

MVV Environment Services Ltd

Energy from Waste Combined Heat and Power Facility, Forties Road, Dundee

Environmental Statement
Volume One

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 **MVV** Environment

ARUP

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Glossary and abbreviations

AADT	Annual Average Daily Traffic volumes
ACC	Air Cooled Condenser
AIL	Abnormal Invisible Loads
Ambient Noise Level	The ambient noise level is the overall noise level measured at a location from multiple noise sources. When assessing noise from a particular development, the ambient noise level is defined as the remaining noise level in the absence of the specific noise source being investigated. For example, if a fan located on a city building is being investigated, the ambient noise level is the noise level from all other sources without the fan running. This would include sources such as traffic, birds, people talking and other nearby fans on other buildings
Aquifer	An aquifer is an underground layer of water-bearing permeable rock or unconsolidated materials from which groundwater can be extracted using a water well
As	Arsenic
ATC	Automatic Traffic Count
ATS	Authority Transfer Station
Background Noise Level	The background noise level is the noise level that is generally present at a location at all or most times. Although the background noise may change over the course of a day, over shorter time periods (e.g. 15 minutes) the background noise is almost-constant. Examples of background noise sources include steady traffic (e.g. motorways or arterial roads), constant mechanical or electrical plant and some natural noise sources such as wind, foliage, water and insects
BAT	Best Available Techniques
BGS	British Geological Survey
BoCC	Birds of Conservation Concern
BT	British Telecom
BTO	British Trust for Ornithology
C ₆ H ₆	Benzene
CCTV	Closed Circuit Television
Cd	Cadmium
CEMP	Construction Environmental Management Plan
CEMS	Continuous Emission Monitoring System
CHP	Combined Heat and Power
CIEEM	Chartered Institute for Ecology and Environmental Management
CIHT	Chartered Institution of Highways and Transportation

CLO	Contaminated Land Officer
Co	Cobalt
CO	Carbon Monoxide
Conceptual Site Model	A conceptual model represents the characteristics of the site in diagrammatic or written form that shows the possible relationships between contaminants, pathways and receptors
Contaminant	A substance that is in, on or under the land and has the potential to cause harm or to cause pollution of controlled waters
Contaminated Land	Any land which appears to the local authority in whose area it is situated to be in such condition, by reason of substances in, on or under the land that – (a) significant harm is being caused or there is a significant possibility of such harm being caused; or (b) significant pollution of controlled waters is being caused, or there is a significant possibility of such pollution being caused
Cu	Copper
Cr	Chromium
CSM	Conceptual Site Model
CTMP	Construction Traffic Management Plan
CV	Calorific Value
D&ARW	Dundee and Angus Residual Waste
DAS	Design and Access Statement
dB(A)	dB(A) denotes a single-number sound pressure level that includes a frequency weighting (“A-weighting”) to reflect the subjective loudness of the sound level. The frequency of a sound affects its perceived loudness. Human hearing is less sensitive at low and very high frequencies, and so the A-weighting is used to account for this effect. An A-weighted decibel level is written as dB(A)
DCC	Dundee City Council
Deadweight	The socio-economic outputs which would have occurred without the project (can also be known as the “reference case”)
Decibel	The decibel scale is a logarithmic scale which is used to measure sound and vibration levels. Human hearing is not linear and involves hearing over a large range of sound pressure levels, which would be unwieldy if presented on a linear scale. Therefore a logarithmic scale, the decibel (dB) scale, is used to describe sound levels. An increase of approximately 10 dB corresponds to a subjective doubling of the loudness of a noise. The minimum increase or decrease in noise level that can be noticed is typically 2 to 3 dB
DERL	Dundee Energy Recycling Limited
Desk Study	Is a desk based review of relevant information including geological and hydrogeological mapping, historical maps, environmental records, which inform the development of the

	Conceptual Model, and allow an assessment of risks to human and environmental receptors to be undertaken
Direct effects	An estimate of the total effect in terms of a specific output, for example the jobs directly created or supported by the project
Displacement	The proportion of the project's socio-economic outputs accounted for by reduced outputs elsewhere in the target area
DMRB	Design Manual for Roads and Bridges
EA	Environment Agency
EDEN	East Dundee Environment Network
EfW	Energy from Waste
EIA	Environmental Impact Assessment
EPUK	Environmental Protection UK
ES	Environmental Statement
FE	Further Education – not ref from first use socioec
FRA	Flood Risk Assessment
FTE	Full Time Equivalent
GEL	Geotechnical Engineering Limited
GLVIA3	Guidelines for Landscape and Visual Impact Assessment 3 rd Edition
GVA	Gross Value Added
Harm	Harm to the health of living organisms or other interference with the ecological systems of which they form part and, in the case of man, includes harm to his property
HCl	Hydrogen Chloride
HE	Higher Education – not ref socioec
HF	Hydrogen Fluoride
Hg	Mercury
HGV	Heavy Goods Vehicle
HoPI	Habitat of Principal Importance
HRA	Habitats Regulations Assessment
IAQM	Institute of Air Quality Management
IBA	Incinerator Bottom Ash
IEA	Institute of Environmental Assessment (now the Institute of Environmental Management and Assessment (IEMA))
IED	European Union Directive 2010/75/EU on Industrial Emissions
IEMA	Institute of Environmental Management & Assessment
IHT	Institution of Highways and Transportation
IMD	Index of Multiple Deprivation – needs to be referenced in socio-ec

ISO	International Organisation for Standardisation
ITR	Interim Transport Report
kV	Kilovolt
L _{A90}	The L ₉₀ statistical level is often used as the “average minimum” or “background” level of a sound level that varies with time. Mathematically, L ₉₀ is the sound level exceeded for 90% of the measurement duration. As an example, 45 dB LA90, 15min is a sound level of 45 dB(A) or higher for 90% of the 15 minute measurement period.
L _{Aeq}	The ‘equivalent continuous sound level’, L _{eq} , is used to describe the level of a time-varying sound or vibration measurement. L _{eq} is often used as the “average” level for a measurement where the level is fluctuating over time. Mathematically, it is the energy-average level over a period of time (i.e. the constant sound level that contains the same sound energy as the measured level). When the dB(A) weighting is applied, the level is denoted dB L _{Aeq} . Often the measurement duration is quoted, thus L _{Aeq} , 15 min represents the dB(A) weighted energy-average level of a 15 minute measurement.
LBAP	Local Biodiversity Action Plan
LCT	Landscape Character Type
Leakage	The proportion of outputs which benefit those outside the project’s target area
LES	Local Economic Scheme
LGV	Light Goods Vehicle
LLCA	Local Landscape Character Area
LNR	Local Nature Reserve
MAGIC	Multi-Agency Geographic Information for the Countryside
MJ/kg	Megajoules per kilogram
Mn	Manganese
Mph	Miles per hour
MW	Megawatts
MWe	Megawatt electric
MWth	Megawatts thermal
NH3	Ammonia
Ni	Nickel
NO	Nitric Oxide
NO2	Nitrogen Dioxide
NOx	Nitrogen oxides (nitric oxide and nitrogen dioxide)
NTS	Non-Technical Summary
NVQ	National Vocational Qualification – Socio-ec needs to be listed in full

OGV	Other Goods Vehicle
ONS	Office for National Statistics
OS	Ordnance Survey
PABX	Private Automatic Branch Exchange
PAH	Polycyclic Aromatic Hydrocarbons
PAN	Planning Advice Note
PASS	Planning Application Supporting Statement
Pathway	A route or means by which a receptor can be exposed to, or affected by, a contaminant
Pb	Lead
PIA	Personal Injury Accidents
PM10	Fine Particulate Matter
PM2.5	Very Fine Particulate Matter
PPC	Pollution Prevention and Control
PR	Public Relations – socioec not ref
PSV	Public Service Vehicle
Receptor	Something that could be adversely affected by a contaminant, such as people, an ecological system, property, or a water body
SAC	Special Area of Conservation
Sb	Antimony
SEO	Social Enterprise Organisations
SEPA	Scottish Environment Protection Agency
SINC	Site of Importance for Nature Conservation
Site investigation	(SI) can comprise intrusive and non-intrusive techniques to gain information about the subsurface character of a site. Intrusive techniques commonly include trial pitting, window sampling or drilling
SME	Small to Medium Enterprise
SNCI	Sites of Nature Conservation Importance
SNCR	Selective Non-Catalytic Reduction
SNH	Scottish Natural Heritage
SO ₂	Sulphur Dioxide
SoPI	Species of Principal Importance
SPA	Special Protection Area
SPP	Scottish Planning Policy
SPRI	Scottish Pollutant Release Inventory
SQE	Suitably Qualified Ecologist
SSEPD	Scottish and Southern Energy Power Distribution
SSSI	Site of Special Scientific Interest

STATS19	Police database / accident recording system, named after the number of the first questionnaire issued when the system was introduced in 1949
SUDS	Sustainable Drainage Systems
SWPM	Site Waste Management Plan
TA	Transport Assessment
Tl	Thallium
TMP	Traffic Management Plan
TOC	Total Organic Carbon
Tpa	Tonnes per Annum
Tph	Tonnes per Hour
TPH	Total Petroleum Hydrocarbons
UPS	Uninterruptible Power Supply
V	Vanadium
VOC	Volatile Organic Compound
Workplace	An individual site (for example a factory or shop) associated with an enterprise
ZoI	Zone of Influence
ZTV	Zone of Theoretical Visibility

1 Introduction

1.1 Overview

- 1.1.1** This Environmental Statement (ES) is part of a suite of documents submitted to Dundee City Council (DCC) in support of an application for planning permission by MVV Environment Services Limited (MVV) (the Applicant) for the construction and operation of an Energy from Waste Combined Heat and Power Facility (EfW CHP facility) (The Proposed Scheme) on land situated on Forties Road, in the north-east of Dundee (the Application Site).
- 1.1.2** The proposed EfW CHP facility would replace the existing Dundee Energy Recycling Ltd (DERL) EfW facility on the neighbouring site on Forties Road.
- 1.1.3** The Environmental Statement (ES) has been prepared pursuant to The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2011 (EIA Regulations). It comprises two volumes with supporting appendices, and a non-technical summary (NTS), namely:
- a. **Volume One (this volume):** This provides a description of the existing Application Site and surroundings (Section 2), a description of the Proposed Scheme (Section 3), a description of alternatives (Section 4), a description of the EIA approach and methodology (Section 5) and a summary of the environmental assessment results (Section 0);
 - b. **Volume Two:** This provides assessments for the following topics:
 - Acoustics (Volume 2, Section 2);
 - Air Quality (Volume 2, Section 3);
 - Ecology (Volume 2, Section 4);
 - Ground Conditions and Contamination (Volume 2, Section 5);
 - Landscape and Visual Amenity (Volume 2, Section 6)
 - Socio-economics (Volume 2, Section 7);
 - Traffic and Transport (Volume 2, Section 8);
 - Water Resources (Volume 2, Section 9); and
 - Interactive Effects¹ (Volume 2, Section 10).

¹ It is noted that cumulative effects are assessed in the topic section (Volumes 2) of the ES.

- c. **Volume Three:** this provides the supporting figures to Volume One and Volume Two;
- d. **Appendix Volume One:** this provides supporting reports and documents to Volume One;
- e. **Appendix Volume Two:** this provides supporting reports and documents to Volume Two;
- f. **NTS:** This provides a summary description of the Proposed Scheme and environmental assessment results presented in non-technical language.

1.1.4 In addition to the appendix of figures, there are also some images within the main body of Volumes 1 and 2.

1.1.5 A master glossary and abbreviations section has been included in this document for use with all Proposed Scheme application documents. The ES should be read alongside this glossary and abbreviations.

1.1.6 The ES has been prepared by Arup with the exceptions of the following sections, for which information has been provided by the Applicant:

- The Applicant (Volume 1, Section 1.3);
- Site location and context (Volume 1, Sections 2.2 and 2.3);
- Existing site use and operation (Volume 1, Section 2.4);
- Proposed Scheme development stages (Volume 1, Section 2.6);
- Proposed Scheme description (Volume 1, Section 3);
- Alternatives (Volume 1, Section 4);
- Engagement (Volume 1, Section 5.2);
- Construction Environmental Management Plan (CEMP) (Appendix 1-F);
- Site Waste Management Plan (SWMP) (Appendix 1-G); and
- The baseline photography and photomontages, which have been commissioned by the Applicant (Volume 3).

1.2 Application documents and plans defining the Proposed Scheme

1.2.1 This ES is being submitted to DCC by the Applicant as part of an application for planning permission, along with the following other documents:

- Application Form;
- Planning Application Fee;
- Ownership Certificate(s) and Notices;

- Planning Application Drawings;
- Transport Assessment;
- Planning Application Supporting Statement (PASS);
- Heat and Power Plan;
- Pre-application Consultation Report (PAC); and
- Design and Access Statement (DAS).

1.2.2 The following documents are to be submitted when they are finalised:

- Flood Risk Assessment Level 2;
- Drainage Strategy;
- Habitats Regulations Assessment Screening – Statement to Inform. This is pending the results from the air quality modelling for the permit application;
- WRATE Model and Technical Report; and
- Waste Flow Model.

1.2.3 All these reports will be to a standard acceptable to DCC and the Scottish Environment Protection Agency (SEPA).

1.3 The Applicant

1.3.1 The Applicant is a wholly owned subsidiary of MVV Umwelt which is a member of the German utility company MVV Energie. MVV Umwelt provides flexible solutions for waste disposal, producing environmentally sustainable energy.

1.3.2 In Germany, MVV Umwelt operates six EfW and biomass plants, managing 1.6 million tonnes of waste a year. With over 45 years' experience, MVV Umwelt is in the top three companies in Germany in its field.

1.3.3 In the UK, the Applicant aims to replicate the success of MVV Umwelt in the German EfW sector. Having been awarded a long-term contract for the treatment of residual waste in an EfW CHP facility in Plymouth, and having developed a waste wood biomass EfW facility in Kent, the Applicant is now using its extensive expertise in generating energy from residual waste to develop further projects in the UK market. The EfW CHP facility in Plymouth has an annual incineration capacity of 245,000 tonnes and when operating in CHP mode is able to achieve an energy efficiency of up to 49%, which is more than twice as efficient as is currently typical for British plants.

1.4 Requirements for an Environmental Impact Assessment

1.4.1 The Proposed Scheme falls into Schedule 1 Part 10² of The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2011 (EIA Regulations). The EIA Regulations define an EIA development as that which is either within Schedule 1 or 2 of the EIA Regulations, and (in the case of Schedule 2 developments), is likely to have significant effects on the environment by virtue of factors such as its nature, size or location. The Proposed Scheme falls under Schedule 1 Part 10 of the EIA Regulations and therefore an EIA is mandatory.

1.4.2 An EIA scoping letter was submitted to DCC by the Applicant on 22 September 2015 (Appendix 1-A, Section A1), following which a scoping response was received from DCC with input from the Scottish Environment Protection Agency (SEPA) on 13 November 2015 (Appendix 1-B).

1.4.3 Schedule 4 of the EIA Regulations sets out the information required for inclusion in this ES which is reproduced in Table 1. This table includes details of where the information can be found in this ES.

Table 1: EIA Regulations Schedule 4 information for inclusion in ESs

EIA Regulations – Schedule 4: Information for Inclusion in Environmental Statements	Location within this ES
Part 1	
Description of the development, including in particular— (a) a description of the physical characteristics of the whole development and the land use requirements during the construction and operational phases; (b) a description of the main characteristics of the production processes, for instance, nature and quantity of the materials used; and (c) an estimate, by type and quantity, of expected residues and emissions (water, air and soil pollution, noise, vibration, light, heat, radiation etc.) resulting from the operation of the Proposed Scheme.	(a) Section 3.2 and Section 2.5 respectively (b) Section 3.3 (c) Volume 2, Sections 2, 3 and 5. There will also be an addendum to the air quality and acoustics information in the Environmental Permit application (Section 1.5).
An outline of the main alternatives studied by the Applicant and an indication of the main reasons for	Section 4

² “Waste disposal installations for the incineration or chemical treatment (as defined in Annex I to Council Directive 2008/98/EC under heading D9) of non-hazardous waste with a capacity exceeding 100 tonnes per day”.

EIA Regulations – Schedule 4: Information for Inclusion in Environmental Statements	Location within this ES
the Applicant’s choice, taking into account the environmental effects.	
A description of the aspects of the environment likely to be significantly affected by the development, including, in particular, population, fauna, flora, soil, water, air, climatic factors, material assets, including the architectural and archaeological heritage, landscape and the interrelationship between the above factors.	Section 2.3 and Volume 2
A description of the likely significant effects of the development on the environment, which should cover the direct effects and any indirect, secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative effects of the development, resulting from: (a) the existence of the development; (b) the use of natural resources; (c) the emission of pollutants, the creation of nuisances and the elimination of waste, and the description by the Applicant of the forecasting methods used to assess the effects on the environment.	Section 6 and Volume 2
A description of the measures envisaged to prevent, reduce and where possible offset any significant adverse effects on the environment.	Section 6
A non-technical summary of the information provided under paragraphs 1 to 5 of this Part.	Non-Technical Summary
An indication of any difficulties (technical deficiencies or lack of know-how) encountered by the Applicant in compiling the required information.	Volume 2: ‘Limitations and Assumptions’ section for each topic
Part 2	
A description of the development comprising information on the site, design and size of the development.	Section 2.5 and Section 3.2
A description of the measures envisaged in order to avoid, reduce and, if possible, remedy significant adverse effects.	Section 6
The data required to identify and assess the main effects which the development is likely to have on the environment.	Appendix 1 and Appendix 2
An outline of the main alternatives studied by the Applicant or appellant and an indication of the main reasons for the choice made, taking into account the environmental effects.	Section 4
A non-technical summary of the information provided under paragraphs 1 to 4 of this Part.	Non-Technical Summary

1.5 Other required consents

1.5.1 A separate Environmental Permit is to be obtained from SEPA for the operation of the waste facility under the Pollution Prevention and Control (PPC) (Scotland) Regulations 2012. The existing DERL EfW facility on Forties Road, Dundee is subject to an Environmental Permit issued by SEPA. The Applicant is currently in discussions with SEPA regarding an application for the new Environmental Permit associated with the proposed EfW CHP facility, with a view to submitting an application for consideration following the submission of the planning application.

1.5.2 It is anticipated that the application for the new Environmental Permit will be submitted in January 2017.

2 Site and surroundings

2.1 Overview

2.1.1 This section provides a description of the existing environmental conditions on and around the Application Site. Section 2.2 provides details of the area in which the Application Site is located describes land uses adjacent to the Application Site. Section 2.3 includes details of constraints, designations and receptors in the surrounding area. Details of the existing site use and operation are set out in Section 2.4.

2.2 Site location

2.2.1 The Application Site lies approximately 5km north-east of Dundee city centre, as shown on the Site Location Plan (Appendix 1-C). The postcode for the existing DERL EfW facility and Proposed Scheme is DD4 0NS and the national grid reference (NGR) is NO 44576 32863.

2.2.2 The Application Site, is shown on the Planning Application Boundary with Internal Operational Boundaries Plan (Reference PA02, as shown in Appendix 1-D). It extends to approximately 8 hectares (ha) and is located wholly within the jurisdiction of DCC.

2.2.3 The Application Site comprises the existing waste management site known as the existing DERL EfW facility (Area E on the Internal Operational Boundaries Plan) and existing ATS site (Area C), the land immediately to the south and west of this (Areas A and D respectively), and a plot of land to the south-west of the existing waste management site, on the south side of the Dighty Water (Area B). The components of the existing site are described in more detail in Section 2.4.

2.2.4 The Application Site includes all land required to deliver the Proposed Scheme. This includes land that would be required temporarily for use as a construction compound and for contractor parking (Area D).

2.2.5 Land to the north of the Application Site is primarily residential in nature, with some associated green open space.

2.2.6 Land to the east of the Application Site is predominantly industrial. Immediately to the east of the Application Site is a Tyre Factory which is owned and operated by Michelin, and associated green space. Further east are numerous industrial units, and beyond these, is open farmland.

2.2.7 Land immediately to the south of the Application Site is industrial, with a car-breakers yard located immediately adjacent to the Application Site. There is a footpath and cycleway which runs along the northern edge of the Dighty Water, to the south side of Beryl Street. Beyond this, on the southern side of the Dighty Water, are

some industrial and storage services, and beyond these areas, the land use is primarily residential.

2.2.8 Land immediately to the west of the Application Site and Forties Road, comprises a mixture of grassland, scrub and a few industrial units to the north-west.

2.2.9 The Dighty Water runs in an east-west direction to the south of the Application Site, and the Fithie Burn runs in a north-south direction, east of the Michelin tyre manufacturing facility. The watercourses merge to the south-east corner of the Michelin facility, to the west of Baldovie Road and north of Balunie Drive.

2.3 Site context

2.3.1 This section describes the nearest sensitive receptors to the Application Site.

Residential receptors

2.3.2 The nearest residential areas to the Application Site are:

- Residences on Strathaven Terrace, located approximately 810m north-west;
- Residences on Britannia Drive, located approximately 660m north-west;
- Residences on Montpellier Gardens, located approximately 420m north;
- Residences on Hawick Drive, located approximately 640m north-east; and
- Residences on Balunie Drive, the closest of which are located approximately 380m south.

Ecological receptors

2.3.3 Within the Zone of Influence, the key ecological receptors are:

- The Dighty Water and Fithie Burn;
- The surface water connection to The Firth of Tay and Eden Estuary Special Area of Conservation (SAC);
- The presence of habitats with the potential to support nesting birds, including kingfisher (*Alcedo atthis*); and
- The presence of potential otter couches along the watercourses.

Water receptors

2.3.4 As described in Section 2.2.9, the nearest watercourses are:

- The Dighty Water, which runs east-west and is located to the south of the main facility within the Proposed Scheme; and

- The Fithie Burn, which runs north-south and is located approximately to the east of the Proposed Scheme.

2.3.5 The most recent groundwater vulnerability map produced by British Geological Society³ shows that the area in which the Application Site is located is classified as vulnerability class 4. Using the text accompanying the map, the Application Site can be characterised as being '*vulnerable to those pollutants not readily adsorbed or transformed*'.

Other receptors

2.3.6 The geology of the Application Site comprises alluvium, and beneath the northern section of the DERL site there is a drift geological boundary, whereby the superficial deposits are noted as 'glacial meltwater deposits' of 'moundy sand and gravel'. The solid geology beneath the proposed development area consists of undifferentiated sedimentary units, mainly sandstone. It is underlain by an aquifer.

2.3.7 The entire Application Site is within the Dundee Air Quality Management Area.

Committed Development

2.3.8 Where it is known that land use is likely to change as a result of planning approvals and introduce additional sensitive land uses (in this case residential), these future receptors have been assumed for the purposes of the assessment.

2.3.9 Future baseline receptors and cumulative developments have been identified from the DCC Planning Portal and are described in Appendix 1-J.

2.4 Existing site use and operation

2.4.1 The existing waste management facility on Forties Road comprises an existing ATS site and DERL EfW facility, which are currently owned by DCC and operated by DERL.

2.4.2 Appendix 1-D shows the Planning Application Boundary with Internal Operational Boundaries, and identifies the components of the existing site as follows:

- A. A 0.87ha area of hardstanding currently used for the recycling and storage of highways construction waste materials. The area is operated by Tayside Contracts and is a separate

³ O' Dochartaigh et al (2011) User Guide: Groundwater Vulnerability (Scotland) GIS dataset, Version 2
British Geological Survey Open Report
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operation from DERL facility. The activity will shortly be relocated to Riverside in Dundee;

- B. A 1.99ha area of semi-improved grassland to the south of the Dighty Water;
- C. A 1.79ha area known as the existing ATS site, where bulky and trade waste sorting operations currently occur (Section 2.4.6);
- D. A 1.24ha area of semi-improved grassland currently unused, but allocated in the Dundee Local Plan for economic development; and
- E. A 2.00ha area known as the existing DERL EfW facility, which treats circa 90,000 tonnes per annum (tpa) of residual waste and has a maximum power production of 10.5 Megawatts (MW) (gross) of electricity.

2.4.3 Since 2000, the DERL facility has managed the residual household waste from Dundee and Angus Councils and a small quantity of similar residual C&I waste. The DERL facility currently operates 24 hours a day, seven days a week.

2.4.4 There are approximately 45 full-time equivalent people currently employed at the existing DERL facility.

2.4.5 The main elements of the existing DERL waste treatment facility are:

- The ATS site (Area C); and
- The DERL EfW facility (Area E).

2.4.6 The ATS site to the north of the existing DERL facility managed the residual waste from Dundee from the 1970's, until the DERL facility came on line in 2000. It continues to pre-treat some residual waste; is used for the storage of Incinerator Bottom Ash (IBA); and acts as a depot for the refuse collection vehicles and parks department providing garaging, stores and messing facilities.

2.4.7 The following elements of the existing DERL waste treatment facility are of relevance to this assessment:

- The gatehouse;
- The two weighbridges;
- The drainage system;
- The firewater storage tank; and
- Some of the existing connections to infrastructure.

2.5 Site layout and Proposed Scheme components

2.5.1 The components of the Proposed Scheme (as shown in Appendix 1-D) are as follows:

- A. This is where the proposed EfW CHP facility will be constructed and operated;
- B. This area is proposed by the Applicant to be used as the pre-selected flood mitigation area;
- C. This area will continue to operate as a depot for the collection vehicles (and the parks department);
- D. This area is proposed to be used as the construction compound and contractor’s parking area; and
- E. Parts of this area will be further used to operate the Proposed Scheme, and parts will be handed back to DCC after the existing DERL EfW facility is shut down (as indicated on Figure 2.2 in Appendix 2).

2.6 Proposed Scheme development stages

2.6.1 The phases of development for the Proposed Scheme are summarised in Table 2.

Table 2: Summary of phases of development for the Proposed Scheme

No	Phase	Description	Dates
1	Construction	<p>Summary</p> <ul style="list-style-type: none"> - Includes site set up. - Existing DERL EfW facility visible and operational, proposed EfW CHP facility being constructed. <p>Construction</p> <p>All major civil and process construction activities will take place in this phase, including groundwork, excavations, piling, foundations, reinforced concrete structure, buildings, steelwork, cladding and installation of all major process equipment (boiler, turbine Air Cooled Condenser (ACC), Air Pollution Control (APC) system and chimney).</p>	3 rd Quarter (Q) 2017 to 4 th Q 2019
2	Construction and Commissioning (Switching)	<p>Summary</p> <ul style="list-style-type: none"> - Transition between existing DERL EfW facility (shut down) and proposed EfW CHP facility (start-up). 	1 st Q 2020 to 3 rd Q 2020

No	Phase	Description	Dates
		<p>- Existing DERL EfW facility visible and operational, proposed EfW CHP facility visible and operational.</p> <p>Construction</p> <p>Final external works – finishing works to roads and hardstandings, site landscaping works, mechanical and electrical building services and internal fit out. Final internal process works – electrical installations, small bore piping systems.</p> <p>Commissioning</p> <p>The Applicant does not intend to operate the existing DERL EfW facility beyond construction of the proposed EfW CHP facility being completed.</p> <p>The existing DERL EfW facility will be operated to the point where MVV have the ‘First Waste Fire’ at the new facility, expected to be approximately two days after the proposed EfW CHP facility has passed ‘Readiness Testing’. The new facility will operate at average 70% load for the ‘Hot Commissioning’ period which will be sufficient capacity for the complete contract waste for Angus and Dundee.</p> <p>During ‘Hot Commissioning’, if there is a period when the new facility cannot treat the full contract waste, DERL will be restarted for a short period, however there will be no parallel waste combustion in both new and existing facilities. The existing DERL facility would start after the shutdown of the new facility, and the new facility would then restart after the shutdown of the existing DERL. Also the ‘Hot Commissioning’ period of the new facility is four months, so any requirement to restart the new facility would fall within this period</p> <p>For preheating or shut down of any waste boiler it is required to use oil fuel, so there could be parallel emissions of waste combustion in one plant, and oil preheating in the other plant.</p>	
3	Operation (of proposed EfW CHP facility) and	Summary	4 th Q 2020 onwards

No	Phase	Description	Dates
	Decommissioning (of existing DERL EfW facility)	<ul style="list-style-type: none"> - Proposed EfW CHP facility in full operation. - Existing DERL EfW facility to be retained (but not working). Proposed EfW CHP facility visible and operational. <p>Decommissioning of Existing (DERL) EfW facility</p> <p>Will consist of shutting down the existing DERL EfW facility and carrying out any necessary electrical or process isolations (throwing switches and shutting valves and emptying silos).</p> <p>Demolition of Existing (DERL) EfW Facility</p> <p>There is no demolition of the existing DERL EfW facility within the scope/remit of this planning application. DERL The facility will continue to be present but will not operate.</p>	

3 Proposed Scheme description

3.1 Overview

3.1.1 Section 3 provides a description of the Proposed Scheme. This description should be read in conjunction with the planning application drawings.

Purpose

3.1.2 The primary purpose of the proposed EfW CHP facility is to treat the household waste collected by Dundee and Angus Councils that has not been recycled, reused or composted (residual waste). The remaining processing capacity will be used to process similar commercial and industrial (C&I) waste from local businesses in the surrounding area. This waste will be delivered by local waste collection companies and will be restricted to waste from which recyclable and biodegradable material has already been removed.

Proposed Scheme

3.1.3 The principal components of the Proposed Scheme are outlined in Section 3.2.

3.1.4 The footprint of the main building of the proposed EfW CHP facility itself will cover approximately 3,900m² and together with small auxiliary buildings and equipment total approximately 4,400m², on a site of approximately 8ha. The process equipment layout is optimised to give as compact a footprint as possible, which also helps to deliver clean simple lines to the buildings.

3.1.5 As well as the operational plant delivering the service requirements of the Dundee and Angus Residual Waste (D&ARW) treatment contract, visitor facilities will be provided for use by the public, including an area within the administration building incorporating space for community use.

Summary of process

3.1.6 The proposed EfW CHP facility is designed to treat 110,000tpa of waste at the thermal design point of 39.9 Megawatts thermal (MWth) (hourly throughput of 13.725 tonnes per hour (tph)) with a lower Calorific Value (CV) of 10.5 Megajoules per kilogram (MJ/kg). This has an expected availability of 91.3% (equal to 8,000 full load operational hours per year) and guaranteed availability of 90% (equal to 7,884 full load operational hours per year).

3.1.7 Under low CV conditions the mechanical throughput could be as high as 16.489tph, based on a maximum capacity of 130,000tpa and the lowest availability of 7,884 full load operational hours per year.

3.1.8 The waste will be combusted and the heat will be used to generate steam. The steam will drive a steam turbine and generate renewable electricity for:

- Use at the proposed EfW CHP facility;
- Future use at the Michelin tyre manufacturing facility; and
- Export to the grid.

3.1.9 Steam will also be extracted from the turbine and fed into the Michelin tyre manufacturing factory steam network to be used for process and heating purposes. The proposed EfW CHP facility will therefore incorporate CHP technology.

3.1.10 Solid residues will be left in the form of:

- Bottom ash, which will be transported off site, processed and reused; and
- Residues from the air pollution control (APC) system, which will require disposal off site, at a licensed hazardous waste landfill.

3.1.11 Data on the projected amounts of inputs and outputs can be found in the Waste Flow Model, which will be available as part of the planning support documents.

3.1.12 More detail on the proposed EfW CHP facility process is described in Section 3.3.

Relationship with existing DERL EfW facility

3.1.13 The Proposed Scheme will take over waste sorting operations from the existing ATS plant.

3.1.14 The proposed EfW CHP facility will share the existing DERL access road and trafficked areas for operational purposes, including weighbridges and gatehouse, drainage, firewater storage tank and some of the connections to infrastructure.

3.1.15 There will be no concurrent operation of the Proposed Scheme and the existing DERL facility burning residual waste; instead the transition between DERL and the proposed EfW CHP facility will be almost instantaneous, with the shut-down of DERL following the hot commissioning of the new facility on low sulphur light fuel oil and preceding the hot commissioning of the new facility with residual waste.

3.2 Principal components of the proposed EfW CHP facility

3.2.1 The facility will comprise the following principal components:

- Main building (which contains many of the components listed below);
- Administration block (including meeting rooms and visitor facility);
- Central control room;
- Tipping hall;
- Waste bunker;
- Boiler house;
- Turbine hall;
- Chimney;
- APC system, including a 90m high chimney;
- Air cooled condenser (ACC);
- Water treatment plant;
- IBA storage bunker;
- Transformer compound integrated into the building for the export of electricity from the facility;
- Emergency diesel generator enclosure; and
- Electricity cables, switchgear rooms and steam and condensate pipework for connection to the relevant networks.

Main building

3.2.2 The majority of the waste treatment process will take place within the main building, which has been designed to enable the various plant items within it to be maintained and replaced as necessary throughout the life of the facility.

3.2.3 The maximum height of this building will be 38m and the minimum height 15m. The total length of the building will be 120m and the width will vary between a minimum of 31m and a maximum of 48m.

3.2.4 The main building needs to be 38m high in order for the plant to meet the strict requirements of the Industrial Emissions Directive (IED) to protect human health and the environment. Specifically, the secondary combustion chamber is sized so that the products of combustion remain at a temperature of at least 850°C for a minimum of two seconds after the last introduction of air to ensure the efficient destruction of organic compounds and carbon monoxide. The products of combustion rise vertically within this chamber. The height of the building is therefore dictated by the need for the

secondary combustion chamber to be sufficiently tall to allow a temperature of 850°C to be maintained for two seconds.

Administration building

3.2.5 An administration building will be provided as part of the main building, containing the staff welfare facilities, offices and meeting rooms, including a visitor facility.

3.2.6 Access to the visitor facility will be controlled and bookable via the Community Liaison Officer.

Central control room

3.2.7 A control room will be provided in the administration building from which the facility will be operated and monitored.

Tipping hall

3.2.8 The tipping hall will be situated within the main building which is fully enclosed and provides:

- A reception area for incoming vehicles delivering waste to the facility;
- Four tipping bays with access to the waste bunker; and
- A dedicated storage area for bulky wastes to be stored and shredded, before they are transferred to the waste bunker.

Waste bunker

3.2.9 The waste bunker consists of the reception bunker (750m³) and the storage bunker (4,200m³). The storage bunker serves space for fuel required for six days continuous plant operation (or ten days, if only contract waste is considered).

Boiler house

3.2.10 The boiler house will be the largest part of the main building. The boiler house is where the main incineration process will take place and will contain the furnace and boiler.

Turbine hall

3.2.11 The turbine hall is located adjacent to the boiler house and will contain the steam turbine generator, demineralised water treatment plant and associated equipment.

Chimney

3.2.12 A 90m high stack will release flue gases into the atmosphere. The height of this stack has been determined by the results of the air quality stack height assessment (Appendix 2-B) which has

modelled the relative effectiveness of emission dispersion for a variety of possible stack heights.

Air pollution control system

3.2.13 An APC system will be provided. Flue gases which have passed through the boilers will enter the APC area, where the gases will be cleaned using a dry reagent injection system and bag filter unit before they are released into the atmosphere via the chimney. The reagents required for the APC system are hydrated lime and activated carbon. Facilities will be provided in the APC area for loading of APC residues into enclosed vehicles for subsequent transport off site.

3.2.14 Continuous emissions monitoring equipment will be installed and the results published on the Applicant's website:

https://www.mvv-energie.de/en/uiu/uiu_mv_v_environment/dundee_and_angus_waste_project/dundeeandangus.jsp.

Air cooled condensers

3.2.15 Air Cooled Condensers (ACCs) will be provided to condense the exhaust steam from the steam turbine without producing a visible plume associated with water cooled condensers. The ACC will be positioned on the roof of the turbine hall.

The ACC will consist of several sections as follows:

- Tube bundles in carbon steel with aluminium fins;
- A cooling fan system including adjustable blade pitch, frequency regulated electric motors, and direct drive reduction gear;
- Screening of the air exit openings to reduce visual impact; and
- A steel support structure.

Water treatment plant

3.2.16 A water treatment plant will be provided to produce demineralised water for the boiler from the municipal water supply, and clean the return condensate from the Michelin tyre manufacturing facility. The plant will be located in the turbine hall.

IBA storage area

3.2.17 Facilities will be provided within the main building for the transfer of IBA to suitable vehicles for subsequent transport off site.

Generator transformer compound

3.2.18 A generator transformer compound will be provided at the facility, adjacent to the main building to the north of the waste bunker.

Emergency diesel generator enclosure

3.2.19 An emergency diesel generator enclosure will be provided at the facility next to the generator transformer compound.

3.3 The proposed EfW CHP facility process

3.3.1 This section outlines the key stages of the waste management process, including:

- Waste collection;
- Waste delivery;
- Waste combustion;
- Steam generation;
- Air pollution control;
- Filtering;
- Electricity generation;
- Managing emissions to water;
- Processing of IBA; and
- Managing APC residues.

Waste collection

3.3.2 Table 3 identifies the current waste collection arrangements for Dundee and Angus Councils, and the changes to those arrangements that will arise once the proposed EfW CHP is operational.

Table 3 Current and proposed waste collection arrangements

Authority	Current arrangements	Changes to arrangements arising from use of proposed EfW CHP facility
Dundee	Approximately 85% of the household residual waste is delivered to the Existing facility in refuse collection vehicles. The remaining 15% is delivered to the adjacent ATS site where it is sorted, recyclate removed and shredded. This is then taken round to the Existing facility for treatment	Once the new site is available all of the household residual waste will be delivered to the New facility. Any large or bulky items will be received on site and sorted prior to treatment.
Angus	The residual household waste is delivered to the Existing facility. Bulky waste and waste from the Household waste recycling centres is delivered to the Restenneth landfill site for disposal	Once the new site is available all of the household residual waste will be delivered to the New facility. Any large or bulky items will be received on site and sorted prior to treatment.

Authority	Current arrangements	Changes to arrangements arising from use of proposed EfW CHP facility
C&I Waste	Residual Commercial and Industrial waste from the Dundee, Angus, Perth and north Fife area that has been sorted to remove recyclable products is either taken to landfill at Binns Farm, Perth or to the Restenneth Landfill site for disposal or it is baled and exported to Europe as fuel for energy from waste plants	The introduction in 2020 of the ban on landfilling biodegradable waste will create a requirement for residual C&I waste to be diverted from landfill and it is anticipated that the proposed EfW CHP facility will be able to accept about 30,000 tpa of C&I waste from the Dundee, Angus, Perth and north Fife area.

Waste delivery

3.3.3 Waste will be delivered to the proposed EfW CHP facility in enclosed refuse collection vehicles, roll-on/roll-off vehicles with enclosed containers, and sheeted or enclosed bulk transfer vehicles.

3.3.4 Waste will be unloaded in an enclosed tipping hall. The tipping hall will have a ‘negative air pressure’ system to ensure that all odours are contained within the building and treated so that they do not give rise to nuisance. The malodourous air will be used as primary combustion air in the furnace. The tipping hall will also be provided with a single entrance and exit roller shutter door that will be closed outside of the facility opening hours. Delivery vehicles transfer waste directly into the waste bunker via one of four available tipping bays.

Waste combustion

3.3.5 Waste will be stored and mixed within the waste bunker. The crane operator will mix the waste to maximise homogeneity and calorific value so as to optimise the combustion of the waste, and then use the grab crane to feed waste from the waste bunker into the furnace.

3.3.6 The combustion technology will incorporate an inclined reciprocating grate. Ash generated from combustion will drop off the end of the grate directly into a water bath equipped with a mechanical ash discharge conveyor. Combustion air will be drawn from the waste bunker and fed into the combustion chamber.

3.3.7 Combustion gases will pass into a secondary combustion chamber. The chamber is sized so that the products of combustion, after the injection of secondary air, remain at a temperature of at least 850°C for a minimum of two seconds. This is to ensure the efficient destruction of organic compounds and carbon monoxide. In the unlikely event that the temperature arising from the combustion of

the waste on its own is not sufficient (e.g. when burning very low calorific value waste), auxiliary burners are used to maintain this temperature. In addition flue gas will be circulated from behind the fabric filter into the firing chamber in order to enhance the incineration process and lower the formation of oxides of nitrogen (NO_x).

3.3.8 The waste feed rate, the supply of primary and secondary combustion air and the grate speed will be regulated by an advanced combustion control system which measures steam flow rate, flue gas oxygen content and combustion temperature, and controls the plant to keep the rate of steam generation constant. This ensures that:

- The boiler and generator operate at their optimal efficiency; and
- Over firing of the boiler with the consequent increase in thermal stress and corrosion as well as the risk of increased CO emissions is avoided.

3.3.9 The amount of heat released by the waste will vary according to its net calorific value (NCV). The automatic control system will respond to this variation by modifying the waste feed rate and the grate speed to maintain a constant heat release from combustion and hence a constant steam flow rate.

3.3.10 In addition to this, the combustion control will record and control the fire location and thus the burnout on the grate.

3.3.11 The combustion process generates NO_x. In order not to exceed the emission limit for these substances, the facility will be equipped with a NO_x reduction system which will inject urea solution into the secondary combustion chamber of the furnace.

3.3.12 Urea acts as a reducing agent which decomposes during injection in the hot flue gas stream, initially to ammonia. The hydrogen in the ammonia then reacts with the oxides of nitrogen to produce molecules of water vapour and nitrogen. This is known as a selective non catalytic reduction process (SNCR), which is optimised at temperatures of between 850°C and 1,000°C.

Steam generation

3.3.13 High pressure (43bar) and temperature (405°C) steam will be created by the evaporation of water in the boiler and the further heating of the saturated steam in the super-heaters.

3.3.14 The combustion gases will cool rapidly when passing through the boiler, maintaining heat transfer efficiency, minimising erosion and also minimising the presence of ash deposits on the tubes. The economiser sections of the boiler will reduce the gas exit temperature to the optimum required for the flue gas treatment process and preheat

the boiler feed water for increased efficiency. The rapid cooling coupled with minimal ash deposits will help minimise the reformation of dioxins and furans.

3.3.15 On average approximately 10MW of steam would be exported to Michelin for use within their factory for production and heating purposes. New pipework would be installed to connect to the existing heat distribution system and some existing pipework will need to be replaced. A separate planning application will be made for the steam connection, once the arrangements have been agreed with Michelin.

3.3.16 The steam provided would replace steam generated by the Michelin boilers which run on natural gas and which occasionally, in times of gas disruption, run on distillate oil.

Air pollution control

3.3.17 The process will use a dry APC system using hydrated lime, which will be delivered in sealed bulk powder carriers which are pneumatically emptied.

3.3.18 Acid pollutants Hydrogen Chloride (HCl), Sulphur Dioxide (SO₂) and Hydrogen Fluoride (HF) will be removed by a dry scrubbing and filtration system, using hydrated lime as the reagent, to enable more energy to be recovered from the flue gas. A controlled amount of powdered activated carbon will also be injected into the flue gas upstream of the fabric filter.

3.3.19 The flue gases will pass through the fabric filter in which the entrained particles are trapped in the filter cake which covers the filter bags. The neutralisation reaction will be completed as the flue gases pass through the filter cake. The filter cake will be removed at regular intervals by reverse air pulses and fall into the filter discharge hoppers. A proportion of this residue will be re-circulated into the flue gas duct upstream of the fabric filter and reactivated by injection of water or steam. This increases the neutralisation reaction efficiency, thereby reducing the final quantity of un-reacted lime in the APC residue. The SO₂ and HCl concentrations at the boiler outlet and at the emission monitoring points in the chimney will be continuously monitored and the quantity of hydrated lime injected will be adjusted, in accordance with the difference in the concentrations of the acid gases at the two measurement points, to achieve the permitted emission limits.

3.3.20 The primary method of minimising the release of dioxins will be by careful control of the combustion conditions. The gas residence times and the temperatures in the combustion system are such that dioxins and furans are efficiently destroyed.

3.3.21 For additional removal of dioxins and furans an activated carbon injection system will be used. The activated carbon adsorbs

mercury, and organic compounds including dioxins and furans. Other heavy metals such as copper and cadmium are filtered out as particulates by the fabric filter.

Filtering

3.3.22 The fabric filter bags act as a foundation for the formation of a filter cake which serves as an additional reaction medium for both the acid gas neutralisation and the adsorption of heavy metals and organic compounds and provides particulate filtration.

3.3.23 The filter cake will be periodically removed from the bags by the automatic cleaning system.

Electricity generation

3.3.24 The facility will use a finned-tube ACC to condense the exhaust steam from the steam turbine. In the ACC the steam will be condensed under vacuum to extract the maximum practical mechanical energy from the expansion in the steam turbine.

3.3.25 The steam turbine will generate electricity from the superheated steam produced in the boiler. The superheated steam from the boiler will be expanded in a steam turbine. The expansion of the steam will deliver energy in the form of shaft power which, in turn, will be used to drive an electrical generator. Provision will be made in the design of the steam turbine for steam extraction to the existing Michelin tyre manufacturing facility network.

3.3.26 On average approximately 10 Megawatt electric (MWe) is generated by the steam turbine, of which 1.0MWe is consumed by the plant as the parasitic load, leaving 9MWe as the net electrical output for export to Michelin and the Scottish and Southern Energy distribution network.

Managing emissions to water

3.3.27 In normal operation, the production and consumption of liquid effluent will be balanced. Boiler blowdown water or backwash water from the boiler water treatment plant will be returned to the ash quench water seal system on the boiler. During plant shut down, when the ash quench does not act as a consumer, or at times of increased demineralised water production, surplus process water is discharged into the foul sewer, after a treatment to ensure it meets the requirements of the discharge consent.

Processing of incinerator bottom ash

3.3.28 The IBA remaining after combustion equates to approximately 23% by weight (dry) of the input waste, this equates to approximately 30,000 tpa (wet), assuming a total waste throughput of 110,000 tpa.

3.3.29 IBA including metals will be discharged from the end of the combustion grate directly into the ash quench bath. From there, the ash will be transferred by means of an ash extraction conveyor into the ash bunker, which has a storage capacity of 4 days. The bunker will have a sloping floor so that surplus quench water runs back into a collection sump and can be returned to the quench bath from time to time. The ash retains approximately 20% by weight of the water from the quench bath.

3.3.30 The bottom ash will be loaded by means of a travelling overhead grab crane into a collection vehicle. The vehicle will be sheeted before leaving the ash loading station.

Managing air pollution control residues

3.3.31 The residue from the bag filter, which contains fly ash, the reaction products from the acid gas neutralisation process and activated carbon with the absorbed metals and organic compounds, is considered hazardous waste. The main reason for these residues being classified as 'hazardous' is their alkalinity⁴.

3.3.32 The residue will be conveyed from the filter hoppers to an intermediate storage silo. Part of the residue will be returned to the dosing system to improve the utilisation of hydrated lime.

3.3.33 The balance is conveyed to the residue storage silo. The silo will have a capacity of 150m³ which provides a total of 4 days' storage. The residues have a very low moisture content. The silo is vented through a bag filter to ensure there are no fugitive emissions from the system.

3.3.34 The APC residues amount to approximately 3.5% of the total waste by weight, which equates to approximately 3,500-4,000tpa, assuming a total waste throughput of 110,000tpa.

3.3.35 An example chemical content of the APC residues is detailed in Appendix 1-E. This is an example from the EfW CHP facility the Applicant operates in Plymouth, however it should be noted that the proposed EfW CHP facility in Plymouth is based on sodium bicarbonate rather than lime.

3.4 Waste management: IBA processing and APC residue disposal

IBA processing plan

3.4.1 The IBA will be processed at an off-site facility situated at Peterden Quarry, Dundee. Peterden Quarry is owned and operated by the DJ Laing Group who will seek to utilise a significant proportion of IBA

⁴ The APC residues are not dissimilar to cement in this respect, which is routinely transported by road in the same type of vehicles as the APC residues would be transported.

as a secondary aggregate. The treated IBA can be used in highway works, pavement concrete, landfill engineering projects, quarry restoration and brownfield remediation projects.

- 3.4.2** At least 95% of the output IBA (target 99%) will be reprocessed as a secondary aggregate after the extraction of ferrous and non-ferrous metals, with the remainder sent to an appropriately licensed landfill site, as inactive waste attracting the inert waste landfill tax.

Alternative locations for IBA processing

- 3.4.3** In the event that IBA cannot be taken to Peterden Quarry, the Applicant will investigate other local sustainable options for the processing of IBA. There are a number of other existing facilities in the region currently being developed for the processing of IBA, which will have planning permission and appropriate permits to operate, including:

- Viridor, Dunbartonshire; and
- FCC Environment, Edinburgh.

- 3.4.4** The mechanical processing will include screening and removal of ferrous and non-ferrous metals. Metals might typically represent approximately 3.5%, by weight, of the IBA. The levels of ferrous and non-ferrous metals remaining in the IBA is a function of the input waste composition, and thus the levels of recycling.

- 3.4.5** The DJ Laing Group will make arrangements with metal merchants to collect and recycle the ferrous and non-ferrous metals recovered from the IBA at appropriately permitted sites, thus avoiding landfill and achieving high diversion rates.

APC residue disposal

- 3.4.6** The Applicant will dispose of APC residue under a contract with the William Tracey Group. The APC residue will be transported to a facility owned by Tracey in sealed bulk powder carriers, which are pneumatically loaded and emptied. The Applicant's intention is to arrange for some of the APC residue loads to be transported away in bulk powder carriers which have delivered lime to the facility, which would reduce vehicle movements.

- 3.4.7** The site, located at Dunniflats, East Ayrshire, is fully operational and is licensed to receive hazardous wastes. It already has the requisite consents to be able to cater for the additional volumes of APC residue envisaged. The Applicant will also investigate other local sustainable options for the disposal of APC residue.

3.5 Access, traffic movement and parking

Access roads

- 3.5.1** The location of the Application Site means that the predominant highway access to the Application Site will be from Drumgeith Road via Forties Road.
- 3.5.2** Access for all vehicles will be provided to and from the proposed EfW CHP facility using the existing internal access road to the DERL facility from Forties Road. The existing road will be modified to suit the line and level of the proposed EfW CHP building.
- 3.5.3** The existing DERL weighbridges and a gate house will be retained on the internal access road. The Application Site will utilise the two existing weighbridges positioned to allow weighing in and weighing out of all waste delivery vehicles, vehicles delivering consumables, and vehicles transporting products and residues.
- 3.5.4** A new road will be formed around the proposed EfW CHP building to allow vehicles to access the tipping hall, via the door which is located on the south side of the building.
- 3.5.5** In addition to this, a new access from Forties Road will be created on the south side of the proposed EfW CHP building. This access will be kept closed and only be available for emergency vehicles so that the fire and rescue service have an alternative access to the Application Site by which they can access all facades and building entrances in the case of an emergency.
- 3.5.6** The internal road and pedestrian area layout has been designed to allow the safe movement of vehicles and pedestrians, and with regard to relevant health and safety legislation and good industry practice.

Traffic movement

- 3.5.7** In terms of the movement of waste vehicles, the access procedure will be as follows:
1. Vehicle arrives at site;
 2. Vehicle stops at weighbridge;
 3. Security checks are undertaken and vehicle is weighed-in;
 4. Vehicle proceeds on to site and is unloaded / loaded in the enclosed tipping hall or the relevant area which may be in the open for the delivery of chemicals;
 5. Vehicle returns to weighbridge and is weighed-out;
 6. Vehicle exits site.

- 3.5.8** There will be traffic lanes provided in parallel to the weighbridge lanes that will allow vehicles not requiring to be weighed to bypass the weighbridge facility. The layout is such that the weighbridge lanes will accommodate two vehicles each, without obstructing the bypass lanes.
- 3.5.9** Operational vehicles will be controlled on site via designated truck paths by the use of appropriate road markings, signage and traffic control bollards, as required. A speed limit of 10 miles per hour (mph) will be imposed and maintained across the Application Site. This will be prominently displayed on traffic signs and enforced by the operating company.
- Emergency vehicles will have freedom to move around the total site via the perimeter road.
- 3.5.10** The facility has been designed such that HGVs can achieve a turnaround time, from arriving at the entrance weighbridge to leaving the exit weighbridge, of between 15 and 25 minutes (depending on the type of delivery vehicle). This time will include entering the Application Site, being weighed, discharging the waste and being re-weighed (see 3.5.7).
- 3.5.11** Detailed calculations have been made of the movements of vehicles expected to arrive at and depart from the proposed EfW CHP facility. These calculations can be found in the Transport Assessment.
- 3.5.12** The predicted average number of HGVs associated with the proposed EfW CHP facility will be a total of 59 two way movements per day. In addition, there will be an average of 33 private staff car visits per day (66 two-way movements). Full details of the vehicles generated by the Facility are set out in Volume 2, Section 8.

Parking spaces and cycle racks

- 3.5.13** Car parking for staff and visitors, including disabled allocation, will be provided.
- 3.5.14** The existing DERL car park will be retained for staff parking, and a new car park will be created alongside the administration building, where it is proposed that a total of 15 new car parking spaces will be provided at the proposed EfW CHP facility.
- 3.5.15** In conjunction with the existing car parking associated with the DERL facility, there will be provision for three disabled parking bays. Of the total parking provision, five spaces will be identified for short-term use by visitors who will call at the gatehouse / weighbridge to obtain access and instructions to enter the Application Site, including details of where they can park once they are on site.

3.5.16 The remaining spaces will be provided within the Application Site itself to cater for staff and visitor requirements and five sheltered cycle parking spaces and three motorcycle spaces will also be provided on site.

Site user movements

3.5.17 The majority of the trips to and from the facility will be associated with the proposed EfW CHP plant operation itself, with a small number of associated staff trips. In addition, a small number of visitor trips associated with the facility are also expected.

3.5.18 Visitors are most likely to be business users arriving by car and users of the visitor facility arriving by car, cycle or on foot, or school trips which will normally arrive and leave by coach or bus, outside of peak hours and on an ad hoc basis.

3.6 Drainage

3.6.1 The proposed drainage strategy has been developed by Arup. An outline drainage layout drawing and an outline drainage strategy report will form part of the planning application. A detailed drainage design will be progressed by the contractor as the design is developed.

Roads and hardstanding

3.6.2 Positive drainage will be provided to all hardstanding areas through the use of a combination of gullies, linear drains or channels and hard pipe. The surface water will pass through a class 1 by-pass petrol interceptor (estimated size at this stage NSB20 - to be confirmed at detailed design stage) prior to being discharged to the Scottish Water separate drainage system in Forties Road. There will be a water retention and management system on site to ensure that the rate of discharge at the point of discharge will be controlled such that it is above a 1 in 200 years +CC return period. Consequently, the design of the surface water system will be based on free discharge flow conditions.

3.6.3 It is intended to provide an emergency cut-off valve immediately upstream of the outfall to the Scottish Water network such as to prevent any water discharging to the environment in the event of an accidental spill on site.

Roof and walls

3.6.4 It is proposed to provide a drainage system to drain the run-off roof and wall rain water to an infiltration system. It is intended that the main building roof and wall surfaces will be drained to an infiltration basin.

3.7 Connections to infrastructure

3.7.1 Clean water and waste water treatment are delivered to the Proposed Scheme by Scottish Water.

Mains water

3.7.2 A water supply is required to provide water for the process requirements, the fire protection systems and for domestic and potable requirements. This will be supplied from the Scottish Water supply network via a connection to the mains either on the DERL site or in the Forties Road area.

3.7.3 Mains cold water will be distributed around the buildings to serve all drinking water connections as close to the rising main as practicable, with connections being provided to the domestic cold water storage tanks.

3.7.4 For the provision of hot water for domestic requirements, consideration has been given to local water heating rather than centralised production and storage and a number of low water use appliances will be installed throughout the facility.

3.7.5 The average water consumption of the process during normal operation is 2-3m³/h. The condensate loss during times of steam extraction for CHP purposes, in the range of 6-7m³/h, is replaced by the steam customer.

Foul sewer connection

3.7.6 The rainwater collection system from building roofs, roads and hard standings will be discharged by means of a separate surface water drainage system whilst sanitary and process wastewater will be discharged to foul sewer.

3.7.7 In normal operation there is no continuous discharge to foul sewer from the process part of the facility, as waste water generated is reused to make up the water lost in the IBA quenching system. Therefore, in normal operation the only discharge to foul sewer is from the sanitary and domestic facilities.

3.7.8 Occasionally there will be the need to discharge process water from the facility (e.g. during shutdowns or when periods of increased steam off-take with high condensate losses by Michelin leads to increased waste water from the water treatment plant) and for this purpose a neutralisation tank and water quality testing are provided with a controlled discharge to the foul sewer to ensure compliance with the requirements of the trade effluent discharge consent for the facility.

3.7.9 The foul sewer connection will be made to the existing public network.

Electricity

3.7.10 In order to start up the facility it is necessary to import electrical power from an external network. With the facility in operation electrical power will be generated at 11 kilovolt (kV) with the plant power requirement (parasitic load) being supplied via the internal power distribution system and transformers, at the required auxiliary voltage level of 400V. The plant is able to operate in island mode such that the generator provides the parasitic load requirement only without exporting power, in the event that the connection to the grid is lost. An emergency diesel generator is not necessarily required to shut down the plant safely in the event of total power loss (failure of the grid connection coinciding with failure of the turbine generator), as the boiler system is fail safe and a uninterruptible power supply (UPS) system supplies the consumers, which are required for shut-down. For export, the power is transformed to 33kV by the internal feed-in transformer.

3.7.11 Technical meetings and discussions have been held jointly with Scottish and Southern Energy Power Distribution (SSEPD) (Section 4.4). The resulting feasibility studies have determined that the optimum solution is to export the electrical power via a direct connection into the electrical distribution system by means of a connection to the 33/11 kV substation, located within the Application Site. Excess generated power will be exported to the grid via the substation, whilst power necessary for start-up will be imported via the same connection.

3.7.12 SSEPD has carried out a formal study which confirms that the arrangements and route for cable connections will only require minor reinforcement of the network involving the replacement of some switchgear at the substation.

Refuse disposal and recycling

3.7.13 General site waste, such as that generated in the administration block, will be collected and stored in enclosed bins and recyclable waste will be collected and stored separately. A reputable collector will be employed to remove general refuse and recyclables from the Application Site.

Telephone connection

3.7.14 The facility will be provided with a private automatic branch exchange (PABX) type telephone exchange and switchboard system with the requisite number of internal extensions to serve the various areas of the facility and the administration building. Separate direct lines will be installed to critical locations in the facility such as the control room and facility managers' office. The telephone line connections will be supplied from the local British Telecom (BT) network.

- 3.7.15** In addition, the facility will require high speed broadband internet connections for remote monitoring of process parameters and the general communication requirements of the operation and management of the facility. The internet connection provider will be selected at the time of plant construction in order to ensure that the most favourable option can be secured.

Connections to Michelin steam distribution network

- 3.7.16** New pipework will be installed to connect to the existing system; some of the existing pipework will need to be replaced. This will be the subject of a separate planning application.

3.8 Aesthetic design, materials and finishes

The main building

- 3.8.1** The main building has been designed to reflect the plain industrial buildings which front onto Forties Road, and it will be clad in a similar grey metallic cladding material, and comprise a collection of angular shapes, reflecting the technology within the building. The neutral coloured forms have a continuous and homogenous roof / wall composite. This encloses a simple clad box.

Administration block

- 3.8.2** The administration block including the visitor facility are in the form of a rectangular and angular clad box. This cladding will be in a contrasting colour to grey, to identify the entrance to the building for visitors.

Boiler house and turbine hall

- 3.8.3** In keeping with the overall concept of an anonymous industrial building, this part of the building is predominantly finished in a grey metallic cladding with grey louvres at low level in the boiler house and roof mounted vents for ventilation purposes.
- 3.8.4** The turbine hall will be a continuation of the main building and have a similar external appearance but will be heavily insulated to contain the noise from the turbine.

Flue gas treatment / bag filter

- 3.8.5** The flue gas treatment is located on the north side of the building facing the existing DERL building. It will be largely screened from public view by the waste tipping hall and the administration building. The majority of the flue gas treatment area is expressed functionally via the exposed flue gas treatment equipment. Silos, pipework and ductwork are all visible to facilitate easy access and maintenance.

- 3.8.6** The one area that has to be enclosed is the top of the bag filter, part of the flue gas cleaning equipment, which is expressed as a grey metallic clad structure. This is formed in trapezoidal cladding.

Air cooled condensers

- 3.8.7** The ACCs sit on top of the turbine hall due to the limited ground space. They are connected to it by overhead pipework. The ACCs are clad in a similar grey metallic cladding. The whole structure sits on legs to allow the passage of air underneath.

Chimney

- 3.8.8** The chimney stack is a simple cylindrical structure which will be formed in painted steelwork which is finished in a light grey with an area of stainless steel at the apex. It will be up to 90m in height.

3.9 Landscape

- 3.9.1** At this stage it is not anticipated that any additional on-site or off-site landscaping will be undertaken given the off-site landscaping which already exists.
- 3.9.2** The complex of buildings comprising the ATS site; the existing DERL facility and the proposed EfW CHP facility are well screened from the north, east and south by mature woodland and views from the south-west are screened by woodland to the south of the access to the cyclo-cross / skateboard park. Forties Road which affords close views of the proposed facility already has a significant number of buildings which are very close to the highway which are of similar appearance to the proposed EfW CHP facility and which have no screening.
- 3.9.3** The principal sensitive views of the Application Site are from the south, from the housing fronting Balunie Drive in Douglas and from the footpath along the Dighty. There is already scots pine and birch along the footpath on the north bank of the Dighty Water, which screens the car-breakers yard which lies to the south of the Proposed Scheme. Given the level of landscaping that exists and the height of existing trees, it is not proposed to supplement it. Views of the mid-upper levels of the proposed EfW CHP would be visible from the surrounding townscape/ landscape above the existing vegetation, these views cannot be screened by planting.

3.10 Construction of the proposed EfW CHP facility

Construction programme

- 3.10.1** The Applicant will construct the proposed EfW CHP facility.

3.10.2 Subject to obtaining planning permission, construction is expected to occur between late 2017 and late 2020 and to take approximately 35 months.

3.10.3 For the purposes of summarising the construction programme and activities, the construction programme is split into four general phases:

- Mobilisation and Early Works (Section 3.10.4 to 3.10.5);
- Main Works (Section 3.10.6 to 3.10.16);
- Process Installation (Section 3.10.17); and
- Commissioning.

Mobilisation and early works

3.10.4 A construction compound will be established on the land on the west side of Forties Road opposite the proposed EfW CHP facility (Area D). This will include:

- Erection of construction site offices and stores; and
- Creation of car park for construction staff.

3.10.5 The scope of the mobilisation and early works will include:

- Discharge of any pre-commencement planning conditions;
- Additional geotechnical site investigation as required;
- Detailed civil and structural engineering designs;
- Temporary works designs;
- Relocation of the outside perimeter fence;
- Preparation of a fully integrated and coordinated programme;
- Preparatory works for the site mobilisation;
- Connection to temporary electricity supply, most likely to be fed from the existing supply at the existing DERL EfW facility;
- Construction of the access road from the existing DERL EfW facility entrance gate around the perimeter of the Application Site; and
- Construction of a flood mitigation area adjacent to the south side of the Dighty Water (Area D).

Main works

3.10.6 Following completion of the early works, the main site earthworks and piling will be carried out by the civil contractor.

3.10.7 It is proposed that the level of Area A within the Application Site is raised with inert selected granular material to provide a level platform at 28.5m Above Ordnance Datum (AOD). This will lift the new

building above the 1 in 200 year + climate change flood risk, and minimise the extent of excavation in difficult ground conditions, whilst raising the deeper elements of the new structure (the waste bunker), thus reducing the level of dewatering required during construction.

- 3.10.8** Groundwater monitoring is being undertaken across the Application Site as part of the ground investigations.
- 3.10.9** The deepest area of the proposed main building is the reception area of the waste bunker at 21.5m AOD. The waste will be stored in the storage bunker above ground and thus above 28.5m AOD. Groundwater levels obtained from previous investigations suggest the deeper portion of the reception bunker will be within the water table therefore dewatering will be required during construction.
- 3.10.10** The optimum solution that has been developed for dewatering this area is to use a secant piled wall with grout curtain for the retaining walls of the waste bunker. When the retaining wall is completed the ground will be excavated within this, and well points and a temporary water pump will be installed until the base of the reception bunker has been completed and been made watertight.
- 3.10.11** The groundwater has high sulphate levels and as such dewatering discharge may require treatment to ensure that it does not have any adverse impacts to receiving water bodies. Treatment may include, but is not limited to, sediment filtration, settlement or neutralisation. Final proposals will be dependent on further sampling during construction.
- 3.10.12** The excavated material has been identified as suitable for re-use on an industrial site, and as such, the design has been based on all material being re-used on site. This significantly contributes towards the D&ARW partnership aspiration for significant reduction in waste to landfill.
- 3.10.13** It is proposed to found all areas of the main structure on piled foundations extending approximately 23m into the ground, in places where bedrock is not reached with the piles earlier. Pile arisings will require lime stabilisation to dry out, and be suitable as engineering fill in the hardstanding areas.
- 3.10.14** The external hardstanding areas of the Application Site will take the form of a concrete hardstanding, founded on a layer of well compacted Type 1 granular material. This construction make up will overlie the existing granular formation at lower levels and a well compacted granular fill material used to raise the main site level to 28.5m AOD. Transition slabs will be provided at all level access points into the building.

3.10.15 Grading of the site access routes will be required to provide a constant grade to make up approximately 1.0m from the exiting DERL access road to the new site level.

3.10.16 The erection of concrete structures and steelwork framing, and roof and wall cladding, will then take place.

Process installation

3.10.17 Process installation will partly overlap with the main works and will include the installation of grate and boiler works, ACC and auxiliary coolers, the turbine, a water treatment plant, balance of plant and APC system.

Commissioning

3.10.18 Following the completion of main works and process installation, there will be a period of start-up and testing known as ‘commissioning’. This will end with an acceptance test before the planned service commencement date.

3.10.19 On completion of commissioning, parts of the existing EfW DERL facility will be handed back to DCC (as shown on the plan in Appendix 1-D).

Construction working hours

3.10.20 Anticipated normal working hours during the construction period are outlined in Table 4.

Table 4: Anticipated normal construction working hours

Day of the week	Anticipated working hours
Monday to Friday	07:00 – 18:00
Saturdays	08:00 – 13:00
Sundays	None
Public / Local Holidays	None

3.10.21 Routine maintenance of plant and equipment may be carried out outside of normal working hours.

3.10.22 There may be instances where certain construction activities which have started, cannot be interrupted (e.g. concrete pours), and continue beyond normal working hours. Such instances will be minimised as far as possible and agreed in advance with the Environmental Health Service of DCC.

Employment

3.10.23 The Applicant will employ a variety of local and international subcontractors to deliver the facility.

3.10.24 The number of staff will vary during the course of the construction period, from approximately 37, at the end of the construction phase when the plant is being commissioned and the finishing touches are being made to the facility, to a peak of approximately 300 during the construction phase in 2019.

Construction traffic

3.10.25 Construction traffic will access and leave the Application Site via Forties Road to Drumgeith Road. The number of vehicles per day will vary throughout the construction period.

3.10.26 In order to avoid fouling of the public highway the following measures will be put into place:

- An automatic wheel-wash (or similar) will be provided prior to construction commencing, and be installed as part of the early works; and
- A road sweeper will keep the access roads clean.

3.10.27 Traffic movements will be optimised and the potential for adverse impacts to air quality associated with vehicle emissions will be minimised through:

- Design of vehicle routing on site;
- Optimising delivery schedules to minimise truck queuing in the site and at the Application Site entrance; and
- Routing of traffic to optimise access to the trunk road network.

3.11 Construction environmental impact control

3.11.1 A CEMP for the Proposed Scheme can be found in Appendix 1-F.

Site waste management plan

3.11.2 Sustainable waste management methods to be applied when dealing with the construction waste arising are set out in the outline Site Waste Management Plan (SWMP) (Appendix 1-G).

Dust suppression

3.11.3 Water bowsers fitted with spray bars to provide dust suppression to the work areas and access/egress route will be utilised where necessary. All dust emitting plant and equipment will be chosen as a last available option, and would be fitted with water suppression equipment. Stockpiles of materials will be covered to limit the generation of dust during dry periods.

Minimisation of fire risk

3.11.4 Before commencement of the construction works, the Applicant will develop adequate safety and security plans for the construction site,

in close co-operation with the local fire, emergency and police authorities. A first step will be the 'Fire Risk Assessment', followed by a 'Fire Risk Audit'. The identified fire risks in the 'Fire Risk Assessment' and the 'Fire Risk Audit' will be addressed appropriately, and fire prevention measures will be developed and made accessible to the site personnel.

Control of external lighting

3.11.5 The construction site will be lit adequately to ensure safe working conditions. All lighting will be positioned and adjusted so that it does not cause a nuisance to neighbouring properties. Night time illumination, outside of working hours, will be reduced to a minimum commensurate with the need to maintain the security requirements of the Application Site, to reduce the environmental impact, and reduce light pollution.

Security

3.11.6 The necessary infrastructure and personnel to provide a secure and safe construction site will be provided, and equipment to control unauthorised access to the site will be installed. This includes:

- Security fencing around the entire site perimeter and site compound on the west side of Forties Road;
- Appropriately positioned Closed-Circuit Television (CCTV) system;
- Full time (24 hour, seven days a week) attendance of security personnel;
- Access control at all entrances to and exits from the sites;
- Adequate lighting; and
- Acoustic and visual fire and emergency alarm system.

3.11.7 Security fencing with access gates will be established around the perimeter of the construction site, the Application Site compound on the west side of Forties road and the access routes as required. Construction of this new fence will be one of the first activities of the construction phase, and there will be no significant presence on the site until this fence is complete.

3.11.8 All systems will be regularly inspected and maintained, including:

- Daily visual inspections of the fence line;
- Daily inspections of the CCTV;
- Regular testing of the audible and visual emergency warning system; and
- Prompt repair of any identified faults or damage.

3.12 Operation of the proposed EfW CHP facility

Hours of operation

- 3.12.1** Waste will be capable of being accepted between 07:00 and 20:00, every day of the year, including on bank holidays, but excluding Christmas day.
- 3.12.2** The facility will be operational (i.e. burning waste) 24 hours a day, seven days a week, 365 days a year, and staff will therefore be on-site outside of the opening hours indicated in Section 3.12.1.
- 3.12.3** The Applicant recognises that there may be some occasions when the D&ARW partnership may request that the facility accepts contract waste deliveries outside the normal opening hours, for example in the case of an emergency or to accommodate the delivery of contract waste where authorised vehicles have been unavoidably delayed; or in other similar circumstances. It is therefore proposed that the facility be able to accept waste outside the operating hours stated in Section 3.12.1, with advance agreement with the Local Planning Authority.
- 3.12.4** The existing gate house is positioned on the Application Site entrance immediately east of Forties Road, and will be occupied at all times that the proposed EfW CHP facility is open to accept waste deliveries. Vehicles on the weighbridge will be monitored by CCTV. When the gatehouse is closed the entrance will be controlled by staff in the control room, with CCTV oversight of the entrance.

Employment

- 3.12.5** Once operational, the proposed EfW will provide employment for a total of 37 staff; comprising 33 technical staff and four waste operatives in the tipping hall.

3.13 Operation environmental impact control

- 3.13.1** Quality and Environmental Management Systems, compliant with International Organisation for Standardisation (ISO) 9001 and ISO 14001, will be implemented. As part of the Quality and Environment Management System, an Environmental Impact Control Method Statement will be developed, maintained and updated on a monthly basis. The method statement will include the procedures and actions required to:
- Minimise the environmental impacts of transporting, receiving, treating and disposing of waste;
 - Meet environmental conditions and applicable legislation;
 - Minimise amenity impacts on the local population;
 - Maintain the grounds and visual integrity of the building, cladding, external boundaries and fencing; and

- Operate a web site on which the environmental monitoring results will be published.

Waste management

- 3.13.2** All storage, processing and treatment of waste will take place within the confines of a building with appropriate environmental controls provided. All waste, residues, products and other materials will be stored in designated on-site storage areas, bunkers or containers.
- 3.13.3** Waste arriving at the Application Site will be processed in a timely fashion in accordance with the principles of Good Industry Practice. All waste being stored prior to combustion will be stored within a designated storage bunker.
- 3.13.4** Residues from the APC system are strongly alkaline and require off-site disposal at a licensed hazardous waste landfill. Facilities will be provided within the APC area for the transfer of APC residues to enclosed vehicles for subsequent transport off site.
- 3.13.5** The Application Site will be kept in a clean and tidy manner both internally and externally. Litter and detritus will be cleared up on a daily basis with particular emphasis on public areas. Any litter escaping the Application Site or deposited by site users will be cleared up to a 10m distance from the site boundaries, where it is possible to obtain access.

Minimisation of noise

- 3.13.6** The proposed EfW CHP facility has been designed to minimise operational noise levels as far as is practicable, including selection of:
- Low noise plant items;
 - Wall and roof cladding constructions to minimise noise breakout from the plant buildings; and
 - Acoustic attenuated ventilation openings to minimise noise breakout from the proposed EfW CHP facility buildings.
- 3.13.7** Vehicle access openings will be equipped with roller shutter doors or similar. The door to the tipping hall will normally remain open during peak delivery times, and will not be opened and closed between each delivery vehicle movement. If there are long intervals expected between deliveries, the door may be closed, and it will normally be kept closed outside of opening hours. The majority of traffic movements and principal external noise generating equipment (such as the ACCs) are located on the southern side of the building and are 380m away from the closest residential properties on Balunie Drive.

Minimisation of emissions to air

- 3.13.8** A comprehensive suite of controls on emissions to air will be implemented as an integral part of the design. The design of the

facility incorporates Best Available Techniques (BAT) in order to comply with the requirements of IED.

3.13.9 The controls incorporated in the consented facility will include the following:

- ‘Negative air pressure’ in the tipping hall;
- Control on combustion conditions (e.g. maintaining the flue gases above the minimum temperature specified in the IED for a sufficient time and with adequate mixing);
- Rapid cooling of the flue gases to minimise the formation of dioxins and furans;
- Injection of urea to remove oxides of nitrogen from the flue gases;
- Injection of hydrated lime for control of acid gases;
- Injection of activated carbon for control of mercury and dioxins and furans; and
- A bag filter system for removal of particulate matter.

3.13.10 The plant will be equipped with an advanced Continuous Emission Monitoring System (CEMS) which will continuously record the concentrations of oxygen, carbon monoxide, oxides of nitrogen, volatile organic compounds, particles, hydrogen chloride and sulphur dioxide.

3.13.11 Flue gas flow-rate and moisture content will also be measured to enable the mass flow of flue gases to be calculated and all measurements to be corrected to the standard reference conditions. The CEMS will be controlled by a computer system which will analyse and store the emission data and enable the data to be reproduced and analysed in accordance with the reporting requirements contained in the Environmental Permit.

Dust suppression

3.13.12 Dust will be controlled by drawing the combustion air required by the combustion plant from the waste bunker. During facility shut down the air will be extracted from the waste bunker by a separate exhaust system and treated by a combined dust filter and activated carbon filter which is located in the boiler house.

Minimisation of odour

3.13.13 The Applicant will develop and implement an Odour Management Plan to ensure that odours are appropriately controlled, which will include measures such as:

- Tipping all waste from vehicles in a designated reception and tipping hall, which will be maintained under ‘negative pressure’ to prevent fugitive emissions;

- Equipping vehicle access openings with roller shutter doors or similar, which will be closed when not in use (Section 3.13.7);
- Drawing the combustion air required by the combustion plant from the waste bunker (Section 3.13.12); and
- Regular inspections and sniff tests around the perimeter and operational area of the Application Site, to establish whether odours are being produced and/or carried off the site;
- Immediate recording of odour assessment results by the assessment; and
- Making odour assessment records available for inspection by the relevant authorities.

Control of external lighting

- 3.13.14** Street lighting is proposed for safety and security at the entrances to the Application Site and entrances to the building which will house the proposed EfW CHP facility. It is proposed that the internal roadways are illuminated during the hours of darkness, and when required, in the early evenings.
- 3.13.15** Street lighting, where required, will use light columns, with the attachment of directional hoods where appropriate, in order direct light at a suitable angle whilst minimising extraneous light. Daylight sensors will be used where possible.
- 3.13.16** Cowling will be used to minimise light spillage and brightness of the lighting will also be kept as low as possible (commensurate with operational requirements) and, as noted in Section 3.13.15 will be limited to periods after dusk and before dawn.

Minimisation of water pollution

- 3.13.17** During normal operation, there will be no continuous discharge to foul sewer from the process part of the facility, as any waste water generated will be reused to make up the water lost in the IBA quenching system. Therefore, in normal operation the only discharge to foul sewer is from the sanitary and domestic facilities.
- 3.13.18** The rainwater collection system from building roofs, roads and hard standings will be discharged by means of a separate surface water drainage system.
- 3.13.19** Occasionally there will be the need to discharge process water from the facility (e.g. during shutdowns or when periods of increased steam off-take with high condensate losses by Michelin leads to increased waste water from the water treatment plant), and for this purpose a neutralisation tank and water quality testing will be provided with a controlled discharge to the foul sewer to ensure compliance with the requirements of the trade effluent discharge consent for the facility.

Minimisation of spillages

- 3.13.20** The facility will be constructed and operated in accordance with the Pollution Prevention Guidelines and will be licensed by SEPA under the Environmental Permitting regime. To prevent spillages, all bulk storage tanks will be appropriately bunded and located on areas of hard standing and all wastes (including wastes to be delivered to the proposed EfW CHP facility) will be stored appropriately within the building. All tanks, bunds, drains and hard standing will be inspected frequently for damage, maintained and remedial works conducted if necessary.

Security

- 3.13.21** A colour capable CCTV monitoring system will be provided to cover and record key areas including the weighbridge, access routes, pedestrian routes, un-loading and loading areas. The system will also monitor unauthorised access to the site and be operational during hours of darkness or poor lighting. Space will be provided for storing the recorded information for 90 days.

- 3.13.22** A new permanent security fence will be established on the west, south and east sides of the Application Site, such that the site and its access route are fully secure. The north side of the Application Site will be secured by the fencing around the existing DERL facility. New security arrangements will be developed once the DERL facility ceases to operate.

Minimisation of vermin and other pests

- 3.13.23** The facility has been designed, and will be maintained, such that vermin, seagulls, flies etc. will not find the facility an attractive environment.
- 3.13.24** Since waste within the waste bunker will be continuously mixed and agitated, the conditions will not be attractive to vermin.

Maintenance

- 3.13.25** An annual maintenance programme will be prepared to ensure all elements of the facility are inspected frequently for damage, maintained and remedial works conducted if necessary. The annual maintenance period, during which waste combustion does not occur, but during which the facility continues to receive waste, will take place over approximately 21 days per year (on average).

4 Alternatives

4.1 Overview

4.1.1 This section describes the main alternatives considered by the Applicant and provides an indication of the main reasons for the choice made.

4.1.2 This section summarises the overall approach to technology and site selection that has been undertaken as part of the Proposed Scheme. The section also considers the evolution of design and the detailed design options and response considered.

4.2 Technology

4.2.1 There are three basic processes for thermal treatment of residual solid waste:

- **Thermal combustion**, which comprises complete oxidation with surplus oxygen. The combustion process does not require an external energy source (such as gas or electricity) because it releases heat and is self-supporting. The flue gas primarily comprises water vapour, CO₂, hydrogen chloride (HCl), NO_x and oxygen. Combustion type processes can be split into the following two types:
 - a. advanced moving grate technology; and
 - b. fluidised bed technology;
- **Pyrolysis**, which comprises thermal breakdown of waste in the absence of oxygen. Waste is heated to high temperatures (over 300°C) by an external energy source, without adding steam or oxygen. The products are char, pyrolysis oil and syngas (pyrolysis gas); and
- **Gasification**, which comprises thermal breakdown/partial oxidation of waste under a controlled oxygen atmosphere where the oxygen content is lower than necessary for combustion. Waste reacts chemically with steam or air at a high temperature (over 750°C). The process requires, as for pyrolysis, an external energy source to heat the process.

4.2.2 Thermal combustion of waste is considered by The Applicant to be the most efficient and effective means of recovering energy from residual household and C&I waste.

4.2.3 Using a moving grate which varies the speed at which the grate moves and the residence time of the waste in order to achieves a complete burn out of the waste, was considered the most efficient technology. Fluidised bed technology is very effective when the fuel has a standard calorific value and it can be pulverised and fed into the

combustion chamber as a powder. Residual waste does not have a standard calorific value and cannot be crushed to a powder.

- 4.2.4 Pyrolysis does not provide the same benefits in generating energy and requires a large amount of external energy to operate and is a very expensive solution to burn a low value product.
- 4.2.5 Gasification requires extensive pre-treatment of the waste and is therefore more costly to operate and has more components and stages which can fail and interrupt processing.

4.3 Sites

- 4.3.1 There is a strategic need for the Proposed Scheme, as the existing DERL EfW facility is close to the end of its economic life and it does not operate in CHP mode. Subsequent challenges in operating the existing DERL EfW facility have led the D&ARW partnership to jointly invite tenders for a new waste management facility, and to make this particular site available for the facility.
- 4.3.2 The Applicant has looked at the Scottish Government Heat Map and used this to identify the largest heat users in Dundee. There are other General Economic Development Areas identified in the Dundee Local Development Plan where the Proposed Scheme could have been located, however none of the alternative Economic Development Areas are able to offer the opportunity to provide such a large quantity of heat, in such an efficient manner, as the Application Site which has been made available by DCC on Forties Road, adjacent to the Michelin tyre manufacturing facility.
- 4.3.3 The Applicant did consider using alternative sites which could have been made available on Forties Road.
- 4.3.4 The ATS site (Area C) was not considered suitable because it would require the management, messing and parking facilities associated with DCC refuse collection and parks and street scene activities, to be relocated before the site would be available. Parts of this site are also used in association with the existing DERL activities, and it would be necessary to relocate these activities during the construction phase. The changes in level, would also make the layout difficult to design whilst maintaining access for emergency vehicles all around the perimeter of the site.
- 4.3.5 The prolonged use of the existing DERL EfW site (Area E) was considered, however investigations into its condition established that in the Applicant's opinion, it would not be practical or economically viable to continue to operate the facility for 25 years. In order to achieve the desired operational hours, significant changes would be required to the technology involving prolonged shut downs.

4.3.6 The use of the west site (Area D) was a possibility, however this is not immediately adjacent to the Michelin facility, and would therefore require much longer runs of pipework to provide energy to Michelin. This would also involve running any connections across the public highway, making the establishment and maintenance of such connections more difficult, expensive and disruptive to traffic (during construction and operation).

4.3.7 The use of the south site (Area A) presented the best opportunity to construct a new facility which would allow the DERL facility to operate during the three year construction period; allow the supply of energy to Michelin in future, and also allow some of the existing DERL buildings to be incorporated into the new facility thus optimising the use of the assets. The Tayside Contract's use of the south site (Area A) was already proposed to be relocated to the Riverside in Dundee, and therefore the site would be vacant allowing for easy access and minimum disruption to DERL activities.

4.4 Engagement

4.4.1 The Applicant has undertaken engagement with stakeholders, interested parties and the general public.

4.4.2 Engagement was undertaken by the Applicant with the following groups:

- Scottish Natural Heritage;
- DERL Good Neighbour Group on 28 June 2016;
- Tayside Friends of the Earth on 10 August 2016; and
- Whitfield Development Group on 12 October 2016.
- Dundee University, Abertay University, and Dundee & Angus College (12-13 November 2016)

4.4.3 A summary of this is shown in Appendix 1-H.

4.4.4 Formal public consultations have also taken place for the Proposed Scheme. The first round of exhibitions was held on 29 and 30 June and the second round of exhibitions was held on the 12 and 13 October 2016, during which a number of comments were received on environmental matters.

4.4.5 A pre-application consultation report was commissioned from PPS Scotland by the Applicant. This consultation report has been included as part of the planning application, and forms part of the planning application supporting documents.

4.4.6 Comments received, along with Proposed Scheme responses are contained in the Pre-application Consultation Report.

4.5 Design

4.5.1 The proposed EfW CHP facility has been designed to fit on the south site (Area A) in a way which presents:

- The enclosed structures with the traditional industrial appearance facing Forties Road to the west and Balunie Drive to the south; and
- The more complex parts of the building with a diverse external appearance of pipework and silos on the north and east elevations where they are less visible to the public.

4.5.2 The traffic circulation has been determined by the desire to utilise the existing entrance to the DERL facility and associated weighbridges which have a safe location with good sight lines. The traffic circulation layout also provides continuity between the operation of both the existing and the proposed facility, and therefore causes the least disruption and confusion to general traffic using Forties Road and drivers delivering to EfW facilities.

5 Approach to the assessment

5.1 Overview

5.1.1 This section sets out the approach to the EIA. It provides an overview of the stakeholder engagement undertaken for the EIA (Section 5.2) and details the general methodology followed by the environmental topic assessments (Section 5.3).

5.1.2 The approach to the environmental design of the Proposed Scheme has sought to prevent and reduce significant effects through active design input. This approach ensures a reasonable worst-case assessment of environmental effects.

5.2 Engagement

5.2.1 The assessment of the Proposed Scheme has been undertaken in accordance with the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2011. Section 5.3 sets out the general EIA methodology including legislation, guidance and policy which has informed the assessment.

Scoping

5.2.2 A request for scoping opinion was prepared and submitted by the Applicant to DCC on 22 September 2015.

5.2.3 DCC responded on 13 November 2015, also incorporating comments from SEPA. The scoping response is provided in Appendix 1-B.

5.2.4 The scoping opinion included a number of general, cross-topic comments which related to the level of detail required in the ES and general methodology.

5.2.5 A summary of topics included and excluded from the ES is summarised in Table 5. This reflects comments raised in the scoping response, ongoing technical engagement and represents the content of this ES.

Table 5: Summary of topics included and excluded from the ES

Topic	Included	Excluded
Acoustics	✓	
Air Quality	✓	
Archaeology and Cultural Heritage*		✓
Ecology	✓	
Ground Conditions and Contamination	✓	
Landscape and Visual Amenity	✓	
Socio-economics	✓	

Topic	Included	Excluded
Traffic and Transport	✓	
Water Resources	✓	
Waste		✓

5.2.6 The rationales for not assessing archaeology and cultural heritage and waste, are described in this section.

5.2.7 Archaeology and cultural heritage

5.2.8 Following consultation with DCC it was confirmed that Archaeology and Cultural Heritage could be scoped out as a topic from the ES. Due to the pre-existing industrial character of the area it is not expected that there will be significant adverse effects to the setting of designated buildings or sites. In addition, the distance between the proposed site and nearby Listed Buildings and Scheduled Ancient Monuments is considered sufficient that they will not be significantly affected by the Proposed Scheme. Discussions with topic specialists have confirmed that no significant adverse effects are expected in relation to the historic environment. In summary, there are no archaeological concerns regarding the Proposed Scheme and no credible risk for adverse physical impacts on the historic environment.

5.2.9 This is justified in more detail in Appendix 1-I.

5.2.10 Waste

5.2.11 Waste has been scoped out as a topic in the EIA on the following basis:

- A Site Waste Management Plan has been produced to manage construction waste on-site, which is contained in Appendix 1-G;
- A CEMP has also been produced, and is contained in Appendix 1-F;
- The Proposed Scheme is inherently concerned with waste management and the waste handled is considered to be part of the waste management process rather than an effect of the Proposed Scheme; and
- It is not considered that the operational waste generated by on-site operations (e.g. site workers) would result in a significant environmental effect on the existing waste management capacity.

Ongoing stakeholder engagement

- 5.2.12** Following scoping, engagement continued with stakeholders to agree topic scopes and assessment methodologies. Details of this topic-specific engagement is contained within each topic section of Volume 2.
- 5.2.13** There have also been ongoing meetings with the Planning Officer at DCC at which EIA issues have been discussed. This includes the submission of several technical notes on EIA methodological aspects for the Proposed Scheme. Comments received in relation to these notes have informed the ES.

5.3 EIA methodology

Overview

- 5.3.1** This section sets out the general EIA methodology. The assessment methodology for each topic is contained in Volume 2, and supporting appendices. This covers relevant legislation and guidance and the significance criteria applied to the topic assessments. Where the methodology varies between construction, operational and decommissioning effects for each stage of the Proposed Scheme, this is explained.
- 5.3.2** The assessment area varies from topic to topic and in each case is explained. The approach to gathering baseline information is described including sources of information and how this is used in the assessment. Assumptions made and any limitations in undertaking the assessment are identified.

Legislation, guidance and policy context

- 5.3.3** The application has been prepared in accordance with the provisions of the Town & Country Planning (Scotland) Act 1997, and The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2011 (as amended). As the proposed development falls within Schedule 1 of the EIA Regulations, the application is required to be accompanied by an Environmental Statement.

ES structure

- 5.3.4** The format for presenting the assessment is generally the same for each topic to allow ease of navigation through the ES. This is structured as follows:
- a. Introduction;
 - b. Engagement – an overview of stakeholder engagement undertaken for each topic;
 - c. Methodology – an overview of the assessment methodology for each topic is given;

- d. Assumptions and limitations;
- e. Baseline – this describes existing environmental conditions within the defined assessment area for each topic;
- f. Potential effects and good environmental design management – this explains on a topic specific basis key aspects of the development which may be the source of topics effects as well as measures which have been embedded into the design for each topic;
- g. Assessment – this sets out the assessment for construction, operation and decommissioning as appropriate to each topic for each stage of the Proposed Scheme;
- h. Supplementary mitigation – this identifies measures above and beyond those contained in the design which are recommended in response to significant adverse effects;
- i. Residual effects – the residual effects are reported, taking account of measures contained within the design and supplementary mitigation options;
- j. Cumulative effects – this identifies whether effects may be elevated due to the combined effects of the Proposed Scheme with other specified developments; and
- k. Assessment summary tables – summary tables for construction, operation and decommissioning effects.

5.3.5 Further details of the approach to the assessment are provided here.

Baseline

5.3.6 Prior to undertaking the impact assessments for each topic the current environmental conditions have been identified. Information about the existing environment has been obtained from field surveys, information provided by stakeholders and desk based information. This has allowed the existing and future environmental receptors to be identified and evaluated.

Phasing

5.3.7 The assessments have been undertaken in line with the phasing outlined in Table 2.

CEMP and SWMP

5.3.8 The assessment presented in this ES has assumed the application of the CEMP (Appendix 1-F) and SWMP (Appendix 1-G).

Significance criteria

5.3.9 Effects are described as significant or not significant, beneficial or adverse, consistent with the EIA Regulations which requires: “A *description of the likely significant effects of the development on the*

environment...’ (Schedule 4 – Part 1 (4)). This encompasses all effects specified in Schedule 4 of the EIA Regulations (*‘...direct effects and any indirect, secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative effects of the development’*).

5.3.10 This takes into consideration the magnitude of an impact and sensitivity of a receptor. Each topic assessment identifies (with justification) what represents a significant effect (either beneficial or adverse during construction, operation or decommissioning of the Proposed Scheme) for their topic. This includes details of any graded scales of significance e.g. major, moderate or minor beneficial or adverse, used within the topic assessments.

Supplementary mitigation and residual effects

5.3.11 Mitigation measures which are recommended in response to significant adverse effects are set out in the topic assessments, and summarised in Section 0. Taking account of measures contained within the SWMP and CEMP, design and supplementary mitigation options, the residual effects are reported.

Cumulative assessment

5.3.12 Schedule 4, Part 1 of the EIA Regulations requires an ES to include an assessment of cumulative effects. ‘Cumulative’ is not defined in the EIA Directive or Regulations and there is no standard approach to the assessment of cumulative effects, with different projects adopting different approaches.

5.3.13 A review of nearby developments which may give rise to cumulative effects has been undertaken. Identified developments relevant to the cumulative effects assessment include planning applications from the last five years for developments of ten dwellings or more, or where significant increases in vehicular traffic may result.

5.3.14 This review has identified developments within 1km of the Application Site that are either:

- a. Projects that are under construction;
- b. Planning permission(s) (for major or EIA developments) not yet implemented;
- c. Submitted application(s) not yet determined; or
- d. All refusals subject to appeal procedures not yet determined.

5.3.15 The list of developments identified in categories (a) to (d) are set out in a schedule and shown on a plan in Appendix 1-J.

5.3.16 This development schedule has been used as the basis of the cumulative effects assessment undertaken by each topic (as described in Volume 2).

- 5.3.17** It does not include developments for which a planning application is expected but not yet submitted. This is because details of the proposals and their associated environmental effects are not known. Similarly, developments for which a planning application has been rejected are not considered as it is assumed that they would not be constructed. In summary, only submitted/permited (and therefore ‘live’) applications are considered.
- 5.3.18** A radius of 1km was selected for the consideration of cumulative developments.
- 5.3.19** The information in the development schedule (Appendix 1-J) has been considered and assessed by the environmental topics. This involves considering future conditions with the Proposed Scheme and then evaluating if other developments are likely to give rise to elevated effects above and beyond those assessed for the Proposed Scheme.
- 5.3.20** While development information is provided within a 1km radius of the Application Site boundary, topics have only considered developments of relevance. Some topics, primarily air quality and visual consider cumulative effects over a radius greater than 1km as explained in their topic methodologies in Volume 2.
- 5.3.21** **Interactive effects**
- 5.3.22** An assessment of multiple effects on a single receptor such as noise, dust, air quality and visual is often termed ‘interactive effects’. The assessment of interactive effects draws upon other topic assessments and is presented in Volume 2, Section 10.
- 5.3.23** **Non-technical summary**
- 5.3.24** As required by the EIA Regulations, a separate Non-Technical Summary (NTS) volume has been prepared. The NTS provides a summary of the information provided in the ES in an easily accessible and understandable manner and makes extensive use of photographs and graphics to communicate as effectively as possible key information from the assessment.

6 Assessment summary

- 6.1.1** A summary of the effects identified for each topic is contained in the following assessment summary tables.

6.1.2 Assessment summary – Construction

Table 6 : Summary of environmental effects, mitigation and residual effects: Construction

Aspect of the Project	Description of effect and significance	Supplementary mitigation	Residual effects summary
Noise and vibration			
Noise arising from construction activities	Prediction of noise levels arising from construction activities at the closest receptor were found to be below construction noise thresholds and therefore not significant	None proposed assuming BPM are applied.	Effects unchanged. Not significant.
Vibration from construction activities	Effects from vibration upon existing receptors are assessed as not significant	None required	Effects unchanged. Not significant.
Noise from increase in construction traffic on nearby road network	Increase in traffic flows are expected to be less than 3dB increase as a result of construction traffic and therefore effects are assessed as not significant.	None required	Effects unchanged. Not significant.
Air Quality and odour			
Dust emissions	With the application of the appropriate embedded mitigation measures outlined in the CEMP, the impact would be not significant.	None required	Effects unchanged. Not significant.
Vehicle emissions	Air quality from traffic associated with construction of the EfW CHP has not been assessed as part of the ES but will be assessed as part of the permit submitted to SEPA.	-	-
Ecology			
Pollution incident	As the CEMP includes all necessary measures for preventing any pollution incidents, the effects of any pollution incident would be not significant.	None required	Effects unchanged. Not significant.

Clearance of vegetation or felling of trees	As the CEMP includes all necessary measures for the timing of vegetation clearance, the effects of clearance would be not significant .	None required	Effects unchanged. Not significant.
Potential disturbance to kingfisher nest burrow	Should works be required within 100m of either bank of either the Dighty Water or the Fithie Burn during the bird breeding season, a pre-construction survey for kingfisher burrows should be undertaken by a Suitably Qualified Ecologist (SQE). Therefore the effects of any potential disturbance would be not significant .	None required	Effects unchanged. Not significant.
Potential disturbance to otter couches	Should works be required within 100m of either bank of either the Dighty Water or the Fithie Burn, a pre-works check for otter activity would be undertaken by an SQE. Therefore the effects of any potential disturbance would be not significant .	None required	Effects unchanged. Not significant.
Ground conditions and contamination			
Superficial geology	Disturbance of soils Exacerbation of ground related hazards, e.g. running sands Construction related sources of contamination Compaction of the soils through the use of heavy machinery Temporary adverse significant effect.	Creation of geotechnical interpretative report. Detailed permeability testing Specification of foundation requirements and earthworks Geotechnical design	Undertaking these activities will permit appropriate geotechnical assessment and recommendations pertaining to ground conditions and hydrogeology to be made. Appropriate geotechnical design which will permit the mitigation of geo-related risks. Residual effects will be not significant .
Solid geology	The solid geology at the site is not protected and is not rare; therefore the overall magnitude of impacts due to loss or disturbance to solid geological features is considered to be negligible. Effects are not significant .	None required	Effects unchanged. Not significant.

<p>Hydrogeology</p>	<p>Temporary adverse significant effect.</p>	<p>Creation of geotechnical interpretative report. Detailed permeability testing Specification of foundation requirements and earthworks Geotechnical design</p>	<p>Undertaking these activities will permit appropriate geotechnical assessment and recommendations pertaining to ground conditions and hydrogeology to be made. Appropriate geotechnical design which will permit the mitigation of geo-related risks. Residual effects will be not significant.</p>
<p>Loss of mineral resources</p>	<p>Desk study research has identified that there is no history of coal mining or quarrying in this locality and that there are no economic resources beneath the site. On the basis of the above, the potential impact on mineral resources is considered to be negligible. Effects are not significant.</p>	<p>None required</p>	<p>Effects unchanged. Not significant.</p>
<p>Contamination</p>	<p>Construction phase impacts in respect to contamination issues are considered to be moderate – major (without appropriate remediation and mitigation) which will only be determined following the completion of the contamination assessment. Effects are potentially permanent adverse significant effects.</p>	<p>Undertaking of contamination assessment and development of Revised Conceptual Site Model. Site Waste Management Plan Development of Remediation Statement Undertaking of remedial and mitigation activities. Production of Remediation Verification Report</p>	<p>Contamination Assessment will identify contamination Source – Pathway- Receptor Linkages that require remediation and mitigation measures to be developed and will form the basis of the Remediation Statement. Remediation activities undertaken will require to be documented and recorded in Remediation Verification Report to be submitted to CLO / Building Control for sign off of contamination planning conditions to be signed off. Residual effects will be not significant.</p>

Landscape character and Visual impact			
Landscape character	Limited impact on the setting of the Local Landscape Character Areas (LLCAs) result in a Minor adverse effect. Not significant.	None required	Effects unchanged. Not significant.
Visual impact	Visibility of construction works from locations in close proximity to the site, including residential receptors on Balunie Drive and recreational receptors using the Core Path 1E/Green Circular to the south of the site. Construction activities would be visible from these locations, however would be temporary in nature. This would result in a significant temporary adverse effect.	No practical mitigation measures available.	Effects unchanged. Significant temporary adverse effect.
Socio-economics			
Supplier development	The total expected change in GVA generated by local supplier contract spend is estimated to be the order of £50 million including indirect and induced multiplier effects. Supplier development events and business mentoring for Small to Medium Enterprises (SMEs) and Social Enterprise Organisations (SEOs) will support the local business base and maximise their ability to access relevant contract opportunities arising from the project. Overall, this is identified as a moderate beneficial effect. Significant temporary positive effect.	None required	Effects unchanged Significant temporary positive effect.

<p>Employment and skills</p>	<p>The construction of the plant will require in excess of 500 people over the 3-year period with up to 300 on site at any one time. These posts will include opportunities in construction related disciplines that are relatively accessible to the local labour force.</p> <p>Not less than 70% of the workers employed in the construction phase will live within the wider locality.</p> <p>A Local Employment Scheme (LES) will operate and deliver 4 new start employment opportunities.</p> <p>The project will support 10 Construction Trade Apprenticeships (6 project initiated, 4 existing) and work collaboratively with Dundee and Angus College. There is also the potential for an agreement with Michelin Tyre Company.</p> <p>The LES will, where appropriate, use the Construction Skills Bank – targeting 100%. This will contribute to improving the matching of project opportunities with the local workforce.</p> <p>The project will provide 6 work experience placements – contributing toward increased employment rates and lower claimant activity in the local economy.</p> <p>Overall, this is identified as a moderate beneficial effect.</p> <p>Significant temporary positive effect.</p>	<p>None required</p>	<p>Effects unchanged</p> <p>Significant temporary positive effect.</p>
<p>Community and awareness raising activity</p>	<p>An area will be established within the DERL Facility or the EfW CHP Facility temporary construction camp area to welcome all visitors to the site.</p> <p>A dedicated Community Liaison Manager will communicate and raise public awareness of waste management and assist in positive change in attitude and behaviour. The community Liaison Manager will manage and contribute to a number of events that raise awareness amongst the local community.</p> <p>Where material is identified which is surplus to requirements, contractors and sub-contractors will be encouraged to donate this to SEOs and other community groups. This may offer potential value to social enterprise organisations in the local area.</p> <p>Overall, this is identified as a minor beneficial effect.</p> <p>No significant effect.</p>	<p>None required</p>	<p>Effects unchanged.</p> <p>No significant effect.</p>

Transport			
Road users, severance, driver delay, pedestrian delay, pedestrian and cycle amenity, fear and intimidation of road users, hazardous loads.	Impact of construction vehicles on the operation of local road network at count sites in the vicinity of the development are considered to be ‘not significant’ at all sites excluding Site ‘A’ where a significant temporary adverse effect is anticipated.	Development of a Construction Traffic Management Plan (CTMP)	Subject to the successful implementation and monitoring of the CTMP and in conjunction with the temporary nature of the construction process the residual effect as a direct result of the construction process will be not significant .
Accidents and safety	Increases in accident rates at Site A are predicted to be minor. Combining ‘low’ sensitivity of receptors at count site A, with ‘negligible’ magnitude of the effect at count site, it is considered that effects of HGV construction traffic on accident rates along Drumgeith Road / Baldovie Road will be ‘minor’. This is considered to present an effect which is not significant .	None required	Effects unchanged. Not significant.
Water			
Flooding	Flood risk assessment is ongoing and with the application of any appropriate mitigation the impact would be not significant .	None required	Effects unchanged Not significant
Drainage	The Drainage Strategy is currently being developed and with the application of any appropriate mitigation the impact would be not significant .	None required	Effects unchanged Not significant

6.1.3 Assessment summary – Construction and Commissioning (Switching)

Table 7: Summary of environmental effects, mitigation and residual effects: Construction and Commissioning

Aspect of the Project	Description of effect and significance	Supplementary mitigation	Residual effects summary
Noise and vibration			
Construction and commissioning noise	As there will be no overlap in operations of existing and proposed plants assessment of the switching phase has been scoped out of the assessment.	None required	Effects unchanged. Not significant.
Air Quality and odour			
Air pollutant emissions	It is understood that there will be no coincident plant operation during the switching period.	None required	No assessment required
Air pollutant emissions	Demolition of the exiting DERL site is not included within the scope of this planning application, therefore it is understood that there are no operations which would give rise to dust, air pollution or odour during decommissioning of the DERL site.	None required	No assessment required
Ecology			
No additional ecology effects are identified during this phase.		None required	Effects unchanged. Not significant.
Ground conditions and contamination			
Superficial geology	Overall, impacts to drift geology throughout the site are considered to be negligible. Effects are not significant.	None required	Effects unchanged. Not significant.
Solid geology	The solid geology at the site is not protected and is not rare; therefore the overall magnitude of impacts due to loss or disturbance to solid geological features is considered to be negligible. Effects are not significant.	None required	Effects unchanged. Not significant.
Hydrogeology	Overall, impacts to hydrogeology (specifically shallow groundwater) are considered to be negligible. Effects are not significant.	None required	Effects unchanged. Not significant.

Loss of mineral resources	Desk study research has identified that there is no history of coal mining or quarrying in this locality and that there are no economic resources beneath the site. On the basis of the above, the potential impact on mineral resources is considered to be negligible. Effects are not significant .	None required	Effects unchanged. Not significant.
Contamination	The impacts of contamination during the phase 2 construction and commissioning phase are assessed to be negligible, and effects to be not significant as remediation and mitigation would be required to be devised and undertaken as part of the initial construction phase.	None required	Effects unchanged. Not significant.
Landscape character and Visual impact			
Landscape character	Limited impact on the setting of the LLCAs result in a Minor adverse effect. Not significant.	None required	Effects unchanged. Not significant.
Visual impact	Visibility of both existing DERL facility and proposed EfW CHP building and stack from locations in close proximity to the site, including residential receptors on Balunie Drive and recreational receptors using the Core Path 1E/Green Circular to the south of the site. Both existing DERL facility and proposed EfW CHP building and stack would be visible from these locations. This would result in a significant permanent adverse effect .	No practical mitigation measures available.	Effects unchanged. Significant permanent adverse effect.
Socio-economic			
No socio-economic effects are identified during this phase.		None required	Effects unchanged. Not significant.
Transport			
Road users, severance, driver delay, pedestrian delay, pedestrian and cycle amenity, fear and intimidation of road users, hazardous loads, accidents and safety, dust and dirt.	Switching phase is expected to have a limited effect (beneficial or detrimental) on the traffic flows being generated to site. Assessment of the switching phase has been scoped out of the assessment.	None required	Effects unchanged. Not significant.

Water			
Flooding	Flood risk assessment is ongoing and with the application of any appropriate mitigation the impact would be not significant .	None required	Effects unchanged Not significant.
Drainage	The Drainage Strategy is currently being developed and with the application of any appropriate mitigation the impact would be not significant .	None required	Effects unchanged Not significant.

6.1.4 Assessment summary – Operation (of new EfW CHP facility) and Decommissioning (of existing DERL EfW facility)

Table 8: Summary of environmental effects, mitigation and residual effects: Operation

Aspect of the Project	Description of effect and significance	Supplementary mitigation	Residual effects summary
Noise and vibration			
Operational noise from EfW facility	Operational noise has not been assessed but it is assumed that it would be controlled by design to meet DCC/SEPA policy and has therefore been assessed as not significant .	None required	Effects unchanged. Not significant.
Noise from increase in traffic on nearby road network	Increase in traffic flows are expected to be less than 3dB increase as a result of operational traffic and therefore effects are assessed as not significant .	None required	Effects unchanged. Not significant.
Air Quality and odour			
Air pollutant and odour emissions	Operational air quality and odour from the EfW CHP installation has not been assessed as part of the ES but will be assessed as part of the permit submitted to SEPA.	-	-
Ecology			
Pollution incident	As the CEMP includes all necessary measures for preventing any pollution incidents, the effects of any pollution incident would be not significant .	None required	Effects unchanged. Not significant.
Additional lighting and noise as a result of the proposed scheme	As the CEMP includes all necessary measures for the control of operational lighting and noise, the effects of these aspects would be not significant .	None required	Effects unchanged. Not significant.
Additional disturbance to otter along the watercourses	Operational activities will be located adjacent to areas already in use and located away from the watercourses. Therefore the effects of this aspect would be not significant .	None required	Effects unchanged. Not significant.
Ground conditions and contamination			
Superficial geology	Overall, impacts to drift geology throughout the site are considered to be negligible. Effects are not significant .	None required	Effects unchanged. Not significant.

Solid geology	The solid geology at the site is not protected and is not rare; therefore the overall magnitude of impacts due to loss or disturbance to solid geological features is considered to be negligible. Effects are not significant .	None required	Effects unchanged. Not significant.
Hydrogeology	Overall, impacts to hydrogeology (specifically shallow groundwater) are considered to be negligible. Effects are minor adverse .	Creation of geotechnical interpretative report. Detailed permeability testing Geotechnical design Design of Groundwater Control System	Undertaking these activities will permit mitigation of risks associated with shallow groundwater in the permanent case. Residual effects will be not significant .
Loss of mineral resources	Desk study research has identified that there is no history of coal mining or quarrying in this locality and that there are no economic resources beneath the site. On the basis of the above, the potential impact on mineral resources is considered to be negligible. Effects are not significant .	None required	Effects unchanged. Not significant.
Contamination	Whilst appropriate remediation and mitigation as required from the contamination assessment will have been performed during the construction phase, the EfW CHP process will result in the production of contaminative materials which will require appropriate storage, handling and management, therefore the magnitude of impacts during the operational phase are assessed to be moderate/large. Effects will be significant permanent negative effect .	Appropriate Site Controls for the production, storage, handling and transportation of contaminative materials produced from the EfW process.	Development of Site Waste Management Plan in adherence to requirements of Pollution and Prevention Control (PPC) regulations (Scotland 2012). Residual effects will be not significant .
Landscape character and Visual impact			
Landscape character	Limited impact on the setting of the LLCAs result in a Minor adverse effect. Not significant.	None required	Effects unchanged. Not significant.
Visual impact	Visibility of both existing DERL facility and proposed EfW CHP building and stack from locations in close proximity to the site, including residential receptors on Balunie Drive and recreational receptors using the Core Path 1E/Green Circular to the south of the site. Both existing DERL facility and proposed EfW CHP building and stack would be visible from these locations. This would result in a significant permanent adverse effect .	No practical mitigation measures available.	Effects unchanged. Significant permanent adverse effect.
Socio-economic			

<p>Supplier development</p>	<p>The operation of facility will be associated with annual spending on goods and services. This will support the local economy by providing opportunities for local businesses to supply goods and services to the facility.</p> <p>Supplier development events and business mentoring to SMEs and SEOs will support the local business base and maximise their ability to access relevant contract opportunities arising from the project.</p> <p>Overall, this is identified as a minor beneficial effect.</p> <p>No significant effect.</p>	<p>None required</p>	<p>Effects unchanged.</p> <p>Not significant.</p>
<p>Employment and skills</p>	<p>The majority of the new recruits to the permanent staff will be expected to be local staff as a result of the recruitment policy. Not less than 70% of the workers employed will live within the wider locality.</p> <p>The operation of the new facility will provide employment for 37 staff; comprising 33 technical staff and 4 waste operatives. Taking into account indirect and induced multiplier effects the equivalent total GVA impact is in order of approximately £1.3 million per annum.</p> <p>Outage periods will provide additional employment of approximately 70 jobs through operations sub-contractors. These are opportunities that are potentially well suited to local companies requiring skills such as scaffolding, painting and general engineering.</p> <p>A Local Employment Scheme (LES) will operate and deliver 4 new start employment opportunities.</p> <p>The project will support 6 Apprenticeship roles (2 project initiated, 4 existing) and work collaboratively with Dundee and Angus College. In addition, it will provide 1 work experience placement (employability programmes) per annum – working collaboratively with the University of Dundee, Abertay University and Dundee & Angus College.</p> <p>Overall, this is identified as a moderate beneficial effect.</p> <p>Permanent significant positive effect</p>	<p>None required</p>	<p>Effects unchanged.</p> <p>Permanent significant positive effect.</p>

<p>Community and awareness raising activity</p>	<p>The local community will be continually engaged and an integrated approach will be developed through in order to present a positive image regarding the impact of the new EfW CHP Facility. This will be undertaken formally through scheduled community engagement meetings and informally through the Community Liaison Manager.</p> <p>A minimum of 2 Awareness Raising activities or visits per annum over the lifetime of the project will be delivered.</p> <p>Overall, this is identified as a minor beneficial effect.</p> <p>No significant effect.</p>	<p>None required</p>	<p>Effects unchanged.</p> <p>Not significant.</p>
<p>Environmental awareness</p>	<p>The Community Liaison Manager will assist the Partnership Councils in relevant environmental awareness-raising and community events throughout the duration of the Contract. This will include delivering a minimum of 10 “Environmental Events” each year - such as facility open days, attendance at local gala days.</p> <p>Overall, this is identified as a minor beneficial effect.</p> <p>No significant effect.</p>	<p>None required</p>	<p>Effects unchanged.</p> <p>Not significant.</p>
<p>Transport</p>			
<p>Road users, severance, driver delay, pedestrian delay, pedestrian and cycle amenity, fear and intimidation of road users, hazardous loads, accidents and safety, dust and dirt.</p>	<p>Operation of the new facility is expected to generate a negligible increase in general traffic flows or HGV flows. Based on the above the effects resulting from the operational phase of the development proposals are predicted to be not significant.</p>	<p>None required</p>	<p>Effects unchanged.</p> <p>Not significant.</p>

Water			
Flooding	Flood risk assessment is ongoing and with the application of any appropriate mitigation the impact would be not significant .	None required	Effects unchanged Not significant.
Drainage	The Drainage Strategy is currently being developed and with the application of any appropriate mitigation the impact would be not significant .	None required	Effects unchanged Not significant.