



INDEPENDENT CLOSURE AUDIT

FINAL REPORT

Prepared for:

Diageo Great Northern Brewery

(Industrial Emissions Licence No. P0440-01)

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1 INTRODUCTION

1.1 Scope of Report

This report by Byrne Ó Cléirigh covers the second stage of a two-stage Independent Closure Audit carried out at Diageo Ireland (trading as The Great Northern Brewery), Carrick Road, Dundalk, Co. Louth, ref. Industrial Emissions Licence No. P0440-01. The Great Northern Brewery ceased operations permanently in September 2013.

The audit was conducted on the implementation of the Closure, Restoration and Aftercare Management Plan (CRAMP) which the company submitted to the Environmental Protection Agency (EPA) under its application for surrender of the licence.

At a meeting held between the Agency and Diageo at EPA Offices in Clonskeagh, Dublin on 7th May 2014 it was put forward by Diageo that the Closure Audit for the site would be conducted in two stages. The first stage would cover all of the activities on site and all of the environmental issues except for soil and groundwater issues, in particular areas of current environmental concern, viz: (i) soil/groundwater contamination at the Generator Building, designated AEC6; (ii) elevated chloride levels in groundwater at borehole BHA; and (iii) elevated COD levels in groundwater at borehole BHC. An interim report would be issued on completion of the first stage of the audit. The second stage of the audit would be carried out after the outstanding areas of environmental concern had been resolved to the satisfaction of the Agency. A final report would be issued at that stage, which would update the interim audit report.

The interim audit report, BÓC ref no. 287-X228, was submitted to the Agency on 9th June 2014. At a meeting held between the Agency and Diageo at EPA Offices in Clonskeagh, Dublin on 12th June 2014, Diageo informed the Agency that in their opinion, and in the opinion of their advisers, the three outstanding areas of environmental concern noted above could now be closed out, and that Diageo would arrange for the report on the Independent Closure Audit to be finalised to update the interim report and include the second stage of the audit. The report contained herein covers both stages of the Closure Audit.

1.2 Brewery History

Brewing commenced on the Carrick Road site in 1897 when the Great Northern Brewery (GNB) was established. The Brewery was purchased by Guinness in 1959 and converted to a lager brewery. The company's name was changed to the Harp Lager Brewery and the first Harp Lager was brewed at the site in 1960. In 1997, the Brewery, along with its sister companies in the Guinness Group, became part of the Diageo Group. The company's name was subsequently changed to Diageo Ireland (trading as The Great Northern Brewery).

The Great Northern Brewery was granted an IPC Licence in May 1999. The licence was changed to an IPPC Licence by technical amendment in 2005. In December 2013, the licence was changed to an Industrial Emissions Licence.

A location map and site layout drawing for the Brewery is contained in Attachment 1.

1.3 Site Closure

In January 2012, the Brewery informed the EPA in writing that Diageo had announced that they proposed to cease production at the Great Northern Brewery and close the plant with effect from July 2013, with this date subject to amendment as it was dependent upon a New Brewhouse being built at Diageo's St. James's Gate in Dublin.

The Brewery submitted a formal application for surrender of its licence to the Agency on 14th June 2013. The application included a CRAMP and a scope for the Independent Closure Audit. Production operations at the Great Northern Brewery ceased permanently on 30th September 2013 and the Agency was informed by letter dated 15th October 2013.

Following a meeting with the Agency on 4th November 2013, Diageo submitted an updated CRAMP and an updated scope for the Independent Closure Audit to take into consideration information regarding potential end-users of the site and updated information regarding areas of environmental concern on the site, which had been the subject of detailed quantitative risk assessments. A further update of the CRAMP and audit scope was submitted to the Agency on 26th May 2014 to take account of the developments regarding the current areas of environmental concern as noted in Section 1.1 above.

1.4 Current Activities on Site and Future Use

Diageo have advised the Agency that they have concluded contracts for the sale of the Great Northern Brewery site, complete with buildings, plant, utilities and services, to a company controlled by Mr. John Teeling, formerly of Cooley Distillery, and that the sale is agreed but is contingent on the successful the surrender of the IE licence. The new owner intends to convert the brewery into a distillery using the existing brewhouse and vessels to produce a feedstock which will then be distilled on site. It is understood that the whiskey production plant will be subject to an application for an IPC/IE licence by the new owner.

The northern half of the site, generally comprising the newer fermentation block and storage areas, will not be required for the distillery operation. The current plan of the new owner is for this part of the site to be leased to a company who will produce lactic acids from materials such as lactose whey and brewers' grains.

2 SCOPE OF AUDIT

A copy of the scope for the Independent Closure Audit submitted to the Agency is contained in Attachment 2 to this report.

The audit was conducted by Ambrose Clarke, BE, C. Eng, FIEI of Byrne Ó Cléirigh Consulting. A number of inspection visits were made to the site in the course of the audit: on 16th & 18th December 2013, on 29th January 2014, on 9th & 19th May 2014 and on 18th June 2014.

Following the inspection visits, a list of actions arising from the inspection was prepared by the auditor for GNB. These actions related, primarily, to cleaning and waste removal activities. Progress on implementing these actions was checked during the follow-up inspection visits.

The following Diageo personnel were present during various stages of the inspection visits:

Mr. James Huey, Compliance Manager
Mr. Declan Grennan, Engineering Manager
Mr. Sean Cunningham, Site KDR
Ms Katie Cartwright, Systems Administrator
Mr. Noel Connolly, Finance Manager
Mr. David White, Site Engineer

3 CRITERIA FOR SUCCESSFUL CLOSURE

The CRAMP set out a number of criteria which should be met to demonstrate successful closure of the site. The criteria relevant to this first stage of the Closure Audit were:

- Production plant and equipment was safely decommissioned using standard procedures;
- Service/utility plant and equipment in Category 1 (to be maintained in the live condition) are available to be taken over by the new owner;
- Service/utility plant and equipment in Category 2 were safely decommissioned using standard procedures;
- Wastes were handled, packaged, stored and disposed of / recovered in accordance with the appropriate conditions of the IPPC licence and the relevant waste legislation;
- Appropriate waste management records relating to the collection and disposal / recovery of wastes were retained throughout the closure process;
- Records relating to raw materials transferred off site for reuse were retained throughout the closure process;
- Records relating to the check lists used during the decommissioning of the production and services plant and equipment were retained throughout the closure process;
- Verification reports demonstrated that the objectives of any monitoring programmes and remediation works have been achieved.
- Conditions of the licence were complied with during the closure process;
- The site's EHS Management System remained in place and was actively implemented during the close down of the Brewery;
- Costs associated with the CRAMP were discharged.

These criteria were used to structure the findings of the audit in this report.

Note:

An aspect of the sale agreement for the Great Northern Brewery site is that certain services, such as refrigeration, are to be kept live for handover to the new owner. These services were termed Category 1 services in the CRAMP. Services that were to be decommissioned as part of the CRAMP were termed Category 2. These categorisations are used in the audit report.

4 AUDIT FINDINGS

4.1 Disposal of Materials

4.1.1 Production Raw Materials & Product

Stocks of production raw materials were run down in advance of the closure of the site. Stocks remaining at the cessation of production activities were transferred to other Diageo sites. Finished product remaining at the cessation of production activities was transferred to other Diageo sites.

4.1.2 Cleaning Chemicals

Stocks of chemicals, e.g. acids and caustics used for cleaning, were run down in advance of the closure of the site. Stocks remaining at the cessation of production activities were either used for cleaning during the decommissioning activities or disposed of as hazardous waste.

Certain chemicals have been left on site as part of the sale agreement for the site (see details in Section 4.2.6).

4.1.3 Laboratory Materials

Laboratory chemicals were transferred to another Diageo site or disposed of as hazardous waste. Laboratory consumables, such as glassware etc, were transferred to another Diageo site, some were given to local schools and some have been left in the laboratories for use by the new owner.

4.1.4 Engineering/Maintenance Materials

Engineering and workshop materials, such as spare parts and consumables, have been left on site as part of the sale offer for the site. Cylinder gases were returned to the suppliers. Residual lubricating oils and cleaning materials were disposed of as waste.

The residual stock of salt used for de-icing roadways and yard areas remains in the Garage for use by the new owner.

4.1.5 Office Materials

Office materials were run down in advance of closure. Remaining office materials form part of the sale agreement for the site.

4.2 Decommissioning and Disposal of Plant & Equipment

4.2.1 Production Plant

Production plant was itemized using the company's asset register and was decommissioned in accordance with a checklist system. An example of the checklist system used is attached in Attachment 3.

All production plant and the interconnecting piping were emptied, drained down, flushed/blown through as appropriate, and cleaned.

The production plant listed in Table 1 was removed from the site by Diageo.

Table 1: Removal/Disposal of Production Equipment

Plant Item	Destination
Centrifuges (2 No.)	Transferred to another Diageo site
Filter (from Filter Room)	Transferred to another Diageo site
Other equipment from Filter Room	Disposed of as scrap metal
Selected process instrumentation	Transferred to another Diageo site
Selected spare parts	Transferred to another Diageo site

All remaining production plant forms part of the sale agreement for the site.

Since the Brewery shut down, some plant and ancillary equipment have been removed /relocated from the Old Brewhouse and from the CIP Room for the Filter Room. This work was carried out by Diageo on behalf of the future owner of the site as enabling works for the redevelopment of the site as a distillery. This work is continuing as of the date of this report. See Section 4.14 for further details.

4.2.2 Services/Utilities Plant & Equipment

The Closure Plan for the site, contained within the CRAMP, identified two categories of services and utilities, viz:

Category 1: Services/utilities that would be retained live/filled for handover to the future owner as part of the sale agreement for the site.

Category 2: Services/utilities that would be fully decommissioned as part of the close down and surrender of the IE licence.

The services plant and equipment to be fully decommissioned were decommissioned in accordance with a checklist system based on the Asset Register. The decommissioning and disposal activities, and the current status on the services/utilities systems, are summarized in Table 2.

4.2.3 Workshop Equipment

Workshop equipment, e.g. lathe, drill, hydraulic press, saw, and benches etc. were cleaned of swarf and oil and left in-situ as part of the sale agreement for the site.

4.2.4 Laboratory Equipment

Some laboratory equipment was transferred to another Diageo site and some was provided to local schools. The remainder has been left in-situ as part of the sale agreement for the site. This equipment includes two gas chromatographs which have licensed radioactive sources – see also Section 4.10.

Table 2: Decommissioning Activities and Status of Services Plant & Equipment

System	Description of works carried out	Current status
Steam generation & distribution	Boilers were shut down and drained. Desiccant was added to protect tube bundles from corrosion. Condensate system was drained.	System is decommissioned. A pallet of salt (in 20 kg bags) for use for softening boiler feed water is stored in the Boilerhouse
Natural gas distribution	Gas supply lines to boilers were isolated and lines were vented at burners. Gas supply to site was isolated at the incoming skid. Residual gas in distribution line on site was draw down via the Canteen boiler.	System is decommissioned.
Electrical supply & distribution	Power supplies to equipment were isolated at sub-distribution boards.	Essential electrical services are live, e.g. power to water pumps, extract fans, lighting, monitoring and alarms.
Towns water supply	Towns water head tanks in New Block were drained down.	Towns water reservoir is full. Water ring main, which is fed from reservoir, is live.
Brewing water supply/water treatment	None	Brewing water reservoir and brewing water head tank are full. System is live as it supplies the firewater main.
CIP systems in	CIP chemicals tanks and distribution pipelines were drained and flushed	Systems are decommissioned.
Ammonia refrigeration	Systems (4 No.) were shut down and isolated. Oil separators were drained down and the vapour side of refrigeration plants was vented into IBC of water. Cooling towers were drained down.	Ammonia systems are charged, shut down and isolated. Compressors contain lube oil. Systems are available for use by new owner but will require re-commissioning. Ammonia detection systems are active.
IMS refrigeration	System was shut down and isolated.	IMS system is charged, shut down and isolated. System is available for start-up by new owner.
CO ₂ Collection	CO ₂ collection system was vented.	System is depressurised and isolated. Compressors contain lube oil. System is available for use by new owner.
Air conditioning & refrigeration/cooling units	Units containing CFC and HCFC refrigerants (R12 and R22) were de-gassed.	Units containing HFC refrigerants are available for use by new owner. See also Section 4.8
Bulk nitrogen	Bulk nitrogen and evaporator system was returned to the supplier	System is decommissioned.

System	Description of works carried out	Current status
Compressed air	Compressed air systems were depressurised and vented.	Systems are shutdown, depressurised and isolated. Compressors contain lube oil. Systems are available for use by new owner.
Oil storage & distribution	Residual oil in two old oil storage tanks was drained down and tanks were cleaned. Oil distribution line from active diesel tank (small double-skin tank inside main oil storage bund) was drained down and isolated at the tank. Concrete floor in bund was cleaned.	Diesel oil storage tank contains oil. Tank is isolated and banded and is available for use by new owner.
Effluent pH balancing	Effluent pH balancing sump was pumped out and sludge was removed. The dosing chemicals tanks (acid and caustic) were isolated.	The pH balancing system is shut down. The chemicals used for pH balancing (sulphuric acid and caustic) are awaiting transfer to Diageo's Dublin Brewery. See also Section 4.2.6. There is some build-up of sludge in the sump since it was cleaned in December 2013. See also Section 4.3.1.
Effluent monitoring	Chemicals used for instrument calibration were removed and disposed off as waste. TOC meter on discharge was removed and shipped to another Diageo site. Sump at flow monitoring flume and channel at pH monitoring station at final discharge were pumped out and sludge removed.	System is decommissioned. There is some build-up of sludge in the sump and channel since they were cleaned in December 2013. See also Section 4.3.2.
LPG	None	The contents of the small 1,400 litre tank of LPG are being run down for fuelling the fork lift trucks on the site. The tank, and two LPG cylinders beside the tank, will be removed by the fuel supplier prior to surrender of the licence or when they are empty (if sooner).
Fire suppression systems	None.	Systems are charged and available for use.

4.2.5 Services Equipment Removed from Site

A list of the services equipment removed or to be removed from the site as part of the close down of the facility is given in Table 3.

Table 3: Removal/Disposal of Services Equipment

Item	Destination
TOC meter on effluent discharge	Transferred to another Diageo site
Bulk nitrogen system	Returned to supplier
LPG tank and cylinders at pH balancing plant	To be returned to supplier (see also Table 2)
Some laboratory equipment	Transferred to another Diageo site; given to local schools

4.2.6 Oil and Chemicals Remaining on Site

A summary list of the chemicals and oil, which will remain in place as part of the sale agreement for the site, is given in Table 4.

Table 4: Summary of Oil and Chemicals Remaining on Site

Location	Function	No. Tanks	Contents
Oil Storage Bund	Fuel for forklift trucks	1	Diesel (~650 l)
Garage	Yard de-icing	n/a	Salt in 20-25 kg bags (~5.5 tonne)
Boilerhouse	Water softening	n/a	Salt in 20 kg bags (~220 kg)

As noted previously, in Table 2, the chemicals used for pH balancing of the final effluent are on site as of the date of this report. The amounts are ~ 8 tonnes of Sulphuric Acid and ~11.5 tonnes of Caustic. Diageo have advised the auditor that arrangements have been made to transfer these chemicals to Diageo St. James's Gate Brewery when the stock levels at the Dublin Brewery are able to accommodate the transfer.

4.2.7 Services Remaining Live on Site

A summary list is provided in Table 5 of the services/utilities remaining live as part of the sale agreement for the site. Further details are provided in Section 4.2.2.

Table 5: Services Remaining Live on Site

Service	Status
Electricity	Electrical supply live to main distribution boards and essential services.
Water	Towns water and brewing water supplies live.
Primary refrigeration	Ammonia system charged and isolated.
Secondary refrigeration	IMS system charged and isolated.
AC & refrigeration/cooling units	Units with HFC refrigerants are charged and available for use.
Fire suppression (FM200)	Systems charged and available for use.

4.3 Drainage Systems

4.3.1 Effluent Drains and Sumps

The effluent drains were flushed through with water on completion of the cleaning operations. The effluent sump at the pH balancing plant, the sump at the inlet to the flow monitoring flume and the open channel at the final monitoring/sampling point tank were pumped out, de-sludged and power washed. The sludge/waste water was removed for disposal off site. This cleaning/de-sludging was carried out and witnessed during the inspection visits on 16th and 18th December 2013. It was noted during the inspection on 19th May 2014 that there was some sludge build-up in the inlet sump to the flow monitoring flume, and the Auditor has recommended to Diageo that a final cleaning/de-sludging be carried out prior to the EPA's Exit Audit.

4.3.2 Surface Water Drains & Interceptor

The surface water drains on the site connect to the effluent drainage system at various points around the site. The final discharge from the site at licensed emission point SE-1 is a combined effluent and surface water discharge. The oil interceptor on the surface water drainage system was pumped out, power washed and inspected. The sludge/waste water was removed for disposal off site. This pumping out/de-sludging was carried out and witnessed during the inspection visit on 16th December 2013. The Auditor has recommended to Diageo that a final cleaning/de-sludging of the interceptor be carried out prior to the EPA's Exit Audit.

4.3.3 CCTV Survey of Drains

A CCTV survey of the drainage system on the site was carried out in September/October 2011. Defects were graded 1 to 5 using the standard nomenclature, with Grade 5 being the most significant defect. A programme of works to repair Grades 4 & 5 defects, and some Grade 3 defects, was carried out in November 2013. A follow-up CCTV survey was carried out on the repaired sections of drains between November '13 and January '14. Diageo have advised that the set of CCTV reports from 2011-2014 forms part of the sale agreement for the site.

4.4 Bunds

The bund schedule for the Great Northern Brewery lists a total of 125 bunds comprising fixed bunds, generally used for bulk storage tanks, and mobile bunds used for storage of oils and chemicals in IBCs and drums. The last round of bund testing was carried out between November 2011 and January 2012. The schedule indicates that 16 bunds failed the integrity testing at the time: nine of these were mobile bunds (bunds ref. 39, 40, 49, 50, 69, 72, 78, 79 and 116) and seven were fixed bunds (bunds ref. 14, 20, 29, 51, 55, 56 & 57).

Diageo have advised that the mobile bunds that failed the integrity testing were taken out of service; and that due to changes in detergent usage a number of the fixed bunds were no longer needed and their use was discontinued – these fixed bunds were bunds ref. 29, 51, 55 & 56.

Bund 14, containing a tank of Adjunct Alk, a boiler feedwater chemical, was replaced with a new bund following the failed test. Bund 20, the oil storage bund, had not been in use as a bund for some time as the two large diesel storage tanks in the bund had been drained down because they were no longer

required (the gas boilers are fired on natural gas); the remaining diesel storage requirement, mainly for forklift trucks, was met by a small 1,300 litre double-skin tank located within Bund 20. There is no available record of repairs being carried out to bund ref 57, containing a tank of caustic solution for CIP, which continued in service.

4.5 Underground Tanks and Pipelines

There are no underground tanks or pipelines (other than drains) on the site.

4.6 PCBs

In 2012, Diageo commissioned a survey to confirm the PCB status of the existing inventory of equipment at GNB. The survey was in response to correspondence from by the EPA dated 30 November 2011.

The report on the survey commissioned by Diageo¹ found the following:

- All 'in scope' transformers on site were found not to contain PCBs following laboratory analysis of the transformer oils, with the exception of two transformers. These two transformers, Trafo 5 and Trafo 6, were resin-cored and, as a result, could not be sampled without damaging the equipment. These two transformers were to be left in situ but labelled as potentially containing PCBs, with the intention that when the site closed down the transformers would be analysed for PCBs.
- All 'in scope' capacitors on site were found not to contain PCBs following laboratory analysis of oils or confirmation from the manufacturer.
- All 'in scope' circuit breakers were found not to contain PCBs following laboratory analysis of oils.
- A number of fluorescent lighting fixtures at GNB were deemed potentially to contain PCBs in their ballasts/capacitors on the basis that it could not be confirmed during the survey that these light fittings were installed post 1989. The total amount of PCBs contained within these fixtures, if they all did contain PCBs, was calculated to be 8.8 litres based on EPA guidance. These figures were considered conservative and the true amount of PCBs present within lighting at GNB was expected to be lower than this figure.

The two resin-cored transformers, Trafo 5 & 6 were decommissioned. On inspection by Diageo at the time of decommissioning, these two transformers were noted to be air cooled. A sample of the insulation between the windings was sent for analysis and was confirmed not to contain PCBs.

As part of the close-down activities on the site a significant number of the older light fittings were removed and disposed off as PCB-containing waste.

Diageo have advised that the report on the PCB survey forms part of the sale agreement for the site.

¹ Report on PCB Survey at Diageo Great Northern Brewery, Byrne Ó Cléirigh report ref 348-X0190, May 2012.

4.7 Asbestos-Containing Materials

An asbestos management survey, including sample analysis and risk assessments, was conducted on the site in November 2012. The survey identified asbestos-containing materials (ACMs) mainly in metal cladding, pipeline gaskets and floor tiles. The risk assessment classified the ACMs and their locations as either Priority 1 (investigate prior to disturbing), Priority 2 (remedial work required) or Priority 3 (manage in place and monitor periodically). Diageo have advised that the reports from the asbestos management survey form part of the sale agreement for the site.

4.8 Refrigerants

The status of the primary (ammonia) and secondary (IMS) refrigeration systems on the site is described in Table 2 in Section 4.2.2.

The site register for F-gases and Ozone Depleting Substances (ODS) was updated by Diageo since the interim audit report was issued. The updated register lists 63 units containing HFC refrigerants. These units comprise air conditioning units, fridges, coolers, and a dryer (for air compressors). The Register also lists 20 units that previously contained CFC (R12) and HCFC (R22) refrigerants but which have been de-gassed since the interim Audit Report was issued. The de-gassing was carried out by a contractor with a current F-gas Registration Certificate and a current Prior Annual Notification submitted to the EPA.

Eleven of the units containing HFC refrigerants have charges greater than 3 kg (the charges range from 3 to 5 kg) and are therefore subject to routine testing. These units hold current test certification.

Diageo have advised that the updated register forms part of the sale agreement for the site.

4.9 Waste Disposal

Wastes generated during the implementation of the CRAMP were disposed of using licensed waste contractors and licensed waste facilities.

As of the date of this report, the following waste skips are on site:

- 1 x skip of general waste
- 1 x skip of builders rubble
- 1 x skip of waste metal (mild steel)
- 1 x skip of waste metal (stainless steel)
- 1 x skip of waste metal (electrical copper cable)

These skips are in use currently, along with some wheelie bins, for the ongoing construction-related works which Diageo are carrying out on behalf of the future owner of the site as enabling works for the redevelopment of the site as a distillery. See Section 4.14 for further details.

During the inspection visit on 18th June 2014 the following wastes were on site ready for collection by waste contractors:

- Bitumen in two half-barrels in Middle Engine Switchroom;
- Residual chemical (Performax 3400) from tank in Cooling Room;
- Caustic in 25-litre drum in New Block CIP Room;
- IBCs of oil/ammonia water from drain-down/venting of refrigeration systems;
- Drum of oil-contaminated waste (plastic gloves, etc.) at AEC6;
- Removed light fittings and old fluorescent tubes.

Arrangements for the removal of these wastes are in hand by Diageo as of the date of this report.

4.10 Radiation Sources

Diageo hold a licence from the RPII for the custody of the two radiation sources in the gas chromatographs in the Laboratory. This equipment forms part of the sale agreement for the site. Diageo have completed the following forms in respect of the licence: (i) *Industrial Section Schedule 2 Amendment Application Form – Sealed/Unsealed Sources*, and (ii) *Schedule 3 Amendment Application Form – Personnel*, and these forms are awaiting submission to the RPII on conclusion of the sale of the site.

4.11 Compliance with Licence Conditions

4.11.1 Historical Compliance

A review of the EPA Site Inspection Reports, Audit Reports and correspondence over the past five years prior to the closure of the site was undertaken to see if there were any outstanding corrective actions that could be material to the successful closure of the site. There were no open corrective actions.

4.11.2 Compliance during implementation of the CRAMP

The Great Northern Brewery operated their EHS management system to the extent that was practicable during the implementation of the CRAMP. There was no monitoring of emissions to air once the operations on site ceased. Effluent pH balancing and daily effluent monitoring at SE-1 continued until December 2013. The AER for 2013 was submitted to the Agency in March 2014.

On 13th December 2013, the Agency approved a request from Diageo for an amended monitoring regime for discharges at SE-1 in view of the cessation of production operations and the completion of decommissioning and cleaning operations. The amended monitoring regime, which entails grab sampling every two weeks and testing for selected parameters, is being implemented as part of the aftercare monitoring on the site. The Agency's approval for the amended monitoring regime was renewed on 11th March 2014 for a 3-month period from 13th February 2014. Diageo applied for a further extension on 13th May 2014, which was approved by the Agency on 11th June 2014. The monitoring results to date from the amended monitoring regime are all within the licence limits. The results are presented in Table 6.

Table 6: Monitoring Results for Effluent Emission Point SE-1 (2014)

Date of Sample	pH	COD (mg/l)	SS (mg/l)
06/01/2014	7.5	<5	3
21/01/2014	7.4	10	5
06/02/2014	-	32	<2
17/02/2014	7.3	17	7
24/02/2014	7.3	11	4
10/02/2014	7.4	5	5
18/03/2014	7.5	20	4
31/03/2014	-	5	2
14/04/2014	7.6	11	<2
28/04/2014	7.3	263	5
12/05/2014	7.3	82	3
27/05/2014	7.1	14	5
09/06/2014	7.3	7	4

4.12 Review of Records

4.12.1 Records for Disposal of Materials and Equipment

Records of the disposal of materials, plant and equipment were maintained during the closure period. A sample of these records was reviewed during the audit and the records were satisfactory.

4.12.2 Waste Management Records

Waste management records were maintained during the closure period. A sample of waste management records were reviewed during the audit visits. At the time of writing this report, the waste record is incomplete as some follow-up documentation for consignments taken off site is awaited from waste contractors.

4.13 Soil & Groundwater

4.13.1 Site Assessment

The CRAMP described the Preliminary Site Assessment (PSA), the Detailed Site Assessments (DSA), the Generic Quantitative Risk Assessments (GQRA) and the Detailed Quantitative Risk Assessments (DQRA) which were carried out as part of the closure of the GNB site and the surrender of the licence. The PSA identified thirteen Areas of Potential Environmental Concern across the site. Following the completion of DSAs and GQRAs, two of these areas were identified as Areas of Environmental Concern, with the other potential areas of concern assessed as indicating insignificant risks to human health and controlled waters. The two Areas of Environmental Concern were designated AEC7 (Former Maintenance Garage and Pit) and AEC6 (Redundant Standby Generator and Sump) and. The contamination in each case was petroleum hydrocarbons.

Two other areas of environmental concern were identified following the submission of the report on the annual round of groundwater monitoring to the Agency in November 2013. These related to elevated chloride levels at borehole BHA and elevated COD levels at borehole BHC.

4.13.2 AEC7: Former Maintenance Garage and Pit

A DQRA and updated DQRA for AEC7 were submitted by Diageo to the Agency on 11th July 2013 and 9th December 2013, respectively. The conclusions of the DQRAs were that the contaminants of concern reported in soil and groundwater underlying AEC7 present an insignificant risk at the 28 m compliance point agreed with the Agency for this AEC. The report concluded that no further works are considered to be required to assess or remediate identified contaminants of concern in soil or groundwater in AEC 7 and it is no longer considered to be an area of environmental concern.

At the meeting between Diageo and the Agency on 31st January 2014 the Agency confirmed that it had no further comments on the DQRA for AEC7.

4.13.3 AEC6: Redundant Standby Generator and Sump

The soil and groundwater contamination at AEC6 was remediated by Diageo following approval by the Agency of Remedial Options Assessments and a Corrective Action Design & Implementation Plan. The remediation works were carried out between 17th April and 9th May 2014 and were followed by aftercare monitoring of the groundwater as specified in the plan.

The Corrective Action Implementation & Verification Report for AEC6, prepared by URS Ireland, is contained in Attachment 5 to this audit report.

The conclusions of the Corrective Action Implementation & Verification Report are that the objectives of the corrective action programme have been met; that AEC6 is no longer considered an area of environmental concern; and no further works are considered to be required.

4.13.4 Elevated Chloride Levels at Borehole BHA

Diageo have provided a number of reports to date on the elevated chloride levels at BHA at the request of the Agency. Attachment 6 to this audit report contains the Close-out Report for BHA, prepared by URS Ireland. This report provides the background to the issue, up-to-date monitoring results' tables and graphs, and an assessment of the results.

The conclusions of the Close-out Report for BHA are that given that elevated chloride concentrations detected in groundwater at site are localised to BHA, that concentrations are decreasing both in BHA and in cross- and down-gradient wells, and that an insignificant risk has been identified to human health on-site or to potential down-gradient groundwater receptors, no further action is recommended in relation to the chloride in groundwater at BHA. Accordingly, groundwater in the area of BHA is not considered an area of environmental concern, and URS consider this issue to be closed out.

4.13.5 Elevated COD Levels at Borehole BHC

Diageo have provided a number of reports to date on the elevated COD levels at BHC at the request of the Agency. Attachment 7 to this audit report contains the Close-out Report for BHC, prepared by URS Ireland. This report provides the background to the issue, up-to-date monitoring results' tables and graphs, and an assessment of the results.

The conclusions of the Close-out Report for BHC are that given that alcohols are no longer detected at BHC and COD concentrations have significantly decreased and are not detected at elevated concentrations immediately down-gradient of this well, no further action is recommended. Accordingly, groundwater in the area of BHC is not considered an area of environmental concern, and URS consider this issue to be closed out.

4.13.6 Groundwater Monitoring Results

In its Request for Information to Diageo dated 21st January 2014, the Agency requested that quarterly groundwater monitoring be completed at specified monitoring wells on the site including all the wells covered by the routine annual groundwater monitoring survey and selected wells in the vicinity of AEC6.

This quarterly monitoring survey was carried out in February and June 2014. A copy of the report for the June 2014 survey, which also includes the results for the February 2014 survey, is contained in Attachment 8 to this audit report. The report summarises the results and findings for the three areas described earlier, i.e. AEC6, BHA and BHC, and concludes also that no appreciable changes or patterns in groundwater chemistry has been observed in down-gradient monitoring wells, which could be attributable to AEC6, BHA and BHC.

4.13.7 Decommissioning of Groundwater Monitoring Wells

Currently, all the groundwater monitoring wells are operational. At the meeting between Diageo and the Agency on 12th June 2014, Diageo requested the Agency's guidance on leaving the monitoring wells in place or decommissioning some or all of them. It was agreed that Diageo would submit a proposal to the Agency for decommissioning selected wells on the site, taking into consideration the potential use of the monitoring wells by the new owner of the site. Diageo have advised the auditor that they will decommission whichever monitoring wells are agreed should be decommissioned.

4.14 Current Works on Site

As noted in Sections 4.2.1 and 4.9, Diageo are carrying out construction-related works on the site on behalf of the future owner; these are enabling works for the redevelopment of the site as a distillery. The works, which are in progress as of the date of this report, are being carried out in the Old Brewhouse and in the CIP Room for the Filter Area. The works include:

- Removal of some building works, e.g. concrete bases, structural steel frames;
- Preparation of rooms in existing buildings for fitting out at a later date;
- Removal/relocation of some process vessels and removal of/modifications to process piping;
- Removal of/modification to mechanical and electrical services.

4.15 Aftercare Management

The Great Northern Brewery site is being serviced and monitored until the conclusion of the sale and the handover of the site to the new owner. Currently, this aftercare management comprises:

- 24-hour security;
- Routine visual inspections of live systems (ammonia, IMS, water, electricity);
- Pest control;
- Gardening.

The following aftercare monitoring is continuing while the Agency requires it to be undertaken:

- Monitoring of discharges at SE-1;
- Groundwater monitoring.

4.16 Site Inspections

Site inspections were carried out by the auditor on 16th & 18th December 2013, 29th January 2014, 9th & 19th May 2014, and 18th June 2014. Following the visits a list of actions arising from the inspection was prepared by the auditor for Diageo. These related, primarily, to cleaning and waste removal activities. Progress on completing the lists of actions was checked during the follow-up inspection visits. The inspections included the following activities:

- A review of the decommissioning checklists for production plant and services/utilities systems;
- A visual inspection of the internals of the vessels and tanks on the site to check they had been drained and cleaned. Not all vessels were inspected internally – where there was a multiple of the same type of vessel, e.g. fermentation vessels and storage vessels, a representative sample of the vessels was inspected.
- A check that pipelines had been drained by inspection of a sample of pipeline disconnections;
- A visual inspection of the internals of the raw materials (grain) handling equipment to check that they were clear of grain and dust.
- A visual inspection of the redundant equipment in the Main Brewery and the Old Brewhouse.
- A visual inspection of the yard areas including an internal inspection of the spent grains silos and the redundant oil storage tanks in the upper yard.
- A visual inspection of the sumps at the effluent pH balancing and monitoring systems, and the interceptor on the surface water drainage system.
- An inspection of waste collection areas.
- A visual inspection of production areas, offices, laboratories, boilerhouse, cooling rooms and other plant rooms, workshops, stores areas, canteen and Brewmaster's House.
- A review of the documentation relating to the run-down/disposal of raw materials, and the collection and disposal of wastes.

As of the date of this report the outstanding tasks relating to the decommissioning activities and the findings of the inspection visits are as follows:

1. Transfer of caustic and acid from pH balancing plant as noted in Section 4.2.6
2. Removal of LPG tank and cylinders as noted in Section 4.2.5
3. Removal of final quantities of hazardous and non-hazardous wastes as noted in Section 4.9.
4. Final waste management documentation for waste consignments taken off site as noted in Section 4.12.2.

4.17 Discharging Costs of the CRAMP

Diageo have discharged those costs of the CRAMP that could be discharged up to the date of this report. Of necessity some accounts relating to the CRAMP remain open at this stage, such as payment for collections of wastes for disposal, for aftercare monitoring, and for professional services. These costs will be settled by Diageo in due course. Confirmation that all accounts relating to the CRAMP will be discharged was provided to the auditor by the Diageo Operations Director who is responsible for the Great Northern Brewery and who will oversee the settlement of the final accounts.

5 AUDIT CONCLUSIONS

The conclusions of the Closure Audit carried out by Byrne Ó Cléirigh at the Great Northern Brewery, supported by the soil and groundwater assessments carried out by URS Ireland and the outcomes of remediation works that have been undertaken, are:

1. The Closure Plan was implemented in accordance with the requirements set out in the CRAMP.
2. Certain services have been left charged as part of the conditions for the sale of the site and these are noted in the audit report. These services are isolated and secured. All other plant and equipment have been decommissioned satisfactorily with the exception of the sulphuric acid and caustic tanks used for pH balancing and an LPG storage tank. These items are noted in the report and Diageo have arrangements in place to transfer the pH balancing chemicals to their Dublin Brewery site and to run-down the remaining LPG for fuelling the fork lift trucks which are in use on the site.
3. Small quantities of wastes remain on site awaiting collection for disposal, and waste records are pending for some waste consignments taken off site to date. These are noted in the report.
4. Areas of environmental concern identified in the course of the groundwater monitoring and site investigations carried out as part of the closure of the site have been closed out. No further remedial action is considered to be required at the site in respect of soil and groundwater.
5. The groundwater monitoring wells are still operational. A decision on retaining some or all of the groundwater monitoring wells – to make them available for use by the new owner of the site – will be made by Diageo in consultation with the EPA.
6. Appropriate aftercare management is in place for the site.
7. Criteria for successful closure set out in the CRAMP have been achieved as noted in Table 7 overleaf.

Table 7: Criteria for Successful Closure

Criteria for Successful Closure	Audit Finding
Production plant and equipment was safely decommissioned using standard procedures.	Criteria achieved
Service/utility plant and equipment in Category 1(to be maintained in the live condition) are available to be taken over by the new owner.	Criteria achieved
Service/utility plant and equipment in Category 2 were safely decommissioned using standard procedures	Criteria achieved (subject to Conclusion 2)
Wastes were handled, packaged, stored and disposed of / recovered in accordance with the appropriate conditions of the licence and the relevant waste legislation	Criteria achieved (subject to Conclusion 3)
Appropriate waste management records relating to the collection and disposal / recovery of wastes were retained throughout the closure process	Criteria achieved (subject to Conclusion 3)
Records relating to raw materials transferred off site for reuse were retained throughout the closure process	Criteria achieved
Records relating to the check lists used during the decommissioning of the production and services plant and equipment were retained throughout the closure process	Criteria achieved
Verification reports demonstrated that the objectives of any monitoring programmes and remediation works have been achieved	Criteria achieved
Conditions of the licence were complied with during the closure process	Criteria achieved
The site's EHS Management System remained in place and was actively implemented during the close down of the Brewery	Criteria achieved
Costs associated with the CRAMP were discharged	Criteria achieved (see Section 4.17)

Based on the findings of the Detailed Site Assessments and the Detailed Quantitative Risk Assessments for the site; based on the outcomes of the monitoring programmes and remediation works carried out on the site; based on the declaration from URS Ireland contained in Attachment 4 to this report; and based on the findings of the Independent Closure Audit, we state our opinion: that the condition of the site at the time of the completion of this report is not causing or likely to cause environmental pollution; and that subject to the completion of outstanding tasks as listed in Section 4.16 of this report, the site of the activity is in a satisfactory state and all known environmental liabilities have been addressed.

Signed on behalf of Byrne Ó Cléirigh Consulting



Ambrose J. Clarke BE, CEng., FIEI
 Director

Attachment 1: Site Layout Drawing

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Attachment 2: Scope of Independent Closure Audit

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Diageo Great Northern Brewery

Carrick Road, Dundalk, Co. Louth

IE Licence Register No. P0440.01

Updated Scope for Independent Closure Audit for Surrender of IE Licence

1. Introduction

This document sets out the scope for the Independent Closure Audit at Diageo Great Northern Brewery, Carrick Road, Dundalk, Co. Louth, to be conducted as part of the surrender of IE Licence Register No. P0440-01.

Diageo has notified the EPA of the decision to close down brewing operations on the Great Northern Brewery site and to surrender the IPPC licence for the activity. Production on the site ceased in September 2013 and the site closed down at the end of December 2013. Diageo has completed contracts for the sale of the Great Northern Brewery site to a company that plans to convert the brewery into a distillery as soon as possible. The sale is agreed but is contingent on the successful surrender of the IE licence.

Diageo has prepared a Closure, Restoration and Aftercare Management Plan (CRAMP) for the site, which was submitted to the EPA with the application for surrender of the IPPC licence. An updated CRAMP, incorporating information on the new owner and the future use of the Great Northern Brewery site, and updated information on areas of environmental concern on the site, will be submitted to the Agency with this updated scope for the Closure Audit.

The *Application Form for Surrender of Licence*, published by the EPA in August 2011, requires that an Independent Closure Audit be carried out by a competent, adequately qualified and experienced person, and that the scope of the audit be agreed with the Agency. Diageo Great Northern Brewery has appointed independent consultants Byrne Ó Cléirigh Ltd. to carry out the Closure Audit and to manage the inputs from specialist hydrogeologists URS Ireland Ltd. into the soil and groundwater assessments for the audit report.

2. Scope of Audit

The scope of the Closure Audit will take into account the guidance contained in the checklist in Attachment 2 to the *Application Form for Surrender of Licence*. The following is the proposed scope of the audit.

Decommissioning

- Review and assess the records relating to decommissioning of the facilities on the site in accordance with the details and checklist procedure set out in the CRAMP. The scope of the review will include removal/disposal of the following: production raw materials, non-production materials (e.g. consumables), production plant & equipment, and services plant & equipment.
- Assess the status of any service/utility that is to remain live on closure as part of any sales agreement with the new owner of the site, as provided for in the CRAMP.
- Review and assess the waste management records relating to all the waste streams generated on the site both during normal operations prior to closure and from the decommissioning activities.
- Review and assess the records relating to the emptying and cleaning of the plant and equipment, bunds, sumps and drains, and the disposal of the residues / wastes from these items / areas.
- Review and assess records relating to the inspection, removal and disposal of any asbestos containing materials, PCBs and refrigerants, and check the status of any such materials that may be remaining on the site.

Soil & Groundwater Assessment

As part of the preparation and updating of the CRAMP, Diageo commissioned a Preliminary Site Assessment (PSA), Detailed Site Assessments (DSA) and Detailed Quantitative Risk Assessments (DQRA) for the Great Northern Brewery site. The PSA and DSA were undertaken in accordance with the EPA's draft 2012 framework document entitled "*Framework for Management of Contaminated Land and Groundwater at EPA Licensed Facilities*", while the DQRAs were undertaken in accordance with the EPA's 2013 guidance document entitled "*Guidance on the Management of Contaminated Land & Groundwater at EPA Licensed Sites*". Subsequently, at the request of the Agency, Diageo commissioned a Remedial Options Assessment and a Corrective Action Design & Implementation Plan to deal with soil/groundwater contamination on the site. The latter was prepared in accordance with the relevant sections of the Agency's template entitled "*Guideline Template for Corrective Action Feasibility & Design Report for the Environmental Protection Agency*".

The audit will review and assess the implementation of the recommendations from the site assessments, the DQRAs, the corrective action plans and the most recent groundwater monitoring results. It will assess the findings of verification monitoring and verification reports prepared on completion of corrective action plans.

Site Inspection

A comprehensive inspection of the site will be carried out as part of the audit, with particular emphasis on any areas of previous or potential contamination, and the findings will be documented in the Closure Audit Report.

Licence Compliance

A review of the non-compliances issued by the EPA for the facility over the past 5 years will be carried out to determine if any corrective actions are outstanding that may be material to the closure of the site.

Aftercare Management

The audit will assess the suitability of the proposed Aftercare Management Plan in the CRAMP in light of the implementation of the CRAMP, the outcome of the DQRAs, the outcome of remediation works, the outcome of the inspection of the site, the results of the groundwater monitoring, and the future use of the site.

Verification of Criteria for Successful Closure

The implementation of the CRAMP will be reviewed and assessed against the criteria for demonstrating successful closure of the site, which are set out in the CRAMP.

3. Timescale & Reporting

It is planned to carry out the Independent Closure Audit in two stages. The first stage will cover all of the activities relating to the site which are above-ground, i.e. it will not cover ground and groundwater issues. An interim report will be issued on completion of the first stage of the audit. It is planned to conclude this stage of the audit and issue the interim report to the Agency before end of May 2014.

The objective of conducting the Closure Audit in two phases is to allow Diageo respond to any Requests for Information from the Agency at the earliest possible time and thus help to expedite the licence surrender process.

The second stage of the audit will cover soil and groundwater issues and, in particular, the close-out of the outstanding areas of environmental concern which Diageo are progressing with the Agency currently. A final report will be issued on completion of the second stage of the audit, which will update the interim audit report. It is hoped that this final report will be issued to the Agency before the end of June 2014.

The final report will contain a declaration on the condition of the site in respect of environmental pollution and environmental liabilities as required under the Agency's guidance for scoping the audit.

4. Auditors

The Independent Closure Audit will be conducted by Byrne Ó Cléirigh Ltd. Byrne Ó Cléirigh is an independent firm of engineering and management consultants specialising in the Energy, Environmental and Risk Management areas since 1981. Byrne Ó Cléirigh has carried out numerous environmental audits and risk assessment projects, including due diligence, environmental impact assessment, site investigation and remediation, risk assessment including quantitative risk assessment, and licensing and permitting. Byrne Ó Cléirigh has particular expertise in the brewing sector. The company is wholly owned by the senior professional staff and has no commercial or financial links with any other body.

The audit team will be led by Ambrose Clarke B.E, C.Eng, FIEI, who is a Director of Byrne Ó Cléirigh and an experienced Environmental Auditor. He will manage the input into the audit from URS Ireland who have prepared the PSA, DSAs, DQRAs and Corrective Action Plans for the site. The URS team will be led by Sinéad Fitzpatrick B.A, M.Sc., who is a Principal Environmental Scientist with URS.

Diageo Great Northern Brewery
Carrick Road, Dundalk, Co. Louth

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Attachment 3: Sample Decommissioning Checklist

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Equipment List (by System/Area)		Equipment Details				Services							Status							Sign-off								
ID	Description	Type	Year	Qty	Code	Gas	Electricity	Oil /hydraulics	Pneumatics	Ammonia	IMS/Water	Water	[Other...]	Equipment Drained	Equipment Cleaned	Services Isolated	Services Purged	Services Drained	Services Cleaned	Services Left 'Live'	Status	Equipment Destination	Destination (for Sale or Transfer)	Checked by	Date	Signed off by	Date	
1	System / Area #1 (Malt Intake)																											
1.1	Dust Extraction System					N/A	Yes	N/A	Yes	N/A	N/A	N/A	N/A	Yes	N/A	N/A	N/A	N/A	N/A	Yes	Completed	Left in situ		Sean Craven	03-Oct-13	Declan Grennan	03-Oct-13	
1.2	Pit					N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Yes	Yes	N/A	N/A	N/A	N/A	N/A	Completed	Left in situ		Robbie O'Hagan	09-Oct-13	Declan Grennan	09-Oct-13	
1.3	Conveyors					N/A	Yes	N/A	Yes	N/A	N/A	N/A	N/A	Yes	N/A	N/A	N/A	N/A	N/A	Yes	Completed	Left in situ		Sean Craven	03-Oct-13	Declan Grennan	03-Oct-13	
1.4	Elevators					N/A	Yes	N/A	Yes	N/A	N/A	N/A	N/A	Yes	N/A	N/A	N/A	N/A	N/A	Yes	Completed	Left in situ		Sean Craven	04-Oct-13	Declan Grennan	04-Oct-13	
1.5	Rotary Valve					N/A	Yes	N/A	Yes	N/A	N/A	N/A	N/A	Yes	N/A	N/A	N/A	N/A	N/A	Yes	Completed	Left in situ		Sean Craven	05-Oct-13	Declan Grennan	05-Oct-13	
1.6	Malt Silo 1					N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Yes	N/A	N/A	N/A	N/A	N/A	N/A	Completed	Left in situ		Robbie O'Hagan	21-Oct-13	Declan Grennan	21-Oct-13	
1.7	Malt Silo 2					N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Yes	N/A	N/A	N/A	N/A	N/A	N/A	Completed	Left in situ		Robbie O'Hagan	21-Oct-13	Declan Grennan	21-Oct-13	
1.8	Malt Silo 3					N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Yes	N/A	N/A	N/A	N/A	N/A	N/A	Completed	Left in situ		Robbie O'Hagan	21-Oct-13	Declan Grennan	21-Oct-13	
1.9	Malt Silo 4					N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Yes	N/A	N/A	N/A	N/A	N/A	N/A	Completed	Left in situ		Robbie O'Hagan	21-Oct-13	Declan Grennan	21-Oct-13	
1.10	Malt Silo 5					N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Yes	N/A	N/A	N/A	N/A	N/A	N/A	Completed	Left in situ		Robbie O'Hagan	21-Oct-13	Declan Grennan	21-Oct-13	
1.11	Malt Silo 6					N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Yes	N/A	N/A	N/A	N/A	N/A	N/A	Completed	Left in situ		Robbie O'Hagan	21-Oct-13	Declan Grennan	21-Oct-13	
1.12	Malt Silo 7					N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Yes	N/A	N/A	N/A	N/A	N/A	N/A	Completed	Left in situ		Robbie O'Hagan	21-Oct-13	Declan Grennan	21-Oct-13	
1.13	Malt Silo 8					N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Yes	N/A	N/A	N/A	N/A	N/A	N/A	Completed	Left in situ		Robbie O'Hagan	21-Oct-13	Declan Grennan	21-Oct-13	
1.14	Malt Silo 9					N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Yes	N/A	N/A	N/A	N/A	N/A	N/A	Completed	Left in situ		Robbie O'Hagan	22-Oct-13	Declan Grennan	22-Oct-13	
1.15	Malt Silo 10					N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Yes	N/A	N/A	N/A	N/A	N/A	N/A	Completed	Left in situ		Robbie O'Hagan	22-Oct-13	Declan Grennan	22-Oct-13	
1.16	Malt Silo 11					N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Yes	N/A	N/A	N/A	N/A	N/A	N/A	Completed	Left in situ		Robbie O'Hagan	22-Oct-13	Declan Grennan	22-Oct-13	
1.17	Malt Silo 12					N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Yes	N/A	N/A	N/A	N/A	N/A	N/A	Completed	Left in situ		Robbie O'Hagan	22-Oct-13	Declan Grennan	22-Oct-13	
1.18	Malt Silo 13					N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Yes	N/A	N/A	N/A	N/A	N/A	N/A	Completed	Left in situ		Robbie O'Hagan	22-Oct-13	Declan Grennan	22-Oct-13	
1.19	Malt Silo 14					N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Yes	N/A	N/A	N/A	N/A	N/A	N/A	Completed	Left in situ		Robbie O'Hagan	22-Oct-13	Declan Grennan	22-Oct-13	
1.20	Malt Silo 15					N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Yes	N/A	N/A	N/A	N/A	N/A	N/A	Completed	Left in situ		Robbie O'Hagan	22-Oct-13	Declan Grennan	22-Oct-13	
2	System / Area #2 (Malt Outake Silo to Brewhouse)																											
2.1	Elevators					N/A	Yes	N/A	Yes	N/A	N/A	N/A	N/A	Yes	N/A	N/A	N/A	N/A	N/A	Yes	Completed	Left in situ		Eamon Murphy	09-Oct-13	Declan Grennan	09-Oct-13	
2.2	Conveyors					N/A	Yes	N/A	Yes	N/A	N/A	N/A	N/A	Yes	N/A	N/A	N/A	N/A	N/A	Yes	Completed	Left in situ		Eamon Murphy	09-Oct-13	Declan Grennan	09-Oct-13	
2.3	Roast Weigher 1					N/A	Yes	N/A	Yes	N/A	N/A	N/A	N/A	Yes	N/A	N/A	N/A	N/A	N/A	Yes	Completed	Left in situ		Eamon Murphy	09-Oct-13	Declan Grennan	09-Oct-13	
2.4	Roast Weigher 2					N/A	Yes	N/A	Yes	N/A	N/A	N/A	N/A	Yes	N/A	N/A	N/A	N/A	N/A	Yes	Completed	Left in situ		Eamon Murphy	09-Oct-13	Declan Grennan	09-Oct-13	
2.5	Malt Weigher					N/A	Yes	N/A	Yes	N/A	N/A	N/A	N/A	Yes	N/A	N/A	N/A	N/A	N/A	Yes	Completed	Left in situ		Eamon Murphy	10-Oct-13	Declan Grennan	10-Oct-13	
2.6	Destonner					N/A	Yes	N/A	Yes	N/A	N/A	N/A	N/A	Yes	N/A	N/A	N/A	N/A	N/A	Yes	Completed	Left in situ		Eamon Murphy	10-Oct-13	Declan Grennan	10-Oct-13	
2.7	Screen					N/A	Yes	N/A	Yes	N/A	N/A	N/A	N/A	Yes	N/A	N/A	N/A	N/A	N/A	Yes	Completed	Left in situ		Eamon Murphy	10-Oct-13	Declan Grennan	10-Oct-13	
2.8	Dust Extraction System					N/A	Yes	N/A	Yes	N/A	N/A	N/A	N/A	Yes	N/A	N/A	N/A	N/A	N/A	Yes	Completed	Left in situ		Eamon Murphy	10-Oct-13	Declan Grennan	10-Oct-13	
3	System / Area #3 (Brewhouse)																											
3.1	Malt Hopper 1					N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Yes	N/A	N/A	N/A	N/A	N/A	N/A	Completed	Left in situ		Eamon Murphy	22-Oct-13	Declan Grennan	22-Oct-13	
3.2	Malt Hopper 2					N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Yes	N/A	N/A	N/A	N/A	N/A	N/A	Completed	Left in situ		Eamon Murphy	22-Oct-13	Declan Grennan	22-Oct-13	
3.3	Malt Decoction Vessel (Old Brewhouse)					Yes	N/A	N/A	Yes	N/A	N/A	N/A	N/A	Yes	N/A	N/A	N/A	N/A	N/A	N/A	Completed	Left in situ		Sean Craven	22-Oct-13	Declan Grennan	22-Oct-13	
3.4	Mash Conversion Vessel					Yes	N/A	N/A	Yes	N/A	N/A	N/A	N/A	Yes	N/A	N/A	N/A	N/A	N/A	N/A	Completed	Left in situ		Sean Craven	22-Oct-13	Declan Grennan	22-Oct-13	
3.5	Lauter Tun					Yes	N/A	N/A	Yes	N/A	N/A	N/A	N/A	Yes	N/A	N/A	N/A	N/A	N/A	N/A	Completed	Left in situ		Sean Craven	22-Oct-13	Declan Grennan	22-Oct-13	
3.6	Weak worts Tank					Yes	N/A	N/A	Yes	N/A	N/A	N/A	N/A	Yes	N/A	N/A	N/A	N/A	N/A	N/A	Completed	Left in situ		Sean Craven	25-Oct-13	Declan Grennan	25-Oct-13	
3.7	Underback					Yes	N/A	N/A	Yes	N/A	N/A	N/A	N/A	Yes	N/A	N/A	N/A	N/A	N/A	N/A	Completed	Left in situ		Sean Craven	25-Oct-13	Declan Grennan	25-Oct-13	
3.8	Kettle & Hop Dosing Tank					Yes	N/A	N/A	Yes	N/A	N/A	N/A	N/A	Yes	N/A	N/A	N/A	N/A	N/A	N/A	Completed	Left in situ		Sean Craven	25-Oct-13	Declan Grennan	25-Oct-13	
3.9	Whirlpool					Yes	N/A	N/A	Yes	N/A	N/A	N/A	N/A	Yes	N/A	N/A	N/A	N/A	N/A	N/A	Completed	Left in situ		Sean Craven	25-Oct-13	Declan Grennan	25-Oct-13	
3.10	Trub Tank					Yes	N/A	N/A	Yes	N/A	N/A	N/A	N/A	Yes	N/A	N/A	N/A	N/A	N/A	N/A	Completed	Left in situ		Sean Craven	25-Oct-13	Declan Grennan	25-Oct-13	
3.11	Water Tank 1	Not cleaned just drained				N/A	N/A	N/A	Yes	N/A	N/A	N/A	N/A	Yes	N/A	N/A	N/A	N/A	N/A	N/A	Completed	Left in situ		Sean Craven	25-Oct-13	Declan Grennan	25-Oct-13	
3.12	Water Tank 2	Not cleaned just drained				N/A	Yes	N/A	Yes	N/A	N/A	N/A	N/A	Yes	N/A	N/A	N/A	N/A	N/A	N/A	Completed	Left in situ		Sean Craven	25-Oct-13	Declan Grennan	25-Oct-13	
3.13	Water Tank 3	Not cleaned just drained				N/A	Yes	N/A	Yes	N/A	N/A	N/A	N/A	Yes	N/A	N/A	N/A	N/A	N/A	N/A	Completed	Left in situ		Sean Craven	25-Oct-13	Declan Grennan	25-Oct-13	

Attachment 4: Declaration from URS Ireland in Respect of Soil and Groundwater

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20 June 2014

Mr. Declan Grennan
Diageo Ireland
Great Northern Brewery
Dundalk
Co. Louth

For the attention of Mr. Declan Grennan

Our Ref: 47092702
Your Ref: IPPC Licence No. P0440-01

Dear Declan,

Re: Environmental Declaration – Diageo Great Northern Brewery, Dundalk, Co. Louth

In respect of soil and groundwater aspects of the site, based on the investigations, assessments and remediation completed at the site by URS, and on its continued commercial use, we are of the opinion that the condition of the site is not causing or likely to cause off-site environmental pollution and the site is in a satisfactory state, and environmental liabilities identified at the site have been addressed.

Yours faithfully
for **URS Ireland Limited**

Sinead Fitzpatrick
Principal Environmental Scientist

Direct Line: +353 (0)1 2933 238
sinead.fitzpatrick@urs.com

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www.ursglobal.com

URS Ireland Limited
Place of Registration: Ireland
Registered Number: 107912
Registered Office: 410/411 Q House, 76 Furze Road, Sandyford, Dublin 18

Attachment 5: Corrective Action Implementation & Verification Report (AEC6)

(URS Report dated 19th June 2014 - provided as a separate document in three volumes)

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Attachment 6: BHA Close-out Report

(URS Report dated 20th June 2014 - provided as a separate document)

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Attachment 7: BHC Close-out Report

(URS Report dated 20th June 2014 - provided as a separate document)

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Attachment 8: Quarterly Groundwater Monitoring Report (June 2014)

(URS Report dated 23rd June 2014 - provided as a separate document)

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