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Our Ref: EMRC-114944

28 June 2010

Mr Richard Sutherland
Principal Environmental Officer
Office of the Environmental Protection Authority
Level 4
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168 St George's Terrace
PERTH WA 6000

Dear Richard

REFERRAL OF EASTERN METROPOLITAN REGIONAL COUNCIL'S PROPOSAL TO DEVELOP A RESOURCE RECOVERY FACILITY

The Eastern Metropolitan Regional Council (EMRC) wishes to refer its Resource Recovery Facility (RRF) proposal to the Environmental Protection Authority (EPA) for consideration pursuant to Section 38 of the *Environmental Protection Act 1986* (EP Act). Hard and electronic copies of the referral documentation (letter of referral and EPA Referral Form) are enclosed with this letter.

Referral of this proposal is made following a meeting held on 6 May 2010 between EPA, EMRC and Cardno (WA) Pty Ltd (Cardno) representatives, where requirements of the overall environmental approvals process were discussed. During this meeting the attendees agreed that a Public Environmental Review (PER) Level of Assessment would be the likely outcome of this Referral, and that a Scoping Document should be submitted subsequent to the EPA setting the Level of Assessment.

This letter provides additional information to assist the EPA in setting the Level of Assessment.

1. The Regional Council

The EMRC was formally constituted in 1983, and now includes six participating Member Councils:

- Town of Bassendean;
- City of Bayswater;
- City of Belmont;
- Shire of Kalamunda;
- Shire of Mundaring; and
- City of Swan.

Collectively, the EMRC's six Member Councils cover a geographic area that extends over one-third of the Perth metropolitan area (2,100 square kilometres). The respective locations of each Member Council within the EMRC boundary are shown on **Figure A** (attached). The EMRC administration office is located at 226 Great Eastern Highway, Belmont, approximately 7km east north-east of the Perth City centre. The location of the office is also shown on **Figure A**.

The EMRC currently has a population of approximately 300,000 people, and this number is expected to increase to 400,000 by 2030.

The EMRC was originally established with a designated purpose to manage and dispose of the Region's waste. Although the EMRC's range of services has since expanded to include other areas such as regional development, environmental services and risk management, waste management is still considered as the Council's primary role.

The EMRC currently has a workforce of approximately 90 employees who work across four business units (Corporate Services, Waste Management Services, Resource Recovery and Regional Services). The EMRC's operations are governed by the Council which comprises of 12 Councillors (two Councillors from each Member Council), with another six Councillors (one from each Member Council) appointed to deputise in their absence. The Chair of the Council, Cr Graham Pittaway, was elected by the Councillors.

2. Current Waste Management Practices

Currently all Member Councils' non-recycled waste generated within the Region is landfilled at the EMRC-owned and operated Red Hill Waste Management Facility located at 1094 Toodyay Road, approximately 25km northeast of Perth City. The Red Hill site comprises of Lots 1, 2, 11, 12 and part of Lots 81 and 501. The site is located in the City of Swan while also bordering the Shire of Mundaring. **Figure B** (attached) illustrates the lot boundaries within the Red Hill site.

In accordance with the facility's licence conditions, Red Hill is an approved Class III and IV landfill and accepts a range of wastes, including inert waste, putrescible waste, contaminated and hazardous wastes and the facility also acts as a collection and storage area for dry recyclables and household hazardous waste received at the transfer station. Red Hill accepts waste from various organisations within and outside the region including the general public, commercial operators, and Local, Regional, State and Federal Government organisations.

Modern sanitary landfill design and operation techniques are used at the Red Hill landfill, including best practice cell membrane lining systems, leachate collection and methane gas capture and power generation. An established greenwaste processing area is located at the Red Hill facility, which includes open windrow composting and mulching of source separated greenwaste. An administration office and an Environmental Education Centre are also located on the Red Hill site.

Approximately 130,000 tonnes of Member Council municipal solid waste (MSW) was disposed of at the Red Hill landfill in 2008/09. Based on recent projections, the total amount of Member Council MSW is expected to increase to 185,000 tonnes per annum by the year 2034/35. The Red Hill facility has an estimated 25 year lifespan for the acceptance of Class II/III (putrescible) materials, and an estimated lifespan of 14 years for Class IV (hazardous) materials (based on current and projected landfilling rates).

3. The Proposal

The EMRC proposes to develop a RRF to process Member Council kerbside MSW. RRFs are used to sort and treat domestic waste collected from the kerbside (excluding comingled recyclables) to produce a valuable resource such as compost and/or energy and recyclables. The establishment of a RRF is intended to assist the EMRC in:

- Diverting waste from landfill and increasing the life expectancy of Red Hill;
- Reducing the environmental impacts associated with landfilling, including greenhouse gas emissions and potential contamination of soil and groundwater etc.;
- Generating a marketable product, such as compost and/or energy and recyclables;
- Increasing the recovery of resources;
- Producing renewable power; and
- Complying with the Waste Authority's strategies and targets for MSW as detailed in the Draft II *Waste Strategy for Western Australia* (March 2010).

The EMRC has yet to decide on a few of key planning decisions the most relevant to this proposal being the decision on the alternative waste treatment (AWT) technology to be implemented at the facility. As such, this proposal includes a number of potential AWT technology options for EPA assessment, including:

Mechanical Biological Treatment (MBT) – Anaerobic Digestion (AD) (to produce biogas for energy production and compost).

Energy from Waste (EfW) – gasification, pyrolysis and combustion to produce renewable power.

These technology options and their relevant implications are explained briefly in **Section 5** below.

The capacity of the proposed facility will depend on the technology implemented, and in the case of AD technologies, the type of domestic kerbside collection system used (i.e. two-bin or three-bin kerbside collection system). However, for the purposes of the proposal, a maximum capacity of 200,000 tonnes per annum is proposed for all technology options.

It should be noted that this capacity estimate is based on the projected tonnage throughput over a 20 year life of the facility, and the initial operating capacity (i.e. year 1) of the facility is expected to be lower.

Assuming an 18 month approvals process (for Part IV of the EP Act), the projected timeline for the proposal includes the following stages:

Activity	Approximate Date/s	Expected Timeframe
Part IV environmental and town planning approvals processes	June 2010 – January 2012	18 months
Member Council resolution to continue project	February 2012 – March 2012	1 month
Request for Tender process	March 2012 – August 012	5 months
Evaluation of Tender submissions	August 2012 – December 2012	4 months
Finalise RRF contract	December 2012 – July 2013	7 months
Development Approval, Works Approval and Building Licence processes	July 2013 – October 2013	3 months
Complete construction of RRF	October 2013 – January 2015	15 months
Obtain Operational Licence	October 2014 – January 2015	3 months
Wet commissioning of RRF	January 2015 – April 2015	3 months

It is expected that the Part IV environmental approvals process will involve a multiple technology Environmental Impact Assessment process and an approval for such technologies. The final selection of the technology is likely to be made either before or after the tender assessment process.

The successful tenderer (Contractor) commissioned to undertake construction and the initial operation of the facility (for up to 2 years) will be required to obtain the Works Approval and Licence for a Prescribed Premises under Part V of the EP Act. No discussions have taken place with the DEC in relation to obtaining approvals under Part V of the EP Act.

4. RRF Project History

The EMRC RRF Project planning process began shortly after commencement of the consultancy contract with Cardno in 2004, with preliminary assessments made on potential sites, AWT technologies, contract delivery models, and waste (bin) collection systems. Community and stakeholder consultation was an important part of the preliminary assessment process with local community workshops and larger regional workshops held to determine the assessment criteria and nominate suitable weightings for each.

Consultation and engagement has been ongoing since commencement of the project to keep the Member Councils, associated committees and community groups updated, and to obtain input for various stages of the decision-making process.

A number of potential Project options were placed on a provisional shortlist based on the results of the preliminary assessments. As additional research was undertaken, some of the shortlisted options were deemed unsuitable, or in the case of technologies, a new option (plasma) was given consideration.

The RRF Project reached a milestone in May 2009 when Expressions of Interest (EOIs) for the Project were sought by the EMRC. The EOI invitation detailed the key project specifications (including preferred sites, technologies, contract models, and waste collection systems) considered as acceptable by the EMRC at that stage of the planning process. The opportunity was taken to obtain additional technical and financial information from the EOI Respondents to assist in the project planning process. Seven of the nine EOI Respondents were listed as Acceptable Tenderers, and are therefore eligible to submit a proposal during the tender stage of the project.

The information obtained from the EOIs prompted further desktop investigations, consultation with international expertise and updates to the financial models. All information gathered to this stage in the process was used as input into the most recent preferred options decision process. The Council adopted a set of preliminary recommendations in September 2009 which formed the basis for discussion with the community and Member Councils. In May 2010, Council resolved that:

1. The following options are confirmed as the preferred options for the RRF:
 - a) Red Hill Waste Management Facility is the preferred site for the RRF.
 - b) The Design & Construct contract ownership model is preferred to a Build Own Operate contract model at this stage of the project.
 - c) The RRF technology options include anaerobic digestion, gasification, pyrolysis and combustion. Plasma technology will only be considered if it is an integral part of one of these technologies.
 - d) A third bin for household organic waste collection be considered in conjunction with anaerobic digestion technology, otherwise a two bin system is recommended for the thermal technology options.
2. Council proceeds with the environmental and planning approvals task for the Resource Recovery Project based on the preferred site and technology options.

5. Proposed Alternative Waste Treatment Technologies

A detailed study of each of the following technologies and their implications will be undertaken during the PER process:

MBT – Anaerobic Digestion:

The first stage of the MBT process includes mechanical separation of the waste to remove the recyclable items and residual waste from the organic fraction prior to biological treatment. This process is particularly important if a two-bin kerbside system (i.e. refuse bin and recyclables bin) is used to collect waste. The sorted organic waste is then treated through anaerobic digestion being a process of organic decomposition in the absence of oxygen. Anaerobic digestion can be undertaken either in-vessel (e.g. tunnel composting) or in covered windrows where microorganisms transform the organic material to biogas and digestate. Biogas is captured to generate electricity, or can be flared. The remaining organic digestate undergoes a process of maturation to produce compost.

Key environmental implications potentially resulting from construction and / or operation of an AD facility include:

- odour emissions;
- noise emissions; and
- air emissions (including greenhouse gases).

EfW – Gasification and Pyrolysis:

The gasification process involves the conversion of carbon-based materials in the presence of heat, typically at temperatures of 760°C to 1370°C, in a low oxygen environment (less than stoichiometric). Syngas (composed primarily of H₂ and CO) is produced, which may be utilised in boilers, gas turbines, or internal combustion engines to generate electricity. The inorganic materials are converted to either bottom ash or a solid, vitreous slag.

Pyrolysis is the thermal degradation of carbon-based material via an indirect, external heat source, typically at temperatures of 400°C to 900°C in the absence, or almost complete absence of oxygen. The volatile component of the waste material is converted to a syngas (composed of hydrogen (H₂), carbon monoxide (CO), CO₂, methane (CH₄), and complex hydrocarbons), which can be used in boilers, gas turbines or internal combustion engines to generate electricity. Tars, oils, char and bottom ash are by-products that are potentially produced from the process.

Key environmental implications potentially resulting from construction and / or operation of a gasification or pyrolysis facility include:

- air emissions (potentially including greenhouse gases, particulates, heavy metals, oxides of nitrogen (NO_x), oxides of sulfur (SO_x), dioxins, furans, volatile organic compounds (VOCs)); and
- noise emissions.

EfW – Combustion:

The combustion process involves the burning of carbon-based materials in an oxygen-rich environment (greater than stoichiometric), generally at temperatures of 760 degree Celsius (°C) to 1370°C. A waste gas (flue gas) primarily made up of carbon dioxide (CO₂) and water vapour (H₂O) is generated from the process, which is used to heat water for steam and electricity generation through a steam turbine and alternator set. The flue gas is cleaned extensively to remove particulates, acid gases, metals and dioxins/furans to generate a fly ash. The cleaned flue gas is then discharged through a stack to the atmosphere. Inorganic materials are recovered as bottom ash from the furnace.

Key environmental implications potentially resulting from construction and / or operation of a combustion facility include:

- air emissions (potentially including greenhouse gases, particulates, heavy metals, NO_x, SO_x, dioxins, furans, and VOCs);
- noise emissions; and
- loss of visual amenity (due to stack).

It should be noted that all of the alternative waste treatment technologies listed above can, to varying degrees, abate the net greenhouse gases emitted by:

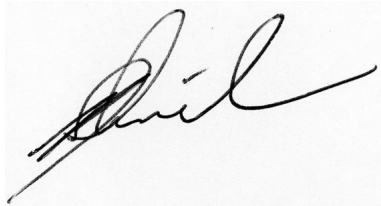
- a) reducing methane emissions from landfill due to the inadequacies of the capture system; and
- b) producing renewable power thus reducing the reliance on energy from fossil fuel sources.

6. Conclusion

As discussed, referral of this proposal is made following a meeting held on 6 May 2010 between EPA, EMRC and Cardno representatives. The ensuing Environmental Impact Assessment process, following the setting of the Level of Assessment by the EPA, will provide greater detail on the proposal, on the existing environment at Red Hill and its surrounds, and on the potential implications of the proposal. The relevant proposal options, including technology options and location options (within Red Hill Waste Management Facility), will be addressed separately so potential impacts and mitigation measures specific to each option is identified.

The EMRC wishes to thank the Authority for the advice given to date on this proposal, and look forward to your response. If you have any queries regarding this proposal, please do not hesitate to contact Andrew Mack, Cardno's Manager of Environmental Services in the first instance on (08) 9273 3888 or at andrew.mack@cardno.com.au, or Steve Fitzpatrick, EMRC's Manager Project Development in the second instance on (08) 9424 2232 or at Stephen.Fitzpatrick@emrc.org.au.

Yours sincerely

A handwritten signature in black ink, appearing to read 'Peter B. Schneider', is centered on a white rectangular background.

PETER B. SCHNEIDER
Chief Executive Officer

Enclosed

1. Attached: EPA Referral Form (EMRC-114783)
2. Figure A - Member Council Locality Plan
3. Figure B - Red Hill Waste Management Facility Lot Boundaries