ANALYSIS OF THE LICENSING & PERMITTING PROCESSING FOR BIOGAS DEVELOPMENTS IN SOUTH AFRICA

Submitted for:

Stakeholder Review & Comment

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## ABBREVIATIONS AND ACRONYMS

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<th>Description</th>
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<tr>
<td>BAR</td>
<td>Basic Assessment Report</td>
</tr>
<tr>
<td>BPEO</td>
<td>Best Practicable Environmental Option</td>
</tr>
<tr>
<td>CA</td>
<td>Competent Authority</td>
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<td>CHP</td>
<td>Combined heat and power generator</td>
</tr>
<tr>
<td>COD</td>
<td>Chemical Oxygen Demand</td>
</tr>
<tr>
<td>Cu</td>
<td>Cattle unit</td>
</tr>
<tr>
<td>DAFF</td>
<td>Department of Agriculture, Forestry &amp; Fisheries</td>
</tr>
<tr>
<td>DEA</td>
<td>Department of Environmental Affairs</td>
</tr>
<tr>
<td>DOE</td>
<td>Department of Energy</td>
</tr>
<tr>
<td>DWA</td>
<td>Department of Water Affairs</td>
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<tr>
<td>EA</td>
<td>Environmental Authorisation</td>
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<tr>
<td>EAP</td>
<td>Environmental Assessment Practitioner</td>
</tr>
<tr>
<td>EHS</td>
<td>Environmental, Health &amp; Safety</td>
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<tr>
<td>EIA</td>
<td>Environmental Impact Assessment</td>
</tr>
<tr>
<td>EIR</td>
<td>Environmental Impact Report</td>
</tr>
<tr>
<td>GIS</td>
<td>Geographic Information System</td>
</tr>
<tr>
<td>GWh</td>
<td>Giga Watt hour</td>
</tr>
<tr>
<td>I&amp;APs</td>
<td>Interested and Affected Parties</td>
</tr>
<tr>
<td>IDP</td>
<td>Integrated Development Plan</td>
</tr>
<tr>
<td>IEM</td>
<td>Integrated Environmental Management</td>
</tr>
<tr>
<td>ISO</td>
<td>International Organisation for Standardisation</td>
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<tr>
<td>kV</td>
<td>Kilo Volt</td>
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<tr>
<td>LUPO</td>
<td>Land Use Planning Ordinance</td>
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MEC  Minister of the Executive Committee
MW  Mega Watt
NEMA  National Environmental Management Act 107 of 1998
NEM:AQA  National Environmental Management: Air Quality Act 39 of 2004
NEM:BA  National Environmental Management: Biodiversity Act 10 of 2004
NEM:PAA  National Environmental Management: Protected Areas Act 57 of 2003
NERSA  National Energy Regulator of South Africa
NHRA  National Heritage Resources Act
NID  Notice of Intent to Develop
NSBA  National Spatial Biodiversity Assessment
NWA  National Water Act 36 of 1998
OHSA  Occupational Health and Safety Act
S&EIR  Scoping & Environmental Impact Report
SAHRA  South African National Heritage Resources Agency
SANBI  South Africa National Biodiversity Institute
SANS  South Africa National Standards
SDF  Spatial Development Framework
SEMA  Special Environmental Management Acts
# GLOSSARY OF TERMS

<table>
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<th>Term</th>
<th>Definition</th>
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<td><strong>Acceptable Risk Level</strong></td>
<td>The concentration of a substance that will have a minimal effect on the environment.</td>
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<tr>
<td><strong>Analysis</strong></td>
<td>An investigation to ascertain the constituents of a waste.</td>
</tr>
<tr>
<td><strong>Aquifer</strong></td>
<td>Water-bearing strata of fractured or permeable rock, sand or gravel. When capable of sustaining community water or other needs, such strata may be considered to represent strategic water resources, requiring protection from pollution.</td>
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<tr>
<td><strong>Attenuation</strong></td>
<td>In this context, attenuation is the process of reducing leachate concentration by means of natural physical, chemical and biochemical processes such as dilution, oxidation and cell synthesis. Natural systems have an attenuation capacity which may render small volumes of contaminants (leachate) insignificant. However, when this capacity is exceeded, pollution results.</td>
</tr>
<tr>
<td><strong>Audit</strong></td>
<td>A site inspection at which the condition of the site on that day is appraised in terms of a number of predetermined criteria.</td>
</tr>
<tr>
<td><strong>Audit Team</strong></td>
<td>Those who attend the audit or site inspection and assist in compiling the audit report.</td>
</tr>
<tr>
<td><strong>Bio-Accumulation</strong></td>
<td>The combined intake of pollutants from food and water by organisms.</td>
</tr>
<tr>
<td><strong>Biogas</strong></td>
<td>Biogas is a mixture of gases produced as a result of anaerobic breakdown of organic matter by bacteria. The gases in the mixture are methane, 60%, which is the main component and a source of fuel; carbon dioxide, 36%, and hydrogen, oxygen, nitrogen and hydrogen sulphide making up the rest.</td>
</tr>
<tr>
<td><strong>BPEO</strong></td>
<td>&quot;Best Practicable Environmental Option.&quot; The outcome of a systematic consultative procedure that emphasises the protection of the environment. It establishes, for a given set of objectives, the option that provides the most benefit or least damage to the environment as a whole at acceptable cost.</td>
</tr>
<tr>
<td><strong>Buffer Zones</strong></td>
<td>Buffer zones in this case refer to separations between the boundaries of registered landfill sites and residential developments. They may vary between 500m and 1000m in width, depending on the classification of the landfill. No residential development may take place within a proclaimed buffer zone. At the discretion of the local authority and the state department, however, developments such as industrial developments may be permitted.</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
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<tr>
<td>Business Waste</td>
<td>Waste that emanates from premises that are used wholly or mainly for commercial, retail, wholesale, entertainment or government administration purposes.</td>
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<tr>
<td>Carcinogens</td>
<td>A substance or agent producing or inciting cancer. These substances can be grouped as: Group A - Clinically and epidemiologically proven in humans, Group B - Proven without doubt in laboratory animals, Group C - limited evidence in animals, Group D - Inadequate and doubtful data.</td>
</tr>
<tr>
<td>Cattle Unit</td>
<td>The number of non-bovine species considered equivalent to one bovine animal.</td>
</tr>
<tr>
<td>Chronic Toxicity</td>
<td>The effects of prolonged exposure of organisms or of man to a chemical substance.</td>
</tr>
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<td>Class A Landfill</td>
<td>Landfill site for the disposal of Type 1 Waste with Hazardous Ratings 1 – 4 and includes asbestos waste, expired, spoilt or usable hazardous products, PCBs or PCB containing waste &gt;50ppm, general waste excluding domestic waste, which contains hazardous waste or hazardous chemicals and mixed, hazardous chemical wastes from analytical laboratories and laboratories from academic institutions in containers less than 100 litres.</td>
</tr>
<tr>
<td>Class B Landfill</td>
<td>Landfill site for the disposal of Type 2 Waste which includes domestic waste, business waste not containing hazardous waste or hazardous chemicals, non-infectious animal carcasses and garden waste.</td>
</tr>
<tr>
<td>Class C Landfill</td>
<td>Landfill site for the disposal of Type 3 Waste which includes post-consumer packaging and waste tyres.</td>
</tr>
<tr>
<td>Class D Landfill</td>
<td>Landfill site for the disposal of Type 4 Waste which includes building and demolition waste not containing hazardous waste or hazardous chemicals and excavated earth material not containing hazardous waste or hazardous chemicals.</td>
</tr>
<tr>
<td>Closure</td>
<td>The act of terminating the operation of a facility. Closure is preceded by rehabilitation and followed by post closure monitoring.</td>
</tr>
<tr>
<td>Community</td>
<td>The people living in the vicinity of a proposed, planned or developed activity.</td>
</tr>
<tr>
<td>Compaction</td>
<td>The process whereby the volume of waste is reduced, using a purpose built compactor or other suitable machine.</td>
</tr>
<tr>
<td>Competent Authority</td>
<td>An authority mandated to make a decision related to a specific legislation.</td>
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<tr>
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<td>Definition</td>
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<tr>
<td>Composite Liner</td>
<td>An assembled structure of geosynthetic materials and low permeability earth materials (clay or benotinite), placed beneath a landfill to form a barrier against the migration of leachate into the underlying soils and ground water.</td>
</tr>
<tr>
<td>Compost</td>
<td>Stabilised, homogenous, fully decomposed substance of animal or plant origin to which no plant nutrients have been added and that is free of substances or elements that could be harmful to man, animal, plant or the environment.</td>
</tr>
<tr>
<td>Compostable organic waste</td>
<td>Carbon-based material of animal or plant origin that naturally enhances fertility of soil through a natural degradation process but excludes human made organic chemicals and naturally occurring organic chemicals which have been refined or concentrated by human activity. This excludes infectious, poisonous, health-care and hazardous organic wastes.</td>
</tr>
<tr>
<td>Composting</td>
<td>Controlled biological process in which organic materials are broken down by micro-organisms.</td>
</tr>
<tr>
<td>Concept Permit</td>
<td>Any landfill permit issued before the promulgation of the Environmental Conservation Act, 1989 (Act 73 of 1989).</td>
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<tr>
<td>Contaminate</td>
<td>The addition of foreign matter to a natural system. This does not necessarily result in pollution, unless the attenuation capacity of the natural systems is exceeded.</td>
</tr>
<tr>
<td>Corrosive</td>
<td>Solids or liquids that can, in their original state, severely damage living tissue. Corrosivity can be measured by determining the degree to which a standard coupon of steel dissolves.</td>
</tr>
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<td>Cover</td>
<td>The material used to cover waste. Cover Material is usually soil, but may comprise builders’ rubble, ash or other suitable materials.</td>
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<td>Cradle - to - grave</td>
<td>A policy of controlling any Waste from its inception to its ultimate disposal.</td>
</tr>
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<td>Danger Group</td>
<td>For transport purposes, hazardous substances that are listed in SABS Code 0228 are placed in a Danger Group.</td>
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<td>Delisting</td>
<td>The reclassification of a hazardous waste for disposal on a lower class of landfill. This would only be allowed by the Department, based on proof of low mobility or concentration, or proof of successful treatment to render it less hazardous.</td>
</tr>
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<td>Destruction</td>
<td>To neutralise or get rid of a waste by incineration or other physical or chemical means.</td>
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<tr>
<td>Term</td>
<td>Definition</td>
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<tr>
<td>Detection</td>
<td>This is routine water monitoring carried out bi-annually, using a limited number of indicators parameters, with a view to indicating pollution from the landfill.</td>
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<td>Monitoring</td>
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<td>Dispersion</td>
<td>The movement of a substance from a landfill into the surrounding environmental.</td>
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<td>Domestic waste</td>
<td>Primarily household waste and garden refuse.</td>
</tr>
<tr>
<td>Dose</td>
<td>The amount of a substance in g/ha that is to be landfilled.</td>
</tr>
<tr>
<td>Duty of care</td>
<td>This requires that anyone who generates, transports, treats or disposes of waste must ensure that there is no unauthorised transfer or escape of waste from their control, and must retain documentation describing both the waste and any related transactions. The person retains responsibility for the waste generated or handled.</td>
</tr>
<tr>
<td>Ecotoxicity</td>
<td>The potential to harm animals, plants, ecosystems or environmental processes.</td>
</tr>
<tr>
<td>Effluent</td>
<td>Liquid outflow from an industrial process operation.</td>
</tr>
<tr>
<td>Engineered Cell</td>
<td>A cell that is designed and engineered to contain hazardous waste. It is underlain by a liner to prevent the waste or the leachate from the waste coming into contact with the environment.</td>
</tr>
<tr>
<td>Environment</td>
<td>The natural environment, consisting of air, water, land and all forms of life. The social, political, cultural, economic and working context and other factors that determine people’s place in and influence on the environment and the natural and constructed spatial surroundings.</td>
</tr>
<tr>
<td>Environmental Impact</td>
<td>An investigation to determine the potential detrimental or beneficial impact on the surrounding communities, fauna flora, water, soil, and air, arising from the development or presence of a landfill.</td>
</tr>
<tr>
<td>Assessment (EIA)</td>
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<tr>
<td>Estimated Environmental</td>
<td>The Estimated Environmental Concentration represents the concentration of a substance in the aquatic environment when introduced under worst case scenario conditions. It is used to indicate possible risk, by comparison with the minimum concentration estimated to adversely affect aquatic organisms or to produce unacceptable concentration in biota, water or sediment.</td>
</tr>
<tr>
<td>Concentration (EEC)</td>
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<tr>
<td>Exposure</td>
<td>The amount of hazardous substances available to man or living matter.</td>
</tr>
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</table>
Fatal Flaw  A factor or situation which prevents the development of an environmentally acceptable waste disposal facility, except at prohibitive cost.

Feasible  Acceptable, capable of being used or implemented successfully, without unacceptably damaging the environment.

Fertiliser  Any substance which is intended or offered to be used for improving or maintaining the growth of plants or the productivity of the soil.

Fertilizer group  The category under which a particular fertilizer falls. Fertilizers are categorised as follows:

•  **Group 1** which is a fertilizer containing a total equal or greater than 100 g/kg of N, P or K or any combination thereof; or

•  **Group 2** which is a fertilizer containing a total of less than 100 g/kg of N, P or K or any combination thereof or any other recognised plant nutrient(s) in acceptable amounts as indicated in Tables 1 -9 and 13 -15;

•  **Group 3** which is a fertilizer containing natural or synthetic substance(s) or organism(s) that improve(s) or maintain(s) the physical, chemical or biological condition (fertility) of the soil; and “soil Improver” has the same meaning.

Flocculation  The intentional grouping of very small particles or colloids in a suspension in water or other liquids, the purpose being to increase the settlement rate of the solids.

General Waste  Waste that does not pose an immediate hazard or threat to health or the environment, and includes domestic waste, building and demolition waste, business waste, inert waste or any waste classified as non-hazardous in terms of regulations made under section 69 of NEM:WA.

Generator  A Waste Generator is any person whose actions, production processes or activities, including waste management activities, results in the generation of waste.

Geosynthetic Clay Liner (GCL)  A manufactured composite barrier system comprising f layers of clay material and geosynthetic materials to form a single sheet for use as a liner.

Ground Water  Water occupying pores in the soil and cavities and spaces in rocks in the saturated zone of the profile. This water may rise from a deep, magmatic sources or be due to the infiltration of rainfall (recharge).
| **Guideline** | While not requirements, guidelines are recommended actions which represent good practice. They are not enforceable, but may form the basis for site specific permit conditions in which case they become mandatory. |
| **Hazard Rating** | A system for classifying and ranking wastes according to how great a hazard they present to human health and the environment. |
| **Hazardous waste** | Any waste that contains organic or inorganic elements or compounds that may, owing to the inherent physical, chemical or toxicological characteristics of that waste, have a detrimental impact on health and the environment and includes hazardous substances, materials or objects within business waste, residue deposits and residue stockpiles for any wastes identified in Schedule 3 of NEM:WA Amended Act 26 of 2014. |
| **Hazardous Waste Landfill** | A containment landfill, designed specifically for the disposal or co-disposal of hazardous waste. |
| **Health Care Waste** | Waste emanating primarily from human and veterinary hospitals, clinics and surgeries. Also from chemists and Sanitary Services. They may comprise, inter alia, sharps (used hypodermic needles and scalpel blades), malignant tissue, body parts, soiled bandages and liner, and spent or outdated medicines or drugs. They have the ability to affect other living organics, and are considered hazardous. |
| **Healthcare risk waste** | Infectious waste emanating primarily from hospitals, clinics, surgeries, chemists and sanitary services. |
| **IMDG-RSA Code=SABS Code 0228** | A code in which over 4000 hazardous substances are listed and assigned a danger group for transport purposes. The Code forms the basis of the present system for classifying Hazardous Waste and is being upgraded for waste disposal purposes. In future hazardous substances will be assigned a hazardous rating for waste disposal in the SABS Code 0228. |
| **Immobilisation** | Immobilisation (or chemical stabilization) is a process in which the waste is converted to a more chemically stable or more insoluble or more immobile form. |
| **Industrial Groups** | Industrial groups or activities, which are likely to produce a Hazardous Waste. |
| **Industrial waste** | Hazardous and non-hazardous waste in either a dry or liquid form from industrial and commercial generators. |
| **Infectious Substances** | Micro-organisms including those which have been genetically modified, pathogens, cells, cell cultures and human endoparasites which have the potential to provoke infection, allergy or toxic effects. |
Infectious Waste: Any waste which is generated during the diagnosis, treatment or immunization of humans or animals; in the research pertaining to this; in the manufacturing or testing of biological agents - including blood, blood products and contaminated blood products, cultures, pathological wastes, sharps, human and animal anatomical wastes and isolation wastes that contain or may contain infectious substances.

Integrated Environmental Management (IEM): A management approach designed to ensure that the environmental consequences of development proposals are understood and adequately considered in the planning process.

Interested and Affected Parties (IAPs): Any persons who will be affected in some way by the development of a facility. They may be represented by adjacent residents or farmers, a residential community, the public at large, interest groups, NGOs or local, provincial and national government forums.

ISO 14001: Specifies requirements for an environmental management system, to enable an organization to formulate a policy and objectives taking into account legislative requirements and information about significant environmental impacts.

ISO 17025: Specifies the general requirements for the competence to carry out tests and/or calibrations, including sampling.

ISO 9001: Specifies requirements for a quality management system where an organisation needs to demonstrate its ability to consistently provide product that meets customer and applicable regulatory requirements, and aims to enhance customer satisfaction through the effective application of the system, including processes for continual improvement of the system and the assurance of conformity to customer and applicable regulatory requirements.

Lagoon: A lined dam constructed to contain liquid waste or effluent.

Lairages: Kraals in which animals are received and penned at an abattoir prior to slaughter.

Landfill gas: A combination of gases that form as a result of the anaerobic decomposition of organic waste in a landfill site.

Landfill site: The area permitted for waste disposal on which landfill cells and other structures required for the safe disposal of waste are constructed.
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leachate</td>
<td>An aqueous solution arising when water percolates through decomposing waste and as a result of the biodegradation of the waste. It contains final and intermediate products of decomposition, various solutes and waste residues.</td>
</tr>
<tr>
<td>Leachate Management</td>
<td>The collection and drainage of leachate to a point where it can be extracted for treatment.</td>
</tr>
<tr>
<td>Liner</td>
<td>A layer of low permeability material placed beneath a landfill, lagoon or any waste storage site and designed to direct leachate to a collection drain or sump, or to contain leachate.</td>
</tr>
<tr>
<td>Local authorities</td>
<td>Municipalities, district councils and government institutions who have a mandate to administer laws and by-laws pertaining to specific areas.</td>
</tr>
<tr>
<td>Manifest System</td>
<td>A system for documenting and controlling the fate of a Hazardous Waste from cradle-to-grave.</td>
</tr>
<tr>
<td>MCCSSO</td>
<td>A standard system of soil profiling, which describes the soil in terms of Moisture, Colour, Consistency, Structure, Soil type and Origin.</td>
</tr>
<tr>
<td>Minimum Requirements</td>
<td>A standard by means of which environmentally acceptable waste disposal practices can be distinguished from environmentally unacceptable waste disposal practices.</td>
</tr>
<tr>
<td>Monitoring</td>
<td>The process of checking for changes in status or trends over time. This may be achieved by compiling successive audits or analyses results.</td>
</tr>
<tr>
<td>MSDS</td>
<td>Materials Safety Data Sheet. It will give you the chemical name and then a description how toxic the waste is to humans and to aquatic life. It will give a short description about the physical and chemical properties, what will happen if you come in contact, inhale or ingest the chemical. How to treat it during a fire. How to handle and to store the chemical. What protection to wear. It will tell you how stable and reactive the chemical is and how to transport the chemical.</td>
</tr>
<tr>
<td>Neutralisation</td>
<td>To render harmless or less hazardous by the addition of acid or alkali to bring the PH in the region of 7.</td>
</tr>
<tr>
<td>Norms &amp; Standards</td>
<td>Norms &amp; Standards are a system of managing activities that require prior authorisation but can be developed for activities where the impacts and mitigation measures are known. Standards are clear, measurable, inflexible rules which provide performance criteria for proactive environmental management. The administrative focus of standards is on monitoring and compliance which is based on the upfront knowledge of impacts and the measurement of specific performance criteria. Compliance with standards should guarantee the absence of significant impacts associated with a development or activity.</td>
</tr>
<tr>
<td><strong>Term</strong></td>
<td><strong>Definition</strong></td>
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</tr>
<tr>
<td>Offal</td>
<td>The organs of a slaughtered animal, usually divided into “red offal” (liver, lungs, heart, diaphragm, tongues, tails, spleen, pancreas, brains, testes, clean fat, damasked heads) and “rough offal” (heads (cattle and sheep), stomachs, intestines, hooves (cattle and sheep), caul fat); rough offal requires more intensive cleaning.</td>
</tr>
<tr>
<td>Organic waste</td>
<td>Waste of biological origin which can be broken down, in a reasonable amount of time, into its base compounds by micro-organisms and other living things and/or by other forms of treatment.</td>
</tr>
<tr>
<td>Permit Holder</td>
<td>The person who, having obtained a Permit to operate a waste disposal site, in terms of Section 20 (1) of the Environmental Conservation Act, is legally responsible for the site, both during and after closure.</td>
</tr>
<tr>
<td>Phreatic Surface</td>
<td>A surface defined by the level at which the ground water will come to rest in a series of boreholes drilled in an area. The surface indicates the level at which the pressure in the ground water is atmospheric.</td>
</tr>
<tr>
<td>PPE</td>
<td>Personal Protective Equipment. This is any devise or item that is issued to an individual to protect them from a physical, chemical, biological and mechanical hazard.</td>
</tr>
<tr>
<td>Precautionary Principle</td>
<td>Where a risk is unknown; the assumption of the worst case situation and making provision for such a situation.</td>
</tr>
<tr>
<td>Recycle</td>
<td>The use, re-use, or reclamation of a material so that it re-enters the industrial process rather than becoming a waste.</td>
</tr>
<tr>
<td>Renewable Energy</td>
<td>Energy obtained from a source that is not depleted when used and can be naturally regenerated over a short time scale such as wind, solar, geothermal and tidal energy, but will also include energy from the decomposition of organic material.</td>
</tr>
<tr>
<td>Residue</td>
<td>A substance that is left over after a waste has been treated or destroyed.</td>
</tr>
<tr>
<td>Risk Assessment</td>
<td>The identification of possible impacts of a waste facility on the environment so that they can be addressed in the design.</td>
</tr>
<tr>
<td>Sanitary Landfilling</td>
<td>A method of disposing of waste on land without causing nuisances or hazards to public health or safety. Sanitary landfilling uses the principles of engineering to confine the waste to the smallest practical area, to reduce it to the smallest practical volume, and to cover it with a layer of earth at the conclusion of each day’s operations or at such less frequent intervals as may be acceptable.</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
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</tr>
<tr>
<td>Solidification</td>
<td>Solidification or cementation is a process in which the waste is converted to an insoluble rock-like material by mixing with suitable materials.</td>
</tr>
<tr>
<td>Standard</td>
<td>A measure by which the accuracy of quality of others or degree of excellence is judged, or a model for imitation.</td>
</tr>
<tr>
<td>Sterilise</td>
<td>Make free from micro-organisms</td>
</tr>
<tr>
<td>Surface Water</td>
<td>Water (usually rainfall) which flows across the ground surface towards and in man-made and natural drainage features such as drains, rivers, streams, lakes and ponds</td>
</tr>
<tr>
<td>Toxic</td>
<td>Poisonous and harmful to health and the environment.</td>
</tr>
<tr>
<td>Transporter</td>
<td>Any person who conveys or transfers waste between the waste generator and the waste management facility or between waste management facilities.</td>
</tr>
<tr>
<td>Treatment</td>
<td>Any method, technique or process that is designed to change the physical, biological or chemical character or composition of a waste, or remove, separate, concentrate or recover a hazardous or toxic component of a waste; or destroy or reduce the toxicity of a waste.</td>
</tr>
<tr>
<td>Waste</td>
<td>Any substance whether or not that substance can be reduced, re-used, recycled or recovered –</td>
</tr>
<tr>
<td></td>
<td>• That is surplus, unwanted, rejected, discarded, abandoned or disposed of;</td>
</tr>
<tr>
<td></td>
<td>• Which the generator has no further use of for the purpose of production;</td>
</tr>
<tr>
<td></td>
<td>• That must be treated or disposed of;</td>
</tr>
<tr>
<td></td>
<td>• That is identified as a waste by the Minister by notice in the Gazette and includes waste generated by the mining, medical or other sector; but –</td>
</tr>
<tr>
<td></td>
<td>• A by product is not considered waste; and</td>
</tr>
<tr>
<td></td>
<td>• Any portion of waste, once re-used, recycled and recovered ceases to be waste.</td>
</tr>
<tr>
<td>Waste Disposal</td>
<td>The burial, deposit, discharge, abandoning, dumping, placing or release of any waste into, or onto, any land.</td>
</tr>
<tr>
<td>Waste Disposal Facility</td>
<td>Any site or premise used for the accumulation of waste with the purpose of disposing of that waste at that site or on that premise.</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
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</tr>
<tr>
<td>Waste Load Allocation</td>
<td>This term refers to volumes of hazardous waste permitted on certain landfills. Such allocations are calculated taking both the nature of the waste and the specific site characteristics into account.</td>
</tr>
<tr>
<td>Waste Management Activity</td>
<td>Any activity listed in terms of NEM:WA and includes the importation and exportation of waste, the generation of waste, the accumulation and storage of waste, the collecting and handling of waste, the reduction, re-use, recycling and recovery of waste, the trading in waste, the transportation of waste, the transfer of waste and the disposal of waste.</td>
</tr>
<tr>
<td>Waste Treatment Facility</td>
<td>Any site that is used to accumulate waste for the purpose of storage, recovery, treatment, reprocessing, recycling or sorting of that waste.</td>
</tr>
<tr>
<td>White Goods</td>
<td>Bulky waste such as old washing machines, fridges and stoves</td>
</tr>
</tbody>
</table>
### AUTHORITIES DETAILS

#### NATIONAL

<table>
<thead>
<tr>
<th>Authority</th>
<th>Details</th>
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<tbody>
<tr>
<td>Civil Aviation Authority</td>
<td>Registration of obstacles near airfields and airports</td>
</tr>
<tr>
<td></td>
<td>Private Bag X73</td>
</tr>
<tr>
<td></td>
<td>Halfway House, 1685</td>
</tr>
<tr>
<td></td>
<td>Tel: +27 11 545 1000</td>
</tr>
<tr>
<td></td>
<td>Fax: +27 11 545 1455</td>
</tr>
<tr>
<td></td>
<td>Website: <a href="http://www.caa.co.za">www.caa.co.za</a></td>
</tr>
<tr>
<td>Department of Agriculture (DoA)</td>
<td>Agricultural land Rezoning Fertiliser Registration</td>
</tr>
<tr>
<td></td>
<td>Private Bag x250,</td>
</tr>
<tr>
<td></td>
<td>Pretoria, 0001</td>
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<tr>
<td></td>
<td>Tel: +27 12 319 6000</td>
</tr>
<tr>
<td></td>
<td>Email: <a href="mailto:Enquiries@daff.gov.za">Enquiries@daff.gov.za</a></td>
</tr>
<tr>
<td></td>
<td>Website: <a href="http://www.daff.gov.za">www.daff.gov.za</a></td>
</tr>
<tr>
<td>Department of Environmental Affairs (DEA)</td>
<td>Environmental Authorisation Waste Management License</td>
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<tr>
<td></td>
<td>Maintenance Management Plan</td>
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<tr>
<td></td>
<td>Private Bag X447</td>
</tr>
<tr>
<td></td>
<td>Pretoria, 0001</td>
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<tr>
<td></td>
<td>Tel: +27 12 399 9000</td>
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<td></td>
<td>Fax: +27 12 359 3609</td>
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<tr>
<td></td>
<td>Email: <a href="mailto:callcentre@environment.gov.za">callcentre@environment.gov.za</a></td>
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<td></td>
<td>Website: <a href="https://www.environment.gov.za">https://www.environment.gov.za</a></td>
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<td>Department of Water &amp; Sanitation (DWS)</td>
<td>Water Use License</td>
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<tr>
<td></td>
<td>General Authorisation</td>
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<tr>
<td></td>
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<tr>
<td></td>
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<td></td>
<td>Fax: +27 12 336 8664</td>
</tr>
<tr>
<td></td>
<td>Website: <a href="http://www.dwa.gov.za">www.dwa.gov.za</a></td>
</tr>
<tr>
<td>National Energy Regulator of South Africa (NERSA)</td>
<td>Registration of biogas facilities</td>
</tr>
<tr>
<td></td>
<td>P O Box 40343</td>
</tr>
<tr>
<td></td>
<td>Arcadia, 0007</td>
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<tr>
<td></td>
<td>Tel: +27 12 401 4600</td>
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<td></td>
<td>Email: <a href="mailto:info@nersa.org.za">info@nersa.org.za</a></td>
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<td>Website: <a href="http://www.nersa.org.za/">http://www.nersa.org.za/</a></td>
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<tr>
<td>PROVINCIAL</td>
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<tr>
<td><strong>Eastern Cape Province</strong></td>
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<tr>
<td>Department of Agriculture and Rural Development</td>
<td>Agricultural land rezoning CARA Permits</td>
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<tr>
<td><strong>Free State Province</strong></td>
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<tr>
<td>Department of Economic Development, Tourism and Environmental Affairs (EDT&amp;E)</td>
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<td><strong>Gauteng Province</strong></td>
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<tr>
<td>Department of Agriculture &amp; Rural Development (GDARD)</td>
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<tr>
<td>KwaZulu Natal Province</td>
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<tr>
<td>Department of Agriculture, Environmental Affairs &amp; Rural Development (DAEA&amp;RD)</td>
<td>Environmental Authorisation</td>
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<tbody>
<tr>
<td>Department of Agriculture</td>
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</tr>
</tbody>
</table>

| | Department of Economic Development, Environment & Tourism (DEDE&T) | Environmental Authorisation |
| | | Waste Management License |
| | | Maintenance Management Plan |
| | | Private Bag X9484 Polokwane, 0700 |
| | | Tel: +27 15 293 8300 |
| | | Fax: +27 15 293 8319 |
| | | Website: http://www.ledet.gov.za/ |

<table>
<thead>
<tr>
<th>Mpumalanga Province</th>
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</thead>
<tbody>
<tr>
<td>Department of Agriculture, Rural Development and Land Administration</td>
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</tbody>
</table>

<p>| | Department of Economic Development, Environment and Tourism (DEDE&amp;T) | Environmental Authorisation |
| | | Waste Management License |
| | | Maintenance Management Plan |
| | | Private Bag X11215 Nelspruit, 1200 |
| | | Tel: +27 13 766 4004 |
| | | Fax: +27 13 766 4614 |
| | | Website: <a href="http://www.mpumalanga.gov.za/dedt/">http://www.mpumalanga.gov.za/dedt/</a> |</p>
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Department of Agriculture, Land Reform and Rural Development</td>
<td>Agricultural land rezoning CARA Permits</td>
<td>Private Bag X5018 Kimberley, 8300</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tel: +27 53 838 9159</td>
</tr>
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<td></td>
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<td>Fax: +27 53 832 4328</td>
</tr>
<tr>
<td></td>
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<td>Website: <a href="http://agric.ncape.gov.za/">http://agric.ncape.gov.za/</a></td>
</tr>
<tr>
<td>Department of Environmental Affairs and Nature Conservation (DEA&amp;NC)</td>
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<td>Private Bag X6010 Kimberley, 8301</td>
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<tr>
<td>Department of Rural, Environment, and Agricultural Development (DRE&amp;AD)</td>
<td>Environmental Authorisation Waste Management License Maintenance Management Plan Agricultural land rezoning CARA Permits</td>
<td>Private Bag X2039 Mmabatho, 2735</td>
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<tr>
<td>Department of Agriculture</td>
<td>Agricultural land rezoning CARA Permits</td>
<td>Private Bag X9179 Cape Town, 8000</td>
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<tr>
<td></td>
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<td>Tel: +27 21 483 4930</td>
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<td></td>
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<tr>
<td>Department of Environmental Affairs &amp; Development Planning (DEA&amp;DP)</td>
<td>Environmental Authorisation Waste Management License Maintenance Management Plan</td>
<td>Private Bag X9086 Cape Town, 8000</td>
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<tr>
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<td></td>
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</tr>
</tbody>
</table>
Cape Environmental Assessment Practitioners (Cape EAPrac) has been appointed by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) to provide an analysis of the licensing and permitting processes required for biogas development in South Africa. In doing so, attention must be given to three existing biogas facilities and the processes that were followed to obtain their approvals whilst also highlighting the weaknesses and strengths of such processes along with any bottlenecks and ways to improve the general decision-making sequence for biogas projects.

GIZ, through the South African-German Energy Programme (SAGEN) facilitates the National Biogas Platform as established at the National Biogas Conference in October 2013. The Platform’s main goals are to address the lessons learnt from existing projects, assess future and current regulatory requirements in order to facilitate the development of the industry and disseminate information about financing options for the biogas projects.

One of the results from the Platform meetings to date was the establishment of three separate working groups dealing with identified topics, namely:

- Information gathering on biogas studies and projects in South Africa;
- Financing of biogas projects; and
- Licensing of biogas projects.

This analysis relies on the outcome of work done to date by the Licensing Working Group, as well as other related projects with which Cape EAPrac has been involved over the past year.

1.1 FRAMEWORK OF THE REPORT

The overall objective of this report is described in the following section:

- get an understanding of the licensing processes for different technologies of biogas,
- develop further the licensing excel tool elaborated by the Licensing Working Group for stakeholder use (mainly governmental department, potential project developers and municipalities),
- identify strengths and weaknesses in regulatory processes,
- provide a report on bottlenecks in the current licensing process;
- and develop proposals for streamlining the processes.

1.2 NATIONAL BIOGAS PLATFORM

The National Biogas Platform was established as a key resolution of the 2013 National Biogas Conference. It is a collaboration between the public and private sectors supported by the German government.
The main aims of the National Biogas Platform are:

- To address the lessons learnt from the existing biogas projects;
- To assess current and future regulatory requirements in order to make the regulations proactive and conducive for the development of the industry; and
- To reveal and bundle the financing options for the biogas projects in order to lift up the industry.

**Working groups**

Three working groups that focus on information gathering, financing options and licensing and regulations for biogas projects were established by the National Biogas Platform. For the purpose of this report, the Licensing Working Group is the most important and will play an important role in the processes for the development of biogas in South Africa.

The primary mandate of the Working Group included compilation of relevant licensing and permitting procedures in order to make it easier for users to understand the permitting and authorisation processes as well as to enable policy makers to easily identify barriers and opportunities for improvements for accelerated service delivery. This exercise has been completed for biogas, landfill gas and biomass to energy activities. To date this includes the development of an excel policy tool providing users with current legislative requirements and procedures for obtaining authorisations in South Africa.
2 BIOGAS TECHNOLOGIES

The term ‘biogas’ is commonly used to refer to a gas which has been produced by the biological breakdown of organic matter in the absence of oxygen (anaerobic digestion). The gases methane, hydrogen and carbon monoxide which are released as a result of this process can be combusted or oxidized with oxygen and the resultant energy release allows biogas to be used as a fuel (BAA, 2014). Methane makes up the majority of the released gases and is the most important for use in electricity generation.

Biogas is a commonly used biofuel around the world and is generated through the process of anaerobic digestion or the fermentation of biodegradable materials such as biomass, manure, organic agricultural and agroindustrial waste, sewage, organic municipal waste, rubbish dumps, septic tanks and green waste and energy crops. This type of biogas comprises primarily methane and carbon dioxide. The actual composition of biogas will vary depending upon the origin of the anaerobic digestion process – i.e. the feedstock.

2.1 AGRO WASTE DIGESTION

Agro waste refers to waste material associated with agricultural practises. This will include manure (i.e. cattle, pig, chicken manure), agricultural (i.e. plant residues) and agroindustrial waste (i.e. milk processing, abattoirs, sugar industry, food industry, breweries) or organic waste from abattoirs), green waste (i.e. garden or forestry waste materials) and energy crops. Plant materials include agricultural crops such as sugar cane, cassava, corn etc., agricultural residues like rice straw, cassava rhizome, corn cobs etc, wood and wood residues (saw dust, pulp wastes, and paper mill).

The main problem with anaerobic digestion of crop residues is that most of the agricultural residues are lignocellulosic with low nitrogen content. To improve the digestibility of crop residues, pre-treatment methods like size reduction, electron irradiation, heat treatment, enzymatic action etc. are necessary. For optimizing the Carbon / Nitrogen (C/N) ratio of agricultural residues, co-digestion with sewage sludge, animal manure or poultry litter is normally recommended (BioEnergy Consult, 2014).

With regards to the licensing/permitting requirements ‘agro-waste’ on its own is classified in the National Environmental Management: Waste Act (NEM:WA) as ‘general waste’ which normally requires a lesser environmental / waste related investigation for approval or a permit. Co-digestion with other types of waste that may be considered ‘hazardous waste’ often then requires more detailed and lengthier investigation processes and more stringent approval / permitting processes.

Crop residues can be digested either alone or in co-digestion with other materials, employing either wet or dry processes. In the agricultural sector one possible solution to processing crop biomass is co-digestion together with animal manure, the largest agricultural waste stream. In addition to the production of renewable energy, controlled anaerobic digestion of animal
manure reduces emissions of greenhouse gases, nitrogen and odour from manure management, and intensifies the recycling of nutrients within agriculture.

In co-digestion of plant material and manures, manure provide buffering capacity and a wide range of nutrients, while the addition of plant material with high carbon content balances the carbon to nitrogen (C/N) ratio of the feedstock, thereby decreasing the risk of ammonia inhibition.

Co-digestion offers good opportunity to farmers to treat their own waste together with other organic substrates. As a result, farmers can treat their own residues properly and also generate additional revenues by treating and managing organic waste from other sources and by selling and/or using the products such as heat, electrical power and stabilised biofertiliser (BioEnergy Consult, 2014).

The ‘origin’ of feedstock used in biogas digesters is important as any material that is considered ‘unwanted’ or ‘unused’ by the primary generator of that product i.e. manure from a feedlot or crop residue from a farm, if disposed of, in other words transferred to a second or third party to use in a biogas digester, such material is considered a ‘waste’.

2.2 WASTE WATER TREATMENT PLANTS

Anaerobic digestion of municipal wastewater sludge has been widely practiced since the early 1900s and is the most widely used sludge treatment method. Overall, the process converts about 40% to 60% of the organic solids to methane (CH$_4$) and carbon dioxide (CO$_2$). If the correct treatment and management practices are applied the residual organic matter is often chemically stable, nearly odourless, and contains significantly reduced levels of pathogens. The suspended solids are also more easily separated from water relative to the incoming sludge or aerobically treated sludge (such as in outdoor pond) (Nazaroff & Alvarez-Cohen, 2000).

Most waste water treatment works (WWTW) are owned and operated by Local Government i.e. Municipalities who dispose of their treated sludge in various ways. The option of rather utilising the sludge (treated or raw) to process for biogas is considered value adding and many municipalities have existing old digesters used mostly for the sludge optimization purposes although some may have been decommissioned and would require a refurbishment.

A common problem with municipal WWTW is the quality of treated effluent and disposal of sludge in environmentally acceptable ways. Treated effluent is mostly discharged into watercourses and sludge is either dried or applied as a soil enhancer or fertiliser. The re-commissioning or introduction of biogas digesters at WWTW has the potential to further improve the quality of the final product thereby addressing environmental conditions and preventing unwanted pollution.
2.3 LANDFILL GAS

One particular type of biogas is known as 'landfill gas' (LFG). LFG is produced by wet organic waste decomposing under anaerobic conditions in a landfill. In the same way that a compost heap works, the waste is covered and then compressed by the weight of the new material that is deposited on top. This material prevents the oxygen from escaping and encourages the anaerobic microbes to thrive. The gas slowly builds up and is released into the atmosphere if the landfill site has not been engineered to capture the gas (BAA, 2014).

Historically most landfill sites in South Africa have not been designed to capture landfill gas thus there are significant costs for rehabilitation of such landfills once it has reached it capacity. Capturing and using landfill gas not only reduces the cost associated with rehabilitation of such facilities at the end of their lifespan, but also allows for reutilisation of renewable energy.

The Department of Environmental Affairs has developed Norms & Standards as guidelines for utilising landfill gas in South Africa (DEA, 2013). See also Section 3.4.

The standards aim at controlling the extraction, flaring or recovery of landfill gas facilities in order to prevent or minimise potential negative impacts on the bio-physical and socio-economic environments. They are applicable to LFG extraction, flaring or recovery facilities initiated, constructed or upgraded after the coming into effect of the Norms & Standards. Facilities are required to comply with the management requirements identified in the Norms & Standards for each phase of its lifespan.
Due to the substantial changes that have occurred in South African legislation, proper understanding of legal responsibilities with respect to implementation of biogas or waste to energy facilities can be daunting. Biogas is generally considered to be a solution to waste management and the main focus therefore lies with the relevant waste management legislation. However, compliance requirements pertaining to the treatment of waste is contained in a wide array of legislation, across all tiers of government and administered by numerous government departments.

Since most feedstock for biogas facilities comes is considered to be ‘waste’, it is important to fully understand the definitions of what constitutes a “waste” in terms of the relevant legislation.

### 3.1 DEFINITIONS OF WASTE


“Waste” includes any solid material or material that is suspended, dissolved or transported in water (including sediment) and which is spilled or deposited on land or into a water resource in such volume, composition or manner as to cause, or to be reasonably likely to cause, the water source\(^1\) to be polluted”.

**National Environmental Management: Waste Amendment Act, 2014 (Act 26 of 2014):**

“Waste” means -

a. Any substance, material or object that is unwanted, rejected, abandoned, discarded or disposed of\(^2\) or is intended or required to be discarded or disposed of, by the holder of that substance, material or object whether or not such substance, material or object can be re-used, recycled or recovered and includes all wastes as defined by Schedule 3 of the Act;

b. Any other substance, material or object that is not included in Schedule 3 that may be defined as a waste by the Minister by notice in the Gazette.

When considering biogas as an operation both the feedstock as well as the digestate can be classified as a ‘waste’ product depending on its composition and origin. The feedstock is a “waste” from the primary use and the digestate is a “waste” from the biogas process, especially if the biogas is being used as an energy generator as its primary use and not waste management. As such

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1. Our emphasis.
2. Our emphasis.
the ‘treatment’ and ‘disposal’ therefore becomes the main focus when assessing the regulatory requirements for biogas in South Africa.

The following Acts are the key pieces of legislation that governs the environment and the activities undertaken within it that may cause harm to the receiving environment. The processes required for each of these legislative components are discussed in each section.

3.2 NATIONAL ENVIRONMENTAL MANAGEMENT ACT 107 OF 1998 (NEMA)

The competent authority for NEMA related activities can be either provincial or national Departments of Environmental Affairs, depending on the location and nature of the activity.

The NEMA is the framework Act dealing with environmental management in South Africa. It covers pollution prevention, environmental management principles, incident management, and environmental authorisations.

An important section of NEMA with respect to waste management in industry is Section 28 that prescribes certain actions in terms of the “Duty of Care and Remediation of Environmental Damage” and requires persons that cause significant degradation of the environment to take reasonable measures to prevent the pollution or degradation from occurring, continuing or recurring.

3.2.1 NEMA Authorisation Process

With regards to biogas options the activities identified in NEMA are relevant to the following:

• Construction of facilities that store effluent, wastewater or sludge (i.e. as an input feedstock or as a digestate);
• Geographical location of a biogas digester (i.e. if in proximity to watercourses or in natural areas);
• As well as the capacity of electricity that can be generated by such a facility; and
• The storage of ‘dangerous goods’ which methane is considered part of.

Any activity that “triggers” a threshold identified in NEMA, has to undertake one of two statutory processes.

• A Basic Assessment (BA) process consists of two phases. The first phase requires the identification of the baseline environment, an assessment of the potential impacts on the environment associated with the activity, the reporting of this information in a single concise document and a public participation process in order for the competent authority to issue a decision. The second phase is the process of decision making by the competent authority.
The BA process is generally considered a “lesser” process but this is not an accurate view. The assessment criteria are the same as for S&EIR below, but the process is significantly shorter in time than S&EIR as the extent of the activities associated with BA’s are smaller and more site specific.

- A Scoping & Environmental Impact Reporting (S&EIR) process consists of three phases. The first phase requires the identification of the baseline environment and the presentation of the activity in a single report that must go through a public participation process (Scoping Report). Once the competent authority is satisfied that the Scoping Report fulfils the requirements of NEMA and has adequately identified potential impacts, the second phase or Impact Assessment phase commences. This requires the assessment of the alternatives identified in the Scoping phase, the reporting of this information in a single concise document and a further public participation process. This is provided to the competent authority for decision on completion of the assessment phase. The third phase is the decision making process undertaken by the competent authority. The S&EIR process is normally associated with large (either in size or capacity) projects that have an impact wider than the immediate site.

NEMA is a national Act and as such the national Department of Environmental Affairs (DEA) is the competent authority for authorising applications. The national minister has however delegated authority to the provincial Minister of the Executive Committee (MEC’s), therefore all applications in terms of NEMA are submitted to the provincial environmental departments and decisions are made at that level. The exception to this is any applications for renewable energy generation that exceeds the listed thresholds and will be fed into the national grid. Since biogas facilities are mostly associated with the generation of electricity, any facilities that generate electricity to be fed into the national grid will be required to apply to the national DEA for authorisation if they exceed the relevant thresholds.

NEMA enables a series of Acts known as the Special Environmental Management Acts (SEMA’s). These focus on specific facets of environmental management that fall under the umbrella of NEMA but are not identified specifically in NEMA, e.g. in specific regions (coastal zone or for specific types of industry, waste management or air emissions). The following are considered SEMA’s:

- National Environmental Management: Waste Act (NEM:WA)
- National Environmental Management: Air Quality Act (NEM:AQA)
- National Environmental Management: Biodiversity Act (NEM:BA)
- National Environmental Management: Protected Areas Act (NEM:PAA)
- National Environmental Management: Integrated Coastal Management Act (NEM:ICMA)

In terms of Chapter 5 of NEMA, any activities identified in the EIA Regulations\(^3\), the NEM: WA Waste Management Regulations or the NEM: AQA Regulations must undertake either a Basic

\(^3\) The Environmental Impact Assessment (EIA) Regulations are a series of legal documents providing details on the required processes for authorisation for activities that are deemed to have potentially negative impacts on the environment. Listed activities are described in terms of specific thresholds related to location and extent.
Assessment (BA) Process or a Scoping & Environmental Impact Reporting (S&EIR) process as identified above. Activities in terms of NEM: Integrated Coastal Management Act, NEM: Protected Areas Act or Biodiversity Act may not require the EIA processes, but will require some form of permitting / licensing (refer to the details further in the report under each section). These statutory processes must comply with the requirements prescribed in the relevant regulations and must be completed before the competent authorities are able to issue a decision either authorising or rejecting the proposal. The processes follow statutory timeframes and steps which are shown in the figures below. An Application for authorisation may require multiple listed activities for a single development proposal. These are captured in one Application.

In terms of Chapter 5 of NEMA, a Basic Assessment is required for any listed activities gazetted in terms of the National Environmental Management Act (NEMA) 2014 EIA Regulations and the National Environmental Management: Waste Act (NEM:WA) Category A. Category A waste activities are those whose thresholds and extents are considered to have potentially negative impacts on the environment including low volumes of hazard waste. The process for the Basic Assessment is the same for both sets of legislation.

Figure 1: Basic Assessment process in terms of the 2014 EIA Regulations
In terms of Chapter 5 of NEMA, Full Scoping and Environmental Impact Reporting (S&EIR) is required for any listed activities gazetted in National Environmental Management Act (NEMA) 2014 Listing Notice 2 or National Environmental Management: Waste Act (NEM:WA) Category B. S&EIR is made up of two very distinctive phases, namely Scoping or baseline investigations and then the Impact Assessment phase. Category B waste activities are associated with any hazardous waste materials exceeding a capacity of 500kg and other waste sources that are likely to have a negative impact on the environment.

Figure 2: Scoping & EIR process in terms of the 2014 EIA Regulations
3.3 NATIONAL ENVIRONMENTAL MANAGEMENT: WASTE ACT 59 OF 2008 (NEM: WA)

The competent authority for NEM:WA related activities is either provincial or national Departments of Environmental Affairs. As a general rule, the national DEA is responsible for any treatment of hazardous waste material and the provincial departments for all other applications.

The White Paper on Integrated Waste Management and Pollution Control of 2000 best sums up the change in thinking of government from a historic "end-of-pipe" approach to pollution to a framework of preventative strategies that's aimed at waste minimization and pollution prevention. The National Waste Management Strategy (NWMS) and the Polokwane Declaration of 2001 further illustrated the intention of government to follow in the direction of waste reduction. These have led to the development of the National Environmental Management: Waste Act (Act 59 of 2008 as amended) and the waste management hierarchy which implicates waste reduction.

The NEM: WA makes provision for the identification and assessment of activities that are associated with the management of ‘waste related’ activities and which require authorisation from the relevant authorities based on the findings of an environmental assessment. The Act aims to protect health and the environment by providing reasonable measures for the prevention of pollution and ecological degradation, thus securing ecologically sustainable development.

The Act deals with the licensing of waste activities, priority wastes, establishment of norms and standards, requirements for storage, transport and disposal of waste, assessment and clean-up of contaminated land, establishment of a waste information system. This is the current legislative instrument which guides and regulates all waste management activities. The NEM:WA lists waste activities which require licensing in Government Notice 921 as well as the licensing requirements to ensure that all biogas activities operate legally.

When considering biogas both the ‘treatment’ and ‘disposal’ of ‘general’ and ‘hazardous’ waste materials require prior approval. Of importance is the type of waste classification for feedstock material that determines the process that should be followed to obtain the necessary approvals and the time it will take for such approval processes.

3.3.1 NEM:WA Authorisation Process

Since NEM:WA is a SEMA, any application for a Waste Management License in terms of NEM:WA follows the same authorising process for NEMA as described in section 3.2.1 above.

NEM: WA is a national act, which is enforced by the national DEA with powers mandated to the provincial authorities for specified activities (mostly dealing with 'general waste'). Any activity related to hazardous materials must be considered by DEA.4

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4 Co-digestions of any waste with a hazardous component will result in the TOTAL volume of waste, irrespective if general waste is in the majority, being considered 'hazardous'. All activities thus relating to 'hazardous waste' will then come into effect.
In 2008 NEMA was amended by providing an enabling provision that allows Ministers and MECs to adopt or develop norms or standards for any NEMA or associated SEMA Basic Assessment listed activities, parts of listed activities of combinations of listed activities, and prescribe such norms or standards in order to meet the requirements of NEMA. As such, NEMA allows a person to commence with a listed activity without prior environmental authorisation, on condition that the conduct of such listed activity is compliant with a standard. Standards therefore are an additional tool for Integrated Environmental Management (IEM) in South Africa and an alternative to the EIA process. Only activities requiring a Basic Assessment process in terms of the EIA Regulations may be considered for the development of standards.

The required characteristics of a standard are not defined per se in NEMA but are rather contained within certain sections of NEMA. The following characteristics of standards have been identified based on the provision of NEMA (DEA&DP, 2012):

1. **Standards are enforceable** - The use of the word “comply” in section 24(2)(d) of NEMA implies that standards must contain clear compliance obligations that can be enforced. The wording of section 24(10)(b)(ii) 17 and section 24F(1)(b)18 provides further support for the view that standards are intended to be enforceable rules. Standards can therefore be used to regulate activities directly.

2. **Standards are inflexible rules which can be uniformly applied** – Section 24(10)(b)(i) indicates the standards must provide “rules, guidelines or characteristics that may be commonly and repeatedly used”. This clearly requires that the standards be applied uniformly, without flexibility and repeatedly in instances where a listed activity is to be conducted. The words “rules, guidelines or characteristics” are intended to be the instructive elements of the standard and are, as such enforceable. Standards must be written in a clear and unambiguous manner to ensure uniformity in their application. Mandatory terms such as “must”, “will” and “shall”, are inflexible and obligatory and therefore are used in standards. Discretionary terms such as “may” and “should”, allow for ambiguity and do not provide a clear obligation, and therefore cannot be included in standards.

3. **Standards provide specific performance criteria or outcomes which can be measured for compliance purposes** - section 24 (10)(b)(ii) requires that standards provide rules, guidelines or characteristics to measure the performance of activities or results thereof for the purposes of achieving the objects of NEMA. This suggests that standards are essentially performance criteria to monitor the efficacy of the management of an activity and requires that compliance with standards to be measurable or quantifiable.
In order to uphold the objectives of NEMA an activity to which standards are applied will need to fulfil the following assumptions:

a. it must be possible to predict all environmental impacts associated with the activity – if not nationally, at least in specific locations to which standards will be made applicable;

b. mitigation measures must be known (i.e. known solutions to known problems) and capable of being prescribed clearly and unambiguously; and

c. compliance with respect to performance criteria (indicators) can be measured either qualitatively or quantitatively.

It is critical to understand the fundamental difference between EIA and standards when drafting standards which may potentially be used as an alternative to the EIA process.

EIA is a process in which impacts are predicted and assessed and mitigations and performance criteria are recommended. The administrative focus of EIA is on the authorisation process which is based on the prediction of impacts.

Conversely standards can only be developed for activities where the impacts and mitigation measures are known. Standards are clear, measurable, inflexible rules which provide performance criteria for proactive environmental management. The administrative focus of standards is on monitoring and compliance which is based on the upfront knowledge of impacts and the measurement of specific performance criteria. Compliance with standards should guarantee the absence of significant impacts associated with a development or activity.

To date the following Norms & Standards that may be applicable to biogas developments have been regulated:


3.4.1 Norms & Standards Registration Process

An activity that can be considered in terms of a Norms & Standards regulation does not require an Environmental Impact Assessment as envisaged by NEMA i.e. no Basic Assessment is are required. This is due to the fact that the Norms & Standards are based on predictable impacts, mitigation measures and performance criteria.
An applicant must register a facility contemplated under a Norms & Standards regulation with the national DEA prior to the commencement of construction. A registration application must include as a minimum:

a. The owner of the facility;
b. The area where the facility is situated;
c. The location of the facility in terms of the name of the local municipality, property number and geographical coordinates;
d. The size of the facility;
e. The proximity of the facility to the nearest residential area; and
f. The land use / zoning.

It must be noted that Norms & Standards do not exempt the applicant from complying with any other legislation that may be applicable.

3.5 NATIONAL ENVIRONMENTAL MANAGEMENT: WASTE AMENDMENT ACT 26 OF 2014 (NEM: WAA)

NEM: WAA came into effect on the 2nd June 2014 and includes among others, the substitution and deletion of certain definitions contained in NEM: WA (2008) and the inclusion of Schedule 3:

The defining changes in this Act also included substitution and deletion of definitions, various administrative requirements, enabling of a pricing structure for applications and fines and to establish a Waste Management Bureau.

The importance of this Act for the biogas industry relates to the definition of what constitutes waste\(^5\) and the understanding of Schedule 3 identified in this Act are critical in determining whether or not a Waste Management License (WML) is required for all types of biogas facilities.

The Amendment Act does not change the process requirements for authorisation.

3.6 NATIONAL ENVIRONMENTAL MANAGEMENT: AIR QUALITY ACT 39 OF 2004 (NEM:AQA)

The competent authority for NEM:AQA related activities is in most instances the relevant district municipality. In some instances the authority has been delegated to either provincial or national Departments of Environmental Affairs.

\(^5\) See definition of “waste” provided in Section 3.1 above.
NEM: AQA was introduced as a replacement to the Atmospheric Pollution Prevention Act (APPA, Act 45 of 1965) in order to protect the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development while promoting justifiable economic and social development. It also allows for the development of national norms and standards regulating air quality monitoring, management and control.

In the context of biogas facilities, it is important to note the provisions in NEM:AQA relating to odour control, boiler heat output exceeding 50MW6 and engine heat input exceeding 10MW7 will require an Atmospheric Emissions License. It must be noted that odour control remains a subjective matter on the whole but section 35(2) imposes an obligation on the occupier of any premises to take all reasonable steps to prevent the emission of any offensive odour caused by any activity on such premises. ‘Offensive odour’ means any smell which is considered to be malodorous or a nuisance to a reasonable person (DEA, 2004).

There is currently some disagreement as to the applicability of Category 10 (Animal matter processing) of Government Notice 893 of November 2013 to biogas. Category 10 refers to “Processes for the rendering, cooking, drying, dehydrating, digesting, evaporating or protein concentrating of any animal matter not intended for human consumption”. The interpretation by many authorities is that this activity was aimed at managing facilities that produce offensive odours such as tanneries etc. and it cannot be applied to biogas plants as the digesters are contained thereby avoiding odours.

Clarity on this must be obtained from the competent authority (generally the district municipality) in each case. This will have to be settled at a national level sooner rather than later as it has implications for biogas projects in terms of the level of assessment required and the costs associated with such assessments. This activity has come from the original Atmospheric Pollution Prevention Act (APPA) listings before biogas was envisioned and many local authorities feel that it has no application in relation to biogas.

3.6.1 NEM:AQA Authorisation Process

Since NEM:AQA is a SEMA, any application for an Atmospheric Emissions License (AEL) in terms of NEM:AQA follows the same authorising process for NEMA as described in section 3.2.1 above.

Applications for new AEL’s require a S&EIR process as per Activity 6 of GN984 of NEMA while changes to existing facilities that require amendments to AEL permits require a BA in terms of GN983 of NEMA.

The decision making for an AEL has been delegated to designated district municipal authorities in most instances.

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6 Sub category 1.4 – Gas Combustion Installations
7 Sub category 1.5 – Reciprocating Engines
3.7 NATIONAL WATER ACT 36 OF 1998 (NWA)

The competent authority for NWA related activities is the national Department of Water Affairs & Sanitation (DWS).

The NWA was instituted to ensure that sustainability and equity are identified as central guiding principles in the protection, use, development, conservation, management and control of water resources. These guiding principles recognise the basic human needs of present and future generations, the need to protect water resources, the need to share some water resources with other countries, the need to promote social and economic development through the use of water and the need to establish suitable institutions in order to achieve the purpose of the Act.

- Section 20 of the NWA deals with the control of emergency incidents and Section 21 describes a number of water uses that are applicable to waste management practices.
- Section 21(f) Discharging waste or water containing waste into a water resource through a pipe, canal, sewer or sea outfall or other conduit - this water use includes discharging waste or wastewater directly into a river. A permit to discharge waste effluent and the need to comply with prescribed discharge standards is required.
- Section 21 (g) Discharging of waste in a manner which may detrimentally impact on a water resource - this water use applies where waste disposal takes place into facilities on-site, e.g. French drains, Oxidation ponds, evaporation dams, and landfill sites.

In general the NWA thus covers pollution prevention, incident management, water use and licensing. In relation to biogas this applies to the abstraction and use of water in the facility, as well as the discharge or irrigation of wastewater and the application of sludge to land.

3.7.1 NWA Authorisation Process

Water use is defined broadly, and includes taking and storing water, activities which reduce stream flow waste discharges and disposals, controlled activities8 (activities which impact detrimentally on a water resource), altering a watercourse, removing water found underground for certain purposes, and recreation. In general a water use must be licensed unless it is listed in Schedule 1 of the Act, is an existing lawful use, is permissible under a general authorisation, or if a responsible authority waives the need for a licence. The Minister may limit the amount of water which a responsible authority may allocate. In making regulations the Minister may differentiate between different water resources, classes of water resources and geographical areas.

The application for a water use licence will be taken in by the Regional Office of the Department of Water and Sanitation (DWS). The Regional Office will charge a licence processing fee, and will do an initial assessment in the Regional Office. The licence application will then be transferred to the Head Office for further processing. The following diagram outlines the process that will

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8 Irrigation and application of sludge to land is seen as “controlled activities”.
be followed. Please note that there are currently no regulated timeframes associated with this process.

On the 12th February 2015, the DWS gazetted draft regulations for procedural requirements for Water Use License Applications. These regulations provide a mechanism for the licensing process to align with the mining and environmental authorisation processes in order to give effect to the “one environmental system”. This system aims to align all the relevant processes affecting environmental management in order to expedite sustainable development.

![Figure 3: DWS WULA Process (DWS, 2015)](image)

Figure 3: DWS WULA Process (DWS, 2015)

Figure 4: Draft process flow chart in terms of the NWA

![Figure 4: Draft process flow chart in terms of the NWA](image)
3.7.2 South African Water Quality Guidelines

The Department of Water and Sanitation (DWS) has provided comprehensive water quality guidelines and targets associated with all types of water use. The water quality guideline is a set of information provided for a specific water quality constituent. It consists of the water quality criteria, including the Target Water Quality Range, for that constituent together with other support information such as the occurrence of the constituent in the aquatic environment, the norms used to assess its effects on water uses, how these effects may be mitigated, possible treatment options, etc.

The South African Water Quality Guidelines consists of guidelines for domestic, recreational, industrial and agricultural water uses, guidelines for the protection of aquatic ecosystems as well as guidelines for the protection of the health and integrity of aquatic ecosystems and guidelines for the protection of the marine environment. Each of these guidelines provides scientific and technical information for a particular water quality constituent in the form of numerical data and/or narrative descriptions of its effects on the fitness of water for a particular use or on the health of aquatic ecosystems.

The following South African Water Quality Guidelines are recognised by the National Water Act:

- Volume 1: Domestic Water Use;
- Volume 2: Recreational Water Use;
- Volume 3: Industrial Water Use;
- Volume 4: Agricultural Water Use: Irrigation;
- Volume 5: Agricultural Water Use: Livestock Watering;
- Volume 6: Agricultural Water Use: Aquaculture;
- Volume 7: Aquatic Ecosystems; and
- Volume 8: Field Guide.

In addition to this series, the DWS also provides a document series for the utilisation and disposal of wastewater sludge. This includes sludge from any treatment process that included domestic and industrial wastewater. The management of sludge on land is related to the criteria identified in the SAWQ Guidelines. The series consists of the following volumes:

- Volume 1: Selection of management options;
- Volume 2: Requirements for the agricultural use of sludge
- Volume 3: Requirements for the on-site and off-site disposal of sludge;
- Volume 4: Requirements for the beneficial use of sludge; and
- Volume 5: Requirements for thermal sludge management practices and for commercial products containing sludge.

The re-use of wastewater and sludge from digestate must comply with the target quality for each criteria as identified in these guides. All registered laboratories will use the valued determined by DWS and should be utilised by industry role players.
3.8 NATIONAL ENVIRONMENTAL MANAGEMENT: BIODIVERSITY (ACT 10 OF 2004)

The competent authority for NEM:BA related activities can be either provincial or national Departments of Environmental Affairs, depending on the location and nature of the activity.

This Act controls the management and conservation of South African biodiversity within the framework of NEMA. Amongst others, it deals with the protection of species and ecosystems that warrant national protection, as well as the sustainable use of indigenous biological resources. Sections 52 & 53 of this Act specifically make provision for the protection of critically endangered, endangered, vulnerable and protected ecosystems that have undergone, or have a risk of undergoing significant degradation of ecological structure, function or composition as a result of human intervention through threatening processes.

NEM:BA plays a smaller role in the requirements for licenses for biogas facilities alone, but needs to be considered when such facilities have associated activities that are located in specific geographical and spatially defined environments. It must in particular be considered when using indigenous vegetative material for biogas feedstock or if indigenous vegetation may be affected for clearing of areas where a biogas facility will be erected.

3.8.1 NEM:BA Authorisation Process

Since NEM:BA is a SEMA, any instances where this Act is applicable the process will be included in the NEMA EIA process; however in some instances e.g. disturbance of critically endangered or endangered vegetation types / species, specific permits may be required from the relevant provincial environmental authorities.

3.9 NATIONAL ENVIRONMENTAL MANAGEMENT: PROTECTED AREAS ACT (ACT 31 OF 2004)

The competent authority for NEM:PAA related activities can be either provincial or national Departments of Environmental Affairs, depending on the location and nature of the activity.

The national Department of Environmental Affairs (DEA) holds the mandate to implement the NEM:PAA although authority is delegated to provincial government in some instances. The aim of NEM:PAA is to provide for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes. The NEM:PAA needs to be read along with the NEM:BA as they have essentially the same underlying objective.

When considering site locations for any biogas facility, it is recommended that NEM: PAA is
referred to, to ensure that the facility is not located within or near to protected areas, and if it is, then consultation with the relevant conservation body must be undertaken.

3.9.1 **NEM:PAA Authorisation Process**

Since NEM:PAA is a SEMA, any activities located within or near to protected areas will require the same authorisation in terms of the NEMA EIA Regulations as outlined in section 3.2.1.

3.10 **NATIONAL ENVIRONMENTAL MANAGEMENT: INTEGRATED COASTAL MANAGEMENT ACT (ICMA, ACT 24 OF 2008)**

The competent authority for NEM:ICMA related activities can be either provincial or national Departments of Environmental Affairs, depending on the location and nature of the activity.

The ICMA is another of the Special Environmental Management Acts (SEMA’s) that fall under NEMA. The ICMA promotes the conservation of the coastal environment by establishing a system of integrated coastal and estuarine management norms, standards and policies. These deal with the sustainable use of coastal areas, as well as the control of inappropriate dumping at sea, pollution on the coast, development and any other activities which may affect the coastal zones.

Currently most activities that may have a direct effect on the coastal environment are dealt with by means of the 2010 EIA Regulations for which environmental authorisation is required. If an environmental authorisation is not required for a coastal activity, the Minister may decide that certain activities require a permit or license, and list the requirements for these permits or licenses in the Government Gazette.

Activities which may require separate permitting include the use of vehicles on beaches, application for launching site for boats or for the discharge of waste water into the sea.

3.10.1 **NEM:ICMA Authorisation Process**

Although not likely to require consideration for a biogas facility, it is not impossible that site location for a facility may need a permit or license in terms of the NEM: ICMA, especially if wastewater is being discharged into coastal waters. Currently this process requires the completion of an Application form to the competent authority and a public participation process without a formal impact assessment process. It is envisaged that the process will align itself with the EIA processes in the future.

The national Department of Environmental Affairs (DEA) has the mandate to implement the NEM: ICMA although authority is delegated to provincial government in many instances.

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9 Use of off road vehicles (ORV) on the beach or coastal waters discharge permits.
3.11 OUTENIQUA SENSITIVE COASTAL AREAS (OSCA)

The competent authority for OSCA related activities are the local municipalities between Great Brak River and Keurbooms River in the Southern Cape.

The OSCA regulations were enacted in terms of the 1989 Environmental Conservation Act and makes provision for properties within specified geographic locations between Great Brak River and Plettenberg Bay in the Southern Cape to apply for a permit to undertake construction activities.

A permit is required on any of the specified properties (or parent properties) for any of the following activities:

2. Earthworks: Excavation, moving, removal, depositing or compacting of soil, sand, rock or rubble.
3. Dredging: dredging, excavation, removal or moving of soil, sand or rock from a river, tidal lagoon, tidal river, floodplain or wetland.
4. Dune stabilisation: planting on, or covering with any vegetative, natural or synthetic material of, dunes or exposed sand surfaces, or the erection of structures or walls thereon with the purpose of preventing the sand from being eroded, accreted or moved by wind or water.

3.11.1 OSCA Authorisation Process

Any activities which will trigger the requirements identified above on the relevant properties will require an OSCA permit. An Application form must be completed and submitted to the competent authority for consideration. Public participation is not mandated but may be requested by the competent authority if they deem necessary.

The local municipalities have been mandated to issue OSCA permits.

3.12 NATIONAL FORESTS ACT (NO. 84 OF 1998):

The competent authority for NFA related activities is the national Department of Agriculture, Forestry & Fisheries (DAFF).

The National Forests Act provides for the protection of forests as well as specific tree species,

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10 Regulations 880, 879, 1526, 1527 and 1528.
11 Mossel Bay, George, Knysna and Bitou Municipalities.
The Department of Agriculture, Forestry and Fisheries (DAFF) published a revised and updated list of protected trees in 2014 which no person may cut, disturb, damage or destroy any protected tree or possess, collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any forest product derived from a protected tree, except under a licence or exemption granted by the Minister.

3.12.1 NFA Authorisation Process

This Act is applicable to biogas facilities where the geographic location of the facility will require the removal or disturbance of any of the specified protected tree species. The specific trees must be identified and mapped and an Application for Removal submitted to the regional office of DAFF.

The national Department of Agriculture, Forestry & Fisheries (DAFF) holds the mandate to implement the National Forest Act.

3.13 NATIONAL HEALTH ACT 61 OF 2003

The competent authority for NHA related activities is the national Department of Health.

This Act provides for the prevention of nuisance and offensive conditions, and provides for municipal health services including water quality monitoring, waste management, and environmental pollution control. Activities that may potentially affect the health of any persons, is required to comply with prescribed norms and standards as provided in the Act.

This Act has specific reference to waste disposal of potentially hazardous materials and proximity of development sites to cemeteries.

3.13.1 NHA Authorisation Process

Biogas development that are affected by this Act require consultation with the relevant authority. There is no formal process related to this Act and the developer will be notified in writing of any decision made by the relevant authority.

Although the national Department of Health has the mandate to implement the Act, provincial health departments generally provide guidance and authority for activities within their mandate.
3.14 HAZARDOUS SUBSTANCES ACT 15 OF 1973 (HSA)

The competent authority for HSA related activities is the national Department of Health.

The aim of this Act is to provide for the control of substances which may cause injury or ill-health to or death of human beings by reason of their toxic, corrosive, irritant, strongly sensitizing or flammable nature or the generation of pressure thereby in certain circumstances, and for the control of certain electronic products; to provide for the division of such substances or products into groups in relation to the degree of danger; to provide for the prohibition and control of the importation, manufacture, sale, use, operation, application, modification, disposal or dumping of such substances and products; and to provide for matters connected therewith.

The regulations provide classification of Group IV Hazardous Substances which may be used for medical, scientific, agricultural, commercial or industrial purposes, and any radioactive waste arising from such radioactive material. Anyone selling, using, letting, operating or installing classified substances is required to obtain a license from the National Health authority.

The classification used in terms of this Act is considered when classifying a waste source for use as biogas feedstock material. This must be read in conjunction with the NEM:WA in order to define feedstock class.

3.14.1 HAS Authorisation Process

Annexure A of the Act provides an Application form to be submitted to the regional Health Authority in order to obtain a license as identified above.

Although the national Department of Health has the mandate to implement the Act, provincial health departments generally provide guidance and authority for activities within their mandate.

3.15 NATIONAL HERITAGE RESOURCES ACT (ACT 36 OF 1998)

The competent authority for NHRA related activities can be either provincial or national Heritage Authorities, depending on the location and nature of the activity.

The national South African Heritage Resources Agency (SAHRA) holds the mandate to implement the NHRA although authority is delegated to provincial government in many instances. This legislation aims to promote good management of the national estate, and to enable and encourage communities to nurture and conserve their legacy so that it may be bequeathed to future generations. Our heritage is unique and precious and it cannot be renewed. It helps us to define our cultural identity and therefore lies at the heart of our spiritual well-being and has
the power to build our nation. It has the potential to affirm our diverse cultures, and in so doing shape our national character.

In terms of Section 38 of the NHRA, authorisation is required for developments that affect any heritage resources and includes the following activities:

"Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorised as--

a. the construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300 m in length;

b. the construction of a bridge or similar structure exceeding 50 m in length;

c. any development or other activity which will change the character of a site—
   i. exceeding 5 000 m² in extent; or
   ii. involving three or more existing erven or subdivisions thereof; or
   iii. involving three or more erven or divisions thereof which have been consolidated within the past five years; or
   iv. the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;

d. the re-zoning of a site exceeding 10 000 m² in extent; or

e. any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority,

must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development."

3.15.1 NHRA Authorisation Process

As a minimum, if any of the activities above are triggered, a Notice of Intent to Develop (NID) must be submitted to the relevant Heritage agency. If it is determined that an impact on heritage resources is likely, an Impact Assessment must be undertaken by a registered heritage practitioner. Heritage practitioners include planners, archaeologists and palaeontologists and depending on the scale and location of a biogas facility such heritage approvals may be a requirement. Although the process makes use of a different form to the EIA process, any authorisation in terms of the NHRA must be done in conjunction with the EIA process if it is triggered.

See the figure below for the process flow chart. Please note that there are currently no regulated timeframes associated with this process. The overall objective is for the NHRA process to align with the NEMA processes. The Heritage Assessment Practitioner (HAP) is responsible for facilitating directly with the competent authority.
3.16 **SUBDIVISION OF AGRICULTURAL LAND ACT (SALA, ACT 70 OF 1970)**

The competent authority for SALA related activities is the national Department of Agriculture, Forestry & Fisheries (DAFF).

Subdivision of agricultural land is not permitted without the consent of the Minister of Agriculture in terms of the Subdivision of Agricultural Land Act. The act is implemented by the national Department of Agriculture, Forestry & Fisheries (DAFF).

In the event that a biogas facility requires the subdivision of land zoned Agriculture, a registered planner should submit the necessary documentation to the relevant authorities. If no subdivision is required, either a consent use or exemption must be obtained from DAFF if the facility is located on property zoned for Agriculture.
3.16.1 SALA Authorisation Process

An Application in terms of the Act must be submitted to the national DAFF for consideration. There are no statutory timeframes or processes currently in place for SALA applications.

3.17 CONSERVATION OF AGRICULTURAL RESOURCES ACT (CARA, ACT 43 OF 1983)

The competent authority for CARA related activities can be either provincial or national Heritage Authorities, depending on the location and nature of the activity.

The act is implemented by the national Department of Agriculture, Forestry & Fisheries (DAFF) with delegation to provincial authorities provided. The aim of the Act is to provide for control over the utilization of the natural agricultural resources of the Republic in order to promote the conservation of the soil, the water sources and the vegetation and the combating of weeds and invader plants.

The relevance of this Act to a biogas facility is related to the management of invasive alien vegetation on the property and the management of soil erosion by stormwater. There is no formal permitting / licensing procedures currently related to these aspects, however the NEMA General Duty of Care takes this into consideration.

3.18 FERTILISER, FARM FEEDS, AGRICULTURAL REMEDIES AND STOCK REMEDIES ACT (ACT 36 OF 1947)

The competent authority for SALA related activities is the national Department of Agriculture, Forestry & Fisheries (DAFF).

The Act aims to control the sale and use of substances that may prove detrimental to livestock and the environment. Its main functions are:

- to provide for the appointment of a Registrar of Fertilizers, Farm Feeds and Agricultural Remedies;
- it allows for the registration of fertilizers, farm feeds, agricultural remedies, stock remedies, sterilizing plants and pest control operators;
- to regulate or prohibit the importation, sale, acquisition, disposal or use of fertilizers, farm feeds, agricultural remedies and stock remedies; and
- to provide for the designation of technical advisers and analysts.

In 2012, the Minister for DAFF signed into effect Regulation 732 in terms of this Act. This
regulation has specific references to the creation, use and sale of organic fertilisers. Any fertiliser that contains organic and plant material that is sold on to another party must be registered as a fertiliser with the department. The use of biogas digestate, if sold, will require authorisation in terms of the regulation.

3.18.1 Fertiliser Act Authorisation Process

The sale of digestate must be completed as per Regulation 732 and submitted to the regional DAFF offices.

An application in terms of section 3(1) of the Act for registration of a fertilizer, must be made on a form available from the Registrar for the purpose, or a clearly legible facsimile thereof on good quality A4 size paper of the same colour as the form supplied by the Registrar. Such application must:

a. be made by a person residing in the Republic of South Africa or, in the case of a legal person that legal person shall have a registered office in the Republic;
b. signed by an approved person;
c. be accompanied by the prescribed application fee;
d. be accompanied by two copies of a typed version of the details relating to the particular fertilizer that will be marked on the container in which it will be sold, or will be attached to the label of such container;
e. be accompanied by guaranteed analysis from an independent ISO 17025 accredited laboratory or Agri Laboratory Association of Southern Africa (AgriLASA) affiliated laboratories for the product which was obtained in the current year of application for registration;
f. be accompanied by a certificate of analysis from an independent ISO 17025 accredited laboratory or AgriLASA affiliated laboratories indicating maximum levels of potentially harmful elements permitted in fertilizer products as prescribed in table 12; and in case of sludge be accompanied by a certificate of analysis for microbial contaminants as prescribe in regulation 39 (1) (d);
g. In the case of Group 3 fertilizers, be accompanied by experimental results conducted under controlled environmental conditions in order to determine the biological efficacy of the particular fertilizer when required; and
h. In the case of Group 3 fertilizers, be accompanied, when required by the Registrar, a risk assessment satisfying that the fertilizer has no adverse effect on animal health, human health or environment.

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12 Group 3 fertiliser is a fertiliser containing natural or synthetic substance(s) or organism(s) that improve(s) or maintain(s) the physical, chemical or biological condition (fertility) of the soil; and “soil Improver” has the same meaning;
The competent authority for NGA related activities is the National Energy Regulator of South Africa (NERSA).

The Act undertakes the following aims:

- To promote the orderly development of the piped gas industry;
- to establish a national regulatory framework;
- to establish a National Gas Regulator as the custodian and enforcer of the national regulatory framework; and to provide for matters connected therewith.

Although mainly responsible for piped gas developments, the NGA does provide for the development of alternative gas sources and to facilitate investment in the gas industry. Registration with the National Energy Regulator of South Africa (NERSA) is required in terms of the Gas Act (Act 48 of 2001) for the following activities:

1. production of gas;
2. importation of gas;
3. transmission of gas for own exclusive use; and
4. Small biogas projects not connected to the national gas pipeline grid.

3.19.1 NGA Authorisation Process

Registrations must be made directly to NERSA as per their framework requirements. It must be noted that persons engaged in the activities identified below are exempted\(^{13}\) from obtaining a license in terms of the NGA, but any biogas developments must be registered with NERSA.

1. Any person engaged in the transmission of gas for that person’s exclusive use.
2. Small biogas projects in rural communities not connected to the national gas pipeline grid.
3. Gas reticulation and any trading activity incidental thereto.
4. Liquefied petroleum gas supplied from a bulk storage tank or cylinder, piped at less than 2 bar gauge and crossing no more than four erf lines between separate property boundaries.

\(^{13}\) Schedule 1 of the National Gas Act.
3.20  ELECTRICITY REGULATION ACT (ACT 4 OF 2006)

The Act undertakes the following:

• To establish a national regulatory framework for the electricity supply industry;
• To make the National Energy Regulator the custodian and enforcer of the national electricity regulatory framework;
• To provide for licences and registration as the manner in which generation, transmission, distribution, trading and the import and export of electricity are regulated; and
• To provide for matters connected therewith.

The applicability of this Act to biogas facilities relates directly to the use of the generated electricity. Certain exemptions are identified in the Act with regard to the obligation of a generator to apply for and hold a license. These are:

• Any generation plant constructed and operated for demonstration purposes only and not connected to an interconnected power supply;
• Any generation plant constructed and operated for own use; and
• Non-grid connected supply of electricity except for commercial use.

Thus any facility generating electricity that is not connected to the grid and is for own use consumption does not require a license in terms of this Act. It must be noted that the Minister may determine that a person identified in this Act who does not necessarily have to obtain a license may be required to register with NERSA. This registration process is similar to that of the National Gas Act but has not yet been implemented for biogas generators.

3.20.1  ERA Authorisation Process

Applications for a license must be made directly to NERSA as per their framework requirements. Applications must include the required fee and all supporting documentation as per the Act. NERSA may require the advertising of the Application and must take into account any objections received as part of their decision making.

3.21  SPATIAL PLANNING AND LAND USE MANAGEMENT ACT (SPLUMA)

The competent authority for SPLUMA and other planning related activities is the relevant local municipality.

The Spatial Planning and Land Use Management Act, 2013 (SPLUMA) was assented to by the President of the Republic of South Africa on 5 August 2013. It will come into operation on a date fixed by the President by proclamation in the Government Gazette. SPLUMA is a framework act for all spatial planning and land use management legislation in South Africa. It seeks to
promote consistency and uniformity in procedures and decision-making in this field. The other objects include addressing historical spatial imbalances and the integration of the principles of sustainable development into land use and planning regulatory tools and legislative instruments.

Land use planning is necessary to ensure that activities take place on properties with the appropriate land use zoning. As a minimum any biogas facility will require Building Plan Approvals from the local municipality and must comply with any of their other requirements.

3.21.1 Planning Authorisation Process

Planning activities must be undertaken in terms of the requirements of each municipality and their relevant bylaws. The process is overseen by the national planning requirements but can only be authorised at municipal level by the council. Appeals decisions may be mandated to provincial authorities.

In general the process should follow the flow chart as provided below.

Figure 6: Generic planning process flow chart
3.22 CIVIL AVIATION ACT (ACT 13 OF 2009)

The competent authority for CAA related activities is the national South African Civil Aviation Authority (SACAA).

The Civil Aviation Regulations 2011 were put in place in terms of the Act to provide for standards, licensing procedures, certification, operation and general regulations pertaining to the aviation industry. The application for biogas and indeed any kind of development is related to possible obstacles that may affect the safety and security of aircraft, people and related infrastructure.

The International Civil Aviation Organisation (ICAO) defines an obstacle as:

- All fixed or mobile objects or parts thereof, whether temporary or permanent that:
  - Are located on an area intended for the surface movement of aircraft; or
  - Extend above a defined surface intended to protect aircraft in flight; or
  - Stand outside those defined surfaces and that have been assessed as being a hazard to air navigation.

3.22.1 CAA Authorisation Process

The South African Civil Aviation Authority requires that all obstacles as identified in the regulations and confirmed by the CAA, are registered with them. Any structure exceeding 45m in heights must have day and night markings attached.

Consultation with the CAA to determine the applicability of this process is advised. In the event that the development does require registration, the required forms must be completed and submitted to the CAA.

3.23 BY-LAWS

Each local and district municipality has by-laws in place for their jurisdiction. These address activities such as storage, registration of waste contractors, flammable substances storage and transport, permitting of scheduled trades, trade effluent discharge. Municipal permits do not necessarily require authorisation in terms of national legislation, but are still a requirement in the event that no Environmental Authorisation is necessary.
The processes and approvals that may be relevant to biogas applications in South Africa, as described in Section 3, are summarised in the following table.

<table>
<thead>
<tr>
<th>Legislation</th>
<th>Authorisation Required</th>
<th>Process required for Authorisation</th>
<th>Competent Authority</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Environmental Management Act – 2014 EIR Regulations 983, 984 &amp; 985 (Listing Notices 1, 2, &amp; 3)</td>
<td>Environmental Authorisation</td>
<td>Basic Assessment / Scoping &amp; EIR</td>
<td>National DEA for any energy applications for inclusion into the national grid, otherwise provincial Departments of Environmental Affairs</td>
</tr>
<tr>
<td>NEM: Waste Act – Regulation 921 Categories A &amp; B</td>
<td>Waste Management License</td>
<td>Basic Assessment / Scoping &amp; EIR</td>
<td>National DEA for activities including hazardous waste, otherwise provincial Departments of Environmental Affairs</td>
</tr>
<tr>
<td>Norms &amp; Standards in terms of NEMA and relevant SEMA’s.</td>
<td>Registration</td>
<td>Registration with the submission of an Environmental Management Programme</td>
<td>National DEA or otherwise provincial Departments of Environmental Affairs if mandated</td>
</tr>
<tr>
<td>NEM: Air Quality Act – GN893</td>
<td>Atmospheric Emissions License</td>
<td>Basic Assessment / Scoping &amp; EIR</td>
<td>District municipalities, or if none, provincial Departments of Environmental Affairs</td>
</tr>
<tr>
<td>National Water Act – Section 21 and Regulations 1199 and 665 for General Authorisation</td>
<td>Water Use License / General Authorisation</td>
<td>Water Use License / Registration</td>
<td>National Department of Water and Sanitation</td>
</tr>
<tr>
<td>NEM: Biodiversity Act – Section 52 and 53</td>
<td>Environmental Authorisation</td>
<td>Basic Assessment / Scoping &amp; EIR or as per NEM: BA Regulations</td>
<td>Provincial Departments of Environmental Affairs or local conservation authorities</td>
</tr>
<tr>
<td>Legislation</td>
<td>Authorisation Required</td>
<td>Process required for Authorisation</td>
<td>Competent Authority</td>
</tr>
<tr>
<td>------------------------------------------------------------------</td>
<td>--------------------------------------------------------------</td>
<td>----------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>NEM: Protected Areas Act</td>
<td>Environmental Authorisation</td>
<td>Basic Assessment / Scoping &amp; EIR or as per NEM: PAA Regulations</td>
<td>Provincial Departments of Environmental Affairs or local conservation authorities</td>
</tr>
<tr>
<td>NEM: Integrated Coastal Management Act</td>
<td>Environmental Authorisation / Coastal Water Discharge Permit / ORV (off road vehicle) Permit</td>
<td>Basic Assessment / Scoping &amp; EIR or as per the ICMA Regulations</td>
<td>National DEA</td>
</tr>
<tr>
<td>Outeniqua Sensitive Coastal Areas Act (OSCA)</td>
<td>OSCA Authorisation</td>
<td>Application</td>
<td>Local municipalities within the designated area</td>
</tr>
<tr>
<td>National Forest Act</td>
<td>Permit to remove or disturb protected tree species</td>
<td>Permit Application</td>
<td>National Department of Forestry</td>
</tr>
<tr>
<td>National Health Act</td>
<td>Compliance with norms and standards / Auditing</td>
<td>Monitoring / Audit</td>
<td>Provincial Departments of Health</td>
</tr>
<tr>
<td>Hazardous Substances Act</td>
<td>License</td>
<td>License Application</td>
<td>National Department of Health</td>
</tr>
<tr>
<td>National Heritage Resources Act</td>
<td>Record of Decision</td>
<td>Notice of Intent to Develop / Heritage Impact Assessment</td>
<td>Provincial Heritage authorities or the national SAHRA</td>
</tr>
<tr>
<td>Subdivision of Agricultural Land Act</td>
<td>Consent / Subdivision Approval / Exemption</td>
<td>Application</td>
<td>National Department of Agriculture</td>
</tr>
<tr>
<td>Conservation of Agricultural Resources Act</td>
<td>Permit / Directive</td>
<td>Application</td>
<td>National Department of Agriculture</td>
</tr>
<tr>
<td>Fertiliser, Farm Feeds, Agricultural Remedies and Stock Remedies Act</td>
<td>Registration</td>
<td>Application for Registration</td>
<td>National Department of Agriculture</td>
</tr>
</tbody>
</table>
One of the main challenges (weaknesses) associated with biogas projects is the way in which the various approvals / licences / permits are interrelated whilst at the same time the applicable Acts have different requirements, processes and timeframes associated with such processes. As an example the discrepancies between definitions (in the various Acts) as well as the interpretation difference between various Provincial Authorities and the National Departments causes confusion for those needing to facilitate the necessary approval processes.

Every attempt has been made to ensure that all legislative requirements have been identified, however it must be noted that the list provided is not exhaustive, and does not consider policy or guidelines that may be in effect, nor any regulations that come into effect after the date of this document.
A Regulatory Tool was developed in order to address some of the problems raised by the Biogas Working Group. The tool was designed to provide potential biogas developers with an interactive mechanism to determine what legislation may need to consider and to provide information on the processes required for each set of laws applicable to biogas.

The tool requires that the potential developer answer questions to determine what sort of authorisation (as identified in the previous pages) the project requires. It also confirms the minimum legislation all biogas projects are required to comply with, namely to register with NERSA in terms of the **Gas Act** and the **Electricity Regulation Act**, and will require municipal approval for buildings.

The tool requires constant maintenance in order to ensure that it is up to date with all relevant legislation (it has undergone four updates since its inception due to regulation amendments already).

Although it provides potential developers with a mechanism to determine what sort of legal processes are required, it does require some specialist knowledge or understanding of certain aspects i.e. geographically sensitive locations that may require authorisation for any kind of development. The tool will be further upgraded to include:

- Adaptation to make the tool web based – although fairly interactive in its current state, there are limitations to the spreadsheet format;
- The route followed by the developer as they work through the tool should capture and save the activities that are identified and produce a “results page” which the developer can then save or print; and
- A web based tool can be properly protected to prevent accidental changes being made by users.
The scope of work require information gathering on three existing projects where biogas facilities are already operational. These include the Bio2Watt abattoir based facility at Bronkhorstspruit, the Landfill Gas project by the eThekweni Municipality in Durban and the Biogas Sludge facility at the Johannesburg Rand Water. The main purpose for collecting data from the abovementioned facilities is to gain better insight and understanding into the licensing challenges as experienced by the parties involved in the licensing process for each project.

Each of these projects have undergone investigations and obtained various approvals / licenses and permits enabling them to operate these facilities. As part of this assessment it is required of these facilities to provide the following information:

- Details on the number and type of approvals / permits / licenses they applied for and from whom they applied for these approvals;
- The time it took to obtain the relevant approvals;
- Where they experienced problems with their approval process; and
- What advice they can offer in terms of streamlining approval processes.

In addition to directly requesting this information from these projects, an online survey was structured and distributed to various other roleplayers. The results of this survey have been captured in Section 6 below.

In addition to consulting with the three identified biogas operators, Cape EAPrac also generated an online survey using www.surveyplanet.com, where a series of 27 questions were presented to participants (see the annexure for a list of questions and results). Apart from the identified stakeholders as per the scope of works, the survey was conducted anonymously.

The survey was distributed via the SABIA database to all members and the members were requested to complete the survey. There was a distinct lack of response from the industry which in itself is a weakness of the process. The impression that has been created is that the industry is concerned that by providing the information as to what approvals they have or have not obtained, they may be penalised. This also applies to making available data from monitoring.
Five (5) respondents took part in the online survey, including the Bio2Watt facility at Bronkhorstspruit and the Landfill Gas project by the eThekweni Municipality in Durban. Of these, the majority were associated with abattoirs and two (2) with landfill gas projects. The aim of the survey was to obtain information from roleplayers on what type of biogas facilities they are currently operating (or proposing), and what their experience was with obtaining the relevant approvals, with specific reference to the challenges faced and current barriers associated with the licensing process.

The results of the online survey are discussed below. It must be noted that the results do not necessarily reflect the industry as a whole but have been provided by a few individuals based on their experiences.

### 7.1 FEEDSTOCK

The feedstock used in biogas facilities provides a good indication of what authorisations will be required. Understanding and identifying the category, volume and potential toxicity of the feedstock (especially in terms of the NEM: Waste Act) is a vital first step in determining the process to follow.

<table>
<thead>
<tr>
<th>What type of feedstock is used at the biogas facility?</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Abattoir waste</td>
<td>3</td>
</tr>
<tr>
<td>Sewage sludge</td>
<td>0</td>
</tr>
<tr>
<td>Animal manure</td>
<td>1</td>
</tr>
<tr>
<td>Biomass (i.e. green waste such as silage, organic waste such as wood chips)</td>
<td>0</td>
</tr>
<tr>
<td>Other</td>
<td>0</td>
</tr>
<tr>
<td>Landfill gas recovery</td>
<td>2</td>
</tr>
<tr>
<td>Co-digestion of any of the above (specify)</td>
<td>0</td>
</tr>
</tbody>
</table>

The results of the online survey showed that the majority of the respondents implemented biogas facilities for waste management at abattoirs. Note that manure is also a product of abattoirs, thus 66.7% of feedstock used in biogas plants is from the abattoir industry.

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*Although a low number of respondents, they do provide information on two of the biogas aspects being dealt with in this analysis namely biogas and landfill gas. The biogas industry is still very small in South Africa and thus the information still provides valuable input.*
7.2 ELECTRICITY GENERATION

The implementation of a biogas plant is for many a means of managing their waste materials with the added benefit of producing electricity for self use. Methane, the product released during the anaerobic digestion process in a biogas facility, is then used as a fuel to generate electricity via a gas generator. A facility's electrical generation capacity is dependant on the amount of methane a feedstock is able to produce and the size / capacity of the generator.

Respondents were asked to specify what their intention for generating electricity was. Four (4) of respondents intend to use the electricity generated from biogas for their own consumption, whilst the landfill gas facility was the only facility generating gas for use in the national grid.

Table 2: Electricity generation results

<table>
<thead>
<tr>
<th>Does the facility feed electricity into the national grid?</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>1</td>
</tr>
<tr>
<td>No</td>
<td>4</td>
</tr>
</tbody>
</table>

The respondents mostly use the electricity generated from biogas for their own use and not for inclusion into the national grid.

7.3 NEMA AUTHORISATION

NEMA Authorisations would have required the development to complete an EIA process. This would have depended on the size of the plant, the generation capacity and location.

Three (3) of the respondents completed an EIA process to obtain authorisation for their facilities, which included amendments to existing authorisations. Respondents who indicated they are ‘unsure’ are associated with facilities for abattoir waste.

Table 3: NEMA authorisation results

<table>
<thead>
<tr>
<th>Did you / do you need Environmental Authorisation in terms of the National Environmental Management Act?</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Unsure</td>
<td>2</td>
</tr>
<tr>
<td>Yes</td>
<td>3</td>
</tr>
<tr>
<td>No</td>
<td>0</td>
</tr>
</tbody>
</table>

It would appear that the clarity of the requirements for authorisation for biogas facilities is not entirely clear. Those respondents that obtained authorisations are regulated by other legislation and had to get a “package” of authorisations before commencing. The single owner operators are generally unaware of the extent of authorisation required.
7.4 **NEM: WASTE ACT AUTHORISATION**

Waste Management Licenses would be the most commonly required license for biogas plants due to their use of waste materials as feedstock.

The two (2) respondents who indicated that they were ‘unsure’ are associated with abattoirs. This confusion is related to the definitions of waste, particularly blood, and has been identified in Section 8 below.

Table 4: NEM:WA authorisation results

<table>
<thead>
<tr>
<th>Did you / do you need a Waste Management License in terms of the National Environmental Management: Waste Act?</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Unsure</td>
<td>2</td>
</tr>
<tr>
<td>Yes</td>
<td>2</td>
</tr>
<tr>
<td>No</td>
<td>1</td>
</tr>
</tbody>
</table>

7.5 **NEM: AIR QUALITY ACT AUTHORISATION**

The NEM: AQA includes activities relating heat input, heat output and animal matter processing. If the competent authority requires an Air Emissions License (AEL) for this activity, an EIA process is required.

Table 5: NEM:AQA authorisation results

<table>
<thead>
<tr>
<th>Did you / do you need an Air Emissions License in terms of the National Environmental Management: Air Quality Act?</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Unsure</td>
<td>2</td>
</tr>
<tr>
<td>Yes</td>
<td>1</td>
</tr>
<tr>
<td>No</td>
<td>2</td>
</tr>
</tbody>
</table>

The online survey results show that neither of the landfill gas plants is of the opinion that they required AELs, whilst most of the abattoirs were ‘unsure’ and one (1) abattoir indicated that they had applied to a provincial authority for authorisation.

The issue of an AEL is currently being debated at multiple levels as the various authorities cannot reach consensus on the applicability of this Act to biogas. Until such time as the debate in this matter remains unresolved and to avoid the potential of a biogas facility operating without an AEL it is strongly recommended that biogas operators approach their local or district Municipalities to determine if they do need to apply prior to, or whilst in operation.
7.6 **WATER USE LICENSE / GENERAL AUTHORISATION**

Water Use License may be required if the water used in the biogas plant is not consistent with registered use on the property, for example where facilities are located on properties zoned for agriculture. In addition, the use of slurry (digestate) and waste water for irrigation and fertilisation is likely to require General Authorisation.

Table 6: NWA authorisation results

<table>
<thead>
<tr>
<th>Did you / do you have to apply for a Water Use License in terms of the National Water Act?</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Unsure</td>
<td>1</td>
</tr>
<tr>
<td>Yes</td>
<td>1</td>
</tr>
<tr>
<td>No</td>
<td>3</td>
</tr>
</tbody>
</table>

One (1) abattoir required a WULA due to its location on agricultural land, the three (3) facilities that did not, are all located within municipal boundaries and use municipal water sources. This is an expected result since most facilities are likely to be within municipal areas that have water reticulation.

7.7 **NATIONAL HERITAGE RESOURCES AUTHORISATION**

The NHRA requires authorisation for developments that alter the landscape within which the facility is proposed.

Table 7: NHRA authorisation results

<table>
<thead>
<tr>
<th>Did you / do you have to apply for a Authorisation in terms of the National Heritage Resources Act?</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Unsure</td>
<td>1</td>
</tr>
<tr>
<td>Yes</td>
<td>0</td>
</tr>
<tr>
<td>No</td>
<td>4</td>
</tr>
</tbody>
</table>

The one (1) respondent who indicated that they were ‘unsure’ was an abattoir facility. It is unlikely that heritage authorisation would be required due to the location and size of most of these facilities.
7.8 AGRICULTURAL AUTHORISATIONS

These regulations relate to facilities that are implemented on properties zoned for agriculture. All respondents indicated that these were ‘not relevant’ to their facilities.

Table 8: Agriculture authorisation results

<table>
<thead>
<tr>
<th>Did you / do you have to apply for Authorisation in terms of the Subdivision of Agricultural Land Act?</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Unsure</td>
<td>0</td>
</tr>
<tr>
<td>Yes</td>
<td>0</td>
</tr>
<tr>
<td>No</td>
<td>0</td>
</tr>
<tr>
<td>Not Relevant</td>
<td>5</td>
</tr>
</tbody>
</table>

None of the facilities were located on property zoned for agriculture. This would really only be applicable for very rural areas and farming operations wishing to improve their waste management.

7.9 PROTECTED TREE SPECIES AUTHORISATION

None of the respondent required permits for the removal of protected tree species. This authorisation would not be a common requirement and depends on the location of facilities.

Table 9: NFA authorisation results

<table>
<thead>
<tr>
<th>Did you / do you have to apply for Authorisation in terms of the National Forest Act?</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Unsure</td>
<td>0</td>
</tr>
<tr>
<td>Yes</td>
<td>0</td>
</tr>
<tr>
<td>No</td>
<td>1</td>
</tr>
<tr>
<td>Not Relevant</td>
<td>5</td>
</tr>
</tbody>
</table>

7.10 SPATIAL PLANNING APPROVALS

Planning approvals are related to the land use of a property. One (1) respondent was unsure, but since this was an existing abattoir, it is not likely that any of these authorisations would be required.
Table 10: Planning approval results

<table>
<thead>
<tr>
<th>Did you / do you have to apply for Planning Approval in terms of the Spatial Planning and Land Use Management Act?</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Unsure</td>
<td>1</td>
</tr>
<tr>
<td>Yes</td>
<td>0</td>
</tr>
<tr>
<td>No</td>
<td>4</td>
</tr>
</tbody>
</table>

The other facilities were located on properties that had existing land use planning authorisation which were suitable for the implementation of a biogas facility i.e. industrial / commercial.

7.11 NERSA REGISTRATION

According to the NERSA Regulations, any biogas facility using gas production to generate electricity is required to register with them, regardless of the size of the facility. The aim is to ensure that a database listing all biogas facilities in the country is maintained.

Table 11: NERSA registration results

<table>
<thead>
<tr>
<th>With respect to Best Practise, did register with the National Energy Regulator of South Africa in terms of the National Gas Act?</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>1</td>
</tr>
<tr>
<td>No</td>
<td>4</td>
</tr>
</tbody>
</table>

The one (1) respondent who registered with NERSA is associated with a landfill gas recovery facility which provides electricity into the national grid. The NERSA requirements for registration of biogas facilities do not have any specific criteria, however in terms of Best Practise all biogas facilities should register. The lack of registration appears to be the confusion between private use of the energy generated or its inclusion into the national grid.

The full set of results have been included in the annexure to this report. From the information provided in the surveys there appear to be several shortcomings in the process. Broadly these are:

- The biogas operators are not conversant with the various pieces of legislation.
- There is a lot of uncertainty regarding licensing and how the various developments fit into the process.
- There is confusion related to understanding of concepts and definitions.
The common problems that have been identified through engaging with stakeholders and through feedback from the Biogas Platform, as well as dealings with relevant Authorities (national DEA, DWS, DAFF and provincial authorities) are provided below. Section 8.1 addresses overall general problems that are experienced in each of the industry types (biomass, biogas and landfill gas) whilst sections 8.2, 8.3 and 8.4 address problems specific to each of the industries.

8.1 GENERAL PROBLEMS

1. Definitions of waste within the various legislation and authorities is not consistent or clear (too broad, inconsistent)

   • Definitions of both animal manure and blood for example have not been consistently applied between provinces, between provincial departments and national departments, and between different national departments. This has led to confusion in the type of process identified to applicants by a Department (Environmental, Agriculture, Air Quality and Waste) as well as to stakeholder confusion when reviewing processes. Currently the national Department of Agriculture has been requested to provide a ruling on how blood from abattoirs should be classified, whether it can be considered “hazardous” or not. The implications of this ruling will be significant for abattoirs of all sizes as blood is one of their biggest waste volumes. Its definition in terms of NEM: WA will determine the type of process required, which has time and cost implications to existing abattoirs.

   • Anaerobic digestion of the feedstock produces digestate. Clarification must be provided that digestate is thus a “treated waste product” and can be used as an organic fertiliser as long as it meets the relevant fertiliser requirements.

   The Departments of Agriculture and Environmental Affairs: Waste Directorate need to provide the industry with a consistent and relevant ruling on waste definitions especially in relation to biogas as most feedstock is organic in nature.

2. Insufficient acknowledgement of the fact that biogas digesters improve existing waste management practices for the better and therefore approval processes should be encouraging such facilities instead of prohibiting it through onerous legislative processes.

   • A specific example of this is the application by some authorities of Category 10 of NEM: AQA triggering this activity automatically requires a full Scoping & EIR process in terms of NEMA without an option of downgrading the process. This is costly and seen as unnecessary by the industry.

   The national DEA should be broached to address this legislative issue. A solution to this issue could be the implementation of Norms & Standards for the biogas industry, especially since the impacts are predictable and mitigations are known and effective.
3. Difference in interpretation of project type by the relevant competent authority (difference between national and the various provinces)

- Since there is no specific legislation that takes biogas into account, some authorities (provincial environmental authorities vs national environmental authorities) view it as an electrical generation facility and refer applications to the national authority, whilst others consider biogas to be a waste solution and the process is dealt with at a provincial level.

   The best solution to this matter would be to provide Norms & Standards, as has been done for landfill gas. This will provide specific requirements to this specific industry without the confusion as to who the competent authority.

4. Electricity generation for the national grid

- The competent authority for waste to energy, when the electricity is to be put into the national grid, is the national DEA. Some provincial authorities seem to consider biogas as more electrical generators instead of waste management systems. This leads to confusion and unnecessary process time delays whilst trying to determine who the decision making authority is (between provincial or national departments or between various national departments).

- The majority of users consider the generation of electricity associated with their plants as a secondary benefit to the management of their waste. Any electricity generated is used on site in order to alleviate dependency on Eskom.

   Thus the emphasis regarding the approach to biogas needs to change at authority level. According to NERSA, any biogas plant must be registered with them, thus it is assumed that biogas facilities are primarily an energy generator. However the process in generating gas revolves around waste management. Consensus must be obtained from the authorities as this affects the processes that need to be followed.

5. The time it takes to obtain decisions

- Delays related to undertaking the various approvals required, or in trying to obtain clarification of such is problematic for the industry, especially those like abattoirs who have been provided with a time limit to improve their waste management strategies as they will be restricted from disposing to landfills in terms of the NEM:WA National Norms & Standards for Disposal of Waste to Landfill. Different industries and waste types have different timeframes associated with the restrictions.
• It must be noted that the 2014 EIA Regulations, WULA and Heritage applications have been aligned (one environmental system) and statutory time frames introduced in order to improve the time required for decisions.

Aligning biogas authorisation to one process such as a Norms & Standards would improve the time management.

6. **Applicability of different legislation (what is the original intent)**

• This refers mostly to the applicability of Category 10 of NEM: AQA. This activity comes from the 1976 APPA regulations before biogas facilities were conceived in South Africa. Many of the authorities do not believe that the intent of this activity can be seen to apply to biogas.
• This leads to different approaches in different areas for the same concept and promotes uncertainty in the industry.

Since NEM:AQA is a national Act, the DEA must finalise the interpretation of this category with relevant input from the industry and other authorities. This should be done as a priority. Officials should be provided with understanding and knowledge as to the nature of a biogas facility and the definitions should be applied consistently.

7. **There is no database available that provides information about existing operations i.e. what volume of waste is treated, what kind of waste is treated, what monitoring requirements are in place and what does the monitoring results show.**

• This would improve access to stakeholders and authorities to information related to biogas and its effectiveness.
• If all developments have to comply with the NERSA registration requirement as a minimum, their details could easily be captured on a database and provided to the various authorities, but the value would be in their sharing of that information.

The information used to set up such a database begins with registration but its end result will provide quantifiable and reliable information that will confirm that the impacts associated with biogas are predictable and manageable. This in turn can lead to the formation of Norms & Standards for this industry.
8.2 AGRO WASTE TO ENERGY

In addition to the above general challenges the specific challenges to agro-waste to energy biogas projects include the following:

1. Scale (small scale operations are unlikely to be financially viable)
   - Small scale operations are unable to financially undertake EIAs and other studies in order to comply with the relevant legislations and either operate unlawfully or do not continue with the use of biogas as a waste management tool.
   - Small scale facilities are unlikely to produce large quantities of electricity and therefore are only effective for waste management. The confusion in the competent authority responsible as identified in the General Problems above refers.

The DEA should be approached to consider a system of Norms & Standards for the industry. This has already been done for Landfill Gas which is essentially the same process.

2. Storage and the application of digestate
   - Once processed via a digester, the digestate should no longer be considered a waste product if it complies with the relevant component Water Affairs & Storage Norms & Standards thresholds.
   - Digestate can be used as an organic fertiliser and should be considered as part of the National Organic Waste Composting Strategy (NOWCS, February 2013) currently underway by DEA.
   - This Strategy has led to development of Draft National Norms & Standards for Organic Waste Composting (Notice 68 of 7 February 2014) which deals with composting facilities. Its applicability to digestate needs to be addressed.

The Organic Waste Composting and DAFF’s Farm Feeds & Fertiliser Act should be incorporated in the Draft Norms & Standards for the manufacture and applicability of organic compost and biogas digestate should be addressed in this document.

3. Geographical location of feedstock
   - Potentially, some agro waste would require transportation to a central point to utilise a biogas facility. This is obviously dependant on what type of organic waste is being considered. Who

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15 The NOWCS has been developed to promote composting as one method to beneficiate organic waste, as one of a basket of options, to divert organics from landfill disposal.
is therefore responsible to obtain relevant authorisations, especially if a biogas facility is set up to accommodate multiple sources?

Agro waste at central facilities like municipal disposal sites would provide sufficient feedstock for a regional biogas digester and could be used to improve municipal electrical supply. Clarification of the issue should be obtained from DEA.

4. Treatment of manure

- Confusion regarding the status of manure as a waste in different provinces has been experienced. It has been stated that manure and manure slurry (such as that from feedlots, dairies or lairages) can be used as organic fertiliser on land without being considered “waste”. However, if a biogas plant is implemented, the manure / manure slurry is digested and then the digestate used on lands as organic fertiliser, the biogas would be considered a mechanism for the “treatment of waste”. This is conflicting as the manure / manure slurry is being considered a waste in one instance and not in another while the biogas digester effectively improves the manure / manure slurry by removing and capturing methane which would otherwise be released naturally on the lands.

The DEA must provide clarity on whether or not animal manure is classified as a waste material.

8.3 WASTE WATER TREATMENT SLUDGE TO ENERGY

In addition to the general issue as well as those overlapping with the agro-waste sector, biogas facilities associated with WWTW face the following key challenges:

1. Lack of appropriate permits for the existing WWTW

- Many existing facilities are historical ones and do not have the relevant, contemporary permits in place. Implementation of a biogas facility to further process the waste sludge should not be withheld based on outstanding / outdated approvals for any existing WWTW. This defeats the objective of trying to improve the output.
- Minor changes can be implemented at existing plants that will allow for a biogas system. These should not necessitate the need for an EIA if it uses existing infrastructure.

The improved sludge must meet the DWS quality guidelines which should form part of the known mitigations recommended for Norms & Standards.
2. Quality of treated sludge

- Once the sludge is treated, it can no longer be considered a waste product, as long as it complies with the DWS criteria for sludge. As such, the implementation of a biogas plant for treated sludge should not be seen as “treatment of waste” and would therefore not require a Waste Management License.

DEA should confirm that this definition can be applied.

8.4 LANDFILL GAS TO ENERGY

With landfill sites there are less likely to be significant challenges since the development of the National Norms & Standards for the capturing and use of landfill gas[^16]. However the following are still noteworthy:

1. Unspecified waste types in the landfill site

- According to NEM:WA National Norms & Standards for the disposal of waste to landfill, landfill sites must comply with the type of waste it accepts, the design of the sites and other disposal requirements. In the interim, landfill sites have to deal with unspecified waste types which make it difficult to define.

Landfill site auditing and control must be improved at municipal level. Educating ratepayers on the correct use of these sites will improve the situation, as has been shown with the recycling initiatives.

2. Multiple competent authorities who make use of the same landfill

- All authorities must be aware of and implement the National Norms & Standards in order to ensure that the correct waste streams are disposed of into the correct landfill sites.

[^16]: There is some uncertainty regarding how only landfill gas was considered for Norms & Standards without taking other biogas processes into account.
In terms of bottlenecks (issues that slow down or unnecessarily delay licensing processes), the survey and subsequent analysis has identified the following:

1. Interpretation of definitions and regulations by different authorities which lead to hold ups in the authorising process.
2. Reluctance by existing biogas operators in providing data (especially monitoring data) to authorities.
3. Lack of understanding (safety concerns, explosiveness of methane) in the public sector which leads to delays in EIA processes.
No strengths were identified by stakeholders in the surveys regarding the licensing processes for biogas plants. This is most likely due to the frustration experienced trying to unravel the various pieces of legislation and their relevant processes. Certainly given that the biogas industry is fairly new in South Africa, there is not likely to be any streamlining of processes for such specialised technology.

It should be noted though that NEM:WA provides for the implementation of Norms & Standards for aspects that fully within its functioning. This could definitely provide a streamlined mechanism for the industry for licensing in the future. It would require collaboration from various departments though, as it is mostly likely that more than one piece of legislation will be involved, thus requiring that interdepartmental arrangements are put in place.

In general the strengths of the licensing process is that it will provide a very comprehensive assessment of any biogas facility from multiple facets. The problem is that this very structure is also the main weakness in achieving the goals for improved waste management by means of biogas in a timeous, cost effective manner.

Although the survey did not highlight any specific strengths it is believed that the presence of the Biogas Platform in itself is a great tool to start addressing the challenges identified in Section 8. Through this manner of interaction many stakeholders have developed a much better understanding of biogas as an industry.

In addition the creation of SABIA is a great step in the right direction whereby members of SABIA can be better informed and will greatly assist operators to better understand legal requirements and what they should be doing and not doing. SABIA can also play a role in ensuring that authorities have access to information about biogas and its applications in the industry which will improve the knowledge base of the decision makers.

Furthermore there are already a number of operational biogas facilities in South Africa, and the number keeps growing, which can be used to provide hands on opportunities for authorities to help them understand the operation and function of a biogas facility. It is through making use of the existing facilities as examples that education and understanding of all stakeholders will improve.

South Africa is currently undergoing a crisis of electricity generation and biogas, especially if there is a move towards regional facilities, could contribute to alleviating some of these problems at site level (those not feeding into the grid) as well as at a national level when they do feed into the grid.
The many processes required for authorisation for a biogas facility need to be considered at the national levels as a starting point since they are based on national legislation. In order to do this some level of input will be required from all the authorities who have mandates in terms of the legislations presented in this report.

It is recommended that the following be undertaken to facilitate the streamlining of authorisations:

1. This document must be presented to all the relevant authorities that have a legal mandate as described in this report. This should include DEA, DWS, SAHRA, CAA, DAFF and NERSA.

2. Using SABIA, focus group sessions should be arranged dealing with the most prominent authorities, especially where there are issues with definitions and application of regulations.

3. Representatives using the three different technologies as discussed in this report should be present to provide practical input and answer questions. Possible site visits are recommended to provide first-hand opportunities for authorities to understanding the process of biogas production.

4. The Regulatory Tool must be distributed to all members of SABIA in order to inform members or potential biogas developers of the various legislative requirements.

5. Formation of a central database in order to have access to monitoring results from existing operators. This should include waste volume reductions, benefits of reutilising landfill gas, electricity generation etc.

6. Promote the development of a Norms & Standards document for the other biogas technologies or investigate the option of including them into the existing Landfill Gas document.

7. Promote regional biogas facilities as a waste management strategy to municipalities. This will improve the waste management in regions, as well as provide a mechanism to ensure electricity generation at specific sites.
The Biogas Licensing Working Group has been tasked with providing an understanding of the legislative requirements in South Africa that pertain to the industry. This analysis relies on the outcome of work done to date by the Licensing Working Group, as well as other related projects with which Cape EAPrac has been involved over the past year.

Biogas facilities whether from biomass, general waste or landfill sites has a threefold benefit for waste management: (1) It provides a mechanism to deal with potentially difficult waste streams in a concise and compact manner, (2) removes methane which would have previously been dispersed into the atmosphere and (3) produces an end material that is suitable for use as an organic fertiliser. It has for many years been a solution to waste streams in Europe, particularly in Germany which has the highest number of digesters processing a multitude of feedstocks (IBBK, 2014). The technology in South Africa is very new and unfortunately the legislation that is in place has not adapted quickly enough to incorporate biogas as a waste solution.

The overall challenges that have been raised in the licensing and permitting process for biogas facilities are the uncertainty that is created in the industry when interpretations, processes and understanding of biogas within all levels of governments differs. Consensus on the interpretation and processes associated / required for the authorisation of biogas facilities will greatly beneficial for future projects.

In general it appears that the main challenges that have been identified are:

1. Ignorance of applicable legislation at all levels. There is a definite requirement for general education at all levels and spheres of government. This should come from people who have the know-how in the industry, to explain what biogas is really about, especially since there are so many international examples where countries have been applying the technology for years now. There is more than sufficient data available to use to ensure a more streamlined approach.

2. Legislation that creates more confusion than guidance because of different descriptions, thresholds and definitions. The general lack of understanding about biogas causes assumptions to be made thus leading to processes that do not add any value to the authorisations or to the industry i.e. something that needs 5 different sets of permissions for something that is inherently a good practice and should be supported.

The national DEA and DoE have committed themselves to working with the industry to improve the processes. It is critical that they are made aware of the shortcomings and problems in the processes, and especially provide clarification on definitions that are creating so much confusion between authorities. As part of the recommendations for streamlining the processes, they with their counterparts from other government departments should be included in industry bodies such as SABIA. Norms and Standards have been developed for other industries which allows for a significant streamlining of statutory processes and it is very strongly recommended that the relevant authorities are approached to assist and facilitate the option of including biogas.

The platform created by SABIA and DoE should be expanded to include representatives from all the various authorities identified in the various processes and definitive, implementable decisions must be made at this level that will be implemented across all spheres.


IBBK (International Biogas and Bioenergy Centre of Competence) (2014). 1st Agro-industrial Biogas Training Seminar and Study Tour, University of Cape Town, Western Cape, South Africa.
