Application SCR evaluation template

Name of activity, address and NGR	Joseph Storey and Company Limited Heron Chemical Works Moor Lane Lancaster Lancashire LA1 1QQ National Grid Reference - SD 48032 61707

Document references relevant to SCRs	The Site Surrender Report refers to the following documents: • IPPC Application & Application Site Report, August 2005 • Design SPMP, August 2006. • SPMP; First Phase Reporting: Assessment of Reference Data, January 2007 • Further Collection of reference data in November 2007, April 2008 and August 2008 • Collection of monitoring data prior to cessation of operations in June 2013 • Surrender: SSCR (February 2014)

Document reference of application SCR, date and version of SCRs	Application Site Report, reference JO0170002A, dated May 2005 prepared by Enviros. PPC Permit No. BU5585IX (decision document dated 23/06/2006) Surrender Site Condition Report, project number: 43636, dated 10th February 2014 prepared by WSP. Proposed borehole location plan forwarded by email on 9th June 2014. Report entitled "response to request for further information to support the site surrender application" project number 70004924, dated 14th August 2014, prepared by WSP. Emails clarifying MH locations on the drainage – 26th & 27th Aug 2014.

Sections 1.0-3.0 have been completed in 2014 following receipt of a surrender application using information from the 2005 Application Site Report, the Decision Document and the handover document.

1.0 Site details (Source)	
Has the applicant provided the following information as required by the application SCR template?	**Response (Specify what information is needed from the applicant, if any)**
Site plans showing site layout, drainage, surfacing, receptors, sources of emissions/releases and monitoring points	The Application Site Report (ASR) contained all relevant plans and drawings to allow determination. All information, submitted in support of application EPR/BU5585IX, was assessed by the Environment Agency and accepted as satisfactory.

2.0 Condition of the land at permit issue (Receptor)	
Has the applicant provided the following information as required by the application SCR template?	**Response (Specify what information is needed from the applicant, if any)**
a) Environmental setting including geology, hydrogeology and surface waters b) Pollution history including: • pollution incidents that may have affected land • historical land-uses and associated contaminants • visual/olfactory evidence of existing contamination • evidence of damage to existing pollution prevention measures c) Evidence of historic contamination (i.e. historical site investigation, assessment, remediation and verification reports (where available) d) Has the applicant chosen to collect baseline reference data?	The ASR contained details of: • the site setting and findings of a desk study and site walkover (including description of site activities, environmental setting and regulatory information, oil storage and use, water use, site drainage and waste water treatment, waste management, previous investigations); • site history; • previous pollution incidents; • environmental setting; • assessment of land pollution potential; • description, uncertainties and assumptions of Conceptual Site Model (CSM); The site report identified evidence of land contamination, specifically boron, copper, zinc, manganese and barium identified during previous investigations undertaken in 1998 by ENSR. Additionally, groundwater contamination, with respect to manganese, barium and boron was also identified. Collection of reference data was required and was requested through the permit (conditions 2.10.10 and 2.10.2) which was reported to the Environment Agency. To ensure the continued effectiveness of the pollution prevention measures, the Operator was required to implement and operate under a Site Protection and Monitoring Programme. The handover document indicated that the following issues had been identified following a review of the ASR: 1. Current integrity of underground drainage 2. Inadequate/inappropriate storage arrangements for raw/finished materials – e.g. no protection from damage from vehicles 3. Lack of or inadequate bunding 4. Condition of internal and external hardstandings 5. Lack of information about pipework/other structures (e.g. fill & draw points) for supply of raw materials to production processes. The handover document stated that the following key issues should be addressed in the Site Protection and Monitoring Programme (SPMP) are as follows: 1. Inspection of site infrastructure. 2. Integrity testing of storage vessels and sumps. 3. Inspection and integrity testing of all underground pipework. 4. Development of SPMP. In line with permit requirements, a Design SPMP[1] was issued to the Environment Agency in August 2006. The objectives of the Design SPMP were to propose an investigation to collect reference data for all activities that had been identified as “reasonable possibility of pollution” in the ASR. The SPMP also outlined the proposed maintenance, inspection and testing regime for pollution prevention measures over the lifetime of the permit.

[1] Design of a site protection and monitoring programme requiring reference data to be collected, reference JO0170004A, dated August 2006, prepared by Enviros

2.0 Condition of the land at permit issue (Receptor)	
Has the applicant provided the following information as required by the application SCR template?	**Response (Specify what information is needed from the applicant, if any)**
	Following on from this a SPMP: First Phase Reporting: Assessment of Reference Data Report[2] was issued in January 2007. The objectives of this report were to set reference data for the site following the installation of permanent monitoring points and the collection and analysis of soil and groundwater samples. In line with the recommendations of this report, further intrusive monitoring was conducted in November 2007, April 2008 and August 2008 to allow for seasonal variation in groundwater flow and quality to be assessed[3]. Further discussion of the SPMP reports are contained in Section 7.0 of this document.

3.0 Permitted activities (Source)	
Has the applicant provided the following information as required by the application SCR template?	**Response (Specify what information is needed from the applicant, if any)**
a) Permitted activities b) Non-permitted activities undertaken at the site	A review summary provided by the applicant confirmed the permitted activities. The site is regulated under the activity: • S4.2 A(1)(a)(iv) – producing inorganic chemicals such as salts The facility also includes the following directly associated activities: • raw materials storage and handling • product storage and handling • waste storage and handling • combustion equipment operation with a combined thermal rated input of 1.5MW • effluent treatment plant

[2] Heron Chemical Works, Lancaster: SPMP first phase reporting: assessment of reference data, reference JO170005, dated January 2007, prepared by Enviros.

[3] Laboratory data was forwarded to the Environment Agency on 6th November 2008. No interpretation was provided

3.0(a) Environmental Risk Assessment (Source)	
The H1 environmental risk assessment should identify elements that could impact on land and waters, cross- referenced back to documents and plans provided as part of the wider permit application.	The Environment Agency reviewed the applicant's environmental risk assessment and assessment of the effectiveness of pollution prevention measures. This concludes that there is a reasonable possibility for potential pollution from the following some activities on site which largely relate to the storage of chemicals and the surface and foul drainage. Further detail is included in Table 5.2 of the site's ASR. The activities were listed in the Decision Document, as follows: • storage of hydrochloric acid; • storage of zinc chloride; • storage of sodium hydroxide; • storage of potassium hydroxide; • storage of sodium silicate; • storage of phosphoric acid; • storage of amine; • storage of surfactants; • storage of stannates; • storage of epoxy floor resin; and • surface and foul drainage.

3.0(b) Will the pollution prevention measures protect land and groundwater? (Conceptual model)	
Are the activities likely to result in pollution of land?	It has been identified that there is the potential for the activities and operations on site to cause pollution to land. The site must comply with the conditions of the permit that ensure the air, land and groundwater are protected. To ensure the continued effectiveness of the pollution prevention measures, the Operator is required to implement and operate under a site protection and monitoring programme. Improvement Condition 1 (IC1) has been set within the permit to require the operator to review the storage arrangements, and pollution preventative measures associated with these, for a number of chemicals (including hydrochloric acid; zinc chloride; sodium hydroxide; potassium hydroxide; sodium silicate; phosphoric acid; amine; surfactants; stannates and epoxy floor resin. This was reviewed and accepted at permit determination. The deadline for this work was set as 23rd December 2006.
For dangerous and/or hazardous substances only, are the pollution prevention measures for the relevant activities to a standard that is likely to prevent pollution of land?	Yes. Infrastructure is in line with BAT, the Operator is required to implement and operate under a site protection and monitoring programme, the operator has a formal maintenance system which included maintenance planning, programmed preventative maintenance, breakdown history and recording of all maintenance completed. PID (Proportional Integral Derivative) systems, ensuring energy usage us minimised, are employed. Level and temperature controls are utilised and linked to automatic shutdown with both visible and audible alarms installed. Product yields are monitored and recorded with variances investigated. Emissions abatement plant for air emissions including use of wet scrubber and bag filter are installed on site. Bunding installed and maintained around storage and process vessels as appropriate. In line with permit requirements, a Design SPMP was issued to the Environment Agency in August 2006. Following on from this a SPMP: First Phase Reporting: Assessment of Reference Data Report was issued in January 2007 and further intrusive monitoring was conducted in November 2007, April 2008 and August 2008 to allow for seasonal variation in groundwater flow and quality to be assessed. Further discussion of the SPMP reports are contained in Section 7.0 of this document.

Application SCR decision summary To be completed by GWCL officer and returned to NPS		**Tick relevant decision**
Sufficient information has been supplied to describe the condition of the site at permit issue	Yes	
Pollution of land and water is unlikely with the conditions set within the permit	Yes	
Historical contamination is present- advise operator that collection of background data may be appropriate	Yes	
Date and name of reviewer (signature of authorising officer on permit)	*M J Peacock* M J Peacock, June 2006	

Operational phase SCR evaluation template

4.0 Changes to the activities (Source)	
Have there been any changes to the following during the operation of the site?	**Response (Specify what information is needed from the applicant, if any)**
a) Activity boundaries b) Permitted activities c) "Dangerous substances" used or produced	The site has been regulated under the following activity: S4.2 A(1)(a)(iv) – producing inorganic chemicals such as salts such as ammonium chloride, potassium chlorate, potassium carbonate, sodium carbonate, perborate, silver nitrate, cupric acetate, ammonium phosphomolybdate. The facility also includes the following directly associated activities: • raw materials storage and handling • product storage and handling • waste storage and handling • combustion equipment operation with a combined thermal rated input of 1.5MW • effluent treatment plant The nature of the operations at the site has not been varied throughout the life of the permit. No new substances have been used in addition to those identified in the original IPPC application. The installation boundary has also not changed. There has been no permit variation applications submitted to the Environment Agency.

5.0 Measures taken to protect land (Pathway)
Has the applicant provided evidence from records collated during the lifetime of the permit, to show that the pollution prevention measures have worked?
Yes. The Design SPMP included the output of a CCTV survey of the drains carried out at the site in 1997. The survey identified a number of problems and the Design SPMP reports that relining works were undertaken although the extent of this is unknown (Section 3.3 & 5.5.1). The Design SPMP proposed to review the current Environment Management System (EMS) in light of IC1. The report provided the details of the current inspection in Table 5.1. A review of the storage and containment of chemicals (as requested by IC1) was submitted to the Environment Agency on 31st January 2011. The document appears to have been written in 2006 as there are a number of 2006 deadlines for implementation. The document reviews the delivery, storage and process activities for all the substances listed in IC1 with the exception of zinc chloride, although the introduction implies that production of zinc borate will be outsourced. The document indicates that small quantities of the chemicals are delivered to the site. Storage of the chemicals is either within buildings or in dedicated bunded areas. The Site Surrender Report provides further information as follows: The monitoring and reporting requirements of the EMS and Environmental Permit EPR/BU5585IX, have contributed to the continued environmental management of site activities with the result that no significant incidents, in respect of land contamination, have occurred during the site's operational life (Executive Summary). The operator had an Environmental Management System (EMS) certified to ISO 14001:2004 which was certified to the end of June 2013. The EMS achieved certification in 2004. The next EMS audit was scheduled for February 2014, however due to the planned closure of the site it was cancelled. The site continued to use the EMS during the decommissioning of the site. A number of written procedures were in places which have been followed

5.0 Measures taken to protect land
(Pathway)

during decommissioning (Section 5.1).

During the operation of the installation, site infrastructure (e.g. hardstanding and tanks) was visually inspected on an a*d hoc* basis. There was a daily inspection of the bund contents and prior to any discharges (Section 5.2).

Ad hoc visual inspections of all materials stored on site were carried out. The disposal of waste was recorded and waste consignment notes held on file. Other areas of the installation were regularly inspected as part of the sites planned preventative maintenance programme such as process equipment, and pipework. The operator also carried out regular internal audits with any non compliance resolved (Section 5.2).

The entire site area was covered with buildings and hardstanding, the condition of which varied due to the age of the site. All production activities took place inside buildings which had concrete floors. The hardstanding and building fabric were regularly monitored and any major cracks in the surfaces were isolated and repaired (Section 5.2).

Section 5.2 also describes activities that were undertaken outside the buildings which comprised:

- delivers and collections to loading area in north of the site;
- occasional storage of raw materials;
- effluent treatment tanks stored within a bund; and
- wastes stored in designated storage areas.

6.0 Pollution incidents that may have impacted on land and their remediation
(Sources)

Has the applicant provided evidence to show that any pollution incidents which have taken place during the life of the permit and which may have impacted on land or water have been investigated and remediated (where necessary)?	The following is from Section 5.2 of the Site Surrender Report: Throughout the life of the permit, there were no recorded environmental incidents or events that required notification to the Environment Agency related to land contamination. There was one reported incident that was for a filter bag which ruptured releasing dust emissions. The site installed a scrubber to address this problem. The operator has stated that following discussions with site personnel it has been confirmed that no incidents have occurred during the operation of the facility or during decommissioning that could have caused pollution to ground or groundwater beneath the site. The management systems and physical infrastructure in place at the site have provided an effective mechanism to protect the condition of the ground and groundwater beneath the site during the lifetime of the permit.

7.0 Soil gas and water quality monitoring (where relevant)

Where soil gas and/or water quality monitoring has been undertaken, does this demonstrate that there has been no change in the condition of the land? Has any change that has occurred been investigated and remediated?

Baseline reference monitoring data was obtained following permit issue and monitoring/surrender data has been collected prior to closure of the installation to demonstrate that the site remains in a “satisfactory state”.

As part of the Design SPMP, a sampling strategy was developed for the site. This report was reviewed by the area GW&CL team and recommendations provided to the inspector for the site, as follows:

1) extending the analytical suite for groundwater samples collected from shallow boreholes given the uncertainty of the drainage system;
2) collection of duplicate or sample blanks for QA purposes.

7.0 Soil gas and water quality monitoring (where relevant)

The First Phase Reporting states that Window Sample holes WS1 to WS10 and Boreholes BH1 and BH2 were drilled in November 2006 in order to collect soil reference data. Groundwater monitoring of these exploratory locations and an existing borehole (ENSR BH) was conducted in December 2006. The report recommends that further sampling is undertaken.

This report was reviewed by the area GW&CL team and comments were provided to inspector for the site. The main comments provided were as follows:

1) the soil and groundwater quality has been linked back to the use/storage of materials at the site. However, there is no interpretation as to whether and where there are ongoing losses. The consultants have identified the drains as an ongoing source of contamination and that contaminants in the groundwater can be linked to those used at the site.
2) page 4 of the report identifies potential reason for/sources of contamination including *ad hoc* storage of substances, supply of sodium silicate to the production process, storage of sodium stannate and the drainage system.
3) recommendation that the results are discussed at a site meeting. To aid this a summary was provided of elevated levels of contaminants in the soils and the current site activities from which they may have originated.
4) recommendation that a site drainage survey is undertaken.
5) recommendation that the groundwater contours are reviewed.

Further groundwater monitoring was undertaken in November 2007, April 2008 and August 2008 to allow for seasonal variation in groundwater flow and quality to be assessed. No interpretation of these results appears to have been provided and the data were not reviewed by the area GW&CL team.

Prior to cessation of the process operations at the end of October 2013, intrusive monitoring was conducted in June 2013. Additional boreholes were drilled as a number of the original monitoring wells were no longer accessible. The monitoring data that was required and the new drilling locations were discussed with the Environment Agency. The new boreholes were located as close as practicable to previous boreholes. (Section 7 of the Site Surrender Report).

8.0 Decommissioning and removal of pollution risk

To be completed by EM/PPC officers

Has the applicant demonstrated that decommissioning works have been undertaken and that all pollution risks associated with the site have been removed? Has any contamination of land that has occurred during these activities been investigated and remediated

The following information has been provided in the Site Surrender Report:

As part of the decommissioning process, all significant pollution risks in the form of chemicals, oils and wastes associated with the activities covered in the environmental permit have been removed from the site (Executive Summary).

The operator's Operations Director acted as the Site Closure Manager (SCM) supported by a team of specialists including the works chemist responsible for environmental issues. All work associated with decommissioning has been carried out in accordance with the site EMS. Contractors were vetted to ensure that they were competent to carry out the proposed work and were issued with a permit to work which included a risk assessment of potential environmental pollution and techniques to minimise these risks (Section 8.2).

Decommissioning has been undertaken by experienced site personnel. Process equipment was made safe and either transferred to a new site in Italy or was sold to a third party in the UK. Any unused raw materials were transferred to the new site (in Italy) or offered back to suppliers and all wastes have been removed by licensed waste contractors (Executive Summary).

Two bulk storage tanks, holding effluent, have been emptied with the contents tested and discharged as effluent. The tanks have been decommissioned and removed from site. Three processing vessels have also been emptied, cleaned but will be left in situ at the site. Their removal was not possible without the structural change to building in order that they could be removed. Bunds were decommissioned following the testing of their contents which were subsequently discharged as effluent. Effluent was discharged via sewer for treatment at Lancaster WWTW. (Section 8.4).

All solid wastes have been collected in skips or sealed containers, depending on their nature. The wastes generated by the process operations and during decommissioning have been disposed of by a licensed contractor. Duty of care documentation and consignment notes are held by JSC for the appropriate time as stipulated in the relevant regulations. Where it has been possible recycling of wastes was continued as appropriate. (Section 8.5).

The drainage system has been purged with water to clean the system and discharged to sewer (Section 8.6). All sumps and interceptors have been cleaned out (Section 3.3).

A capability to respond to unplanned events was maintained throughout the permitted operational and decommissioning phases. The site maintained procedures for minor and major spillages with sufficient human resources and emergency equipment to effectively respond to an incident during all phases of the permitted period including decommissioning. It is understood that since the issue of the permit no environmental incidents occurred with pollution potential of the land or groundwater that required reporting to Environment Agency, this applied to both operational and decommissioning periods (Section 8.10).

9.0 Reference data and remediation (where relevant)

To be completed by GWCL officers

Has the applicant provided details of any surrender reference data that they have collected and any remediation that they have undertaken?

Where appropriate the section of the Site Surrender Report has been referenced:

Prior to cessation of the process operations at the end of October 2013, intrusive monitoring was conducted in June 2013 by both JSC and a developer. Where necessary new monitoring points were drilled, as some the original monitoring wells were no longer accessible. The new boreholes were located as close as practical to previous boreholes and their locations were discussed with the Environment Agency (Section 7). The new borehole referencing includes the suffix H.

Soil samples were collected from the new monitoring points and compared to those collected as part of the SPMP, as follows:

- WS1 compared to WS02H;
- WS4 compared to WS11H;
- WS5 compared to WS01H;

9.0 Reference data and remediation (where relevant)

To be completed by GWCL officers

- WS6 compared to WS06H;
- WS9 compared to WS09H;
- BH1 compared to WS12H;
- BH2 compared to WS07H.

It should be noted that the baseline reference data characterised the site at a number of other locations, i.e. WS2, WS3, WS7, WS8 and WS10 but additional soil quality data has not been collected.

The data is compared in the excel spreadsheet contained in Appendix E. Section 9 identifies samples where the concentrations appear to have increased. Of concern are the following:

- Zinc: WS4 max 84.2mg/kg cf WS11H 5,480mg/kg;
- Zinc: WS9 max 80mg/kg cf WS09H 140mg/kg;
- Aluminium: BH2 cf WS07H (depending on depth of sample)
- Barium: BH2 max 237mg/kg cf WS07H 534mg/kg
- Magnesium: BH2 max 2,258mg/kg cf WS07H 4,340mg/kg;
- Sodium: BH2 max 286mg/kg cf WS07H 718mg/kg;
- Nitrate: BH2 max 13mg/kg cf WS07H 119mg/kg

The report does not contain copies of the borehole logs for the new exploratory locations, the laboratory data sheets or details of the depths of the 2013 samples. Consequently, it is not possible to determine the strata being sampled or any in accuracies in summarising the data.

Potential increases in concentrations have been identified in 3 locations: WS4 cf WS11H, WS9 cf WS09H and BH2 cf WS07H. It should be noted that the new boreholes are located some distance from the original locations and this may account for the variation soil quality identified.

Of most concern is the zinc concentration variation between WS4 and WS11H. Section 9 of the Site Surrender Report states that the sample taken from WS11H is associated with masonry and this could account for the elevated level of zinc. This cannot be substantiated because no logs or information on the sample depths have been provided.

In terms of groundwater quality, samples were original collected from 8 locations (WS2, WS3, WS5, WS8, WS9, BH1, BH2 and ENSR BH). As part of the surrender, 3 groundwater samples were collected, from BH1, BH2 and ENSR BH. These boreholes sampled the deeper groundwater and were originally installed to determine if the drains were leaking.

The data is compared in the excel spreadsheet contained in Appendix E. Section 9 identifies samples where the concentrations appear to have increased. Of concern are the following:

- Sodium: BH2 20-27mg/l cf 46.5mg/l
- Chloride: BH2 31-41mg/l cf 86.3mg/l

Section 9 of the Site Surrender Report indicates that “the levels are of the same magnitude and do not suggest that there has been a deterioration in the groundwater”.

BH2 is located in the southern part of the site. Assuming the groundwater flows towards the River Lune even if the groundwater contours are not correct (as identified during the review of the First Phase Report) there are no boreholes down-gradient of BH2. In terms of potential sources of contamination during the permit the drains are all located north of BH2 and therefore if they had leaked they are unlikely to impact BH2. Taking into account that no spills have been recorded during the operation of the permit and that there are no up-gradient storage locations it seems unlikely that current activities would have caused an increase in sodium and chloride concentrations at this location.

10.0a Statement of site condition

To be completed by EM/PPC officers

Has the applicant provided a statement, backed up with evidence, confirming that the permitted activities have ceased, decommissioning works are complete and that pollution risk has been removed and that the land and waters at the site are in a satisfactory state?

Information is provided in the Site Surrender Report as follows:

Historical sources of potential contaminants on the site are likely to be associated with the activities of the chemical works that dates back to 1860. As part of the ASR an assessment of the likelihood of pollution was undertaken at the application stage, which indicated that there were a number of substances with the potential to cause pollution of the ground or groundwater beneath the site. These included the storage of hydrochloric acid, zinc chloride, potassium hydroxide. Several other substances were also classed as potentially polluting.
A Design SPMP was issued with follow on intrusive monitoring conducted to provide baseline reference data for the site. (Section 2).

A Design Site Protection and Monitoring Programme (SPMP) which required the collection of reference data to benchmark the ground conditions at the site was submitted following the issue of the permit. Soil, gas and groundwater monitoring data were collected for benchmarking purposes. Prior to closure of the installation, monitoring of soil and groundwater has been conducted, to demonstrate that there has been no deterioration in the condition of the ground and groundwater beneath the site during the permitted period. The site is therefore considered to be in a "satisfactory state" (Section 9).

The operator states in Section 10 that "*Based on the available information it is considered that no residual contamination relating to the site's permitted activities has been identified. The permitted activities have now stopped and the site has been decommissioned and will be handed back to the landlord. It is believed that the condition of the site following decommissioning and removal of pollution risks satisfies the EPR requirements of a satisfactory state*".

10.0b Statement of site condition

To be completed by GWCL officers

Has the applicant provided a statement, backed up with evidence, confirming that the permitted activities have ceased, decommissioning works are complete and that pollution risk has been removed and that the land and waters at the site are in a satisfactory state?

Yes, please refer to site surrender report.

With respect to the original surrender application the Environment Agency concluded the following:

- Soil and groundwater data appear to have been collected prior to the cessation of activities at the site. Therefore, the impact of washing through the drains for example will not have been capture by data.
- The locations of the newly installed boreholes, from which soil samples have been collected, are not always close to the original baseline reference data locations. Giving some uncertainty as to whether a different source is being characterised.
- Soil samples have only been collected from 7 of the original 12 locations and groundwater samples have only been collected from 3 locations rather than the 8 in the First Phase Report.
- The groundwater sampling undertaken is from the deeper wells and so impacts in the shallow groundwater have not been assessed.
- No exploratory logs, no laboratory analysis sheets and not details of the depths of soil samples have been provided in the report.
- Although communication, from both the Environment Agency and from the consultant undertaking the SPMP reports, indicated that CCTV surveys of the drains should be undertaken none have been commissioned.
- The investigations undertaken at the site: 1998 by ENSR , 2007/8 by Enviros and 2013 by WSP indicate that contamination is present at the site. Given the history of the site this is not surprising. As it is proposed that the site will be redeveloped, and given its previous use and environmental sensitivity, it is likely that some further work will be undertaken under the planning regime.

Following our review of the Site Surrender Report a Schedule 5 was issued on 1st May 2014. A meeting was held on 23rd May between The Environment Agency, Operator and consultant to discuss the requirements of the Schedule 5 and agree further actions.

A proposed location plan was submitted to the Environment Agency on 9th June 2014 detailing the locations of additional sampling wells. The locations were confirmed as acceptable by The Environment Agency via email on 12th June 2014. A final response to the Schedule 5 was submitted on 14th August 2014 and is reviewed below:

- Report confirms that previously submitted investigation was undertaken prior to the cessation of activities at the site. Consequently, plant decommissioning could have impacted ground conditions.
- The information provided on the drainage is summarised on the plan included below. This indicates that only 5m was relined on the MH1 to MH3 leg around MH2 and none of the drainage above MH4 was relined in 1997. The operator has confirmed that rooms 1, 2, 3 and 4 (located above MH4) were either not used or manufactured dry products. Consequently, the only area of concern is the unlined drain between MH1 and MH3. See diagram below.
- The report details the findings of the additional sampling undertaken at the site in 2014. This comprised the excavation of 5 window samples and the collection and analysis of 18 soil samples and 5 groundwater samples.
- Section 6.1.1 contains an assessment of the soil analysis. Table 6 provides a comparison of the soil results from the 2014 investigation and those from the baseline study. The comparison has been undertaken for the localised baseline and also for a site wide baseline (maximum concentration). At the meeting in May 2014 it was agreed that the concentrations could be compared to site wide concentrations. There are a number of results where the surrender concentrations are higher than the baseline concentrations but only 5 samples exceed the site wide baseline. See Table 1 below:
- To aid the surrender we, the Environment Agency, have summarised the relevant information for the 5 sample locations below (Table 2).
- The report has compared the values to human health Generic Assessment Criteria, however, these are not relevant for the surrender of a permit. For permit surrender the criterion is that the land is in a satisfactory state.
- The data has not been reviewed in light of the “reasonable possibility of pollution” activities identified in the Design SPMP and there is no discussion of the potential sources of the elevated levels.
- Table 1 and 2 indicate that only elevated levels of tin and zinc could have been contributed to during the life of the permit from activities identified as “reasonable possibility of pollution”.

10.0b Statement of site condition

To be completed by GWCL officers

Has the applicant provided a statement, backed up with evidence, confirming that the permitted activities have ceased, decommissioning works are complete and that pollution risk has been removed and that the land and waters at the site are in a satisfactory state?

- The investigation undertaken in 2013 indicates that there is variation in the concentrations of substances across the site. For example higher concentrations of zinc and magnesium were recorded during the 2013 investigation compared to the baseline investigation and the 2014 investigation.
- Given the inherent variability in soil sampling and analysis and that no significant release[4] has occurred during the permit the soil data does not indicate that the land has been impacted during the life of the permit.
- Section 6.2.1 contains an assessment of the groundwater analysis. Table 7 provides a summary of the exceedences between the baseline and the 2014 data. With the exception of the hydrocarbons the levels observed are not significantly greater than the site wide baseline.
- With regards the hydrocarbons: there is a boiler and oil storage annotated on the site plan contained in the ASR (figure 2). The ASR indicates that the boiler is gas fired (see Section 2.2). Hydrocarbon analysis was not included in the analysis proposed in the Design SPMP and no activities associated with hydrocarbons were identified as "reasonable possibility of pollution".
- During the excavation of the baseline window samples hydrocarbon contamination was observed as follows: WS3 – fuel odour at 4mbgl and WS5 very strong fuel/solvent odour at 2.9-4.0mbgl. The first phase report indicates that as a consequence of the observations soils from WS2, WS3, WS5 and WS6 were analysed for EPH C10-C40. However, no nearby source of hydrocarbon contamination could be identified (Section 2.2.4 First Phase Report). Groundwater samples collected from WS5 was analysed for hydrocarbons during the December 2006, November 2007 and August 2008 sampling rounds. A maximum concentration of 1.2mg/l was observed.
- All groundwater samples were analysed for hydrocarbons during the 2014 sampling round. The highest concentrations were observed in WSC (11.9mg/l) and WSD (81.9mg/l). Given that hydrocarbon analysis was only included in the sampling suite as a consequence of observations during the baseline drilling works it is likely that contamination is associated with historic activities.

Table 1:

	Depth	Tin (mg/kg)	Zinc (mg/kg)	Barium (mg/kg)	Magnesium (mg/kg)	EPH (mg/kg)
WSA	0.5-0.7	143	892			
WSB	0.9-1.1	143				
WSC	0.4-0.6	410		981		981
WSC	4.6-4.8				2590	
WSD	0.5-0.8					2840
Site wide baseline (mg/kg)		29	544.7	237	2258	2068
Location & depth		WS7 0.3-0.5	WS6 0.2-0.3	BH2 6.2	BH2 1.2	WS6 0.2-0.3

Table 2:

2014 sampling location	Baseline sampling location	Activities	Proposed analysis from Design SPMP
WSA	WS7	zinc hydroxyl stannate storage	zinc and tin
WSB	WS5, WS6, WS8 and WS9	sodium stannate, zinc chloride & hydrochloric acid storage	sodium, tin, zinc, chloride and pH
WSC	WS4, WS10 and BH1	boric acid, zinc oxide, sodium hydroxide & potassium hydroxide storage Effluent drainage	zinc, boron, sodium, potassium and pH
WSD	WS2 and WS3	sodium silicate and zinc hydroxyl stannate storage	sodium, zinc and tin

[4] See Section 6.1.1 of the "response to request for further information to support the site surrender application"

Surrender SCR decision summary To be completed by GWCL officers and returned to NPS	**Tick relevant decision**
Sufficient information has been supplied to show that pollution risk has been removed and that the site is in a satisfactory state – accept the application to surrender the permit; or	**Y**
Date and name of reviewers: *Suzanne Southern* **28th August 2014** *Matthew Derbyshire* **28th August 2014**	

Appendix D: Site Drainage Plan

MH numbers

Dyno rod Survey - Sheet numbers

1 - MH1 → 2 4.7m
2 - MH 2 → 1 1.6m
3 - MH 2 → 3 16.2m
4 - MH 3 → 4 35.8m
5 - MH 1 → 5 6.9m
6 - MH 6 → 5 1.1m

Drain lining report

① 5m - MH2 - 2m either side

② 36m between MH3 and MH4

③ 15m between MH1 and MH5 and MH5 and MH6.