


**Site Condition Report
Standard Rules SR2012 No12
Permit Application**

Tamar Energy Ltd

Date:
March 2013

Project Issue Number:
SOL0313TA01

VERSION CONTROL RECORD			
Contract/Proposal Number:		SOL0313TA01	
Authors Name:		Steve Butler	
Signature:			
Issue	Description of Status	Date	Reviewer Initials
1	First Issue to Client for Review	March 2013	SMB

This report has been prepared by Sol Environment Ltd (Sol) with all reasonable skill, care and diligence, and taking account of the Services and the Terms agreed between Sol and the Client. This report is confidential to the client, and Sol accepts no responsibility whatsoever to third parties to whom this report, or any part thereof, is made known, unless formally agreed by Sol beforehand. Any such party relies upon the report at their own risk.

Sol Environment Ltd disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the Services.

Contents

INTRODUCTION	1
1. Site Details	2
2. Condition of Land at Permit Issue	3
2.1 Environmental Setting	3
2.1.1 <i>Site Location</i>	3
2.1.2 <i>Geology, Hydrogeology and Surface Waters</i>	5
2.1.3 <i>Designated Sites</i>	7
2.2 Pollution History	9
2.2.1 <i>Environmental Database Records</i>	9
2.2.2 <i>Historical Land Uses</i>	10
2.2.3 <i>Site Reconnaissance</i>	10
2.3 Evidence of Historic Contamination	11
2.4 Supporting Information	11
3. Permitted Activities	11
3.1 Permitted Activities Undertaken at the Installation	11
Annex A – Figures	
Annex B – Historical Maps	
Annex C – Envirocheck Report	

INTRODUCTION

This Application Site Report has been prepared by Sol Environment Ltd and Tamar Energy Ltd (hereafter referred to as “the applicant”) in support of a Standard Rules DR”)! No.12 Permit ‘*Anaerobic digestion facility including use of the resultant biogas*’ for the proposed operation of an Anaerobic Digestion (AD) Plant and Combined Heat and Power (CHP) Facility for A.H. Worth and Co Ltd, located at Manor Farm, Spalding.

This document represents the Application Site Condition Report (ASCR) submitted as part of the Application package to the Environment Agency (EA) (Sol Environment Ref. SOL0313TA01) and has relied on information supplied by the site and various third party information sources (See Section 2).

Tamar Energy Ltd existing site (*the Site*) is located at Manor Farm, Holbeach Hurn, Spalding, Lincolnshire, PE12 8RL.

The proposed development is an on farm agricultural facility to enable anaerobic digestion of vegetable outgrades and green crops to generate biogas, which in turn will be used to produce electricity, heat and a nutrient rich organic fertiliser for use on the farm. The proposed on farm anaerobic digestion (AD) unit will use all vegetables that are outgrades from agricultural activity already taking place at Manor Farm and land surrounding Holbeach Hurn.

The treatment process will be permitted by the Environmental Agency as a Waste Operation and be operated in accordance with the EPR 2012 Regulations.

Sol Environment was engaged by Tamar Energy Ltd to produce an ASCR in accordance with the EA’s Guidance Document H5 Site Condition Reports Guidance and Templates (Version 2.0, dated 04/08/08). This report provides baseline information in relation to the site.

1. Site Details

Name of the Applicant	Tamar Energy Ltd
Activity Address	Manor Farm, Holbeach Hurn, Spalding, Lincolnshire, PE12 8LR
National Grid Reference	OS X (Eastings) 540324 OS Y (Northings) 328455

Document References and dates for the Site Condition Report at permit application and surrender	EP Application Site Condition Report, Tamar Energy Ltd Pre-Application Case Reference: EPR/FP3490VP Sol document reference and date: RSOL0313TA01_ASCR
Document Reference and Site Plans	Annex A of this report: <ul style="list-style-type: none"> • Figure A1 – Site Location • Figure A2 – Proposed Site Layout • Figure A3 – Photos of the site • Annex B: Historic Maps • Annex C: Envirocheck Report , 27th March 2013 • Annex D: Site Process Flow Diagram

2. Condition of Land at Permit Issue

2.1 Environmental Setting

2.1.1 Site Location

The location of the intended Site is shown on Figure A1, Annex A, centered at approximate National Grid Reference OS X (Eastings) 540480; OS Y (Northings) 328080. The proposed site layout is shown in Figure A2.

The proposed site of the digester lies on the southern part of the existing farm complex at Manor Farm, immediately adjacent to an existing drainage ditch and the junction of two private roads, which are owned by A. H. Worth & Co Ltd. The complex comprises a number of large buildings used in connection with vegetable grading, packing and storage. The application site itself is currently used as a machinery display area and overspill staff car park.

Based at Holbeach Hurn, A.H Worth & Co. Ltd's farming business involves the growing, processing, packing and marketing of potatoes and arable crops. Manor Farm is an established farm complex with agricultural buildings, coldstores, existing offices and staff facilities, as well as the processing and packaging plant for QV Foods Ltd.

The area of the application is predominantly agriculture and fairly remote from sensitive receptors. Holbeach Hurn is the nearest residential area which lies approximately 900m to the southwest of the application site. Holbeach Hurn is situated north of the A17 and approximately 9.5 miles east of Spalding.

The closest receptors to the application site are two semi-detached farm worker's houses which lie on the northern side of the Manor Farm access road, approximately 260m from the site of the proposed AD plant. These houses are owned by the applicant and leased to employees of the farm.

Table 2.1 provides further details as required

Table 2.1 Site Setting	
Direction	Description
North	Agricultural: Manor Farm, Hartley Farm, Home Farm
North East	Residential Area: Dawsmere Agricultural: Pollybell Farms, Cardwell Farm, Wiles Farm
East	Dawsmere Road Agricultural: Norfolk House Farm, Red House Farm
South East	Agricultural: Brook House Farm Residential Area: Lutton, Long Sutton Gedney Dyke
South	Residential Area: Holbeach Marsh, Fleet Hartgate

	A17 Washway Road
South West	Residential Area: Holbeach Hurn Agricultural: Horne Farm, Grange Cottages, Woodhouse Farm
West	Marsh Road Residential Area: The Old Forge Agricultural: Crowmarsh Farm
North West	Agricultural: Horne Farm, Grange Cottages , Poplars Farm

The Environment Agency flood zone database indicates that the site is in Flood Zone 3 (high risk). Flood Zone 3 is defined in the Technical Guidance to the NPPF as land that has an annual probability of flooding of greater than 1.0%. Flood Zone 3 is further subdivided into Flood Zone 3a and Flood Zone 3b. The Environmental Agency flood maps identify the area to be at risk in Zone 3a which shows the area, not taking into account existing flood defenses, has a 0.5% (1:200) or greater chance of flooding each year.

As the site is located within Flood Zones 3a, a Flood Risk Assessment (FRA) was carried out in the planning application to ensure accordance with the NPPF Technical Guidance.

2.1.2 Geology, Hydrogeology and Surface Waters

Desk-based research of the local geology, hydrogeology and surface waters has been carried out in order to establish the potential for migration of contamination onto or away from the Site, and to assess the surface water and groundwater sensitivity of the Site area. Information was obtained from a number of sources, namely:

- Environment Agency Groundwater Vulnerability Digital Maps.
- Information provided by an environmental database report (Envirocheck).
- Geological maps produced by the British Geological Survey (BGS) and the BGS Geology of Britain Viewer (<http://maps.bgs.ac.uk/geologyviewer>).
- MAGIC <http://magic.defra.gov.uk>
- BGS Borehole Record Viewer (<http://www.bgs.ac.uk/data/boreholescans/home.html>)

Geology

According to the BGS Geology of Britain Viewer and the Envirocheck geology datasheet, the Site is directly underlain by superficial Tidal Flat Deposits which comprise of clay and silt. The superficial deposits are subsequently further underlain by the Bedrock geology which consists of the Amphill Clay Formation.

The BGS Lexicon of Named Rock Units describes the Amphill Clay Formation as;

'mudstone, mainly smooth or slightly silty, pale to medium grey with argillaceous limestone (cementstone) nodules; some rhythmic alternations of dark grey mudstone in the lower part; topmost beds are typically pale grey marls with cementstone.'

The on-line BGS Borehole Record Viewer and the third-party environmental database show that there are no records of boreholes having been excavated on-site. The nearest commercially available borehole record (ref: TF42NW10) is located approximately 1.5km to the west of the site and was drilled at Red Farm.

The site is located in an area which might not be affected by coal mining. There is moderate hazard potential for compressible ground stability, very low hazard potential for landslide ground stability and moderate hazard potential for running sand ground stability. There is also low hazard potential for shrinking or swelling clay ground stability hazards.

According to data issued by the National Radiological Protection Board (NRPB) in 2002 (now the Health Protection Agency) the land is located in an area where less than 1% of residential properties are above the action level for Radon as set by the NRPB. No radon protection measures are considered necessary by the BGS.

Hydrogeology

The Tidal Flat Deposits and Amphill Clay Formation are both described as unproductive strata. The Environmental Agency describes unproductive strata as rock layers or drift deposits with low permeability that

have negligible significance for water supply or river base flow.

No overlying drift deposits are present on site.

According to the Environmental Agency website, the site does not lie within a Groundwater Source Protection Zones (SPZs).

There are five groundwater abstraction within 2km of the Site, the details of which are shown in Table 2.2 below. These predominantly operated by W B Wright & Sons Limited for general agriculture use.

Table 2.2. Groundwater Abstractions within 2km of the Site

Operator	Distance and Direction	Source	Purpose
W B Wright & Sons Ltd	1503m East	Catch Pit E – Red House Farm	General Agriculture: Spray Irrigation – Direct
W B Wright & Sons Ltd	1718m East	Catch Pit D – Red House Farm	General Agriculture: Spray Irrigation – Direct
W B Wright & Sons Ltd	1830m East	Catch Pit C – Red House Farm	General Agriculture: Spray Irrigation – Direct
W B Wright & Sons Ltd	1839m East	Catch Pit B – Red House Farm	General Agriculture: Spray Irrigation – Direct
W B Wright & Sons Ltd	1881m East	Catch Pit A – Red House Farm	General Agriculture: Spray Irrigation – Direct

The site is considered to be situated in an area of low sensitivity with respect to groundwater resources due to the underlying unproductive strata. This sensitivity is mitigated somewhat by the absence of any groundwater abstraction (sensitive or otherwise) in the immediate area (the closest groundwater abstraction being located 1503m east and that the site is not situated in a groundwater source protection zone.

Surface Water

There are no surface water features located on site.

The nearest main watercourse is the River Whalpole which is located 8km to the north west of the site. The coast is 5km to the north-east so rapid inundation is therefore unlikely.

The River Whalpole is located c. 8km north west of the site at its closest point. Under the EA's General Quality Assessment (GQA) scheme the River Whalpole has been classified as having a Grade E for chemical quality in 2009. This very poor river quality suggests that the river ecosystems are likely to have been impacted by pollutants and prior to any potable use the river water must be treated.

There are no recorded flood events for the site. However, historically there are two events significant to the site:

- Highest rainfall event recorded at Holbeach 24th August 1987 was 110mm in 3 hours;
- Tidal event 1:200 year event accompanied by strong winds and wave action was recorded in June 1978 in section W5 which remains highest on record.

The publically available third party database, Envirocheck, holds four records of licensed surface water abstractions within 2km of the site. There are no surface water abstractions on site and there are four within 2km of the site, the details of which are shown in Table 2.3 overleaf.

Table 2.3. Surface Water Abstractions within 2km of the Site

Operator	Distance and Direction	Source	Purpose
W B Wright & Sons Ltd	913m East	Unnamed Field Drain A – Red House Farm	General Storage Agriculture: Spray Irrigation –
W B Wright & Sons Ltd	1184m North East	Unnamed Field Drain B – Red House Farm	General Storage Agriculture: Spray Irrigation –
W B Wright & Sons Ltd	1432m North East	Unnamed Field Drain C – Red House Farm	General Storage Agriculture: Spray Irrigation –
W B Wright & Sons Ltd	1657m North East	Unnamed Field Drain D – Red House Farm	General Storage Agriculture: Spray Irrigation –

The Environment Agency flood zone database indicates that the site lies partially in Flood Zone 3a. Flood Zone 3a shows the area, not taking into account existing flood defenses, has a 0.5% (1:200) or greater chance of flooding each year.

2.1.3 Designated Sites

The Environment Agency's H1 and H5 guidance states that the potential impacts of the site should be assessed for the following habitat sites within 10km of the Installation:

- Special Areas of Conservations (SAC's and candidate (cSACs) designated under the EC Habitats Directive;
- Special Protection Areas (SPAs) and potential SPAs designated under the EC Birds Directive.
- Ramsar Sites designated under the Convention of Wetlands of International Importance.

It is also stated that within 2km of the Source:

- Sites of Special Scientific Interest (SSSI) established by the 1981 Wildlife and Countryside Act;
- National Nature Reserves (NNR);

- Local Nature Reserves;
- Local Wildlife sites;
- Ancient Woodland.

Information from the Multi Agency Geographic Information for the Countryside (MAGIC) website (<http://magic.defra.gov.uk/>) has been used to obtain the above information.

There are no European Designated Sites, Sites of Special Scientific Interest (SSSI), Regionally Important Geological Sites, Locally Important Geological Sites, Local Nature Reserves or Sites of Interest for Nature Conservation within 2km of the Site.

The site is not located within a nitrate vulnerable zone.

The site is not located within an Air Quality Management Area.

2.2 Pollution History

2.2.1 Environmental Database Records

The following information has been obtained from a search of a publicly available database of environmental information (Envirocheck data sheets, produced by Landmark Ltd).

The database contains records of information from public registers held by environmental regulatory authorities and can be used to assess the site's sensitivity, the potential for neighboring activities to pose a risk to the site and to determine whether specific records of pollution relate to the subject site.

Pollution Incidents

The environmental database (Envirocheck) does not hold any records of pollution incidents relating to the Site. There have been no incidents recorded on the substantial pollution incident register within a 1km radius of the site.

According to the Envirocheck database there have been two pollution incidents to controlled waters within a 500m radius of the site. The closest occurred on the 22nd September 1992 at 272m to the North of the site, details of which are shown in Table 2.1 below.

Table 2.1. Pollution Incidents to Controlled Water

Details		Dist from Site	Location (NGR)
Property Type:	Horticultural	272	540600 328400
Location:	Spalding District		
Authority:	Environment Agency, Anglian Region		
Pollutant:	Oils - Diesel (Including Agricultural)		
Note:	Local Dyke		
Incident Date:	24th July 1997		
Incident Reference:	2488		
Catchment Area:	Not Given		
Receiving Water:	Freshwater Stream/River		
Cause of Incident:	Accidental Spillage/Leakage		
Incident Severity:	Category 3 - Minor Incident	384	540500 328500
Positional Accuracy:	Located by supplier to within 100m		
Property Type:	Not Given		
Location:	Spalding District		
Authority:	Environment Agency, Anglian Region		
Pollutant:	Unknown		
Note:	Irrigation Lagoon		
Incident Date:	22nd September 1992		
Incident Reference:	1429		
Catchment Area:	Not Given		
Receiving Water:	Into And/Or Watercourse		
Cause of Incident:	Unknown		
Incident Severity:	Category 3 - Minor Incident		
Positional Accuracy:	Located by supplier to within 100m		

Prosecutions

No prosecutions or enforcement actions are reported to have been taken against the study site or within 1km of the study site.

Licensed Waste Management Facilities

There is 1 Waste Management Facility located within 1km of the site which is operated by Holbeach Biogas Limited and is an on-farm anaerobic digestion (license number: 101315) located 333m to the north of the site.

Discharge Consents

The Envirocheck database holds three records of current discharge consents within a 1km radius of the site. The closest of which is held by A H Worth & Co Ltd at a point 113m north of the site to land.

Authorised or Permitted Processes

There are no Environmental Permits to operate a Pollution Prevention and Control (PPC) Part A(1) process, a Part A(2) process or a LA PPC Part B at the site or within a 1km radius of the site

2.2.2 Historical Land Uses

Available historical maps for the site have been obtained and reviewed to determine if there is the potential for contamination to be present on Site associated with the Sites historical uses. The historical maps are presented within Annex B of this report and a summary of the historical development of the Site and surroundings is included below.

From the earliest published map (1887) the site is shown as greenland and there has been very little development in the surrounding site.

Due to the surrounding agricultural land and the site never being developed, there is very little potential for contamination at the site.

2.2.3 Site Reconnaissance

Visual/Olfactory Evidence of Existing Contamination

All areas of the site have been subject to a visual inspection at the time of this application document and no structural integrity/pollution pathways were identified.

The inspection was carried out in conjunction with the management of Tamar Energy for the purposes of inspecting as assessing the following:

- Physical condition of hardstanding;
- Condition and adequacy of containment bunds;
- Condition and adequacy of underground drainage and containment systems.

The application site for the proposed development is greenfield agricultural land.

There are no existing above storage tanks (ASTs) or underground storage tanks (UST's) observed as being present within the boundary of the site.

No sources of potential pollution or pollution pathways were identified during the visual inspection.

2.3 Evidence of Historic Contamination

Previous Site Investigation

No previous intrusive investigations have been carried out on site.

However, given the site and the surrounding areas history, there is low potential that widespread existing ground contamination may be present.

2.4 Supporting Information

Figures detailing the location, boundary and layouts of the Installation are shown in Annex A.

Historical Ordnance Survey plans of the site and surrounding area are reproduced in Annex B.

Information from the Envirocheck environmental database (provided by Landmark Information Group) identifying the environmental setting and pollution incidents are reproduced in Annex C.

Photographs of the site are included in the main application support document.

3. Permitted Activities

3.1 Permitted Activities Undertaken at the Installation

3.1.1 Existing Activities

The applicant is applying for a standard rules SR2012 No. 12 permit which will allow an anaerobic digestion facility using farm wastes, including the resultant biogas.

The proposed operation meets the definition of a Biological Treatment 'Waste Operation' as defined by the EPR 2010 Regulations.

There is currently no major activity on site. The site is currently used as a machinery display area and overspill car park. There have been no former industrial, commercial or residential development within the boundary of the site.

3.1.2 Description of the New Process

Tamar Energy Ltd have developed the facility to primarily enable the anaerobic digestion of vegetable outgrades and green crops from the neighboring agricultural facility to generate biogas, which in turn will be used to produce exportable electricity, heat and a nutrient rich organic fertiliser for use on the farm. The plant will also be used to process a wide variety of other commercially available 'similar' wastes.

Tamar Energy Ltd seek to nominally process approximately 24,000 tonnes of agricultural outgrades and commercial wastes, which will in turn will produce an estimated continuous electricity output of approximately 1.3 MWe. The plant has been designed with a design capacity of less than 100 tonnes per day.

The facility will also include a remote digestate storage lagoon which has a storage capacity of approximately 22,730m³.

The proposed waste operation will consist of:

- A Silage Clamp;
- A Feed Hopper;
- The Anaerobic Digester;
- An End-substrate Tank;
- A Run-off Tank;
- A packaged CHP gas engine unit and associated control housing;
- Leachate Lagoon.

The AD unit will be sited entirely on land owned and under leasehold from AH Worth Ltd who own the wider farm / agribusiness. The silage clamp (for the storage of green crops), will be located immediately adjacent to the AD unit. The digestate reservoir will be located approximately 650 meters south of the AD unit and connected by a sealed pipework system.

The end-substrate (digestate) resulting from the AD process will contain high levels of organic matter and be used as a valuable and high quality agricultural fertiliser. All digestate will be re-used entirely within the 4,500 acres farmed by AH Worth Ltd therefore reducing their reliance on externally purchased chemical fertilisers.

A detailed site and process description is provided in the main permit application.

3.1.3 Substances Used and Produced at the Installation

Information on the storage and use of the materials used and produced at the installation are provided in the following sections.

Bulk storage

There will be no bulk storage of hazardous materials on site.

Table 3:1 Raw Material Use

Name	Contents	Capacity (m ³)	Location	Secondary Containment	Contamination Risk	Inspection Regime
Primary Digester	Substrate	2950m ³	External	Yes	No	Monthly, visual inspection
Secondary Digester	Substrate	2160m ³	External	Yes	No	Monthly, visual inspection
Digestate Storage Lagoon	Digestate	22,730 m ³	External	Yes	No	Monthly, visual inspection
Biogas	Bio-Methane	8 Hours	External	N/A	No	Continuous pressure monitoring

The primary and secondary digesters are all installed above ground upon concrete foundations.

Drainage Systems

The digestate storage system has a total storage capacity 27,730 m³ and has been constructed with an impermeable membrane liner.

The lagoon has been designed to receive all the surface water runoff from the delivery areas and the silage lagoon. The design of the lagoon allows sufficient freeboard to ensure that there is sufficient capacity for 1/100 year storm even.

All drainage systems within the permitted boundary are sealed.

The proposed site does not provide any contribution to the drainage of adjacent buildings/yard.

There will be no foul sewer connections or uncontrolled surface water connections at the site. Therefore the potential for fugitive releases of any material into the sewer from the installation is considered low.

Hardstanding

All external loading and unloading areas, structure foundations, silage clamp and roadways will be constructed with impermeable concrete hardstanding which will be designed in accordance to the load bearing requirements of the processing equipment and vehicles used at the facility. Typically, all non-structural areas will be constructed with a of a sealed impermeable clay lining of at least 300mm thickness or fitted with a robust membrane.

Tanks and Bunds

There will be a number of tanks associated with the proposed development. The entire AD and Silage clamp area has been constructed within a secondary containment bund and can contain a minimum of 110% of the volume of the largest storage volume of the tank.

Summary of Pollution Prevention Measures

The proposed operations will not introduce any sub surface or potentially polluting activities to the site.

The following measures have been incorporated into the design of the new activity:

- All major structures, roadways, vehicle loading areas and clamp storage areas are constructed with a sealed impermeable concrete floor slabs which as a minimum will be at least 200mm thickness.
- To ensure the protection of groundwater, the external operational areas of the site is protected with an impermeable engineered liner.
- The entire process area is located within a bunded area which provides a minimum of 110% of the largest storage tank volume.
- All storage tanks, process pipelines and equipment will be installed above ground.
- With the exception of site drainage infrastructure, there will be no underground structures, pipelines or transfer ducts.
- Any oil storage tanks will be equipped with secondary containment bunds that have been designed to comply with EA best practice guidelines as defined by PPG2 – Above Ground Storage Tanks and be fitted with level gauges and alarmed.
- The site will be operated in accordance to a strict maintenance schedule.

3.1.4 Potential for Fugitive Releases to Soil, Groundwater and Surface Water

The materials and substances used in the proposed activity are not considered to have significant potential to cause ground or groundwater contamination under general storage or operating procedures. Furthermore:

- To ensure the protection of groundwater, with the exception of areas which are constructed of impermeable re-enforced concrete all aspects of the AD plant will be lined with an impermeable clay liner.
- All drainage systems are sealed and only discharge to the sealed storage lagoon. In the event of a major spillage no materials will be able to leave the site.

In addition, the site will operate a comprehensive maintenance and management system which is described in Section 3 of the Main Application Document. The management system includes quarterly visual inspections of:

- All tanks and hard surfaced areas and drainage areas to detect any signs of deterioration, leaks, spillage or blockage. Any corrective action required is reported to and implemented by the Site Manager; and
- Equipment in all process areas, to identify equipment degradation which needs to be addressed as part of the company's planned/predictive maintenance programme.

The Site management will be operated by an Environmental Management System which is designed to meet the

requirements of the Environmental Permitting Regulations, associated pollution prevention guidance.

Based on this, the potential for the new activity to impact on soil and groundwater underlying the installation is considered to be low.

Non-permitted activities undertaken at the Installation	Not applicable
Plan showing activity layout	Refer to Figure A2, Annex A
Environmental Risk Assessment	See attached Main Application Document SOL0313TA01.

Annex A – Figures

Annex B – Historical Maps

Annex C – Envirocheck Report

Annex D – Conceptual Model