions trading.</u>
Page 49	49	Section: NSW ENERGY FROM WASTE POLICY STATEMENT, column 1	Deleted: …~~will lead to unnecessary disposal of after materials recycling which was suitable for energy recovery.~~ Added: <u>…may lead to unnecessary disposal of material fully suited to energy recovery. In attempting to reinforce the recycling tier of the waste hierarchy, there is not sufficient emphasis on supporting energy recovery as a tier of the waste hierarchy preferable to landfill disposal.</u>
Page 49	49	Section: NSW ENERGY FROM WASTE POLICY STATEMENT, column 2	Deleted ~~The City considers this Master plan an still accommodate the strictures of the Policy, but it will require increased reliance on other Councils of business waste to achieve more viable processing levels.~~ Added: <u>Notwithstanding this, the City considers this Master Plan can accommodate the technical, thermal and</u>

Page no. (previous version)	Page no. (updated version)	Reference	Amendment
			resource recovery criteria of the Policy, and welcomes that the Policy settings have been provided prior to the full emergence of the energy from waste sector in NSW. The City intends to meet the Policy settings by • approaching the NSW EPA for guidance on the waste loads that can be permitted to a facility given the unique characteristics of the City compared to many other Councils in NSW. • engage with nearby Councils as part of the SSROC Regional Waste Strategy to increase available waste levels for energy recovery. • continue to inform and engage its business community through the Better Buildings Partnership on energy recovery opportunities, and •
Page 49	49	Section DRAFT NSW WASTE AVOIDANCE AND RESOURCE RECOVERY STRATEGY, column 4	Added: The Master Plan sets a preference for diversion of waste including recycling at the level of 95%. The objective of diversion of waste is consistent with the Regional Waste Strategy. The draft *NSW Waste Avoidance and Resource Recovery Strategy 2013-2021* remains in draft-only at the date of this report to Council. The City provided a submission to the NSW EPA on the draft strategy in October 2013. The City acknowledges the draft targets set out in the proposed strategy, noting however that these may be altered within the final released version. The City further notes that these are specifically state-wide targets calculated from NSW total waste generation. The targets are not intended to be binding on any individual council, although the City intends to significantly contribute to the state targets (as finalised).
Page 66	66	Figure 56, Figure 57	Replaced with new figures incorporating alteration to Low Temperature conversion scenario
Page 66	66	Caption text below Figure 56	Deleted ~~LTC – low temperature conversion –waste diversion ranging from 80-84%~~ Added LTC – Low temperature conversion – waste diversion ranging from 80% to 91%
Page 69	69	Figure 60	Alteration to Low Temperature conversion scenario

Page no. (previous version)	Page no. (updated version)	Reference	Amendment
Page 77	77	Section: AVOIDED LANDFILL AND TREATMENT COSTS, column 1	Deleted: ~~and to a more limited extent uncertainties over carbon pricing~~
Page 80	80	Section: ECONOMIC ANALYSIS, column 1	Deleted: ~~(existing carbon price scenario by 2020)~~
Page 84	84	3rd paragraph, 3rd column	Added: and community engagement feedback
Page 84	84	Bullet points 1-9 3rd and 4th columns	**[Re-ordering as per below to match community priority with noted additions]** **Suitable Zoning:** Approved land use zoning for waste recovery facility, such as Heavy Industrial. **Proximity to gas grid pipeline connection.** Of suitable scale and pressure rating for volume of SNG delivered. **Accommodate Facility Footprint:** Sufficient land availability at a suitable land cost, allowing for expansion and addition of waste streams for recovery. **Proximity to source of waste:** The location should be positioned as close to the sources of waste generation as feasible. This would allow commercial intake by avoiding premium transport costs. **Minimise Traffic Impacts:** Consideration of a 'pathway of least impact' for delivery of waste to the facility. Ensure that there are no significant adverse impacts on local traffic congestion, and the re-direction of vehicles from existing waste facilities do not contribute to congestion or on local communities. Direct high traffic access would be preferred, avoiding spill over into residential areas. Impacts on road degeneration from heavy traffic should be considered. **Avoid Noise and Odour pollution:** The Facility located where noise and odour impacts on nearby residents are minimised and meet relevant EPA standards. Hours of operation need to be considered as part of noise and odour management. **Buffer Zones:** Sites need to be sufficiently large or removed from residential dwellings to contain possible environmental challenges and to reduce the operational and approval risks of a facility. **Aesthetics:** The facility and location need to be able to be landscaped, made attractive and visually appropriate and integrated with the local area. **Avoid Urban Encroachment:** Compatibility of current

Page no. (previous version)	Page no. (updated version)	Reference	Amendment
			land use and future zoning so as not to be adversely impacted by changes in land use or residential encroachment. **Climate Change-Proof:** Coastal or estuary sites must consider sea level rise changes **Low Amenity Impact:** Social impacts are considered, such as residential amenity, employment, cultural heritage, health and safety. **Local Tourism and Business impacts**: Impacts on potential business opportunities for the local area to be assessed. Impacts that may negatively impact on local tourism or costs to local business should be considered in location assessment.
Page 84	84	Enabling Action 2	Added Community engagement plans will seek to deliver benefits to the host community where appropriate. Example action may include competitive energy local supply, support for sport and educational activities, or opportunities to investment in the facility.
Page 86	86	Enabling Action 4	Added The City notes that energy recovery is a tier of the NSW waste hierarchy and its promotion over the continued use of landfill should be supported by the NSW EPA. The City considers that given the complex technical nature of this industry sector that a designated waste infrastructure strategy be provided by the NSW government to assist supporting energy from waste projects.

SCHEDULE OF PROPOSED AMENDMENTS TO THE APPENDIX

The amended version of the Appendix: Gasification Technologies Review is provided in Attachment E.
Additional text is shown by an underline, and deleted text shown by a strikethrough.

Page no. **(previous version)**	**Page no.** **(updated version)**	**Reference**	**Amendment**
Page ii	ii	Section: Resource Recovery	Added: Fixed-bed gasification
Page ii	ii	Figure 1	Alteration to value for fixed bed gasification
Page 48	48	Table 3	Alteration to values for emissions performance
Page 49	49	Section: High level mass and energy balances	Deleted ~~Low-Temperature Conversion: the APS pyro-combustion technology developed in California by International Environmental Solutions~~ Added: Low-Temperature Conversion: the fixed-bed (starved air) WtGas gasification technology developed in Australia by Entech Renewable Energy Systems (Entech-RES)
Page 50	50	Table 4 and Table 5	Alteration to reference technology and corresponding data
Page 101	101	Table 16	Alteration to reference technology and corresponding data
Page 109	109	Section: Plant Thermal Input	Deleted: ~~21.4 MW_{th} for LTC~~ ~~94.4 MW_{th} for LTC~~ ~~180.4 MW_{th} for LTC~~ ~~587.4 MW_{th} for LTC~~ Added: 21.5 MW_{th} for LTC 95.0 MW_{th} for LTC 181.0 MW_{th} for LTC 590.4 MW_{th} for LTC
Page 110	110	Figure 56	Alteration to reference technology and corresponding data
Page 111	111	Figure 57	Alteration to reference technology and corresponding data
Page 112	112	Figure 58	Alteration to reference technology and corresponding data
Page 113	113	Figure 61	Alteration to reference technology and corresponding data
Page 115	115	Figure 62	Alteration to reference technology and corresponding data
Page 116	116	Figure 63	Alteration to reference technology and corresponding data

Page no. **(previous version)**	**Page no.** **(updated version)**	**Reference**	**Amendment**
Page 116	116	Section: AWT residuals to landfill	Deleted: • ~~fixed-bed gasification – 9,518.4 tonnes per year by 2029-30;~~ Added: • <u>fixed-bed gasification – 1,758.2 tonnes per year by 2029-30;</u>
Page 117	117	Section: Resource Recovery	Added: <u>Fixed-bed gasification</u>
Page 117	117	Figure 64	Alteration to reference technology and corresponding data
Page 170	170	Table 57	Alteration to reference technology and corresponding data
Page 170	170	Table 58	Alteration to reference technology and corresponding data
Page 175	175	Table 70	Alteration to values for emissions performance