Bradford, Julie

From: Oakes, Ian
Sent: 08 December 2014 10:09
To: Bradford, Julie
Subject: FW: Hafod Update Report and Proposals
Attachments: HAF107 Proposed New Wells_A1p.pdf; Hafod Progress Report Nov 2014.docx

EDRM / PR

From: ICraven@coryenvironmental.co.uk [mailto:ICraven@coryenvironmental.co.uk]
Sent: 28 November 2014 08:28
To: Roberts, Anthony; Oakes, Ian
Cc: GBall@coryenvironmental.co.uk; AHoll@coryenvironmental.co.uk
Subject: Hafod Update Report and Proposals

Tony/Ian
Further to last weeks site visit please find attached an update report and further explanation of the proposals we discussed with you on the day. Over the next two weeks we intend to get manifold 7 moved and the extension to the 180mm main completed. If possible we will also start drilling the pin wells, but will inform you of this prior to starting. If you have any queries please do not hesitate to contact me.

Kind regards

Ian Craven
NW Area Manager

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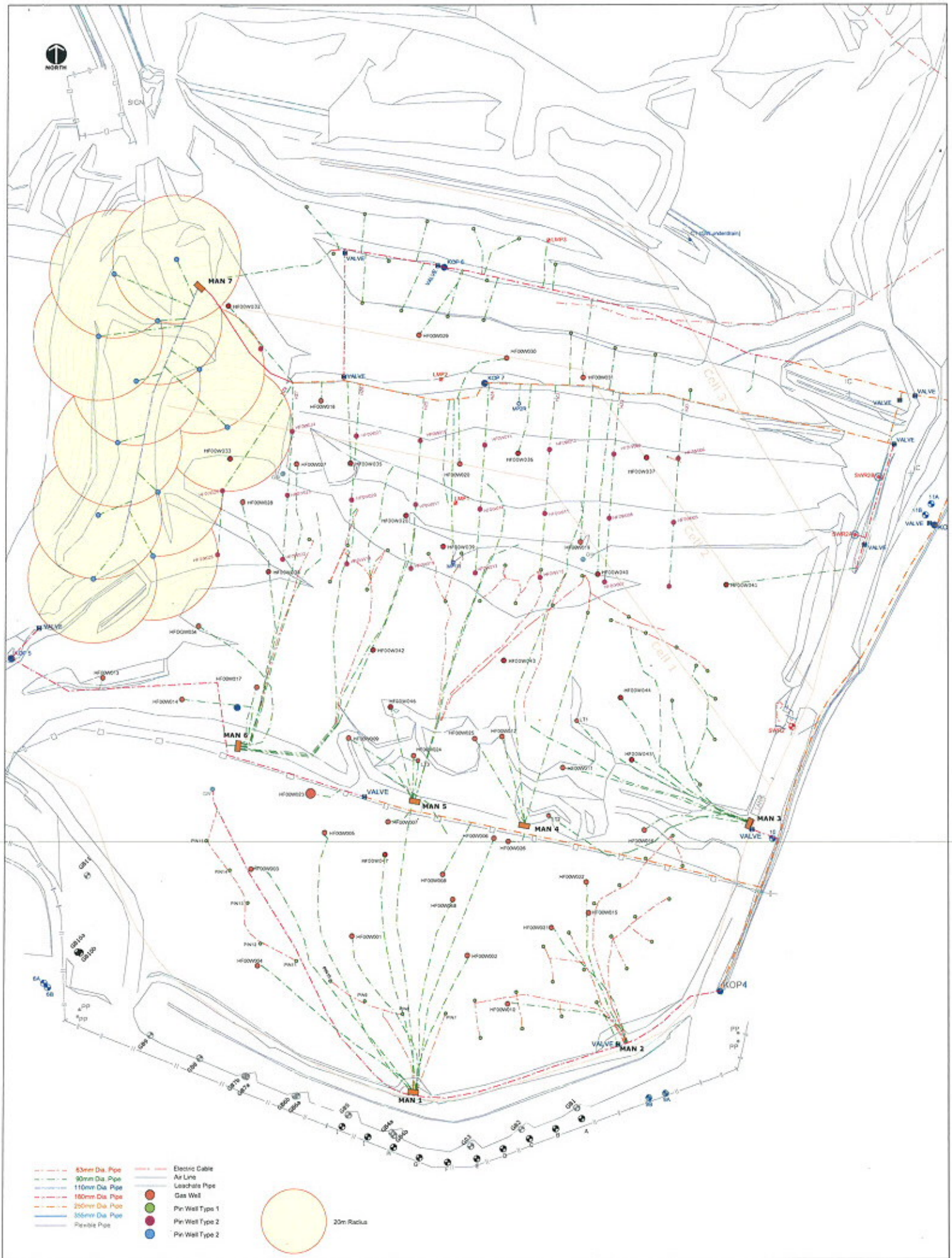

Key

- Leachate extraction sump
- Leachate monitoring well
- Gas monitoring borehole
- Ground water monitoring borehole

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CORY environmental

HAFOD

Proposed New Wells

Drawn	Date	Scale	HAF107
TJG	27-11-14	1:500	

Cory Environmental (Central) Ltd – Hafod Quarry Landfill

Progress Report since NRW Gas Audit 2-3 July 2014

1) **Temporary Capping of Northern Slope of Cell 3.**
Over 14,000 m^2 of LLDPE capping has now been installed on the northern slope of Cell 3. The objective behind this work was to reduce any localised odours in this area and prevent the ingress of surface water which would otherwise be collected as leachate within the Cell 3 intercell bund. Prior to installing the geomembrane the entire slope was reprofiled with benches to allow machine access, and a network of French drains and pipework installed to collect any perched leachate within the slope, further aiding stability. This work has taken approx. 3 months to complete, largely due to the weather and ground conditions experienced. A variety of photos have been attached to demonstrate the works involved.

Plate 1: Before works began. NB: Area of slumping in foreground

Plate 2: Profiling slope whilst working around existing gas collection infrastructure

Plate 3; View of slope from Clay Stockpile

Plate 4: Placement of LLDPE on Western edge of slope.

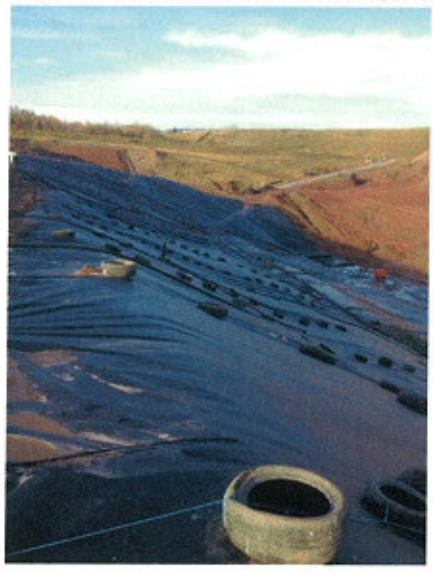
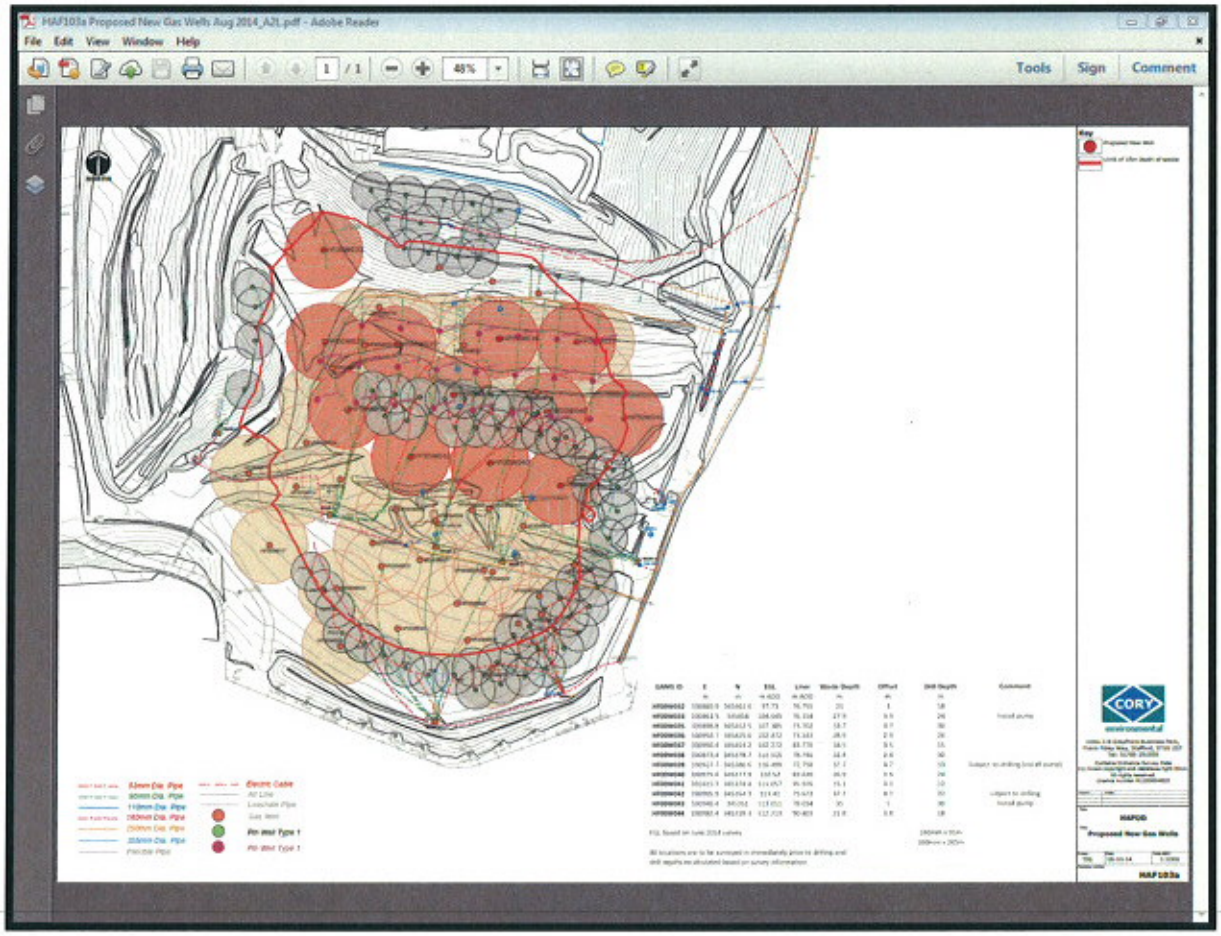


Plate 5: Completion of temporary capping

2) Installation of New Gas Wells

A review was taken of the adequacy of gas infrastructure in August 2014 and proposals immediately submitted to NRW. 12 new gas wells were then drilled during September 2014. Wells were located at critical locations to improve gas abstraction from deeper within Cells 1 and 2, and consideration given to well casing size, slotting and the dewatering of the new wells. The screen shot below shows well locations, well depths and sizing.



Following the installation of the new gas wells, well heads were fitted and some static head monitoring undertaken, before they were connected to the gas extraction system. Once collection pipework had been installed, each well was slowly opened up and balanced in accordance with established procedures.

Plate 6: GW41 connected to extraction system

Plate 7: GW 44 Head works and connecting pipework installed

In addition to having site staff's manual dipping records of liquid levels within each new gas wells, SGG Environmental Services Ltd were hired to conduct a CCTV survey of the status of each well. Observations made highlighted the wells which required pumps to be installed, together with any differences in depths with drill logs. Both the CCTV report and drilling logs have been issued to the NRW for information.

3) Dewatering of Gas Wells

Pneumatic pumps have been installed within GW's 37, 35 and 41. In addition an electric submersible pump has been installed within GW 43. Recharge rates are being noted and gas yields from the wells monitored to see if they respond accordingly.

Plate 8: Pneumatic pump kit in GW37

4) Gas Field Monitoring

It is also worth mentioning that Cory have employed a new gas field technician from October 2014, to provide additional resources for the Gas Team, and ensure all gas field monitoring date is interrogated to ensure extraction is maximised at the site. As part of this process all well ID's at Hafod have been reviewed and the new ID's clearly marked on all wells, manifolds and leachate infrastructure. A new as-built plan has been produced and sent to the NRW to aid any further gas field auditing.

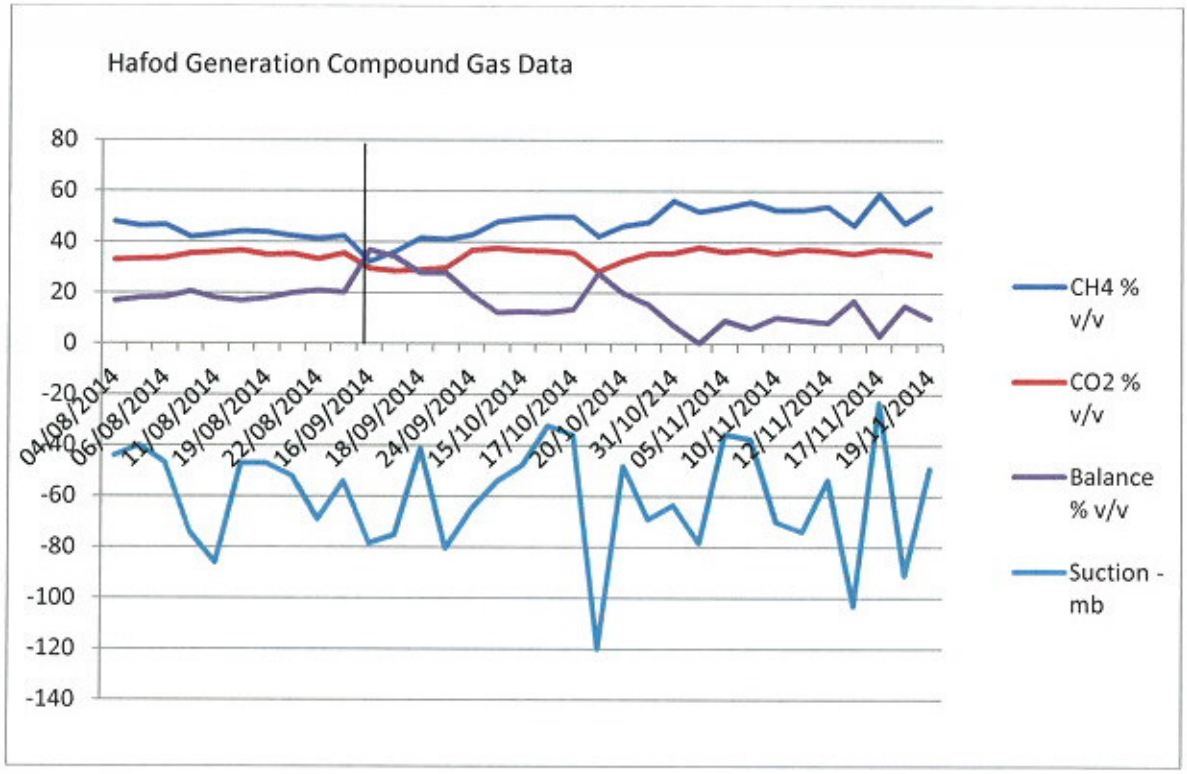
Over the last few months significant effort has gone into re-routing gas collection pipework to remove any potential for condensate accumulation within the pipes preventing the flow of gas. Gas wells have been raised and clay bunds constructed to ensure all pipe falls are towards the manifolds. Any other repairs necessary are also recorded by the technicians and any remedial actions taken in the shortest possible timescale.

Plate 9: Manifold 4 pipework

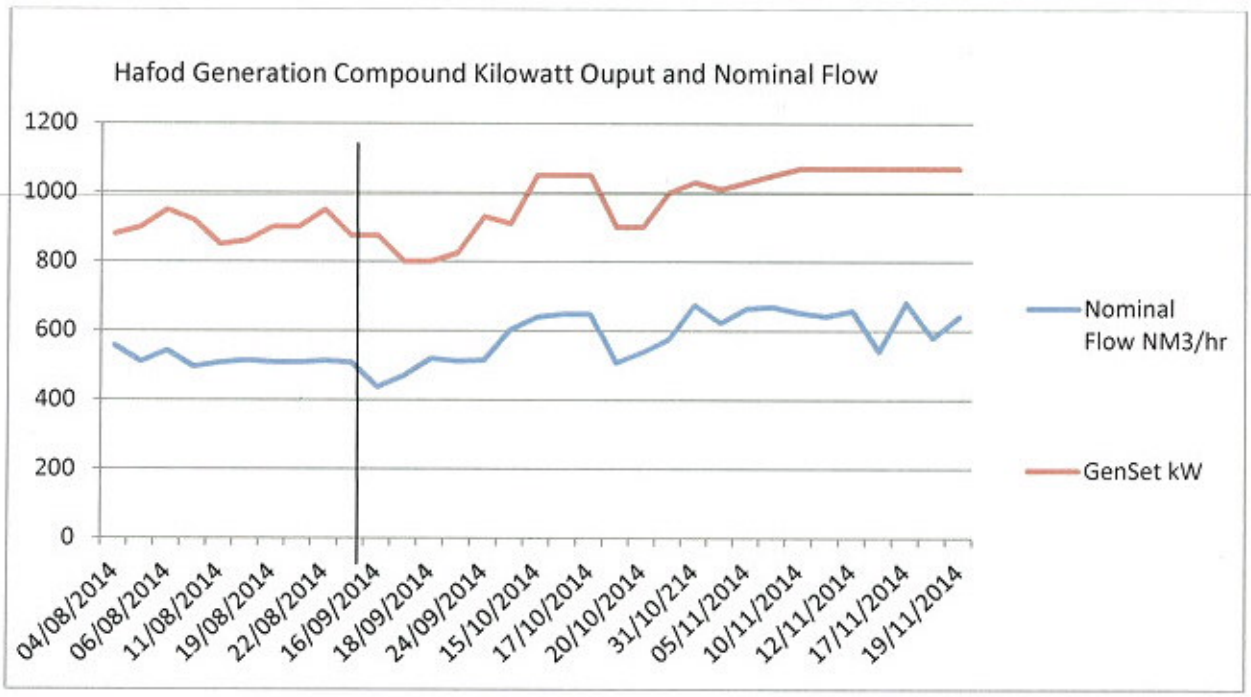
5) LFG Engine Compound and Generation

The newly installed gas wells were added to the gas collection system over a three week period, with the first gas readings taken on 16th September. The graphs below show what effect these additional wells had on gas quality, site vacuum and kilowatt output.

Issues with a site KOP pump distort the readings slightly however, works are scheduled to reduce the impact of the "Hafod trifle".



The graph below demonstrates the nominal flow and the Average Kilowatt output of the site.



Proposals for Continued Improvement

1) **Permanent Capping of Cells 1 and 2**
An area of 6,000m^2 on Cells 1 and 2 is now up to final tipping level and once weather conditions allow will be available to permanently cap with engineered clay. This will assist in reducing odours and leachate generation, whilst also improving the overall visual appearance of the site. We have covered the area up to levels with intermediate cover and just need a period of very cold or dry weather, to allow us to begin this capping. Expected timescales for completion of these works are approx. 3 weeks.

Plate 10: Area to be capped on Eastern side of Cells 1 and 2.

2) **Installation of approx. 12 new pin wells in Western area of Cell 3 (see attached proposal drawing HAF107)**
On the Western most side of Cell 3, where current tipping operations are taking place, there is a lack of active gas extraction. We are proposing to install a number of 6 metre depth pin wells with an auger, based upon a 20 metre grid pattern. The exact location of these pins will be largely dependent on available areas whilst tipping continues, however, drawing HAF107 gives an indication of the intended locations.

To connect these pin wells to the gas extraction system we will extend the 180mm gas main that sits above the temporary capped area, down to a low point within Cell 3, in order to effectively drain any perched liquid within the pipework. Manifold 7 will be relocated to this point and a new KOP installed to dewater the pipework. Timescales for the completion of this work will be within the next two months.

3) **Extension of the Gas Collection Ring Main**
On completion of tipping operations against the Western Sidewall of Cell 3, we intend to extend the main gas ring main along the perimeter of the sidewall and access road. This will enable more permanent gas infrastructure to be installed into this area, such as deeper drilled gas wells or additional sacrificial wells. Timescales for this work will be largely dependent on waste input rates but we would expect to have this in place before the end of summer 2015.