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RJS Civil Engineering Ltd

Parrys Quarry Environmental Permit Application

Site Closure Plan



3 June 2014

AMEC Environment & Infrastructure UK Limited

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Report for

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1. Introduction

The Parry's Quarry site will be restored to provide new woodland, grassland and wildflower meadow habitats and the site is intended for public amenity open space post closure in a domed shape, consistent with the topography to the south west of the site. Planning permission (ref 042468 dated 3 February 2009) requires the submission of an aftercare scheme to restore the site to a condition suitable for nature conservation and public open green space. It also restricts deposit of waste to the approved pre-settlement contours and levels shown on the 'Final Contour Plan (Drawing No 3 Revision A) dated August 2006 (part of Environmental Statement Volume 2, Appendix 2.3). Capping materials are covered in Section 2.2.5 of the ESID (ref 30030/R4150).

The site closure plan will set out the requirements for managing and maintaining environmental controls from the time of cessation of site operations until Permit Surrender, the time at which it can be demonstrated that the landfill is environmentally benign. The Site Closure plan will be based upon current relevant Natural Resources Wales guidance and regularly reviewed in consultation with the Natural Resources Wales during both the site operational, aftercare phase and the closure phase. As the site is developed beyond the design stage through into the construction phase and then on into the operational phase, the content of the Site Closure Plan will be developed to take account of the nature of the installed infrastructure, the detail of the actual installation and the consequential measures subsequently needed to ensure appropriate management and maintenance. At this early stage in the life of the site – pre Permit issue – only generic or general plans are relevant for issues which are already identifiable and will remain fixed for the life of the site. The Site Closure Plan will be a 'live' document subject to review at least once every four years. Any changes to the management and monitoring of the landfill which impact on the Closure Plan will also require a review of the plan. The operator is committed to maintaining and updating this plan in agreement with the Natural Resources Wales and following published guidance and best practice.

2. Site Closure

2.1 Predicted Closure

Waste will be landfilled at a rate of 105,000 tonnes per annum over a 15 year period or at a lower rate for 20 years dependant on waste volumes available. Therefore the site is expected to be operational from 2014 to 2029-2034 dependent on the commencement of waste operations.

Following cessation of waste acceptance the landfill will be capped and restored to provide new woodland, grassland and wildflower meadow habitats. The site will move towards definitive closure when the conditions specified in the permit are satisfied and Natural Resources Wales approves the initiation of the closure period following the submission of a closure report. The Aftercare phase as described in Table ESID4 of the Environmental Setting Installation Design (ESID) Report (Amec report ref 30030/R4150) includes the need active leachate and landfill gas abstraction and treatment.

Leachate generation will be influenced by groundwater influx and rainfall. Tables ESID 5 of the ESID report set out leachate generation at various life-cycle stages and it is predicted to be 13m^3/day following closure of the site. Table ESID6 sets out groundwater influx through liner at various scenarios and this ranges from 0.2m^3 to 60m^3/day depending on liner design. Leachate quality will continued to be monitored as required by the Environmental Permit and the Hydrogeological Risk Assessment (HRA) will be reviewed on a six yearly basis to determine if the site continues to behave as predicted based on actual site monitoring and waste inventory. Monitoring data and the HRA review demonstrating leachate quality does not pose an unacceptable risk to groundwater would form the basis of the surrender application.

Landfill completion with respect to landfill gas is the point where there is insufficient gas generated to require active management and flaring. The Landfill Gas Risk Assessment (LFGRA) (Amec report ref: 3003/R4121) demonstrates that there would be no adverse impact if landfill gas management ceases in 2065 (i.e. after approximately 50yrs following opening of the site) at a total gas generation rate between 50 – 100m3/hr. A re-evaluation of this time scale will be assessed at site closure when the actual waste inventory and gas generation rates would be known.

2.2 Decommissioning

The site will comprise the proposed landfill footprint, associated offices and a weighbridge, a leachate plant and landfill gas flare and engines. For those areas outside the landfill footprint, the design of the site will ensure that:

- underground tanks and pipework are avoided where possible (unless protected by secondary containment or a suitable monitoring programme);
- there is provision for the draining and clean-out of vessels and pipework prior to dismantling;
- insulation is provided that is readily dismantled without dust or hazard;

- materials used are recyclable (having regard for operational or other environmental objectives); and
- Plans of all underground pipes and vessels are kept up to date.

Once the landfill site has ceased receiving waste and all engineering has been completed, any redundant infrastructure outside the footprint of the landfill no longer required for the effective management of the landfill body will be decommissioned. The operator is committed to ensuring any decommissioning required will be carried out in a manner which minimises risk to the remaining infrastructure and the surrounding environment. The decommissioning programme will ensure that:

- Appropriate method statement will be put in place for the dismantling of buildings and other structures;
- Pipelines are flushed out and where appropriate removed;
- Any vessel and tanks are emptied of harmful contents and/or removed;
- Asbestos or other potentially harmful materials are removed unless agreed that it is reasonable to leave such liabilities to future owners;
- If required, testing of soil will be carried out to ascertain the degree of any pollution caused by the activities whether any remediation is required to return the site to a satisfactory state; and
- all plans of all underground pipes and vessels are updated and retained for record.

2.3 Environmental Controls

During landfill site closure it will be necessary to ensure that environmental controls, for example, those required for the management of landfill emissions (landfill gas and leachate) are managed and maintained such that they remain effective in containing and preventing the release of pollutants to the environment, impacting potentially on human and water resources.

The nature of the proposed waste inputs are such that it can be expected landfill gas and leachate will be generated beyond the operational phase of the site and that without continued management and maintenance of environmental controls, environmental pollution and harm could result.

It will be a requirement of the site Environmental Permit to install and maintain gas abstraction equipment on site together with the gas engine and/or flare(s). The gas management system will be managed and maintained until such time that gas emissions have reduced to a level where there is no environmental justification in retaining gas management infrastructure and associated controls. At this time and subject to agreement with the Natural Resources Wales gas management controls will be decommissioned.

It will also be a requirement of the Environmental Permit to manage leachate levels within the waste mass to levels consistent with requirements established by the site Hydrogeological Risk Assessment. Leachate will continue to be removed from site via the installed abstraction system and either disposed of offsite to a permitted waste management facility or treated onsite and discharged under consent to foul sewer.

The requirements for the management of landfill gas and leachate are likely to change during the site closure phase of the landfill as the waste mass degrades and stabilises which underlies the need to periodically review and update the site closure plan.

As part of management of fugitive landfill emissions, the condition of the engineered cap and restoration layer will be regularly inspected for evidence of instability, uneven settlement or stress cracking, which could impact upon the performance of landfill gas and leachate management infrastructure or on local amenity. Where any problems have occurred remedial engineering works will be undertaken in agreement with the Natural Resources Wales.

2.4 Environmental Monitoring

The environmental monitoring programme (landfill gas, groundwater & surface water, leachate, stability, settling behaviour) will be extended into the site closure period of the site to demonstrate continued effectiveness of the site's environmental controls. The environmental monitoring programme will be risk-based and will be reviewed on a regular basis ensuring that the monitoring programme reflects the needs and requirements of the site which will change over the site closure period and as a minimum will be in accordance with the requirements of the Landfill Directive.

Annual reviews of the monitoring data required by the Environmental Permit will be assessed to determine progress towards the initial surrender criteria. If there is a deviation from the expected performance of the landfill then the surrender criteria will be reviewed. In any event, the criteria for surrender of the Environmental Permit will be reviewed at least once every four years to determine:

- Quality and quantity of leachate;
- Generation, flow and concentration of gas;
- Trace composition of the gas;
- Potential for leachate or gas to be generated i the future;
- The physical stability of the waste and the associated structures; and
- The presence of any problem wastes which could present a future risk.

2.5 Site Security

Site security is a key element of site closure and aftercare management. The site security plan will be developed as the site is initially constructed and appropriate security fencing and gates etc are established. Throughout the whole life of the site including the aftercare period, site security measures will be regularly inspected and maintained.