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Prepared for:

Orica Australia Pty Ltd

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Remediation of Car Park Waste Encapsulation Botany Industrial Park Submissions Report

HLA-Envirosciences Pty Limited (HLA ENSR)

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Remediation Of Car Park Waste Encapsulation Botany Industrial Park Submissions Report

17 December 2007

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1.0 Introduction

1.1 Overview of Proposal

The proposed project involves the remediation of Orica Australia Pty Ltd (Orica) land known as the Car Park Waste Encapsulation (CPWE), located within the Botany Industrial Park (BIP). The CPWE contains certain by-products of previous industrial activities at the BIP, collectively known as 'Heavy Ends'. This waste, which includes substances such as hexachlorobutadiene (HCBD), tetrachloroethene (PCE), hexachlorobenzene (HCB) and octachlorostyrene (OCS), has been stored in a synthetic liner awaiting the development of suitable technology for treatment.

Conditions E1, E2 and E3 of the Environment Protection Licence (EPL) No. 2148 require the remediation of the CPWE, defined as the encapsulation cell that lies beneath the car park on the north east boundary of the BIP. The proposed project comprises the remediation of this area of the BIP in accordance with these licence conditions.

The proposed remediation works fall within the type of development identified in Group 9 of Schedule 1 to State Environmental Planning Policy (Major Projects) 2005 (SEPP 2005) and are therefore eligible for assessment under Part 3A of the Environmental Planning and Assessment Act 1979 (EP&A Act). A project approval is therefore being sought for the proposed works.

The proposed remediation works would allow the CPWE site to be returned to productive use in line with the zoning and surrounding land uses.

The project involves the remediation of the CPWE area using Directly-heated Thermal Desorption (DTD) technology. The detailed design of the DTD plant has not yet been finalised, therefore the EA presents the preliminary details of the remediation project.

The remediation project is expected to take approximately 18 months to complete including site establishment, pre-treatment, treatment, validation, decommissioning and reinstatement.

1.2 Overview of Environmental Impact Assessment Process

The proposed project requires approval under Part 3A of the EP&A Act and, as such, the Minister for Planning is the approval authority. The proposal is deemed a 'major project' under the Act. Section 75(F) of the Act requires that, for a major project, a Project Application must be accompanied by an EA prepared by or on behalf of the applicant.

An EA is part of a larger assessment process in which the proponent of a project:

- Identifies a need;
- Considers alternatives and identifies a preferred option;
- Assesses the likely environmental impacts and identifies mitigation measures; and
- Presents the EA to the Department of Planning (DoP) for public exhibition.

The DoP:

- Exhibits the EA and notifies stakeholders in accordance with statutory requirements;
- Seeks comments from other government agencies;

- Considers public comments on the EA and prepares an assessment report recommending one of the following:
  - support for the proposal in the EA;
  - rejection of the proposal in the EA;
  - support for the proposal, with modifications.

Under the EP&A Act, the EA is required to be publicly exhibited for a minimum of 30 days for review by the public.

1.3 Structure of Representations Report

This Submissions Report has been structured in a manner which clearly sets out the issues raised in the submissions on the EA and addresses each issue.

Section 2 of the Submissions Report provides a summary of the issues raised during the public exhibition of the EA and identifies the relevant section in the report where the issues have been addressed.

Section 3 provides a detailed response to the issues raised.

2.0 Summary of Submissions

A total of nine submissions were received comprising private submissions from government and non-government organisations/businesses.

Issues raised during the public exhibition of the EA have been summarised and set out in Table 1 of this report. The table identifies the submission, provides a summary of the issues raised and identifies the section in this report where the issue has been addressed.

In a number of instances, comments received were replicated in a number of submissions. The authors have therefore, in some instances, recorded the comment which sets out the general concern rather than repeat the issue several times. It is noted, however, that this approach is adopted only on a few occasions.

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Table 1: Submission Issues for Remediation of Land, Botany Industrial Park (06_0197)

Respondent Number	Issue Raised	Response Section in this report
1 – *Nature Conservation Council of Australia*	Highly important to remediate the site to the highest standard.	3.1 and 3.4
	Significant concerns regarding emissions from the project, including gases that could have adverse effect on human health.	3.6
	Proper remediation of the site so that all toxic material is removed.	3.4
	A long term solution is required.	3.4
	ITD has a number of significant advantages over DTD, making it a preferable option.	3.3
	There is a serious risk of dioxin re-formation during processing in DTD. DTD plant requires sophisticated air emission control systems to operate in accordance with best practice guidelines of the Stockholm Convention.	3.1 and 3.2.1
	ITD does not have the risk of re-formation of dioxins. ITD can significantly reduce the concentration of persistent chlorinated organic compounds without risk to local residents, nearby workers and the environment. ITD has lower emissions than DTD.	3.3
	Thiess has indicated that ITD technology is well established for remediating contaminated sites in the USA and about 80 projects have been carried out there in past decade.	
	Thiess trials on dioxin contaminated concentrates, demonstrating the capability of BCD gave best results in the terms of reduction of concentration of contaminants below required limits. The Department of Public Works, in respect to the potential success of the BCD process, referred to a trial report by Egis.	
	Greenhouse gas emissions for the CPWE which are based on DTD plant could be reduced further through the use of ITD plant. Both technologies are in use in NSW and evidence would be available from these sites further highlighting the benefits of ITD.	
	ITD would provide a solution that would more adequately remediate the encapsulated waste with reduced environmental impacts.	
	It is important that potential health impacts are carefully considered where selecting remediation technology that is less expensive but also with reduced effectiveness.	

Respondent Number	Issue Raised	Response Section in this report
	The present project will only remediate the car park waste. It is important to properly remediate the whole site where heavy ends contamination is found. To not remediate all heavy ends on the site is not properly solving this serious problem.	3.1
	Little mention of how this remediation project will halt further contamination of the Botany Groundwater Plume. Information on further contamination and the ongoing link between the groundwater plume and car park waste remediation needs to be publicly available as to the effectiveness and success.	
	The surrounding area is already contaminated due to the improper handling of highly toxic waste. Toxic contamination needs to be remediated over the entire site so health risks are reduced to safe levels. Lack of confidence that the CPWE area is the only area contaminated and affecting the groundwater aquifer.	
	With the nearest residential area 300m from the car park waste it is vitally important to fix this serious problem in full and stop further contamination of this area.	
	Superior alternatives to DTD technology are available such as ITD incorporating BCD.	3.3
	There is scope to broaden the remediation project so that a greater area is remediated and the toxic problem moves closer to a proper solution.	3.1
2		
Private submission	Where and when did the additional lots on the CPWE site (outside the car park adjacent to the Cornish Circle) come to light and how many more are there around the BIP.	3.2.2
	The Pagewood Primary school is on the corner of Page and Baker Street, 100 vehicles may be "low numbers" by their assessment but there is already extremely heavy traffic along that route 100 more is not acceptable. Also because of the light industrial businesses and parking of employees along the streets almost all parking places are full. The sheer numbers of an additional 100 vehicles will make traffic congestion and possible accidents a high probability. Why not make the only route to the car park through the Orica site. Orica made the mess.	3.11
	On whose assessment is the finding that "additional environmental issues including ecology, heritage and economic" were " predicted to be minimal and/or confined to the construction period"? Where are the scientific flora and fauna surveys to support this conclusion? Who surveyed all the native birds that cross this area daily?	
	Who and when was any heritage surveys done? Has anyone asked the aboriginal people about the proposed remediation areas of the BIP? No heritage survey of Aboriginal culture was ever done in consultation with any Aboriginal Group on theses sites.	3.11

Respondent Number	Issue Raised	Response Section in this report
	What Heritage, Flora or Fauna biological assessments have ever been done by independent scientific assessors?	3.12
	"Continued release of emissions from CPWE" – so there has been emissions leaking?	3.6
	"Possible spread of contaminants off-site" there is no way they can be positive that this has not happened already.	3.1
	"Limited use of prime industrial land" – this statement is arrogant and offensive to the residents of the area.	3.1
	How far has contamination of surrounding soil actually reached? – from recent monitoring. The liner could have been penetrated by rodents/rats, European rabbit, European fox, all of which burrow and have been seen on the car park site. Invertebrate species could also penetrate the liner such as large beetle, Lepidoptera larvae, Crustacea, spiders, etc. How can this assessment be taken seriously with this level of non factual data?	3.1
	Studies confirming that the identified contamination does not pose an unacceptable risk to human health or the environment has only been done by Orica and their related companies. No independent testing or adequate of any areas on this BIP in the last 17 years has been done by any independent or government agency.	3.7
	The three major figures are two and a half years old, why? The relevance to today cannot be seen as a proper assessment.	3.12
	The list of external neighbours is out of date like so much of the assessment. Many of the light industry areas do not exist any more. Many of the noted distances are incorrect.	
	Material should only be transported down through the Orica site.	
	What happens in case of a crash while transporting and lids are broken? What are the safety procedures if this were to happen during school beginning or closing?	
	How are the external surfaces on the truck going to be decontaminated? – With what?	
	How is it possible for the amount of power required for the plant to be accommodated in the existing grid?	3.4.2
	All toxicity summaries are based on WHO guidelines. These are nothing but guidelines, no independent scientific overseas research is listed even though years of independent research both in Australia and overseas have shown chemicals such that Orica and ICI produce are able to be graphed to coincide with the rise in Children's Cancer.	3.7
	There are many other areas lacking in the EA but as so much of the basis of the report is based on 2005 aerial photos and is not properly prepared. How come this was not picked up before this? Why did DEC not demand the aerial photos be as recent as July 2007?	3.12

Respondent Number	Issue Raised	Response Section in this report
3 – *NSW Health*	Proposed residual contaminant concentrations in soil require further assessment with regard to potential human health risk.	3.7
	It is important to have a consolidated air assessment document that includes the errata and the discrepancies and health effects.	
	It is important to have a complete correct documentation of the health risk assessment available.	
	A comprehensive health risk assessment estimating any impact on mercury body burden of emissions is recommended.	
	WorkCover NSW is recommended to be involved in the assessing risk to onsite workers.	
	Unless a complete health risk assessment of the RBC values, incorporating human exposure pathways, is undertaken demonstrating acceptable outcomes, it is preferable that all onsite soil is remediated to guideline levels specified on page 3-4.	
	The outstanding recommendation in the noise assessment (receptor notification and sheet piling) should be adopted.	3.7 and 3.10
	Incremental increases of PM10 and NO2 from the CPWE operations are significant contributors to the environment and risk to human health, including:	3.6, 3.7 and 3.10
	• Maximum predicted ground level concentrations at discrete receptors for NO2 for only the one hour period exceeds health based guidelines.	3.6
	• Maximum predicted ground level concentrations at discrete receptors for NO2 (including background) for the one hour period exceeds health based guidelines.	
	• Maximum predicted ground level concentrations at discrete receptors for NO2 from the CPWE operations only for the annual period is stated as 14 ug/m3.	
	• Maximum predicted GLC at discrete receptors (excluding background) for the 24 hr period for PM10 is 21ug/m3.	3.6
	• Maximum predicted GLC at discrete receptors (including background) for the 24 hr period for PM10 is 42 ug/m3.	
	No information is provided in regards to the likely source of PM10 and NO2.	3.6
	No analysis has been done to indicate the frequency of high PM10 and NO2 concentrations and resulting top 50 worse days in a year and likely ground level concentrations on days other than maximum.	
	Concentrations of NO2 exceeding health based guideline values may impact on sensitive individuals (Asthma).	

Respondent Number	Issue Raised	Response Section in this report
	Significant increments in exposure to particulate matter such as those expected in the vicinity of CPWE (including Hensley Field) increase the risk of adverse health effects (such as respiratory disease) in exposed people.	3.1
	The estimated emission rates from the DTD plant stack in the assessment do not match with the statement of commitments. If the proposal is approved, the conditions should reflect the lower emission rates of the modelling rather than the higher emission allowances in the statement of commitments, unless further modelling can demonstrate acceptable impacts of the emission rates in the statement of commitments.	3.6
	Mercury emission concentrations exceed POEO limits.	3.6.5
	Several errors remaining in the errata reports include the following: • HCB and HCBD values in table 7-2 appear incorrect	3.6 and 3.7
	• The cumulative risk to adults from dioxins (Table 7-7b) appears to be incorrect. This may be a transcription error as Table 7-6 has this as 0.007.	
	• In the CPWE only tables (Attachment A) levels listed for TCE, HCBD, HCB, and 1,1-DCE appear inconsistent at the grandstand and running track. Values at the grandstand are 10 times lower than the running track. For all other chemicals the value at the running track is lower than the grandstand due to it being further away from the works.	
	• In the normal operations table (Attachment A) tho the erratum units stated for the max GLC is assumed a transcription error. Should read μg/m3.	
	It is important to have a complete correct document of the health risk assessment available.	3.7
	The anomaly of concentrations between the grandstand and running track may have some impact on the conclusions of health risk.	3.7
	NSW Health would like the opportunity to review the HRA once corrections are made.	
	The multi pathway approach to assessing potential impacts of hazardous chemicals is acceptable. Given there has been a significant local source of mercury from the chloride plant a comprehensive health risk assessment should estimate any impact on mercury body burden of emissions from this plant on the local community. A comprehensive health risk assessment of mercury should also include pregnant women as a separate exposure group.	
	There appears to be significant exposures to some toxic chemicals for onsite workers. WorkCover NSW should be involved in assessing these risks at the earliest possible opportunity.	

Respondent Number	Issue Raised	Response Section in this report
	In Table 7-2, we are concerned with the proposed values for chemicals of potential concern remaining in soil outdoors. The RBC values for each of the chemicals exceeds the guidelines values as adopted on page 3-4. The levels recommended in Table 7-2 exceed the odour threshold for most of the chemicals.	
	The risk assessment process to derive these values considered only one very specific exposure scenario – workers located above the buried material.	
	The risk assessment did not consider whether the levels of chemicals that are proposed to remain in the soil might pose a risk to off site human receptors given they might be exposed 24 hours per day compared to 1 hour per day for the workers.	
	The risk assessment did not consider whether the levels of chemicals that are proposed to remain in the soil might be odorous.	
	The risk assessment did not consider whether the levels of chemicals that are proposed to remain in the soil might be an ongoing source of contamination to local groundwater.	
	Unless a complete health risk assessment of the RBC values incorporating all possible human exposure pathways and odour risks is undertaken and demonstrates acceptable outcomes, it is preferable that all soil on the site is remediated to guideline levels specified on page 3-4.	
	The noise assessment highlights that the noise criteria goals would not be met if unmitigated for Hensley Athletic field for each scenario and for either neutral or adverse meteorological conditions or day/evening.	
	The noise assessment highlights that the noise criteria goals would not be met if unmitigated for the daytime goals for Qenos building should sheet piling be required.	3.10
	The noise assessment highlights that the noise criteria goals would not be met if unmitigated with respect to residential receivers, the day time goals are met unless sheet piling is required	
	The noise assessment highlights that the noise criteria goals would not be met if unmitigated for the night time goal for the residential receivers of 40dBA would be exceeded by 6dBA during normal and 9dBA during adverse meteorological conditions.	
	It is noted that the recommended mitigation measures achieve compliance with health based noise objectives with the exception of sheet-piling activities and that the recommended mitigation measures have been adopted in the statement of commitments with one exception. The outstanding recommendation in the noise assessment (that receptors be notified if excessive vibration or noise) should be also adopted.	

Respondent Number	Issue Raised	Response Section in this report
4 – *Randwick City Council*		
	Randwick Council does not object to the proposed remediation of the Car Park Waste site.	Noted
	Any approval is to provide appropriate environmental and operational conditions and is to ensure that community consultation, monitoring and reporting is implemented throughout the project.	3.16
	Potential Noise and Pollution Impacts: It should be ensured that the operation of all plant and equipment shall not exceed noise requirements specified in EPL 2148, particularly during the treatment of soil using DTD plant during the night. Precautionary noise mitigation measures referred to in the EA should be implemented up front to avoid non compliance incidents and any undue discomfort. DECC should ensure all licence conditions are strictly adhered to and ensure any incidents of non compliance are promptly communicated to all stakeholders and responded to.	3.6 and 3.10
	Traffic: The increase in vehicle movements resulting from the remediation project with specific regard to the construction period will result in an increase in road traffic and that increase combined with other concurrent major development nearby is likely to adversely impact on the surrounding road network. The EA does not categorically address the controls, measures and management practices that all vehicles adhere to designated routes. Management measure and cumulative impacts should be identified and included in the proposed traffic management plan or alternatively included as a condition in any instrument of approval for the project.	3.11
	Resource Use: The associated consumption of natural gas, electricity and diesel with the proposed remediation is significant. The impact that this resource has on the environment via greenhouse gas emission has not been sufficiently addressed in the EA. A commitment from Orica to reduce greenhouse gas emissions resulting from the remediation should be made or mandated by DECC. This could be achieved by offsetting a proportion of the projects emissions by purchasing a percentage of Green Power from an accredited renewable energy supplier.	3.16
	Remediation: Council is concerned with the management of materials outside the encapsulation area with specific regard to the eastern embankment. The EA provides little surety with respect to the proposed management of this material. Approval needs clear commitment to a sound process for remediation of the whole area.	3.2.1

Respondent Number	Issue Raised	Response Section in this report
	Any approval process and associated works are to ensure the protection of the environment and that the amenity of the nearby industrial and residential land is maintain, particularly in regard to air emissions, traffic, water treatment and disposal and acoustic comfort.	3.1.6
5 – *City of Botany Bay*		
	Council generally supports the proposal.	Noted
	Groundwater: Although the EA states that contaminated groundwater associated with the CPWE will be managed as part of the existing groundwater containment and treatment program, it does not address the fact that groundwater in the vicinity of the CPWE does not migrate toward the south west as in the majority of the Botany aquifer but to the north east toward Hensley Athletics Field. Management of groundwater in this area must be addressed and the risk to field users assessed in light of this.	3.9.1 and 3.7
	A number of the requirements of the DG in relation to water quality were not adequately addressed in the EA, including:	3.9
	• An accurate representation of the extent of the HCBD hotspots in groundwater adjacent to the CPWE and how this groundwater will be managed/remediated.	
	• Details of how nearby production bores will be managed so as not to exacerbate migration of contaminants from the disturbed area.	
	• Provide details of the proposed monitoring of groundwater and surface water and effective strategies to manage the risk of water contamination.	
	Remediation and Development Control Plan 34: All remediation works should be in accordance with Council's development control plans and LEP, in particular DCP 34 – Contaminated Land, including:	3.12
	• In relation to vibration the EA states that *"it is possible that vibration levels could, at times be perceptible at the residences"* is not in accordance with DCP 34.	3.10
	• Material stockpiled onsite, outside the excavation soil building (ESB) or feed soil building (FSE) shall be stored and managed in accordance with DCP 34.	3.12
	• Section 4.3 describes working hours (for plant) in the ESB that do not comply with DCP 34.	3.12

Respondent Number	Issue Raised	Response Section in this report
	• Upon completion of the remediation works and reinstatement of the CPWE material. Landscaped areas of the site should be revegetated with a diversity of locally native trees, shrubs and groundcover propagated from local genetic stock where possible. In accordance with DCP 34.	3.1
	• All fill imported to the site must be validated and comply with relevant NSW DECC guidelines in accordance with DCP 34.	3.6 and 3.12
	• Noise levels should comply with guidelines set out in DCP 34.	3.10
	Remediation Approach, Performance and Justification: The CEMP referred to in Section 8.1.2 of the EA should be provided to the relevant authorities prior to the works being undertaken.	3.12
	The EA does not adequately address how inorganic constituents which cannot be treated in the directly-heated thermal desorption (DTD) plant will be managed.	3.4
	A number of requirements for the DG in relation to the remediation approach, performance and justification of the remediation were not adequately addressed in the EA, including:	3.3 and 3.4
	• Clear details of the design and technology of the DTD plant;	
	• Description of the DTD commissioning program and verification of the technology and emission controls;	3.4
	• Details of the DTD operation including residence times for processing material;	
	• Detailed information on the pre-treatment building including the ventilation system and worker machinery movements;	3.1
	• Details of the quantities and physio-chemical parameters of the materials to be remediated;	3.4
	• Details on how the technology has been proven acceptable for processing materials similar to those likely to be located on the site; and	
	• Council notes the DG requirement in relation to the remediation criteria was not adequately addressed. The EA did not clearly indicate the proposed remediation criteria to be applied to the site and details of how these were derived.	
	Air quality, including odour and dust: A plan for the air monitoring program once the plant is operational should be designed and should clearly state when monitoring will occur and how and when the results of this will be reported.	3.6

Respondent Number	Issue Raised	Response Section in this report
	In Council's previous submission, it was proposed that an air quality communications strategy be developed to report emission monitoring. Council also suggests fortnightly dioxin emission testing as a minimum during plant commissioning and initial operations. Neither were address comprehensively, and times frames were not included for either dioxin monitoring or reporting to the community participation and review committee.	3.6
	The quantitative air assessment utilised background pollutant concentration data obtained from DECC ambient air monitoring site in Randwick. Only a subset of all pollutants required to be monitored was conducted in the vicinity of the BIP. The data from the DECC Randwick site should not be relied upon to be representative of that of the BIP as the landscape character surrounding is not similar. Use of this data and further monitoring in the vicinity of the BIP should be considered.	
	Section 8.1.2 of the EA states the *"potential odour impacts associated with the proposed remediation of the CWPE may be caused by the release of odours and vapours from the exposure of contaminated materials during excavations and handling"* the possible impacts of odours from the emissions control system and DTD plant stacks should also be considered.	
	Section 8.1.4 states that a monitoring program will be designed for each of the ESB, FSB and DTD plant stacks. More comprehensive details of the monitoring plans should be included in the EA.	3.6 and 3.16
	A number of requirements of the DG in relation to the air quality impacts of the remediation works were not adequately addressed in the EA, including:	3.6 and 3.16
	• Provide a description of baseline conditions including meteorological and topography;	
	• Provide details of all air discharge points and characteristics;	
	• Provide details of the proposed air quality and monitoring program; and	
	• Include a detailed dust impact assessment from the soil disturbance and other remediation activities, and consider cumulative dust impacts from other relevant activities in the area.	
	Other: The Human Health Impact Assessment prepared by URS recommended that emissions from the plant associated with the CWPE remediation works should be monitored and re-evaluated against the assumptions used in the assessment once the plant is operational. It is recommended that this takes place within the first three months of commissioning of the plant.	3.7

Respondent Number	Issue Raised	Response Section in this report
	An interim advice containing the Auditor's comments on the RAP should be prepared and submitted to the DoP, certifying that in the Auditor's opinion the RAP will allow the site to be remediated to commercial/industrial standard prior to the remediation works beginning. Upon completion of the works the validation report and Site Audit Statement prepared by the Auditor should be submitted to the consent authority.	3.4 and 3.5.3
	Upon completion of the detailed design for the DTD plant further environmental assessment should take place, particularly in relation to air and noise emissions.	3.6 and 3.10
6 – *Botany Environment Watch*	Whether unacceptable or not what is the risk associated with air from existing CPWE. Where has the risk been proven to be harmless?	3.6 and 3.7
	BEW have fears for the workers dealing with this project and they must be protected no matter what the expense. Monitoring of the workers health for at least five years after completion of destruction and decommissioning must be written into the workers contracts.	3.7
	Doors double lock entry. Is this proven non failure?	
	Will truck drivers wear protective clothing and how often changed?	3.1
	Mercury emission removal from process gas is poorly understood. Orica is not sure of the temperature to minimise potential emissions. How can approval be given when this declaration of trial and error poses such a threat?	3.4, 3.6 and 5.4
	How often are safety proceedings, evacuation, etc to be held during the time of destruction waste?	3.7
	Has there been a hazard/risk analysis for utilities and resources?	3.7 and 3.8
	Will cleanup liaison committee receive a copy of review of auditing and validation?	3.5.3
	Final design needs to be seen. Why wasn't it prepared for the assessment?	3.4
	Air Quality. Buildings have control emission systems. So what about the workers enclosed inside the building?	3.6
	Workers inside breathing in dust?	3.7
	Will noise measures be in place before or after noise problem is experienced?	3.10
	Would be is constantly used, as detected after the event?	3.10
	Vibration. Despite low risk this is a worry.	3.10

Respondent Number	Issue Raised	Response Section in this report
	Road traffic detail assessment not necessary. We are entitled to know traffic movements as all our streets and roads are threatened with the multitude of traffic generation caused by undesirable industry and their infrastructure.	3.11
	Hazard risks mainly about outside the area. Inside is also a worry.	3.8
	Will mitigation measures be in place before the operations start and not after a problem occurs?	3.16
	The conclusions comment "*the potential risk levels to personnel may be relatively high"* is not good enough. Could a more detailed assessment be given and with proven results?	3.7
	How often is periodic inspection and maintenance for preventative control?	3.6
	Every attempt must be made to protect the workers, residual risk and potential to cause operator injury must not happen. If in doubt don't do it.	3.7
	A more detailed risk assessment is required. Will we know when it is completed? It must be completed before operations begin.	
7 *Sydney Water*	There does not appear to be major water or sewer infrastructure located in the subject site. However, the developer would still be required to obtain a Section 73 Compliance Certificate from Sydney Water. The Certificate will confirm that the developer meets Sydney Water's infrastructure requirements and has made payment of Sydney Water charges.	3.12
	Developers should engage a Water Servicing Coordinator to get a Section 73 Certificate and manage the servicing aspects of the development.	
8 – *DECC*	DECC is able to support the proposal on the basis that the proposal is unlikely to result in adverse impacts to the environment, subject to DoP seeking amendments and additions to the Statement of Commitments.	Noted
	A key issue that requires further examination is whether the proposed new plant will comply with the emission limits for mercury as specified by the POEO Clean Air Regulation (CAR). Orica has indicated that it is uncertain wether mercury emissions will comply with the limit.	3.6.5.4
	DECC considers that Orica should be able to meet the regulatory limit if available control technology is fitted. DECC expects the new plant to comply with regulatory limits. An exemption form the standards is also an option available in certain circumstances, as detailed in Section 284 of the POEO Act.	3.6 and 3.12
	Discussions between DECC and Orica on potential CAR emissions are recommended to occur parallel to the 3A planning process.	3.6 and 3.12

Respondent Number	Issue Raised	Response Section in this report
	It is expected that DECC will be given an opportunity to review the draft DG EASR for this proposal. If the amendments to the draft Statement of Commitments are not included to the satisfaction of DECC it will be recommended that they are included as conditions of approval.	
	The proponent will need to make a separate submission to the DECC to the obtaining of the EPL required to operate.	
	DECC would appreciate receiving a copy of the submissions received by the DoP (or summary of submissions) in response to the exhibition period.	
	DECC considers that the draft SOCs detailed in the EA should be adopted in the development of any proposed approval conditions subject to amendments detailed in the DECC response, including:	3.12
	• SOC1 – Prior to the issue of an EPL, DECC will undertake Technology Assessment of the proposed treatment technology based on documentation that will be submitted by Orica. DECC will then provide more detailed comments which may include providing additional advice on appropriate licence conditions.	3.4, 3.6 and 3.12
	• SOC4 – DECC is supportive of the DTD plant operation and recognises that there may need to be some flexibility in operating parameters where appropriate. However, such parameters will not be agreed at the expense of complying with the specified soil remediation criteria. Other projects have demonstrated that the specified remediation criteria are achievable in practice using this technology and as such the remediation criteria which have been set for the project in the EARs should apply.	3.6 and 3.12
	• SOC8 – Appendix K of the EA appears to question the definition of best practice for thermal oxidiser design, Orica is reminded that the need to meet the requirements of the Clean Air Regulation.	
	• SOC13 – This commitment lists the incorrect concentration limit for mercury. The CAR limit for mercury is 0.2mg_m^3 and not 1.0mg_m^3. Orica can not lawfully operate its plant at the upper limit proposed by this commitment unless it had obtained an exemption from the CAR limit. The commitment also states that Orica will comply with a stack concentration of 205mg_m^3 for nitrogen oxides. However the EA states ground-level concentrations of NO2 are predicted to exceed DECC's 1 hour average impact assessment criterion when modelled assuming an in stack NOx concentration of 234mg_m^3. DECC requests that Orica commit to meeting an emission concentration which enables compliance with DECC's impact assessment criterion for 1 hour average NO2.	3.6 and 3.12

Respondent Number	Issue Raised	Response Section in this report
	• SOC18 – DECC recommends this SOC be amended as follows "Waste removed from the site will be assessed, classified and managed (where necessary) in accordance with the environmental guidelines: Assessment, Classification and Management of Liquid and Non-Liquid Wastes. All waste will be disposed of to an appropriately licensed waste facility".	3.12
	• New SOC - DECC recommends that an additional SOC be added under the Air Quality section which commits Orica to implementing all practicable measures to eliminate or reduce, as far as practicable, all fugitive emissions from transport of material from the ESB to the FSB.	3.6 and 3.12
	• SOC20 – DECC recommends that an additional point be included in this commitment that states "Notification to all those impacted by works likely to cause excessive vibration and noise i.e. if sheet piling is required".	3.10
	• DECC recommends that the following SOCs also be included: (1) Noise generated at the premises must not exceed 55 dB(A) $L_{Aeq,\ 15\ minute}$ at night at any residence within a residential area. The L_{Amax} noise limit for the night period is 63dB(A). (2) For the purpose of (1): Day is defined as the period from 7am to 6pm Monday to Saturday and 8am to 6pm Sundays and Public Holidays Evening is defined as the period 6pm to 10pm Night is defined as the period from 10pm to 7am Monday to Saturday and 10pm to 8am Sundays and Public Holidays	

Respondent Number	Issue Raised	Response Section in this report
	(3) Noise from the premises is to be measured at the most effected point within the residential boundary or at the most effected point within 30m of the dwelling (rural situations) where the dwelling is more than 30m from the boundary to determine compliance with the $L_{Aeq\ 15minute}$ noise limits in condition (1), unless otherwise noted. Where it can be demonstrated that direct measurement of noise from the premises is impractical, the EPA may accept alternative means of determining compliance. See chapter 11 of the NSW Industrial Noise Policy. The modification of factors presented in section 4 of the NSW Industrial Noise Policy shall also be plied to the measured noise levels where applicable. (4) The noise emission limits identified in condition (1) applies under meteorological conditions of: Wind speed up to 3m/s at 10 meters above ground level; and Inversions of 3°C/100m and wind speeds of 2m/s at 10m above the ground. (5) To determine compliance with the L_{Amax} limit in condition (1) noise must be measured at. Or computed for approximately 1m from the dwelling façade. (6) Construction shall be limited to the hours of 7am to 6pm Monday to Friday and 8am to 1pm Saturdays and at no other time without the prior approval of the EPA unless inaudible at any noise sensitive location not associated with the development. Inaudible means the construction activities should not be heard by the human ear at the nearest affected receiver. The assessment location shall be in accordance with condition (3).	3.10
	• SOC26 – This commitment should be amended to cover all aspects of the project similar to SOC 24 and 25 including site establishment, excavation, construction, operation and decommissioning.	3.16
	• DECC recommends an additional SOC be included which states “Only uncontaminated rainwater would be permitted to flow to stormwater drains”.	3.9
	• SOC26 & 28 – Both SOCs make reference to SOC 44 which does not seem to be included in the EA. (It is assumed this reference should be SOC 39)	3.16
	NOx emissions: DECC requests that Orica clarify whether an in-stack concentration of 205mg/m^3 (NOx) will enable compliance with the ground level concentration criterion.	3.6.6

Respondent Number	Issue Raised	Response Section in this report
	Fugitive emissions during transport of contaminated material: • Measures proposed to reduce fugitive dust emissions from trucks are not adequate given the nature of the soil contamination.	3.6 and 3.11
	• Orica must employ additional design measures to prevent contaminated soil coming into contact with trafficable surfaces and truck wheels, especially during truck loading and unloading.	
	• The control of fugitive emissions is critical to minimising the potential for adverse air quality impacts due to the proposal.	
	• It is recommended that Orica be required to commit to redesign how the materials will be handled and transported between the two proposed buildings and to prepare a comprehensive plan to manage fugitive emissions from this source.	
	Compliance with the Regulatory Design Requirements for the Plant: • Appendix K – The Clean Air Regulation required operation at a temperature of more than 980°C. The EA states that the DTD plant would be operated above the minimum temperature of 900°C.	3.12
	• Appendix K also discusses issues associated with meeting the require residence time for the thermal oxidiser and does not commit to meeting the Clean Air Regulation requirements. However it is understood that the plant will be designed to meet the Regulations for a residence time of more than 2 seconds.	
	Greenhouse Gases: The specified soil remediation criteria must not be compromised as a result of plant optimisation. Notwithstanding this Orica should consider more comprehensive additional reduction and energy efficiency opportunities across other aspects of the site operations and not limit this concern to rotary dryer and thermal oxidiser temperatures.	3.13.2
	Revised Air Quality Assessment Report: In addition to the issues addressed in the erratum report, the revised air quality assessment should address the issues identified below:	3.6
	• Baseline values for PM10 in table 9.1 do not appear to be correct, as they do not match the values in Table A1 of the erratum report.	

Respondent Number	Issue Raised	Response Section in this report
	• The maximum predicted off site ground level concentrations (glc) for annual average TCE in Table 1 of the errata report does not appear to be correct. This appears to be a transcription error with 0.038μg/m3 the maximum predicted glc at sensitive receptors surrounding the site, not at the boundary.	3.6
	• The appendices in the errata report do not detail the predicted $CHCl_3$ concentrations for the baseline scenario. Similarly, the appendices do not detail predicted TSP concentrations for the normal or upset scenarios.	
	• The appendices in the errata report indicate the predicted concentrations for HCBD, HDB, HCE, 1,1-DCE and TCE are at least and order of magnitude higher at the Botany Athletic Running Track than the Grandstand. Given the relative locations these results appear to be incorrect. This may be a transcription error with the CWPE scenario shifted a level down. Since the values in this row have been used to calculate risk associated, these estimates may have to be recalculated.	
	• It is not clear why predicted NO2 concentration remain the same for the upset scenario, when a loss of natural gas supply would result in the shutdown of the thermal oxidiser, cessation of natural gas combustion, and consequently a decrease in the NOx emitted from the DTD stack.	
	• Values for PCE in Table A.16 of the errata report appear to be incorrect. The maximum onsite and off-site glcs are lower than for the baseline scenario.	
	• The results in Table 9.3 of the air assessment for 1,1-DCE for the baseline and normal scenarios are incorrect. The appendices indicate that the correct value for both scenarios is 0.04 μg/m3 not 0.405 μg/m3.	
	• Some of the emissions of the volatile chlorinated compounds jump dramatically between normal operation and upset conditions but others remain exactly the same. It is unclear from the assessment as to the reason for these increases and wether they are attributed to the fact that the main emissions for the latter chemicals originate form other parts of the site which then dominates the levels from the CPWE treatment.	
	Revised Human Health Impact Assessment Report: Revised human health report to be submitted, as agreed by DECC, Orica and NSW Health. The revised report should also address the following:	3.7
	• Should the life of the plant be extended to accommodate material from the Pacific National stockpile, DECC would be concerned over the adequacy of the current health assessment (i.e. 2 year only). It is acknowledged that the treatment of other material using the proposed plant would require a Section 96 application to be submitted to DoP at which time any associated risks with extending the program would need to be assessed.	3.7

Respondent Number	Issue Raised	Response Section in this report
	• Table 7-2 needs to be reviewed for HCB and HCBD because these appear to be incorrect.	
	• Table 7-7b in the erratum report, the calculated dioxin value provided for the cumulative impacts from the CPWE remediation and other sources is less than the value provided for the impact from the CPWE only. This suggests that the risk from dioxins decreases when the baseline scenario is added. This is assumed to be an anomaly as a result of transcription error as Table 7-6 shows a different number for the value for dioxin.	
	• In the risks Table (Appendix B), there appears to be an incorrect heading in the table associated with the CPWE only emissions. The last two columns of each table have the same heading. It is believed one of the columns should be referenced to the daily intake values while the other should remain as is.	
	Risk Assessment to determine Soil Based Risk Concentrations: DECC is concerned about the approach taken for the assessment of risk for contaminate levels in soil that could potentially remain in place or be reused on site. The assessment appears to be incomplete and not acceptable as a basis for determining validation criteria and /or treatment outcomes.	3.5.1 and 3.7
	The assessment does not consider whether the proposed levels of chemicals that could remain in the soils might be an ongoing source of contamination to the local groundwater.	
	The assessment does not consider whether the proposed levels of chemicals that could remain in the soils might be odorous.	
	The assessment does not consider whether the proposed levels of chemicals that could remain in the soils might pose a risk to offsite human receptors who live near by given that they are in place 24 hours per day compared to the 1 hour per day that the workers might be present.	
	The assessment does not consider whether the proposed levels of chemicals that could remain in the soils might be phytotoxic – whether a garden could be grown in the outdoor area.	
	According to USEPA region 9 preliminary remediation goals, soil containing PCE can be a source of contamination to groundwater at concentrations as low as 0.06 or 0.003 mg/kg depending on how long it takes for the chemical to migrate or how far away the groundwater is.	3.5.1
	The risk assessment uses a number of incorrect or unsourced data as inputs to the volatilisation models, although it would appear that for the most obvious data errors it has resulted in a more conservative answer that if correct value had been included. Whilst this does not impact the overall assessment it should be a more thorough check of the data for assessments.	3.7

Respondent Number	Issue Raised	Response Section in this report
	The approach used for assessing exposure via the dermal pathway is quite old and does not take into account the advice released in 2004 by the USEPA and in 2006 by WHO. The USEPA approach should be adopted and would result in higher contributions to risk for this pathway which would result in the risk based soil concentrations needing to be lower that currently calculated.	3.5.1
	The proposed use of risk based soil concentration criteria are unclear from the report given that most of the values listed in Table 5 and 6 in the remedial action plan are significantly above the levels actually found in the material inside the encapsulation as listed in Table 1 of the RAP.	3.4
	Remedial Action Plan Issues: Should the RAP be reviewed as a result of the auditor approval process, DECC would like the opportunity to review any proposed changes.	3.6
	Soil Remediation Criteria: DECC has a number of concerns regarding the remediation criteria as presented in both the body of the EA and the RAP, including:	3.5.7
	• The remediation/validation criteria specified in the RAP are greater that the DG EARs and the industrial waste guidelines for a range of compounds, including HCB. The EAR scheduled chemical waste (SCW) criteria are based on the NSW Scheduled Chemical Waste Chemical Control Order 2004 (SCW CCO) and are consistent with the limits set for the Allied Feeds remediation project. In regard to these treatment goals SCW must meet the regulatory level of less than 2mg/kg aggregate as was specified in DECC EARs.	3.5.7 and 3.4
	• Section 8.4.2 of the EA - the statement is misleading and it is only the criterion for dioxins that differs between the requirements of the CCO and the EARs. DECC currently regulates licensees against the WHO-TEQ's for dioxins, furans and dioxin like PCBs as this approach is in accordance with international best practice. The NSW dioxin CCO approach is outdated and only applies in single dioxin congener.	3.6 and 3.12
	• Section 11.4.3 of the RAP – This statement during the optimisation trials may be over stated as DECC are aware of other similar thermal plants that operate at temperatures between 500°C to 550°C which have not resulted in catastrophic failure of the rotary dryer. Further explanation information would need to be provided to justify the statement in the EA.	3.4

Respondent Number	Issue Raised	Response Section in this report
	Materials Management: • Orica must ensure that the materials of the bitumen cap and material surrounding the CPWE are dealt with in an appropriate manner during the process and if it proposed that the bitumen cap is to be land filled, then it will need to be assessed in accordance with DECCs Environmental Guidelines. This is also applicable to any other waste material not remediated during the proposed process.	3.4
	• Section 3.5.2 of the RAP indicates that the Hypalon has a very high concentration of HCBD, higher than the CPWE soil. Careful analysis of the base excavation surface and treatment of the highly contaminated base soils should be ensured.	
	• It is unclear from the information provided as to the exact locations of the proposed reuse sites and the type of backfilling that it would be used for. The RAP does not identify the remediation criteria adopted for this material and nor does it detail odour management. DECC is concerned about the potential generation of offensive odours.	
	• It is unclear that the proposed thermal treatment is capable of treating the vast array of materials (scrap steel, scrap pipework, etc) identified as comprising the encapsulated material, and how the material will be managed in the event they cannot be treated	
	• It is unclear as to the potential future uses of the site, and permissibility given remediation.	
	• The EA makes several references to Treatability Trial data, but it is not included in the report. Provision of the data would provide a clearer understanding of the remediation outcomes.	
	Site Validation Plan: • The RAP identifies the use of industry practice of 2.5 times the criteria in a single sample and 95%UCL. It does not detail whether this practice is to be adopted per stockpile, per excavation are or adopted for a whole of treatment validation. DECC recommends it should be adopted per stockpile, per excavation are and whole of treatment. It is also recommended that if different strata layers are encountered that each strata should be individually validated.	3.4 and 3.5.3
	• In order to determine the adequacy of the grid size and spacing, an estimation of the size of the excavation and depth of the walls would need to be provided. This information is not in the RAP.	
	• Section 14.5 – It is unclear as to whether this refers to the current capping material or any additional capping material that may be brought to the site. If it refers to current material the different types should be separated and classified independently. Furthermore the proposed quantity of this material is unclear and therefore the sample density cannot be determined.	

Respondent Number	Issue Raised	Response Section in this report
	• Section 14.6 – It is unclear from the report as to the quantity of this material to be validated, therefore it is difficult to assess the density. The difference between suite 3a and suite 3b materials is not clear.	
	• Section 14.7 – It is not clear from the information provided as to how the validation process will be affected should the DTD plant not work for eight hours successively.	
	Water Reuse Criteria: • The criteria to enable treated water to be reused on site has not been included in the EA or RAP. Until this is provided the acceptability of the reuse cannot be assessed	3.4
	Other Issues: • Section 12 - Should the option of onsite wastewater treatment be chosen by Orica additional information regarding the proposed location and the proposed remediation and reuse criteria for the contaminated water will need to be provided.	3.4
	• Page 15 of the RAP – DECC questions the use of only one sample. The information on the TEQs is inadequate and should be reported in terms of 1998 WHO TEFs or the 2005 WHO TEF's.	3.4
	• DECC notes that the relative Percent Difference (RPD) recoveries for organics will be more than what is outlined in the RAP. Whilst this is acknowledged no other limit of acceptability has been provided.	3.4
	• DECC considers all treated material will be considered contaminated until validated otherwise.	3.4
	Noise Issues: • In the event of sheet piling being required on the site all associated noise impacts from piling will be controlled via the construction time limits provided in the SOCs. Respite periods should be implemented into the program if complaints are received.	3.10
	• Vibration impacts associated with piling would be regulated via the requirements of DECC's publication *Assessing Vibration: A technical Guideline.*	
	Water Quality Issues: • Section 8.6 – From previous discussions with DECC and Orica it was understood that some of the Qenos bores are no longer in use and had been deregistered. It is requested that Orica clarify the bores that are in use as they may need to be limited given proximity to the contamination.	3.9

Respondent Number	Issue Raised	Response Section in this report
	Hydrocarbon contamination in the groundwater: • The EA does not appear to address the issue of the presence of petroleum hydrocarbon contamination from an existing pipeline at the site. It has only been acknowledged.	3.4
	• DECC is concerned that the pipeline may still contain material contaminated with hydrocarbon contamination, which if ruptured may further contaminate the site and potentially groundwater. Such an incident may also impact the DTD process and large amounts of BTEX and TPH in the soil. The effectiveness of the emission control for the FSB and DTD may need to be assessed once Orica has a better understanding of the level of contaminants present in the soil.	
	Mercury Emissions: *Compliance with the Regulatory Limit:* It appears Orica would be capable of complying with the mercury emission limits through the use of established control technologies, such as injection of activated carbon.	3.6.5 and 3.12
	It appears the conclusions made in Appendix K are based on incorrect assumptions about oxygen corrections that approximately halve the mercury concentration limit that would apply.	
	Some of the statements made in Appendix K refer to remediation projects between 1989 and 1998 which would not have been required to meet the current US standards.	
	An exemption of the POEO Act limits is an option available in certain circumstances. Integral to any exemption is: • A demonstration that it is not practicable for Orica to comply with the Regulation mercury standard when emissions have been reduced to the maximum extent achievable through application of best-practice process design and / or emission controls; and • A rigorous assessment demonstrating that non-compliance with the regulation mercury standard will not have any significant adverse effect on public health, property or the environment.	3.12
	Best Available Control Technologies: It is not demonstrated that it is not practical to inject powdered activated carbon for reducing mercury and does not commit to employing any such control technology or practices.	
	DECC is concerned that the method of reducing mercury control through lowering temperature of the rotary dryer may compromise the effectiveness of soil remediation.	

Respondent Number	Issue Raised	Response Section in this report
	It must be demonstrated that the proposed reduction of mercury emissions is to the maximum extent achievable through application of best-practice process and design and/or control emissions.	
	Impact of Mercury Emissions: It has been assumed for the assessment that all mercury emissions from the DTD plant will be in the form of organic mercury, however DECC understands that there is considerable uncertainty regarding the form of mercury will take in emissions. This uncertainty will not be resolved until the proof of performance trials have been undertaken.	
	If all the mercury were to be emitted as organic mercury the maximum glc would be almost double the criterion for organic mercury. The assessment predicts that there may be impacts at receptors for the plant as proposed. This is unlikely to be an issue for a plant that complies with the regulatory limit for mercury emissions.	

Respondent Number	Issue Raised	Response Section in this report
	Table 1 or the errata report indicates that CPWE is not the major contributor to the maximum offsite and onsite mercury glcs. However the impact of CPWE has a significant effect on maximum glc concentrations of mercury at many sensitive receivers. A summary of the predicted mercury concentrations showing the relative concentrations of the CPWE remediation and other sourced to maximum predicted glcs is shown in Table 1 (refer to submission).	3.12

Table 1: Maximum Predicted Ground Level Concentrations of Mercury (µg/m^3)

Receptor	Baseline		CPWE Only		Normal		Upset
	1 hour	Annual	1 hour	Annual	1 hour	Annual	1 hour
Maximum GLC	**5.33**	**0.56**	**0.56**	**0.017**	**5.33**	**0.560**	**5.33**
Maximum Offsite GLC	**0.85**	**0.015**	**0.31**	**0.015**	**0.85**	**0.016**	**0.85**
Botany Golf Course	0.052	0.0005	0.08	0.001	0.08	0.002	0.06
Banksmeadow Primary School	0.031	0.0002	0.05	0.001	0.05	0.001	0.04
Garnet Jackson Reserve	0.027	0.0002	0.09	0.001	0.09	0.001	0.08
Pagewood Primary School	0.019	0.0002	0.10	0.002	0.11	0.002	0.09
Botany Athletic Centre Grandstand	0.042	0.0004	0.23	0.006	0.23	0.006	0.19
Botany Athletic Centre Running Track	0.039	0.0004	0.21	0.005	0.21	0.005	0.17
Denison Street North	0.076	0.0007	0.20	0.008	0.20	0.009	0.16
Denison Street North 2	0.073	0.0007	0.20	0.008	0.20	0.009	0.16
Denison Street South	0.299	0.002	0.12	0.003	0.30	0.005	0.30
Guides Hall	0.180	0.003	0.10	0.001	0.18	0.005	0.18
Retirement Village	0.018	0.0001	0.10	0.001	0.10	0.001	0.08
Our Lady of Annunciation School	0.033	0.0002	0.11	0.002	0.12	0.002	0.09
Marist Brothers High School	0.035	0.0002	0.10	0.002	0.10	0.003	0.08
Childcare Centre	0.048	0.0003	0.10	0.003	0.11	0.003	0.09
St Agnes Primary School	0.051	0.001	0.08	0.002	0.09	0.004	0.07
South Sydney High School	0.022	0.0002	0.07	0.001	0.07	0.002	0.06
Matraville Primary School	0.088	0.001	0.13	0.003	0.13	0.005	0.11
Kelloggs (manufacturing plant)	0.035	0.0003	0.09	0.001	0.09	0.002	0.07

Main contributor to predicted concentrations for normal scenario

CPWE Remediation project
Other sources (eg. old chlorine plant)
Combination of CPWE and other sources

Respondent Number	Issue Raised	Response Section in this report
	Conclusions: While it is acknowledged that the control of mercury is technically complex, it is expected that the new plant is designed to comply with regulatory limits.	3.12
	An exemption from the standard is available in exceptional circumstances under Section 284 of the POEO Act.	
	DECC recommends that Orica design the proposed plant to meet all regulatory requirements.	
	DECC recommends that Orica implement, either upfront or at the technology assessment and/or proof of performance stage of the project, all measures necessary to ensure that all regulatory requirements are met. Any additional information on the proposed measures to be implemented should be provided at the technology assessment stage of the project.	
	Alternatively Orica may apply the provisions of section 284 of the POEO Act and seek and exemption from meeting the regulation limit. For DECC to support such an application, Orica would need to rigorously demonstrate that it is not practicable to achieve compliance with the limit and that there is no impact from non-compliance. This option has already been discussed with Orica and DECC would be willing to participate in further discussion on this matter.	
9 - *Department of Planning*	Surplus treated soil of 30,000 m3: any further details of what is the final destination of these soils? If not, when will this information be available?	3.1
	Any further details of the final land use of the remediated car park site? If not, when will that information be available?	3.4
	Transport routes. How much and what type of traffic is anticipated along the secondary access routes proposed in the EA (Section 8.5.2)? Is it proposed that trucks use the secondary route along Page St and Holloway St? Is the Port Feeder Rd a route option for construction/remediation traffic?	3.11
	Have you had discussions with the Gas provider to ensure that gas requirements for the DTD Plant are achievable and that there is infrastructure in place to deliver it?	3.12

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3.0 Issues Raised

3.1 Scope of the Proposal

Investigations of the CPWE have shown that it does not currently pose an unacceptable risk to human health or the environment. However, Orica acknowledges that the conditions at the CPWE are not improving. Monitoring results indicate that contamination of the soil surrounding the liner has occurred, low concentrations of HCBD have been detected in groundwater in close proximity to the CPWE and low emissions of HCBD are also present in air emissions in the vicinity of the CPWE. Given that a suitable and proven technology is available, Orica has made the commitment to remediate the CPWE site and, accordingly has prepared an EA for the proposal.

Orica agrees that it is highly important to remediate the CPWE site. Orica proposes to remediate the CPWE to a standard that is suitable for ongoing commercial/industrial land use – in line with the zoning and surrounding land uses. The technology proposed (DTD) will achieve this standard.

Orica is proposing to remediate the material contained within the liner of the CPWE, including remediation of the liner itself where required. The material surrounding and beneath the liner within the CPWE boundary would be tested and assessed against the Remediation Goals. If the material does not meet the Remediation Goals, then it would be treated in the DTD Plant. If it does meet the Remediation Goals, it would remain within the CPWE boundary. The Remediation Goals are detailed in Section 6 of the Remedial Action Plan (RAP), in accordance with the Director-General's requirements.

The remediation project will be undertaken such that it is protective of human health and the environment, and will meet regulatory standards for residues and emissions by the implementation of best practices. The RAP (HLA 2007), which has been revised, provides more detailed information for the project and is provided as a separate document.

It should be noted that the present proposal only considers the CPWE site and focuses on the material contained within the encapsulation liner as defined in the Hexachlorobenzene (HCB) Waste Management Plan (ANZECC 1996). The project does not include remediation of groundwater, contaminated material which may exist outside the boundary of the CPWE area or contaminated material where the source of the contamination is not within the BIP site and not related to industrial activities undertaken by Orica. Management of Orica's other issues at the BIP are ongoing.

There were a number of queries raised in regard to the remediation of the groundwater contamination in the vicinity of the CPWE and operation of groundwater production bores. Groundwater in the BIP area is managed under a separate groundwater management plan that relies on pumping and treatment to prevent migration of contaminated water to Botany Bay. In addition, groundwater monitoring is being undertaken in accordance with Orica's EPL (No. 2148) and the project proposal does not include groundwater remediation. Orica, therefore, considers that it is more appropriate to manage the groundwater contamination as a separate issue, as is the current process. Consequently, limited responses will be provided in regard to the queries relating to groundwater contamination in the vicinity of the CPWE. Monitoring will continue to be undertaken and reported to the DECC and the community. Any other issues raised in regard to this will also be discussed with DECC and the community.

Orica has been undertaking investigations of other hexachlorobenzene (HCB) related wastes, which have focused on known HCB contaminated areas. The areas include the Pacific National Stockpile[1], the

[1] Soil previously identified for treatment in the proposed Geomelt Plant - URS Australia Pty Ltd (2001), *Environmental Impact Statement: Proposed HCB Waste Destruction Facility at Botany, July 2001*.

Denison Street Stockpile[1], the HCB Stores and Southlands (an area of land owned by Orica to the south west of BIP). Information on these investigations was presented to the Community Participation and Review Committee (CPRC) at its November 2006 meeting and updates have been provided throughout 2007. Further information on these areas is provided in the briefing paper prepared for the November 2006 meeting, a copy is provided in **Appendix A**.

Orica is currently reviewing available information to determine whether these other areas of contaminated soil would be appropriate for treatment using DTD technology, In determining whether the technology is appropriate, Orica needs to consider contaminant concentrations (including mercury), timing of this project and other issues. If other waste is identified as suitable for treatment using DTD technology, then Orica would consult with the community and the regulators. Such a proposal would require additional assessment and planning approvals.

Further information in relation to the other projects being undertaken at BIP and the Orica owned Southlands site can be obtained through the following:

- Community hotline: 1800 025 138
- Write to us at: Community Matters, 16-20 Beauchamp Road, Matraville 2036 or email info@oricabotanygroundwater.com or info@oricahcb.com
- Websites: www.oricabotanygroundwater.com and www.oricahcb.com

3.2 The Site and Context

3.2.1 Management and Monitoring of the CPWE

An issue was raised in the submissions in regard to whether there have been emissions 'leaking' from the CPWE. As indicated in Section 2.2.1 of the EA and Section 3.5 of the RAP (HLA 2007), air emissions monitoring has been undertaken at the CPWE since 1997.

The 2002 HCB Waste Management Plan Human Health Risk Assessment (Car Park Waste), prepared by URS Pty Ltd (URS), concluded that the risks to off-site residential, recreational, on and off-site industrial workers associated with emissions to air from the existing CPWE do not represent an unacceptable risk to human health. Results from subsequent air emission monitoring (undertaken in 2004 and 2006) have confirmed the conclusions presented in this report. It should also be noted that ongoing air emissions monitoring is undertaken every 15 months as part of the BIP site-wide monitoring.

The URS (2002) risk assessment and subsequent air emissions monitoring reports have been and will continue to be submitted to DECC. The air emissions results have been and will continue to be presented to the community and Community Participation and Review Committee (CPRC). Information on the monitoring program is also presented on the Orica websites (www.oricahcb.com and www.oricabotanygroundwater.com). These reports have been reviewed by the DECC.

Investigations have been undertaken in the soil surrounding the liner. A summary of the investigations were provided in Section 2.2.2 of the EA and Section 3.5 of the RAP.

Orica agrees that it is possible that the CPWE liner may have been penetrated by burrowing animals and that this may have contributed to the contamination identified in the soil surrounding the liner. Orica does inspect the CPWE area and there is a pest eradication program ongoing at BIP.

It should also be noted that off-site soil investigations were undertaken in 2004. Soil samples were collected from four locations on the western and eastern side of Corish Circle, adjacent to the CPWE area, and analysed for semi volatile chlorinated hydrocarbons (CHCs) and volatile CHCs. The soil results indicated that concentrations of semi volatile and volatile CHCs were not detected above the laboratory detection limit.

As indicated in Section 3.1 (of this report), Orica has acknowledged that conditions at the CPWE are not improving and given that suitable and proven technology is available, Orica has made the commitment to remediate this area. Whilst the EA has concluded that there would be some residual impacts from this project, the mitigation measures identified and Orica's commitment to their implementation would effectively reduce these to an acceptable level of environmental risk. The remediation of the land would provide significant public benefit in terms of improved amenity and environmental health of the area and return the land to productive use. The benefits are considered to outweigh the residual environmental impacts identified in the EA.

It should be noted that the scope of this proposal includes assessing the material surrounding the liner (within the CPWE boundary). Remediation of this material will be undertaken if required, as summarised in Section 3.1 of this report. More detailed information is provided in Section 1.2 of the EA and Section 5.1 of the RAP.

3.2.2 Site Description

A submission queried the number of 'additional lots' to be remediated on the CPWE site. As indicated in the EA, the only area to be remediated is the land known as the CPWE (Part Lot 11 in Deposited Plan [DP] 1039919), located within the BIP – identified on Figure 2 of the EA. The additional areas noted in the EA are not proposed to be remediated. However, they are proposed to be used to accommodate plant and equipment as well as stockpiling of surplus soil. These additional areas have been noted in the EA, as it is a requirement of the 'Major Projects' application and EA process to specify the Lot and DPs of the land included in 'the project'.

As described in Section 2.3.1 and 2.4 and indicated on Figure 3 of the EA, the proposed works would take place on four allotments, as follows:

- Part Lot 11 DP 1039919 (Orica owned land) – this lot contains the CPWE. The area of land (under the same Lot and DP) to the south-east of the CPWE is proposed to be used to stockpile surplus treated soil and for car parking (for Qenos Pty Ltd [Qenos] and the remediation project employees);

- Part Lot 10 DP 1039919 (Qenos owned land) – this is used for car parking. Qenos has permitted Orica the use of the land for the duration of the project. The land would be used to accommodate plant (such as the emission control system for the Excavation Soil Building [ESB]) and for unloading and loading equipment for the duration of the project. The internal haul roads (i.e. to be used to transport the excavated material from the CPWE to the Feed Soil Building [FSB]) would also run through this allotment;

- Lot 4 DP 1016112 (Orica owned land) – this land would accommodate the FSB, DTD Plant and treated soil stockpiles – it is known as the Soil Treatment Area (STA); and

- Part Lot 9 DP 1016112 (BIP owned land) – this is a roadway running through BIP and parts of it will be used to access the CPWE site, including the overflow treated soil stockpile area and the STA.

These land identifiers have been rechecked in response to a query raised at the CPRC meeting held on the 13 November 2007. Orica can confirm that the identifiers within the EA are correct for land utilised as part of the remediation activities.

3.2.3 Surrounding Land Use

A submission commented on the list of external neighbours. More specifically, it was stated that the list of external neighbours was out of date and that the distances noted were incorrect. Orica believes that it has identified the majority of the neighbours surrounding the site, including sensitive (residential and food manufacturing facilities) uses and recreational areas.

Orica did not provide specific addresses and names of the food manufacturing facilities surrounding the CPWE area for 'sensitivity' reasons. However, the areas where food manufacturing facilities exist were acknowledged. It is noted that not all food manufacturing facilities and light industrial sites were identified because the large number would make it impractical to list every site.

During the exhibition period for the EA, Orica contacted businesses and residents located in close proximity to the CPWE site to advise them that the EA had been finalised and to personally invite them to an Information Session, which was held by Orica on 14 August 2007, and to respond to any questions they may have had.

Feedback from the local businesses indicated that they are moderately interested in the project and would prefer to receive updates either in writing (email) or through arranged meetings, and that many local residents do not feel the need to be involved with the consultation process.

It should be noted that three people came to the Information Session (held on 14 August 2007), including a nearby resident and a local business representative who wanted to learn more about the project, and a regular CPRC member who was curious to see the level of interest.

Orica has made a commitment to undertake ongoing consultation with the local community (including businesses and residents in close proximity to the CPWE site and Hensley Athletics Field users) for the duration of the project. However, Orica has not confirmed what the consultation approach will be. Orica feels that it is important to involve all stakeholders in establishing the preferred consultation approach. A meeting is proposed to be held in early 2008, pending approval of the EA, for CPRC members and CPWE target interest groups to meet together to plan the future consultation processes. This was discussed at the CPRC meeting held on 21 August 2007.

In terms of incorrect distances, Orica has indicated the approximate distance to neighbouring sites. Regardless of whether the distances are correct or not, the potential impact on the surrounding sites has been taken into consideration in the EA. For example, a very conservative approach has been undertaken to assess the potential impact on surrounding food manufacturing facilities.

The duration of the project is expected to be approximately 18 months. Consequently, there is a possibility that surrounding land uses could change, such as establishment of a food manufacturing facility adjacent to the boundary of the CPWE or 50 m north of the boundary. The HHIA has taken this into consideration. The potential impact was assessed on the boundary of the CPWE using maximum concentrations. At the boundary of the CPWE, the risks to off-site and on-site workers were considered to be 'low and acceptable'. Therefore, as the distance from the CPWE boundary increases, the maximum concentrations decrease. More detailed information is presented in the HHIA, which has been revised and is presented as a separate document

3.3 Assessment of Alternative Remediation Technologies

Orica reviewed a wide range of methods and technologies potentially available for the remediation of the CPWE. Section 3 of the EA and Section 4 of the Remedial Action Plan (RAP) provides an outline of the review process, including a discussion on the range of methods and technologies available, and the process by which the remediation technology was selected. The review of technologies was conducted in consultation with the DECC, the CPRC and the community, as detailed in Sections 3 and 6 and Appendix J (Community Consultation Report) of the EA.

Based on the detailed review of three thermal technologies (DTD, Indirectly-heated Thermal Desorption [ITD] and *In situ* Thermal Desorption [ISTD]) and feedback from the community, Orica selected DTD as the remediation technology for the CPWE. In-situ bioremediation which was initially the preferred option, was not considered to be a practicable solution for remediating the CPWE, because significantly more research and development was required to implement it.

DTD technology was selected to remediate the CPWE based on several factors, including the degree to which it was proven, simplicity of design and operation, stack emissions, residues (or lack thereof) and project timeframe. The technology is also currently being used to remediate two sites at the Rhodes Peninsula (known as the Allied Feeds and Lednez sites).

DTD technology will provide a long term solution for the CPWE site, enable Orica to meet the EPL requirements and enable the CPWE site to be returned to productive use consistent with its zoning and surrounding land use (i.e. commercial/industrial).

Issues raised in the submissions discussed the advantages of ITD technology over the preferred DTD technology. A summary of some of the disadvantages of ITD technology, which were identified during the remediation technologies assessment, is provided as follows:

- ITD plants typically use a recovery type gas treatment system. The off-gases would be collected and condensed. This condensate (or contaminated sludge) contains concentrated contaminants and water and requires a second stage treatment for destruction.
    - Treatment of the contaminated condensate would most likely be undertaken at an off-site facility (such as Base Catalysed Decomposition [BCD] Technology located in Queensland), necessitating transport of the contaminated condensate (mainly comprising volatile HCBD) on the local road network and potentially across State borders. Based on the approximate volume of material to be treated, around 35 truck loads would be required over the life of the project. To Orica's knowledge, the BCD process is the only commercially available option for destroying the contaminated condensate.
    - Treating approximately 70,000 tonnes of contaminated soil using ITD produces up to 1% or 700 tonnes of contaminated condensate. Using BCD technology to destroy the contaminants converts 700 tonnes of scheduled chemical waste (SCW) into 4,900 tonnes of oil and salt requiring further processing and recycling (oil) or disposal to a landfill (salt).
    - Prior to transportation off-site, the contaminated condensate would also require storage on-site. This would require many safeguards given the volatile nature of the main contaminant (HCBD), and potential consequences if there was a fire.
    - Handling and transportation of the contaminated condensate would also require special consideration given the nature of the contaminants.
    - Additional resources would be required (e.g. energy in the form of gas, fuel, etc) and therefore additional greenhouse gases would be generated through the secondary treatment (including transportation) of the contaminated condensate.
- ITD would increase the project schedule and nuisance impacts on the local community.

A comment was also made in regard to trials that had been conducted by Thiess Services Pty Ltd (Thiess) to demonstrate the capability of the BCD process and referred to a report that had been prepared by Egis, for the then Department of Public Works and Services. It should be noted that this report was written in 1997 based on a bench scale test. It is not generally appreciated that the "condensate" from the ITD process is a wet sludge as a result of fines and water from the treated soil. The contaminated sludge needs to be dried prior to being treated in the BCD process, as the BCD process cannot tolerate any water in the process. The sludge drying process also generates secondary waste and contaminated water, which requires further treatment.

During the consultation for the Rhodes projects and the Orica project, Thiess indicated that both technologies (ITD and DTD) were well established for treating hazardous chemicals and both had been used on about 80 projects in the past decade.

A comment was made in regard to the risk of dioxin re-formation with DTD technology. More specifically, a submission indicated that there was a serious risk of dioxin re-formation in DTD and that 'ITD does not have a risk of the reformation of dioxins'. Additionally, it was stated that DTD technology requires sophisticated air emission control systems. It was also noted that the EA indicated that ITD has lower emissions than DTD.

All thermal processes involve the risk of re-forming dioxins. For ITD plants this may occur in the gas quench system, where the dioxins are captured for subsequent treatment. It may also occur to a minor extent in the furnace which is used to combust non-condensable organics in the off-gas stream prior to being exhausted to the atmosphere through a stack.

The main risk of dioxin re-formation in the DTD process is in the gas exiting the thermal oxidiser. This is addressed by rapidly cooling the thermal oxidiser exhaust gas, which is the best available technique specified in guidance published under the Stockholm Convention for this technology. As indicated in the EA, an evaporative cooler (or quench) has been included in the DTD plant to perform this rapid cooling.

Both ITD and DTD technologies have unique emission profiles and therefore require sophisticated, but different air emission control systems, which conform to best practice emission standards. The proposed configuration of the DTD Plant conforms with best practice guidelines of the Stockholm Convention on Persistent Organic Pollutants (December, 2004).

Furthermore, DTD air emission control systems may appear to be more sophisticated than ITD. However, air emission control systems of the secondary treatment technology to be employed in conjunction with ITD (to destroy the contaminated condensate) also needs to be taken into account in making a valid comparison.

In regard to emissions, it is difficult to compare the emission profiles of the ITD and DTD technologies, due to variation in plant size and processing rates (DTD plants are typically twice the size and capacity of ITD plants). However, it should be noted that in comparing ITD and DTD emissions, a valid comparison will require emission data of the secondary technology to be used in conjunction with ITD (to treat the contaminated condensate). The combined ITD/secondary technology emissions may exceed that of DTD.

In summary, both DTD and ITD processes have their own unique risk profiles. The risks from both processes can be properly managed by the application of best practice design and operation in conformance with Stockholm Convention best available techniques guidance and NSW guidelines and regulations for the operation of hazardous industries (Environmental Planning and Assessment Act, 1979, Protection of the Environment Operations Act, 1997, HCB Waste Management Plan/Environmentally Hazardous Chemicals Act, 1985, Contaminated Land Management Act 1997).

It was also stated that 'it is important that potential health impacts are carefully considered when selecting a remediation technology'. The potential health impacts have been assessed for the project, using DTD technology to remediate the CPWE. The assessment indicated that potential exposures (including cumulative exposures) to residents, recreational users of areas surrounding the CPWE and workers are negligible and representative of acceptable risks to human health. The Human Health Impact Assessment (HHIA), prepared by URS, is provided in Appendix H of the EA.

3.4 Remedial Action Plan

The RAP has been revised to incorporate a number of issues raised in the submissions. The revised RAP is provided as a separate document. As previously indicated, the revised RAP will be reviewed by an independent DECC accredited site auditor (Contaminated Land Auditor). The Contaminated Land

Auditor will be required to review and endorse the RAP, including any modifications or revisions. The revised RAP, including any modifications or revisions, would also be reviewed by DECC. The SoC will be revised to include this information.

3.4.1 Extent of Remediation

There were a number of queries raised in regard to whether the material surrounding the liner (landscaping material) was to be remediated. The extent of the remediation is described in Section 5.1 of the RAP, which has been revised and is provided as a separate document.

In summary, the proposal includes only remediation of the CPWE area, which is identified in Figure 2 of the EA. It is proposed to remediate (or treat in the DTD Plant) only the material contained within the liner of the CPWE, including the liner material itself where required. The material surrounding and beneath the liner within the CPWE boundary will be tested and assessed against the Remediation Goals. If the material does not meet the Remediation Goals, then it may be treated in the DTD Plant, or it may be disposed to an appropriate waste facility that is licensed to accept the material as landfill or recycled. If it does meet the Remediation Goals, it will remain on-site for reuse. Other issues such as odour and groundwater quality protection would also be considered as part of the validation process.

Any material that is proposed to be disposed off-site would be classified in accordance with the *Environmental Guidelines: Assessment. Classification & Management of Liquid & Non-Liquid Wastes* (DEC 2004).

The project does not include remediation of contaminated material that may exist outside the boundary of the CPWE area or contaminated material where the source of contamination is not within the BIP site and not related to industrial activities undertaken by Orica. Nor does it include remediation of groundwater.

3.4.2 CPWE Characterisation

Additional information has been included in Section 3.5.2 of the revised RAP (provided as a separate document) to provide more information on the CPWE characteristics. In summary, the estimated volume of material contained at the CPWE is as follows:

- CPWE – Approximately 45,000 m^3 of material (sand, ash and peat) is contained within the Hypalon liner. Of that, there is approximately 590 m^3 of material which originated from the vinyls manufacturing area. Some foreign material including polythene granules, crushed drums, drum liners, steel reinforcement, scrap steel sections, scrap pipework, timber, Raschig rings, crystalline material, thought to be sodium carbonate and amorphous material, thought to be catalyst pellets are also present in the liner. The volume of this foreign material is not known.
- CPWE Capping Material (bitumen, crushed rock and sand) - The bitumen pavement has a typical thickness of 25 mm, the thickness of the crushed rock sub-base is estimated at 100 mm and the sand is estimated at 100 mm. The estimated volume of the capping material (bitumen, crushed rock and sand) is some 2,500 m^3 (Thiess 2005). The mass of the Hypalon contained at the CPWE was estimated to be approximately 6 tonnes (Thiess 2005).
- Material Surrounding the CPWE - Outside the bitumen pavement the encapsulation batters are overlain by fill sand derived from the BIP site. The estimated volume of material present within these batters is around 17,000 m^3 (Thiess 2005).

A comment was made in regard to the number of samples analysed for dioxins and furans and also questioned how the dioxin results were reported. One composite sample of the material contained in the

CPWE was analysed and contained dioxins and furans (TEQ) at a concentration below the treatment standard in the Director-General's EARs (Environmental Assessment Requirements). The samples selected for this analysis contained a range of chemicals of concern (COCs) at the highest concentrations reported within the CPWE. Given that dioxins are formed, and in this instance would exist in by-products of the manufacture of the organic compounds identified in the CPWE, the analytical results for the composite sample are considered to provide a conservative indication of general dioxin concentrations within other areas of the CPWE.

Section 3.5.2 of the RAP has been revised to include the appropriate reference for the dioxin, furan and dioxin-like PCB results. Refer to the revised RAP, provided as a separate document .

There was a query raised in regard to the extent of HCBD hotspots in groundwater. Some background information has been provided in regard to groundwater contamination in Section 2.2.1 of the EA and Section 3.5.2 of the revised RAP. As indicated in Section 3.1, Orica proposes to address the groundwater contamination as a separate issue, as is the current process. It should be noted that further information in regard to the groundwater monitoring program for the CPWE is available on the website (www.oricahcb.com).

3.5 Remediation Goals

The submissions have identified a number of issues related to the Remediation Goals, in particular the risk-based soil concentrations (RBCs). The Remediation Goals are not detailed in the EA, but are provided in RAP, which is an Appendix of the EA.

The RAP has been revised to clarify how the Remediation Goals will be applied during validation of the site, how the risk-based soil concentrations have been derived and how issues such as odour and protection of groundwater will be managed. The revised RAP is provided as a separate document. These issues are summarised below.

3.5.1 Scope and Application of Risk Based Soil Concentrations

The RBCs have been calculated using the HHIA methodology in combination with additional models for assessment of skin contact and soil ingestion endorsed by NSW Health and the DECC. The RBCs provide soil values that represent a negligible risk to the health of the users of the site after completion of the remediation works. These values are then incorporated into the RAP as part of the development of remediation strategies and site validation. Alternate concentrations may be used as part of the validation process to address issues such as groundwater protection, odour and toxicity to plants. The RBCs are therefore used to identify the maximum values allowable for the protection of human health only.

In relation to plants, it is noted that the CPWE will remain under an industrial land use. As such remediation criteria are not required to address phytotoxicity unlike residential or public open space land use. This is on the basis that landscaping can be selected to meet site conditions and specific requirements utilising suitable plant growing medium as required.

In summary the RBCs are site and chemical specific and applicable only to the CPWE remediation project.

Off-site Human Health Issues

Both NSW Health and the DECC have identified a requirement to consider off-site receptors in the setting of health based RBCs for uncovered surface soil. The revised report has provided specific models used to demonstrate that the on-site RBCs for volatile contaminants do not present an unacceptable risk to off-site receptors namely:

- Commercial workers on adjoining properties;

- Users (adults and children) of the athletics field; and
- Residents (adults and children) residing in the nearest houses to the CPWE.

The models incorporated have made reference to the findings of the HCB Waste Management Plan Risk Assessment (URS 2002) previously reviewed by DECC. The following conservative (i.e. to over estimate the risk) assumptions have been made:

- The vapour concentrations at adjoining commercial properties are the same as on-site concentrations.
- The vapour concentrations at Hensley Athletics Field are the same as the on-site concentrations.
- The vapour concentrations at the nearest house (approximately 200 m to the east) is 0.5 times the on-site vapour concentrations.

The RBCs have been set at the lowest value for all receptors that achieves the defined target risks.

Revised RBC Report

The revised Risk Based Remediation Concentrations (URS 2007) report has incorporated the issues noted above as well as additional issues raised in the submissions. The calculated RBCs differ from those presented in the EA for the following reasons:

- The requirement to use an alternate dermal exposure model; and
- Incorporation of conservative assumptions for off-site receptors in relation to RBCs for volatile contaminants left at the surface.

3.5.2 Remediation Goals and How They Will be Applied

A number of issues were raised in regard to the Remediation Goals, in particular use of the Director-General requirements for SCW, polychlorinated biphenyls (PCBs) and dioxins, furans and dioxin-like PCBs, the criterion for dioxins, furans and dioxin-like PCBs and the proposed use of the RBCs.

The RAP has been revised to clarify what the Remediation Goals are and how they will be applied for the remediation project. Please refer to Section 6.4 of the revised RAP for further detail.

Other issues in regard to Remediation Goals are summarised below:

- A submission response indicated that the following statement in Section 8.4.2 of the EA was misleading – '*The concentrations nominated in the Director-General's EARs*, *are more stringent than criteria currently in force in the relevant NSW CCOs* [Chemical Control Orders]. *This is because they do not consider practicability (technical and economical) which is considered in the CCOs. The dioxin criterion is below that in the current dioxin CCO (1986)*'. It was stated that it is only the criterion for dioxin that differs between the requirements of the CCO and the EARs. DECC currently regulates licensees against the WHO-TEQ's for dioxins, furans and dioxin-like PCBs as this approach is in accordance with international best practice. Furthermore, it was stated that the NSW dioxin CCO approach is outdated and only applies in single dioxin congener and that Orica should be able to meet the criterion.
  - Orica is committed to meeting the standards for SCW compounds in the Director-General's EARs subject to the provisions of the NSW SCW CCO (DEC 2004). The SCW criteria in the Director-General's EARS are based on

the NSW SCW CCO. In regard to these treatment goals, SCW must meet the regulatory level of less than 2 mg/kg aggregate as was specified in the Director-General's EARs. The soil treatment outcome is a function of a removal efficiency, which varies with soil treatment temperature, to the boiling point of the contaminants, the matrix type and the specifics of plant design. Basically as the feed soil concentration increases so does the treated soil concentration, and at some critical feed soil concentration (which is unique to each site) the treated soil concentration will exceed the SCW CCO standard. This is compounded for the SCW CCO where the regulatory standard is based on the aggregate concentration of multiple chemicals. The SCW CCO allows that the DECC may agree to a different treatment standard for reasons unstated, but understood to include practicability. Orica reserves their right to make such a submission to the DECC following commissioning of the DTD Plant should they judge it appropriate, noting that DECC has the power to agree, or not, to any such proposal. Further information is provided in Section 3.5.7.

- Orica agrees that the NSW dioxin approach is outdated. However, dioxins are currently not a chemical of concern (COC) for the CPWE site. Orica commits to meeting the dioxin treatment standard at a sampling rate that will be subject to Contaminated Land Auditor agreement.

3.5.3 Site Validation

The RAP has been revised to clarify and include further information on the site validation process. Please refer to Section 14 of the revised RAP for further detail, which is provided as a separate document.

Other issues raised include the following:

- The capping material referred to in Section 14.5 refers to the soil overlying the CPWE – bitumen, crushed rock and sand. The estimated volume of the material is some 2,500 m^3 (Thiess 2005). This function of this material is to protect the CPWE liner from physical damage and minimise downward migration of surface water. There is no plan to bring capping from an off-site location. Further information is provided in Section 3.5.5.
- With regard to the proposed validation process in the event that the DTD Plant does not operate for a continuous 8 hour period, the material will be sampled and analysed if the period of operation was more than 4 hours. If the period of operation was less than 4 hours, the material will be retreated and sampled as per Section 14.7. This section of the RAP has been amended accordingly.
- In regard to whether the 'proposed levels of chemicals that could remain in the soils might be odorous', the process of validating excavation surfaces (base and walls), excavated capping and landscaping materials and treated material stockpiles will also include an olfactory assessment to ensure these materials are free of odour and are aesthetically suitable for backfilling. This assessment will involve the collection of additional soil samples (during the validation testing) and testing at a suitably qualified odour testing laboratory. Odour testing will be undertaken on approximately 20% of all samples (being those with the highest photo-ionisation detector (PID) readings). The odour testing will be undertaken in accordance with Australian Standard (AS 4323.3) *Stationary Source Emissions - Determination of odour concentration by dynamic olfactometry* and associated odour sample collection methodology. Further information is provided in Section 14.10.1 of the revised RAP.
- In regard to whether the 'proposed levels of chemicals that could remain in the soils might be an ongoing source of contamination to the local groundwater', the potential

for residual contaminants to leach from validated areas and impact the Site's groundwater will be investigated by identifying leachability criteria to protect the Site's groundwater. If, following validation, the leachability of the COCs is greater than the identified criteria, management measures will be considered to address the infiltration of surface waters into validated areas. Such measures will be dependant on Orica's development plans for the CPWE area (i.e. the area may be concreted as part of development thus mitigating infiltration) or a cap may be required if no development is to take place for a significant period of time. These development plans are yet to be determined. This issue is addressed in Section 14.11 of the amended RAP.

- Based on the findings of investigations undertaken at the CPWE to date, the estimated dimensions of the excavation are as follows:

Table 2: Estimated Dimensions of Excavation

	ESTIMATED LENGTH (m)	ESTIMATED DEPTH (m)
North wall	110	2.5 to 3.5
East wall (northern section)	80	3.5
East wall (southern section)	70	3.5
South wall	55	2.5 to 3.5
West wall	150	2.5

3.5.4 Materials Handling

A number of queries were raised in regard to materials management. A summary of the issues and responses are detailed below:

- Appropriate management of the bitumen cap and materials surrounding the CPWE – Details in regard to the management of the bitumen cap and materials surrounding the CPWE have been clarified in Sections 5, 9, 10 and 11 of the revised RAP. As indicated, if material is proposed to be disposed off-site to an appropriate landfill, it will be classified in accordance with the *Environmental Guidelines: Assessment. Classification & Management of Liquid & Non-Liquid Wastes* (DEC 2004).
- Management of the Hypalon liner, material surrounding the CPWE, material beneath the liner and oversize materials, such as scrap steel, pipework, etc - Details in regard to the management of these materials have been clarified in Sections 5, 9, 10 and 11 of the revised RAP. The following is a summary of how the materials will be handled:
  - It is likely that the Hypalon liner will be required to be treated in the DTD Plant. Prior to treatment in the Plant, the liner will need to be shredded. The treated material would be validated against the Remediation Goals.
  - The material surrounding the CPWE (landscaping material) will be excavated, screened and then tested. If the material meets the Remediation Goals, it will be used to reinstate the CPWE site. If the material does not meet the Remediation Goals, it will be treated in the Plant or classified in accordance with the waste guidelines (DEC 2004) and disposed off-site. If the material is treated it will be validated against the Remediation Goals.
  - The material beneath the CPWE liner will be tested and assessed against the Remediation Goals. If the material meets the Remediation Goals, then no

treatment or excavation will be required. If the material does not meet the Remediation Goals, it will be treated in the Plant or classified in accordance with the waste guidelines (DEC 2004) and disposed off-site. If the material is treated it will be validated against the Remediation Goals.

- Oversize material will be stockpiled and tested appropriately before being either disposed to an appropriate waste facility, recycled (if classified as inert waste) or treated in the DTD Plant. Any oversize material to be disposed off-site will be classified in accordance with the waste guidelines (DEC 2004). Materials treated in the Plant will be validated.

- Orica is committed to preventing or minimising external contamination of trucks and minimising the potential for contaminated soil coming into contact with trafficable surfaces and truck wheels. As indicated, wheel washes and other handling procedures have been discussed in the EA to address this issue. During the detailed design stage, ongoing consideration will be given to other possible measures and, if appropriate these will be included in the EMP and other relevant plans.

3.5.5 Placement of Reinstatement Materials

In regard to reinstatement of the CPWE, detailed information is provided in Section 4.7 of the EA and Section 10.3 and 15 of the revised RAP.

As indicated, a Materials Tracking System will be developed to monitor and control excavation of all materials and their movements at the site. The main objective of the system will be to ensure traceability of the remediation process and to track materials through the duration of the project from excavation through to treatment and stockpiling, for subsequent use as backfill during the reinstatement process.

The site would be stabilised with turf at the completion of the reinstatement activities. A landscaped mound will be reinstated along the eastern boundary with Corish Circle. This would ensure compliance with the existing Tree Preservation Order (TPO) and preserve the existing outlook across the CPWE site. The type of trees, shrubs and groundcover used to revegetate the area has not been determined. However, Orica would ensure that the landscaping is commensurate with the local environment, hard wearing and drought resistant.

Orica does not propose to import material to the site, to be used to reinstate the CPWE excavation. If material was required to be imported to the site, Orica would ensure that the material is tested and assessed against DECC guidelines and/or other to ensure that it is suitable for reinstatement purposes.

In regard to placement of surplus treated soil from the CPWE, as indicated in the EA, the material will be stockpiled on BIP for future reuse on other Orica land within the BIP. The stockpile will be managed such that dust and other emissions are controlled. At this stage, Orica has not identified particular areas of the BIP where this material may be placed. However, if it is used to reinstate other areas, the validation requirements stated in the RAP would need to be met, which includes management of odours and other issues.

3.5.6 Occupational Health and Safety

A significant number of concerns were raised in regard to worker safety for the duration of the project. Orica has identified that a high level of personal protective equipment (PPE) will be required to prevent unacceptable exposure to dust and vapour. The level of PPE and rules for its use is a matter of detail that will be assessed by an independent qualified occupational hygienist and documented in an OH&S Plan to be prepared prior to works commencing.

An outline of what the OH&S Plan would include is contained in the revised RAP (provided as a separate document). Key components will include: communication protocols and training procedures,

establishment of PPE standards and mandatory safe work procedures, site and health monitoring and site evacuation procedures. Orica has committed to preparing this Plan (see revised SoCs).

It should be noted that Orica has made a commitment to notify WorkCover NSW of the commencement date for the site works and provide workCover with a copy of the OH&S Plan (see revised SoCs).

3.5.7 Other Detailed Design and Remediation Process Issues

A number of issues regarding the need for more detail regarding the design and remediation process were raised in submissions. A summary response to the issues which includes an outline of the detailed design stage of the project is provided below:

- Progression from approvals to licensing involves submittal of increasing levels of detail with respect to plant design. Additional details on plant design will be submitted to DECC in the Technology Application prior to licensing the plant, including description of the DTD Plant commissioning program and verification of the technology and emission controls. In addition, detailed design for the ESB and FSB and associated emission control systems will be provided in the Technology Application.
- Details of the quantities and physio-chemical parameters of the materials to be remediated were comprehensively addressed in the feasibility stage of the project, and made available to the community through the CPRC. A detailed description of the CPWE conditions is also provided in Section 3.5 of the revised RAP. Additional information in regard to the chemical characteristics is provided in the Risk-Based Remediation Concentrations (URS 2007) report, which is located in Appendix B of the RAP.
- The EA does not address how inorganic constituents, which cannot be treated in the DTD Plant, will be managed because the COCs in the CPWE are organic chemicals. The proposal is not designed to treat inorganic constituents, and there is no requirement to do so to achieve the land use objectives. Thermal desorption is not effective or intended for the treatment of inorganic wastes such as metals, although those with relatively low boiling points, will be vaporised at higher operating temperatures. Inorganics that enter the off-gas stream as vapour or in dust are treated in the emission control system of the thermal plant, and returned to the treated soil. Inorganics in the treated soil are dealt with in terms of allowable total concentration limits or leachability values.
- Double-lock entry doors have been used successfully on the Rhodes Peninsula projects, where it has proved to have a high level of operability and performance, and a fail safe shut mode.
- A comment was made in regard to the statement referring to operating temperatures and the potential for metal fatigue in Section 11.4.3 of the RAP. Orica submits that this is arguable based on best practice considerations and overall environmental outcomes.
- The proposed thermal treatment is capable of treating the range of materials identified at the CPWE area. Materials in the CPWE that are mixed in the soil and meet the feed soil size specification will be fed to the plant and treated. Material that is oversize will be stockpiled and assessed. The fate of this material will depend on the nature and concentration of the contamination and the matrix. Potential options are direct disposal to landfill; washing and hand scabbling followed by landfill; recycling (if inert waste) or crush, shred and treat. Any oversize material to be disposed off-site will be classified in accordance with the waste guidelines (DEC 2004).

- The EA makes several references to Treatability Trial data, but it is not included in the report. The data has not been provided as the treatability trials provide indicative data on potential outcomes for soil treatment and air emissions, including an estimate of variability. It should be noted that the trials may overestimate or underestimate full scale plant performance for a number of reasons, including physical differences between the bench scale and full scale processes and plant design factors that cannot be reproduced at the bench scale. It is inappropriate to use the results of bench scale trials to set performance standards without the flexibility to review these based on full scale performance data.

3.5.8 Regulatory Compliance

Orica had provided information in the EA in regard to regulatory compliance, in particular compliance with the Protection of the Environment Operations (Clean Air) Regulation 2002 (CAR). A number of comments and queries were raised in regard to this matter, which are discussed below.

Orica is confident of the soil treatment temperature range that will result in removal of the mercury from the soil. Orica is also confident that mercury emissions can be controlled such that ground level concentrations (GLCs) at the nearest sensitive receiver are below the maximum allowed GLCs set to protect human health. However, Orica is uncertain of whether the mercury concentrations emitted from the DTD Plant stack will comply with the limits indicated in the CAR.

This issue has been discussed with the DECC on several occasions. An exemption of the CAR limit for mercury is an option available in certain circumstances. Integral to any exemption is a demonstration that it is not practicable for Orica to comply with the mercury standard when emissions have been reduced to the maximum extent achievable through application of best-practice process design and / or emission controls. A rigorous assessment demonstrating that non-compliance with the regulation mercury standard will not have a significant adverse effect on public health, property or the environment. This is noted by Orica and in view of the uncertainty, that it intends to follow the exemption process and will provide documentation in the form of an 'Exemption Application' to the DECC. It should be noted that with this process the 'Board of the Environment Protection Authority (EPA) considers the granting of an exemption'.

Following a recent CPRC meeting, held on 13 November 2007, the community has indicated that they would like an independent review and report of the 'Exemption Application'. This matter is currently being discussed with the CPRC.

There were a number of other queries raised in regard to mercury emissions, these are addressed below:

- Orica considers it is practicable to use best practice powdered carbon injection to minimise mercury emissions. Orica is committed to using this technology to control mercury emissions to the extent practicable. It is included in the current plant design and will be further discussed in the Exemption Application and also the Technology Application.
- The conclusion made in Appendix K is correct even though it assumes that the emission standard would be corrected to 3% O_2 (DECC advised after Appendix K was compiled that it would be corrected to stack oxygen). Table 2 (of Appendix K in the EA) shows estimated stack concentrations at stack oxygen and corrected to 11% O_2 (which was the previous default correction for these plants). Considering the stack concentrations at stack oxygen conditions for a soil concentration of 2 mg/kg (the current estimate for the CPWE), it can be seen that the standard of 0.2 mg/Nm^3 (at stack oxygen) is exceeded by a factor of 7.5 times. The right hand columns contain a calculation that shows that a removal efficiency of near 90% would be required to just meet the standard. This is the concentration of 0.15 mg/Nm^3 referred to in the DECC response. This is a hypothetical calculation and not based on actual performance

data. Whether it can be achieved is conjectural. DECC's statement that 0.15 mg/Nm^3 is well below the standard of 0.2 mg/Nm^3 is also considered inappropriate (i.e. it is not "well below") given the uncertainties involved. Larger safety factors are required for most parameters to ensure compliance at the 100 percentile limit.

- Appendix K of the EA refers to remediation projects between 1989 and 1998 which would not have been required to meet the current US standards. However, they can be used to assess the extent of compliance or non-compliance of the plants relative to the new standard, and the mercury removal efficiency that would have been required to meet the new standard.
- The regulatory limit for mercury in NSW is less stringent than the limits in the US and Europe. However, these limits have been applied mainly to high tempretaure incinerators treating hazardous waste. Results achieved using carbon injection for incinerators are not necessarily transferable to thermal desorbers because the air emission control systems are significantly different, particularly with respect to the quantity and nature of particulates collected in the baghouse. The particulate load in the DTD baghouse is much higher compared with hazardous waste and municipal incinerators and utility boiler applications, because DTD plants treat soil, which generates high dust loads compared with incinerators or boilers. The concentration of carbon in the desorber baghouse is therefore more dilute and control efficiencies are likely to be less. As yet, Orica understands that there are no published results for mercury removal efficiency in DTD plants treating hazardous waste.
- Orica has considered the USEPA discussion paper[2] on proposed US emission standards. Orica understands that the paper which deals with high temperature incinerators and other facilities combusting hazardous waste, refers to the practice of managing the contaminant feed rate by blending waste streams to average out contaminant concentrations or by reducing the total feed rate to meet stack concentration standards (with or without additional emission controls). The opportunity to blend is not available on the CPWE site because the plant is a mobile plant working on a campaign basis. The project would not be approved to bring other contaminated materials (with low mercury contents) for the purpose of blending and treatment.
- Orica has considered and does not support the practice of controlling the soil feed rate to reduce mercury concentrations in the stack. Although the practice may achieve regulatory compliance, it is arguable that it is best practice or leads to a better net environmental outcome. The approach is not supported because:
    - It would result in the same emission of mercury to the environment but over a longer period of time. As such it could be construed as dilution to achieve regulatory compliance;
    - It could result in an extended project duration - up to 7.5 times for the zero removal case (i.e. from 1 year to 7.5 years). The impact from an extended project duration has not been assessed;
    - It would result in ongoing nuisance impacts to the community over the extended duration, which has not been assessed in the EA (and would also invalidate the assumptions of or change the outcomes of the air health risk assessment);
    - It would require approximately the same gas consumption per unit time, which would increase greenhouse gas and associated emissions by up to 7.5 times;

[2] USEPA 2004. National Emission Standards for Hazardous Air Pollutants: Proposed Standards for Hazardous Air Pollutants for Hazardous Waste Combustors (Phase 1 Final replacement Standards and Phase ii)

  - It would increase project costs by up to 7.5 times for minimal or negative incremental benefit in terms of contaminants in soil and air removed, captured or destroyed; and
  - Overall, it is not regarded as a practicable or environmentally sound solution.

- Orica acknowledges that it is possible that mercury emissions could be reduced by treating the soil at a lower temperature. However whether this would achieve compliance or the mercury stack concentration limit and the extent to which soil treatment criteria may be compromised is not known, and will not be known until commissioning trial have been completed.
- It was stated that 'it has been assumed for the assessment that all mercury emissions from the DTD plant will be in the form of organic mercury, however DECC understands that there is considerable uncertainty regarding the form of mercury will take in emissions. This uncertainty will not be resolved until the proof of performance trials have been undertaken'. This is an outdated conservative assumption for the purpose of assessing human health risk in the absence of information on the forms of mercury. It has been revised in the most recent risk assessment because it is likely that none of the mercury in the feed soil is organic (since it is in boiler ash) and none of the mercury will be in the organic form once it has passed through the thermal oxidiser. The uncertainty around the remaining forms of inorganic mercury will not be resolved by the commission trials, but the effectiveness of carbon injection and the extent of compliance will be.
- Orica has committed to review the stack concentrations set at the maximum allowable in the Clean Air Regulations (CAR) once the plant has been commissioned and real performance data are available, and to set stack emission concentrations below the maximum allowable where appropriate. This is further discussed in Section 3.6.6.
- Detailed design will be undertaken prior to commencement. Details will be provided to DoP and DECC.

A number of queries relating to other issues (i.e. not mercury emissions) are addressed below:

- The plant will be designed to meet the CAR for a residence time of more than 2 seconds. However, it is not possible to instantaneously measure residence time in practice (though it can be back-calculated), or to use it as a process control. Orica also notes that they have been advised that a residence time of 2 seconds is not a best practice parameter for the technology in question.
- Orica is committed to meeting the requirements of the Clean Air Regulation with respect to thermal oxidiser design.
- Orica is committed to meeting the best practice requirements of the CAR with respect to thermal oxidiser design, noting that demonstration of 99.9999% destruction and removal efficiency, would determine the definitive thermal oxidiser operating temperature for the plant as advised by DECC.
- Treatability trials have indicated that slagging is not likely to be an issue for the project. However, if the treatability trials are not accurate in predicting the slagging temperature, and slagging occurs during commissioning, Orica would propose a lower operating temperature based on the application of best practice. This would be via an application to the DECC Board for an exemption subject to the usual conditions.

3.6 Air Quality

3.6.1 Revised Report

Pacific Air and Environment Pty Ltd (PAE 2007) has revised the Air Quality Impact Assessment (AQIA) for Remediation of the CPWE report to provide additional information, incorporate the erratum report and respond to a queries raised in the submission. Details are provided below in Sections 3.6.2 to 3.6.6 and the revised report is provided as a separate report.

3.6.2 Background Concentrations

Regional background pollutant data, monitored at the DECC Randwick monitoring station was used to account for background concentrations of nitrogen dioxide (NO_2), particulate matter (PM_{10}) and sulphur dioxide (SO_2). These data are considered indicative of current urban background concentrations of those pollutants. The data from the Randwick station accounts for the concentration of these pollutants caused by emission sources other than those at the BIP. Other BIP emissions, including those from sources at Qenos, Huntsman Chemical Company Australia (Huntsman) and Orica are included in the dispersion model.

Monitoring data for some pollutants, conducted on and around the BIP, has been referenced in the existing air quality section (Section 13) of the AQIA report (PAE 2007). These data have not been used as background data since the sources of these emissions are included in the dispersion modelling. Including these emissions data as background concentrations would result in double counting.

3.6.3 Air Quality Impact Assessment

A revised AQIA report, presented as a separate report, has been updated to include predicted ground level concentrations (GLCs) for the 'CPWE only' scenario and includes amended results for discrepancies highlighted as part of the submissions.

Baseline conditions are provided in the AQIA report and existing air quality is addressed in Section 7. A section on meteorology is provided in Appendix E.

Air discharge points and characteristics of the emissions sources from the proposed CPWE remediation are provided in Section 6 of the AQIA report. Air discharge points and characteristics of the existing emissions sources on the BIP are provided in Appendix C.

Monitoring has been addressed in Section 13 of the AQIA report. Details of the monitoring program will be provided as part of the Construction Environmental Management Plan (CEMP).

Operational mitigation measures are outlined in Section 12.2 of the AQIA and are predominantly associated with the design of the proposed activities in order to prevent emissions. As stated in SOC 10, a monitoring program shall be designed for each of the ESB, FSB and DTD emission control systems and stacks. The monitoring program shall include:

- Monitoring of ESB, FSB and DTD Plant and emission control system components for specified flows, pressures and temperatures;
- Continuous monitoring of the ESB and FSB emission control system for parameters such as relative humidity, pressure, temperature and volatile organic compounds (VOCs);
- Continuous monitoring of the DTD Plant stack for flow rate, temperature, oxygen, oxides of nitrogen (NO_x) and carbon monoxide (CO) concentrations (CO provides feedback on the efficiency of combustion in the thermal oxidiser); and

- Periodic discrete sampling of the ESB, FSB and DTD stacks for a range of combustion pollutants and/or contaminants.

As detailed below, emissions of dust from the proposed remediation activities and other sources on-site have been included in the assessment (see Section 3.5.4.2 regarding predicted PM_{10} concentrations). A cumulative assessment for PM_{10} / fine dust particles is provided where background PM_{10} is included. Larger dust particles typically fall out close to their source. We are not aware of any major dust sources that will exist in close proximity to the CPWE during the period that project is proposed.

Significant concerns regarding emissions from the project, including gases that could have adverse effect on human health have been raised. Orica has also identified that volatile emissions and dust during excavation and handling is a critical issue for the project. This is why Orica proposes to excavate the CPWE material within an enclosed building with an emission control system (ECS) and transport the contaminated soil in a manner that minimises or eliminates the potential for unacceptable emissions (trucks with steel lids). The material will be transported to the FSB. Material will be handled within this building and then to the DTD Plant, which is adjacent. The FSB is an enclosed building with an emission control system.

Orica evaluated options for transporting the materials between the ESB and the FSB, including the option of using an overhead conveyor system. From this review, Orica concluded that transporting the material using trucks with steel lids was the most suitable option. Some of the key considerations were:

- The logistics and cost of transport by truck for the application are well understood and proven compared with a conveyor; and
- The successful use of closed body trucks to contain volatile emissions has precedents.

The option of using an overhead conveyor to transport materials from the ESB to the FSB was discarded for the following reasons:

- Thiess could not identify a supplier which would guarantee the resistance of the conveyor belt to the contaminants (HCBD and other CHCs) contained in the waste material.
- The conveyor would have had an elevated drive motor box and gear box, which is likely to be noisier than trucks.
- Conveyor belts generate static, which could be a problem if vapours are released from the waste material and their concentration approached the lower explosive limit.
- Orica would have to undertake construction work on Qenos land for substantial concrete footings for the conveyor support structure. Qenos did not appear to be comfortable with this.
- Conveyor scrapers are not 100% efficient and some spillage would occur from the returning conveyor belt under the conveyor, which would be difficult to clean effectively.
- The conveyor structure would have to be substantial with walkways either side and a leak proof enclosure over the full length, which would be expensive, create more opportunities for fugitive emissions, be more of a visual intrusion and require a larger emission control system.
- In the case of mechanical breakdown, with trucks you just replace them at short notice, but with a conveyor the whole operation stops.

3.6.4 Odour

The possible impacts of odours from the emissions control system and DTD Plant stacks have been considered as part of Section 10 of the AQIA report. The odour assessment is based on predicted GLCs from the dispersion modelling, which includes emissions from the emission control system on the ESB and FSB and emissions from the DTD Plant stack.

3.6.5 Predicted Ground Level Concentrations

Nitrogen dioxide

As discussed in Section 11.1 of the AQIA report, the long-term (annual average) NO_2 assessment criterion is predicted to be met at the discrete receptors for the normal operating scenario. The maximum predicted annual average NO_2 concentration at the discrete receptors (including background concentration and the contribution from other existing sources at the BIP) was 95% of the DECC guideline. However, the short term (1-hour average) was predicted to be 105% of the guideline, when including background NO_2. Iterative modelling has shown that the maximum prediction for the hourly average that causes a breach of the guideline is influenced more by other sources on the BIP and background NO_2.

The results for maximum NO_2 concentrations provided in the AQIA report are based on a conservative method for treating NO_X photochemistry. The Ozone Limiting Method (OLM) was used to account for oxides of nitrogen (NO_X) conversion to NO_2, however the maximum ozone (O_3) concentration was assumed to exist for all hours of the year. When contemporaneous ozone and background NO_2 concentrations are used in the OLM method for NO_X photochemistry, the maximum predicted NO_2 concentrations are much lower, i.e. a maximum 1-hour average NO_2 concentration was 146µg/m^3 rather than 259µg/m^3, which is well within the guideline value of 246µg/m^3. The contemporaneous OLM method is an acceptable method for treating NO_X photochemistry according to the NSW DECC Approved Methods for Modelling and Assessment of Air Pollutants in NSW (2005).

A comparison between the top 50 maximum NO_2 concentrations for differing approaches to photochemistry is shown in Table 3. Note that the top 50 concentrations shown below do not occur at the same locations, due to these different methods used to account for NO_X photochemistry.

Table 3: Comparison between the top 50 maximum NO_2 concentrations

Rank	Total NOx Conversion Method	Maximum O_3 Concentration (all hours) OLM Method	Contemporaneous OLM Method
1	297	260	146
2	292	234	141
3	285	222	140
4	261	196	132
5	252	192	130
6	249	192	128
7	246	189	128
8	240	167	127
9	235	161	125
10	235	158	123
11	233	158	121
12	231	157	119

13	226	154	118
14	225	153	117
15	224	151	115
16	224	148	115
17	223	146	115
18	223	145	114
19	217	145	112
20	216	144	111
21	214	143	110
22	213	143	108
23	212	143	107
24	211	142	107
25	211	141	106
26	210	141	106
27	209	141	106
28	208	141	105
29	207	140	105
30	206	140	104
31	204	140	104
32	201	140	103
33	200	137	103
34	200	137	103
35	200	136	102
36	200	136	102
37	199	136	101
38	198	136	101
39	198	136	100
40	198	134	100
41	198	134	100
42	197	132	100
43	197	132	99
44	196	132	99
45	194	132	99
46	194	131	99
47	193	131	98
48	192	131	98
49	190	131	98
50	189	130	97

There are many contributors to NO_2 emissions from the BIP. Appendix C of the AQIA report provides NO_2 emissions data for existing sources and Section 6 of the report provides the emissions data for the proposed sources. Table 4 provides a breakdown of the sources by NO_2 emission rate.

Table 4: Sources of NO_2 from BIP by emission rate

Source	Existing / proposed	Contribution	Emission Rate (kg/hr)
Qenos Coal Boilers (2)	Existing sources	42%	39.1
Qenos Olefines Furnaces (5)	Existing sources	25%	22.1
GTP	Existing source	10%	9.1
DTD	Proposed source	8%	7.4
Qenos Gas Boiler	Existing source	5%	5.0
ESB	Proposed source	4%	3.4
FSB	Proposed source	2%	2.1
Qenos Alkatuff Ground Flare	Existing source	1%	1.1
Other sources	Existing & proposed	<3%	-

The largest source of NO_2 from the proposed CPWE is the DTD Plant, which accounts for 8% of the total BIP NO_2 emissions in the assessment.

Iterative modelling has shown that the maximum predicted NO_2 concentration is more influenced by other sources on the BIP and NO_X photochemistry, than by emissions from the proposed DTD Plant. When the DTD Plant stack height is increased to 35m (compared to the proposed height of 30m), the maximum predicted GLCs are almost the same. Furthermore, when the emission rate for NO_X in the DTD Plant is increased to the Clean Air Regulation limit of 350 mg/m^3 compared to 234 mg/m^3 (as in the original modelling), the predicted maximum 1-hour GLC is the same, i.e. 146µg/m^3 (using contemporaneous OLM method for assessing NO_X photochemistry). This exercise demonstrates that other sources on the BIP and background concentrations of O_3 and NO_2 dominate the predicted short term NO_2 GLCs.

The proposed maximum concentration limit for NO_X from the DTD Plant stack as set out in the SOCs is the Clean Air Regulation limit of 350 mg/m^3. Emissions of 350 mg/m^3 NO_X from the DTD Plant stack are predicted to meet the DECC air criteria for NO_2 (see Appendix G – Additional Modelling, Air Quality Assessment Report).

PM_{10}

Predicted maximum GLCs for PM_{10} including background concentrations, are predicted to meet the air quality guidelines. However, the conservative approach to assessment has overestimated the contribution of PM_{10} from the CPWE, which appears to be high, i.e. 21 µg/m^3 24-hour average concentration.

PM_{10} emissions have been assessed under very conservative conditions. The activities that were assessed in the scenario will not happen concurrently even though they have been assessed as if they do. The assessment scenario that was modelled for PM_{10} assumes continuous uncontrolled emissions

from stockpile areas, even though mitigation measures will be practiced. Additionally, continuous emissions (24 hours by 7 days) were modelled for dust from clean soil reinstatement, even though these emissions will only occur during an approximate 14 week period, after the DTD and other soil treatment operations are completed. By combining construction and operations scenarios the assessment allowed for one scenario to be assessed.

The top 50 predicted PM_{10} concentrations assuming uncontrolled emissions from stockpiles and their locations are shown in Table 5.

Table 5: Top 50 predicted PM_{10} concentrations and their locations

Rank	Day	Receptor Number	Receptor ID	24 Hour PM_{10} Concentration ($\mu g/m^3$)
1	207	5	Botany Athletic Centre Grandstand	20.7
2	147	5	Botany Athletic Centre Grandstand	16.4
3	207	6	Botany Athletic Centre Running Track	15.9
4	125	5	Botany Athletic Centre Grandstand	15.6
5	146	5	Botany Athletic Centre Grandstand	14.0
6	193	5	Botany Athletic Centre Grandstand	13.9
7	152	6	Botany Athletic Centre Running Track	13.8
8	183	5	Botany Athletic Centre Grandstand	13.0
9	123	6	Botany Athletic Centre Running Track	12.7
10	247	6	Botany Athletic Centre Running Track	12.5
11	134	5	Botany Athletic Centre Grandstand	12.4
12	124	5	Botany Athletic Centre Grandstand	12.3
13	182	6	Botany Athletic Centre Running Track	11.8
14	300	6	Botany Athletic Centre Running Track	11.6
15	179	5	Botany Athletic Centre Grandstand	11.5
16	90	5	Botany Athletic Centre Grandstand	10.9
17	152	5	Botany Athletic Centre Grandstand	10.9
18	163	5	Botany Athletic Centre Grandstand	10.9
19	133	5	Botany Athletic Centre Grandstand	10.8
20	117	5	Botany Athletic Centre Grandstand	10.8
21	175	5	Botany Athletic Centre Grandstand	10.6
22	188	5	Botany Athletic Centre Grandstand	10.3
23	154	6	Botany Athletic Centre Running Track	10.1
24	206	5	Botany Athletic Centre Grandstand	10.1
25	193	7	Denison Street North	10.0
26	43	5	Botany Athletic Centre Grandstand	9.9
27	206	6	Botany Athletic Centre Running Track	9.9
28	173	6	Botany Athletic Centre Running Track	9.8
29	156	5	Botany Athletic Centre Grandstand	9.7
30	169	6	Botany Athletic Centre Running Track	9.6

31	225	5	Botany Athletic Centre Grandstand	9.6
32	193	8	Denison Street North 2	9.5
33	176	5	Botany Athletic Centre Grandstand	9.5
34	182	5	Botany Athletic Centre Grandstand	9.4
35	160	6	Botany Athletic Centre Running Track	9.3
36	154	5	Botany Athletic Centre Grandstand	9.2
37	147	6	Botany Athletic Centre Running Track	9.2
38	212	5	Botany Athletic Centre Grandstand	9.0
39	91	5	Botany Athletic Centre Grandstand	9.0
40	289	6	Botany Athletic Centre Running Track	8.9
41	216	5	Botany Athletic Centre Grandstand	8.8
42	237	5	Botany Athletic Centre Grandstand	8.8
43	300	5	Botany Athletic Centre Grandstand	8.7
44	180	6	Botany Athletic Centre Running Track	8.5
45	287	6	Botany Athletic Centre Running Track	8.5
46	170	5	Botany Athletic Centre Grandstand	8.3
47	272	5	Botany Athletic Centre Grandstand	8.2
48	11	6	Botany Athletic Centre Running Track	8.2
49	153	5	Botany Athletic Centre Grandstand	8.2
50	333	5	Botany Athletic Centre Grandstand	8.2

Almost all of the top 50 concentrations (48 of 50) are predicted at Receptors 5 and 6, i.e. the Botany Athletic Centre Grandstand and Running Track. These receptors are in close proximity to the CPWE. The predicted concentrations at Receptors 5 and 6 reflect the impacts of modelling continuous clean soil reinstatement works concurrently with other operations. Receptor 7 and 8, i.e. Denison Street North, also appear in the top 50 predicted PM_{10} concentrations. These receptors are closest to the surplus treated soil stockpile. This stockpile was modelled as an uncontrolled emission source for dust, however if a surplus stockpile exists beyond the period of reinstatement it will be controlled by seeding grass, which provides up to 99% dust control.

The top 50 predicted PM_{10} concentrations indicate that the model has overpredicted impacts of dust from the clean soil reinstatement at the CPWE site and the surplus clean soil stockpile. Source contribution analysis at Receptors 5, 6 and 7, reveals that these two area sources of dust contribute between 99.4% and 99.8% to the three highest predicted PM_{10} GLCs at each of these receptors. These sources have been modelled as uncontrolled emissions, and it is extremely unlikely that the maximum predicted PM_{10} GLCs, shown in the Table 5, will occur. Dust control techniques will be implemented, as required, during soil handling activities, which will reduce the chances of PM_{10} concentrations reaching the levels predicted by the model. Section 11.3 of the AQIA report addresses dust impacts. Dust mitigation measures would be included in the CEMP and are also addressed in Section 12.1 of the AQIA report.

A number of techniques can be used to control dust from soil handling activities. Water sprays can be used to dampen soil during adverse weather conditions. Water suppression typically provides approximately 50% control efficiency for stockpiles and will also reduce dust from soil handling. Wind breaks or partial enclosure of soil handling operations can provide 30% dust control efficiency and revegetation, which provides up to 99% dust control, can be implemented if stockpiles are not planned to be disturbed for lengthy periods. Operational constraints, such as stopping work involving soil

handling activities under windy conditions, will also reduce the potential for dust nuisance. As indicated the mitigation measures during construction will be detailed in the CEMP and for operational measures have been incorporated into the project design.

The source contribution analysis of the three highest PM_{10} GLCs at the three highest discrete receptors indicated that the contribution of combustion sources to the maximum predicted PM_{10} GLCs is less than 0.6%. There are a number of PM_{10} emission sources at the BIP. Table 6 provides a breakdown of the PM_{10} emission sources from the BIP by emission rate. Appendix C of the AQIA report provides PM_{10} emissions data for existing sources and Section 6 of the report provides the emissions data for the proposed sources.

Table 6: Sources of PM_{10} from BIP by emission rate

Source	Existing / proposed	Contribution	Emission Rate (kg/hr)
Qenos Coal Boilers (2)	Existing sources	8%	0.21
Qenos Olefines Furnaces (5)	Existing sources	2%	0.06
GTP	Existing source	13%	0.34
DTD	Proposed source	40%	1.04
Stockpiles (no dust control)	Proposed source	13%	0.34
Clean soil reinstatement at car park	Proposed source	13%	0.34
ESB	Proposed source	5%	0.13
FSB	Proposed source	5%	0.13
Qenos Alkatuff Ground Flare	Existing source	1%	0.02

Note that background PM_{10} contributes as much to the maximum predicted GLCs (where background is included) as the contribution from the CPWE (where it also includes concurrent construction and operation activities).

Volatile chlorinated organic compounds

Emissions during the upset operating condition, where the thermal oxidiser flame is extinguished due to loss of natural gas supply, assume that some uncombusted volatile chlorinated organic compounds are substantially removed in the quench and acid gas scrubber by cooling the off gas and condensing contaminants. The remainder is exhausted via the DTD plant stack since these are not destroyed in the thermal oxidiser. The efficiency of condensation was calculated using a proprietary condenser model. Variations between the emission rates of volatile chlorinated organic compounds under normal operations and under upset conditions are due to the different condensation properties of the chlorinated VOCs. Under upset conditions, some chlorinated VOCs are expected to pass through the quench and gas scrubber without being substantially affected, whilst others are reduced significantly by condensation. When the thermal oxidiser flame is operating under normal operation, these chlorinated VOCs are destroyed leaving only trace concentrations at the exhaust.

Mercury

Monitoring, conducted following the completion of the decommissioning activities (removal of all buildings and stockpiled material to the concrete slab) conducted at the former Chlorine Plant area, has enabled a better estimate of mercury emissions from the remaining concrete slab to be provided. The original conservative estimate for mercury emissions from this area, which was used in the original modelling for impact assessment, was 30 kg/year, compared with a revised estimate for mercury from this area of 7.9 kg/year.

The updated estimate for mercury emissions from the former Chlorine Plant area impacts on the predicted GLCs of mercury for all modelling scenarios, since the remaining concrete slab area is included as an existing emission on the BIP in all scenarios.

The original modelling results (provided in Appendix F of the AQIA report) predicted a maximum off-site mercury concentration of 0.85 µg/m^3 (1-hour average) for the Baseline scenario and the same value for the Normal scenario, while the maximum off-site GLC for the 'CPWE only' scenario was 0.31 µg/m^3 (1-hour average). These results demonstrate that the former Chlorine Plant area has a dominant impact on predicted GLCs. It should be noted that these predicted GLCs are within the DECC air criteria for inorganic mercury, which is 1.8 µg/m^3 (1-hour average).

Additional modelling has been conducted to predict the GLCs of mercury for the updated emission rate from the former Chlorine Plant area, i.e. 7.9 kg/year. In this scenario the maximum predicted off-site GLC for mercury for the Baseline scenario was 0.22 µg/m^3 (1-hour average) and for the Normal scenario 0.31 µg/m^3 (1-hour average), while the maximum off-site GLC for the 'CPWE only' scenario was also 0.31 µg/m^3 (1-hour average), i.e. remains the same as in the original modelling.

The additional modelling for mercury demonstrates that there is a higher safety margin between the DECC air quality criteria (1.8 µg/m^3 [1-hour average]) and the revised maximum off-site GLC for mercury (0.31 µg/m^3 [1-hour average]).

Other Emissions issues

In regard to dioxin emission testing, the United States Environmental Protection Authority (USEPA) standard practice is for dioxin testing only during three replicate runs in the Proof of Performance (PoP) test, while treating a worst case contaminant load (i.e. prior to full scale operation). The dioxin testing regime applied by DECC to the Rhodes Peninsula projects is a three run PoP test, followed by monthly testing during routine operations with potential for progression to quarterly dioxin tests subject to satisfactory monthly results.

Orica agrees with DECC's recommendation that an additional SOC be added under the Air Quality section which commits Orica to implementing all practicable measures to eliminate or reduce, as far as practicable, all fugitive emissions from transport of material from the ESB to the FSB.

Orica considers that the proposed use of closed body trucks would prevent dust emission from the soil within the body of the truck. Details of the other measures to be considered to eliminate or reduce fugitive air emissions will be provided to the DoP during the detailed design stage. In addition SOC 5 will be revised to ensure details of final plant selected and how air quality emission concentrations will be achieved will be provided to the DoP during the detailed design stage.

3.6.6 In-stack Concentrations

The approach taken to assessing the impact of stack concentrations for the DTD Plant was to use emission estimates based on:

- high side results from the treatability study (nitrous oxides [NO_X], sulphuric acid [H_2SO_4], chlorine [Cl_2] and hydrogen chloride [HCl]);
- relevant results from other projects (cadmium [Cd], carbon monoxide [CO], dioxins, hazardous substances, cadmium [Cd] and particulate matter [PM_{10}]); and
- in their absence surrogate limits (HCl for hydrogen fluoride[HF]).

Mercury was treated as a special case and zero control efficiency was assumed. The estimates were not based on potential maximum values and were not designed to determine stack concentration limits, but rather to inform them as well as assessing the acceptability of impacts.

Where significant safety factors were determined to exist relative to the most sensitive (the shortest) averaging period (CO, Cl_2, HCl, dioxins and NO_x), the stack concentrations proposed in the SOC were the maximum acceptable concentrations in the CAR. This allows for variation in feed characteristics or performance due to site or plant specific factors, in the context of 100 percentile compliance.

Additional dispersion modelling has been conducted to assess whether emission rates of CO, Cl_2, HCl, dioxins, NO_x and Cd at the CAR limits would exceed air quality guidelines. These modelling results have been included as Appendix G of the revised AQIA report. Predicted GLCs of each of these substances are within the DECC air quality criteria (refer to Appendix G of the AQIA report).

Where the modelled GLCs were above or very near the maximum allowable GLCs (HF, Hg, PM_{10} and H_2SO_4), the same or a lesser stack concentration was proposed to allow for compliance with the GLCs, given the uncertainties involved.

NO_x emissions from the DTD Plant stack were assessed at a concentration of 234 mg/m^3, which is a high side (but not maximum value) from the treatability study. Following a refinement of the NO_x modelling (for NO_X photochemistry) resulting in a substantial increase in the GLC safety factor, the NO_x emission concentration limit proposed in the SOC has been amended from 205 mg/m^3 to 350 mg/m^3 (the maximum allowable in the CAR), because it cannot be reasonably guarantee of that NO_x emissions will be limited to 205 mg/m^3 due to feed soil variations. The emission rate at 350 mg/m^3 NO_X does not increase the predicted GLC for NO_2 (as outlined above in section 3.5.4.1) and meets the DECC air quality criteria (when NO_X photochemistry is treated using the contemporaneous OLM method). Therefore, DTD Plant stack emissions at 205 mg/m^3 have not been assessed.

Orica has committed to review the stack concentrations, set at the maximum allowable in the CAR, once the plant has been commissioned and real performance data are available, and to set stack emission concentrations below the maximum allowable where appropriate. The SOCs have been revised to reflect the changes to the in-stack concentrations and has included the above commitment - revision of the stack concentrations, set at the maximum allowable in the CAR, would be undertaken during commissioning.

Information in relation to mercury emissions and compliance with the DECC CAR is discussed in Section 3.6.5.

3.7 Human Health Impact Assessment

The HHIA has been completed by URS in accordance with current guidance endorsed by the DECC. In particular the HHIA has been conducted in accordance with the following key documents:

- Environmental Health Risk Assessment, Guidelines for Assessing Human Health Risks from Environmental Hazards, June 2002 enHealth; and
- The National Environmental Protection Measure (NEPM) (Schedule B(4), Guideline on Health Risk Assessment Methodology, 1999), prepared by the National Environmental Protection Council (NEPC).

The detailed methodology has been previously reviewed by both DECC and NSW Health and their independent expert Professor Brian Priestly of the Centre for Human Health Risk Assessment, Monash University, as part of the completion of the Orica Botany Consolidated Human Health Risk Assessment (HHRA) prepared by URS for Orica, 2005. The site specific parameters and chemical properties including toxicology used to assess risks reflect the current understanding of the proposed remediation process and site conditions as well as recent assessments of toxicological properties of the chemicals of concern. For example the toxicity profiles were reviewed for the HHIA report and reflect current guidance in the assessment of toxicity in relation to health risk assessments in Australia.

The HHRA provides a comprehensive assessment of groups who may be exposed to emissions during the remediation of CPWE. The characterisation of the calculated risks is based on target risk values

determined by NSW Health and DECC - not URS. The target risk values form the basis for the definition of acceptable risk. The assessment does not require value judgements by the risk assessor, rather reflects acceptable (i.e. negligible) risk as defined by expert opinion from the relevant authorities (i.e. NSW Health and DECC).

A revised HHIA report has been prepared to address specific issues identified in the submissions and to provide further explanation of the methodology, assumptions and input data from the Air Quality Impact Assessment (AQIA) report, prepared by PAE (2007). It should be noted that the findings and conclusions of the HHIA are unaltered.

In summary, the HHIA has been prepared following detailed methodology relevant to the proposed remediation process, site conditions, the groups of people who may be exposed to the emissions and the toxicity of the chemicals of concern in accordance to current guidelines endorsed by NSW Health and the DECC. The revised report provides clarification of specific issues raised but no requirement to change the approach and methodology has been identified.

In order to confirm that the HHIA is conservative (i.e. overestimates risk), monitoring during early operations of the remediation works is proposed to be reviewed against the key assumptions made in the HHIA. The proposed monitoring is explained in detail in Section 13 of the AQIA within Appendix of the EA.

It should be noted that the HHIA addresses health risks for the general public and for workers not involved in the remediation works (i.e. workers on BIP and neighbouring properties). In relation to workers involved in the remediation project, risks are addressed separately in accordance with Occupational Health and Safety (OH&S) legislation and guidelines applicable to the specific work activities. The identification and implementation of safe work practices for remediation workers is therefore undertaken separately with consideration of each work activity and the hazards (chemical and physical) associated with that activity. Further information relating to worker safety is provided in the revised HHIA.

3.8 Hazards and Risk

A few issues were raised in regard to hazards and risks. A summary of the issues and responses are provided as follows:

- The loss of utility supply including water, power and gas supply during operation has been considered in the Hazard and Operability Study for the project.
- As listed in SOC 35, Orica is committed to undertaking a Fire Safety Study, Hazard and Operability Study and Construction Safety Study.

3.9 Water

3.9.1 Groundwater

A number of queries were raised in regard to groundwater quality, more specifically details of the proposed groundwater monitoring program; how the groundwater will be protected during remediation; and whether the Qenos production bores were operational.

As noted in Section 3.1 of this document, Section 1.2 of the EA and Section 5.1 of the revised RAP, the project does not include remediation of the groundwater. However, by remediating the CPWE, a potential source of groundwater contamination would be removed.

It should be noted that groundwater monitoring has been conducted at the CPWE since 1997. The monitoring has confirmed that low levels of organic analytes (volatile and semi volatile CHCs) are present in the groundwater within the vicinity of the CPWE. These levels are not considered to pose a

risk to human health or the environment. Groundwater monitoring will continue to be undertaken in accordance with Orica's EPL (No. 2148).

Given that remediation of the groundwater (including the Qenos production bores) is not included in the project proposal, Orica considers that it is more appropriate to manage this as a separate issue, as is the current process.

In regard to the issue of the petroleum hydrocarbon contamination in groundwater, as Orica has indicated previously the source of the contaminations is believed to be related to the fuel pipelines located outside and adjacent to the BIP boundary. The project does not include remediation of the groundwater. Moreover, it does not include remediation of contamination that is not related to industrial activities undertaken by Orica, nor material that may exist outside the boundary of the CPWE.

Orica has acknowledged that the petroleum hydrocarbon contamination will be one of the OH&S issues addressed during the remediation works. In regard to whether excavation activities may cause the pipelines to rupture, it should be noted that the pipelines are outside the BIP boundary, located beneath a nature strip and pedestrian footpath. The design of the ESB and excavation activities will take these issues into consideration to ensure that they do not occur.

It should be noted that Orica has discussed this issue on a number of occasions with the DECC and has provided documentation relating to the issue. The most recent being a letter report 'Orica Botany, POEO Licence No. 2148 – Progress Update on Special Licence Condition E3', dated 22 June 2007 (reference EN1602-LT-060).

Orica is still of the opinion that DECC should direct those entities which it reasonably suspects are responsible for the petroleum hydrocarbon contamination, to take responsibility for the investigation, and if applicable, remediation of this contamination.

In regard to ensuring that the project does not have an impact on groundwater, it should be noted that groundwater monitoring has indicated that the groundwater table is located greater than approximately 4.0 m below the base of the Hypalon liner (URS 2007c). Given the depth, excavation works associated with the remediation of the CPWE would not encroach on the watertable. However, a number of safeguards are recommended and have been committed to by Orica to reduce this risk. These safeguards are outlined in the Water and Soils revised SOCs.

Orica has also committed to preparing a CEMP, which will provide additional detail regarding the ongoing management of water quality issues during the project (during construction and operation).

A submission noted that the approach undertaking to derive the RBCs did not consider whether the proposed levels of chemicals that could remain in soils might be an ongoing source of contamination to the local groundwater. This has been addressed in the revised RAP and is discussed in Section 3.5.3.

3.9.2 Surface Water

A number of queries were raised in regard to surface water quality, more specifically details of the proposed surface water monitoring program; strategies to manage the risk of surface water contamination; and water reuse criteria.

Orica has committed to a number of safeguards in order to manage the risk of surface water contamination. These safeguards are outlined in the Water and Soils SOC. Orica has also committed to preparing a Construction Environmental Management Plan (CEMP), which will provide additional detail regarding the ongoing management of water quality issues during the project (during construction and operation).

In regard to the water reuse criteria, potentially contaminated water collected on the project site from the following areas/activities will be collected and transported to the on-site wastewater treatment plant (WTP) for treatment:

- Surface water falling on areas such as the external bunded areas of the STA;
- Water purged during the acid gas scrubbing phase of the DTD treatment process;
- Small volumes of free water (seepage) accumulating in active excavations within the CPWE; and
- Water from personnel and plant decontamination processes.

The water from the discussed areas will be treated at the on-site WTP to a standard suitable for discharge to sewer. Site water will not be discharged to sewer unless tested and in full compliance with the licence water quality criteria in the Trade Waste Licence. Other water collected from the project site will be reused during the excavation, remediation and reinstatement works, where possible. More details are provided in Section 6.5 and 12 of the revised RAP.

Orica agrees to the DECC recommendation for an additional SOC be included which states “Only uncontaminated rainwater would be permitted to flow to stormwater drains”.

3.10 Noise and Vibration

A Noise Impact Assessment was undertaken as part of the EA and is provided in Appendix F of the EA. The assessment stated that noise generated from the proposed project would occur during both construction and operation. As outlined in Section 8.2 of the EA day time and night time noise and vibration impacts were considered. It was found that the proposal would generally meet day time criteria and some night time criteria exceedance would occur. However, upon implementation of the environmental safeguards, potential noise impacts are not anticipated to pose constraints to the construction and operation of the proposed remediation facility.

Orica has committed to sourcing/designing the DTD Plant and associated equipment/plant with the objective of achieving the noise goals detailed in Orica’s EPL (No. 2148). The details of the noise mitigation measures adopted and the noise reductions to be achieved will be provided to the Director-General during the detailed design stage and via the Noise and Vibration Management Plan (NVMP),, as indicated in SOC 19. These include measures such as installation of a noise control device on the DTD Plant stack tip and location of the thermal oxidiser burner and baghouse compressor at the base rather than the top of the components. A Noise Compliance report would be prepared and submitted to the Director-General. This information would also be contained within the Technology Assessment to be lodged with DECC.

Noise emissions from the BIP are licensed by DECC, with Orica’s noise emissions being controlled by EPL No. 2148. To ensure noise level criteria are met, Orica has committed to preparing and implementing a Noise and Vibration Management Plan (NVMP) for the duration of the project. The NVMP would ensure that noise level criteria and vibration criteria would be met during construction and operation of the remediation activities.

Orica is committed to implementation of the mitigation measures defined in the Technology Assessment and NVMP to ensure noise goals set out in Orica’s EPL are achieved and to minimise vibration levels.

Noise monitoring will be undertaken regularly during the construction and operation phases to ensure compliance with the noise limits defined in Orica’s EPL. If an exceedance is detected, mitigation measures will be implemented. The noise monitoring program and other information will be detailed in the NVMP.

Other issues include:

- The revised SoC includes additional commitments, related to noise, recommended by the DECC.
- Vibration impacts associated with piling would be regulated via the requirements of DECC's publication *Assessing Vibration: A Technical Guideline*.
- Orica agrees to the additional point recommended by DECC and NSW Health for a revised SOC 20 – "Notification to all those impacted by works likely to cause excessive vibration and noise i.e. if sheet piling is required".
- Orica has committed to undertaking ongoing consultation with the local community for the duration of the project. The detail of this consultation will be provided in a Community Liaison Plan, which Orica has committed to preparing for the project. Some of the key components of the Plan include: establishment of a dedicated 24-hour, 1800 telephone number/service for queries, comments and complaints; and regular project meetings to disseminate information on the progress of the works, including any incidents. The Plan will also include a protocol for informing the BIP workers and surrounding community if excessive noise or vibration is to occur during the project.

3.11 Traffic and Transport

As stated within the EA, vehicles travelling to and from the site will be limited to employees, delivery of plant and equipment and deliveries of consumables. Primary routes to the site would be as follows:

- Inbound: along General Holmes Drive, then Foreshore Road, Beauchamp Road, and then Denison Street accessing the BIP through Gate 3; and
- Outbound: exit via Gate 3, along Denison Street, Wentworth Avenue, and then Southern Cross Drive.

Access routes to the secondary access point at Wight Street are as follows:

- Along Southern Cross Drive, then Foreshore Road, Beauchamp Road, Denison Street, Wentworth Avenue, Baker Street, Moore Street and then Wight Street accessing the CPWE; and
- Along Southern Cross Drive, then Wentworth Avenue, Page Street, Holloway Street, Baker Street, Moore Street and then Wight Street accessing the CPWE.

As queried in Submission 9, the Port Feeder Road will not be utilised by transport associated with the CPWE remediation activities.

Traffic generated by the proposed remediation works will be largely internal to the BIP. The main internal traffic generating activities during excavation and soil treatment will involve the transportation of contaminated materials from the ESB to the FSB (within BIP). This will be done via a fleet of three 12 tonne tip trucks, along with designated internal haul roads. Contaminated material is unloaded within the FSB and trucks decontaminated before returning to the ESB for the next load. It is anticipated that these trucks would operate on the site 12 hours per day, six days per week and would remain on-site out of operational hours for the duration of the works.

As all truck transport would occur within a limited area of the BIP and would be retained on the site for the duration of works, it is expected that there would be no significant impact on traffic volumes within the BIP or on arterial roads surrounding the project site.

Other issues were raised and are summarised below:

- Likely routes for primary access to the site are listed in relation to Road Traffic Noise in Section 8.2.4. The primary routes and access for the site do not include Page Street and Barker Street. These streets are identified as routes to be used as the secondary access point. In addition SOC 23 requires a Traffic Management Plan (TMP) to be prepared prior to site establishment and construction. The TMP will include designated haulage routes within the BIP for heavy vehicle movements. In addition, existing workforce parking and vehicle unloading areas within the BIP will be used. The SOC will also be revised to ensure the TMP will identify designated haulage routes external to the site within the Randwick LGA.
- Traffic movements and potential impacts are assessed in the EA and there are not expected to be significant traffic impacts with the implementation of the environmental safeguards, as mentioned in the EA. In addition preparation of a TMP is committed to be prepared prior to the project commencing.

3.12 Planning and Regulatory Issues

The following information addresses the queries raised in regard to planning and regulatory issues:

- Progression from approvals to licensing involves submittal of increasing levels of detail with respect to plant commissioning and operation and verification of compliance with emission limits. Additional details on plant commissioning and operation and verification of emissions will be submitted to DECC in the Technology Application prior to commissioning and prior to operation of the DTD Plant. Orica has committed to preparing and submitting the Technology Application (SOC 1).
- Orica notes that the SCW CCO was modified in its last revision to give the DECC the flexibility to agree to other criteria where appropriate (clause 12), and to allow the reuse of treated material in appropriate circumstances with approval and without a licence (clauses 24 to 29). Orica confirms its commitment to treat the soil such that it meets the levels specified in the Director-General EARs. Should unforseen circumstances arise related to technical or financial practicability, unintended consequences or perverse environmental outcomes that require a modification of the standard, Orica will seek the approval of the DECC. Further information in relation to the Director-General EARs and Remediation Goals is provided in Section 3.5.
- A Section 73 Compliance Certificate would be obtained from Sydney Water.
- The Director-General's Requirements for the Environmental Assessment, community workshops (including the Community Participation Review Committee meetings) and Environmental Assessment Scoping Report focused the assessment on key issues. Those identified as requiring more attention for this project included remediation approach and criteria, air quality, human health impacts, noise and vibration, water quality, landuse safety and general environmental risk analysis. Ecology, heritage and economic impacts were considered and assessed and considered low risk impacts due to the nature of the existing site and benefit of the remediation works. Therefore detailed analysis was not required.
- Although it is possible to make broad generalisations based on other sites and projects and equipment, experience has shown that site, matrix, contaminant and equipment specific characteristics may result in different outcomes compared with absolute criteria. While Orica is committed to meeting the absolute standards specified in relevant NSW regulations, we note that mechanisms and criteria exist with these and / or the associated Acts, to apply for modifications should the appropriate circumstances arise. Orica properly reserves its rights under these instruments, as has already been raised for the matter of the mercury stack emission limit concentration.

- Comment has been raised about the applicability of DCP34. The potential impacts of the proposal in relation to issues such as air quality, noise, hazard, risk and traffic are assessed in detail in the EA and additional clarification provided through this report. Management measures are also recommended throughout the EA to ensure potential impacts are minimised. Orica's commitment to these measures are presented through the SOCs. The EA and proposed management measures ensure the project is consistent with the DCP34 *objective of ensuring that changes of landuse will not increase the risk to health or the environment.*

3.13 Proposal Justification

3.13.1 Justification

The proposed remediation process is proposed to reduce the risk of possible spread of contaminants off-site. Orica considers that the proposed solution, which involves destroying the contaminants with current best available technology, is a long term solution.

3.13.2 Greenhouse

There were a number of queries raised in regard to greenhouse gas emissions. The responses to these queries are presented below:

- The total energy consumption and greenhouse gas emissions of DTD and ITD technology are comparable. When the secondary treatment process is considered the greenhouse footprint of the ITD process is likely to be greater. Further information is presented in Section 3.3.
- Orica has examined the operating conditions of the plant to identify the soil treatment temperature and thermal oxidiser operating temperature that optimises environmental outcomes from the plant in terms of contaminant removal, contaminant destruction, stack emissions and greenhouse emissions. However, DECC has advised that it will not compromise its absolute soil treatment standards and emission standards to optimise plant operation across all these parameters. Accordingly there is minimal opportunity that more comprehensive additional reduction and energy efficiency opportunities will be realised from other parts of the project. Nevertheless this shall be considered in the Technology Application. Further information in regard to this is provided in Section 3.6.
- In regard to the possibility of purchasing a percentage of Green Power sourced from an accredited renewable energy supplier, Orica will consider purchasing a percentage of Green Power, subject to availability.

3.14 Surrounding Land Use/Amenity

The EA has determined that the proposed works are not expected to result in significant adverse impacts on surrounding landuses. This will be ensured through implementation of the recommended safeguards.

3.15 Consultation

There were a number of queries raised in regard to consultation. The responses to these queries are presented below:

- Prior to establishment, WorkCover NSW will be notified of the proposed commencement date. There is an opportunity for the DoP to refer the EA to Workcover NSW for comment if considered necessary. In addition the revised SOC will include a commitment to sending the Occupational Health and Safety Plan to Workcover.
- The SoC's in the EA will ensure that appropriate community consultation, monitoring and reporting occurs. As indicated in Section 3.2.3, Orica has made a commitment to undertake ongoing consultation with the local community (including businesses and residents in close proximity to the CPWE site and Hensley Athletics Field users) for the duration of the project. However, Orica has not confirmed what the consultation approach will be. Orica feels that it is important to involve all stakeholders in establishing the preferred consultation approach. A meeting is proposed to be held in early 2008, pending approval of the EA, for CPRC members and CPWE target interest groups to meet together to plan the future consultation processes. This was discussed at the CPRC meeting held on 21 August 2007.
- Detailed design will be undertaken prior to commencement. Details will be provided to DoP and DECC. Further information is provided in Section 3.1 and 3.4 of this document.

3.16 Environmental Management/Monitoring and Reporting

There were a number of queries raised in regard to environmental management, monitoring and reporting. The responses to these queries are presented below:

- Inspection and maintenance for preventative control will be undertaken daily during construction and operation works. 24 hour operations are usually monitored/inspected at least once per shift however thermal plant and related operations are constantly monitored via a manned control room.
- Orica has committed to preparing various plans, such as the EMP, NVMP, OH&S Plan, etc, which will ensure that processes and safeguards, that are required to be in place, will be prior to construction commencing. Environmental management, monitoring and reporting during the operational phase of the project will also be detailed in the Plans, which are to be submitted to DoP, DECC and Workcover (in the case of the OH&S Plan) prior to the project commencing.
- No further information in relation to air and noise emissions is expected to be available on the actual performance of the plant until it is commissioned.

3.17 Other Issues

A comment was made in regard to the aerial photographs included in the EA. More specifically the comment was made that the EA was based on aerial photographs from 2005 and that the EA has not been properly prepared. This was also raised by a community member at the CPRC meeting held on 13 November 2007.

During the preparation of the EA, the only aerial photographs available were from 2005. It should be noted that the aerial photographs were used in the Figures (1, 2 and 3) to illustrate the site and surrounding area. Regardless of the aerial photographs used in the Figures, the EA has been undertaken to consider what is actually occurring at the site and surrounding area. An example of this is presented in the HHIA, in considering impacts on surrounding food manufacturing facilities. Further details are provided in Section 3.2.3. Furthermore, Orica is not aware of any requirement (from DECC or DoP) to provide the most recent aerial photographs in the EA.

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Appendix A

Community Participation and Review Committee

Background Briefing Paper

COMMUNITY PARTICIPATION and REVIEW COMMITTEE

Background Briefing Paper
For Meeting Tuesday, 14 November 2006

PURPOSE OF THIS PAPER

This paper has been written to help provide background information to members on the topics to be discussed at the forthcoming Community Participation and Review Committee (CPRC) meeting to be held on 14 November 2006.

There are five matters covered in this briefing paper:
1. Car Park Waste Encapsulation (CPWE), status of the Environmental Assessment (EA) process and monitoring update.
2. Hexachlorobenzene (HCB) Waste, including update on the Independent Review Panel (IRP) report, the export application and the re-packaging plant.
3. Other HCB stores related waste on the Botany site.
4. Draft Terms of Reference for the CPRC.
5. Community consultation.

1. CAR PARK WASTE ENCAPSULATION (CPWE)

Status of the Environmental Assessment

Orica will be distributing the draft EA to the Department of Planning (DoP) (who then distribute it to relevant government agencies) for an adequacy review in mid November 2006. Members of the CPRC will also receive a copy of the draft EA and a **CPRC Question and Answer (Q&A) session will be held on Tuesday 28 November 2006, 5.30-7.30pm at the Orica Administration Building**. Orica welcomes suggestions for this Q&A session and planing can be discussed at the November CPRC meeting.

During December, the draft EA will be amended as necessary in response to feedback and exhibition of the final EA would commence early January 2007, due to the holiday period. Community consultation with the immediate (eg. adjacent industry and Hensley Athletics Field users) and broader community will continue during EA preparation and exhibition.

The current CPWE EA timetable is shown on the following page.

Monitoring of the CPWE

As part of the management process, Orica conducts routine visual inspections of the car park site and its surrounds, and regularly monitors the groundwater and air emissions in the vicinity of the car park.

Samples were collected from the groundwater monitoring wells surrounding the CPWE in October. The report is currently being prepared and is expected to be submitted to the Department of Environment and Conservation (DEC) November/December and will be made available on the Orica HCB website thereafter.

Air emission monitoring – as part of the Botany site wide 15 month monitoring program – is to be conducted within the next few weeks. A report will be prepared following completion of the sampling and receipt of the analytical results.

Current CPWE EA timetable

Activity	2006						2007		
	July	August	September	October	November	December	January	February	March
Preparation of EA									
Submission of draft EA to DoP for adequacy review – 21 days					13				
Determination of adequacy review from DoP						4			
CPRC/Community workshop									
Revision of EA[1]									
Finalisation of EA and submission to DoP									
Exhibition of EA – 30 days									
Review of EA and submissions									
Determination of EA									

2. HCB WASTE

2.1 Regional Siting Project

As updated at the August CPRC meeting, after conducting an extensive regional siting assessment in regional NSW, Orica could not locate a willing community that complied with various criteria for operation of a HCB waste treatment facility. The IRP was required to report to the DoP on the regional siting process in mid-2006. The DoP has advised that a report back from the IRP is likely in November. Once DoP releases the report, Orica will provide details to the CPRC.

2.2 Export Project

As the CPRC is aware, on 4 August 2006 Orica lodged an export application with the Department of Environment and Heritage (DEH). Sections of the application relating to insurance and some international requirements had yet to be finalised at that time. The DEH has since reviewed the information and advised that the application will be assessed as nine separate permits to reflect the varying characteristics of the waste and the location of the treatment plants (four).

On 10 October 2006, Orica attended the DEH Policy Reference Group meeting and provided information as requested.

All outstanding information has now been finalised and the application is complete, subject to DEH requiring any additional information. Orica anticipates that it will be gazetted in November 2006. The time for a decision on the export licence is expected to be some months and will depend on the response time from the other state governments and approval authorities, and on any delays which may result from objections. We are aiming to commence shipments in April 2007.

Once gazetted, a full copy of the application excluding company confidential information (for example, terms of confidential commercial contracts) will be available on request.

[1] This assumes that the Minister will request further information to be included in the EA.

2.3 HCB Waste Re-packaging Plant Construction and Commissioning

The NSW Minister for Planning provided approval for the construction and operation of the HCB Waste Repackaging Plant in mid August 2006. Construction of the plant commenced immediately and is progressing according to schedule. Orica aims to commence commissioning of the plant in early December 2006.

The commissioning process involves ensuring that all the mechanical equipment works in the right sequence, smoke tests to verify the effectiveness of fume extraction systems and a process trial on low level waste to confirm the plant's environmental performance. Once the trials are approved by DEC Orica will commence re-drumming concentrated waste. We hope this will occur just prior to Christmas. However timing is very tight to achieve our target date for completion of construction, commissioning and DEC approval to operate.

3. DRAFT TERMS OF REFERENCE FOR THE CPRC

At the August meeting, the CPRC commenced discussions on a draft Terms of Reference for the CPRC that Mehreen Faruqi had developed. It was agreed that comments raised at the meeting would be circulated to the CPRC for discussion at the November meeting (these were distributed to the CPRC on 31 October).

Time has been allocated in the November meeting agenda to further discuss the role of the CPRC. Please review the comments previously circulated in advance of the meeting if you have the opportunity.

4. POTENTIAL TREATMENT OF OTHER HCB WASTE CONTAMINATED SOIL

This information has been provided to facilitate discussion on possible treatment of soil other than that contained within the CPWE, which has been contaminated through the past storage of HCB waste or which was identified previously during the preparation of the Environmental Impact Statement (EIS) for the proposed HCB waste destruction facility (Geomelt Plant) in 2001. The information has been prepared in response to discussion with the CPRC and the wider community on this issue.

4.1 Introduction

As the CPRC is aware, an EA for the proposed remediation of the CPWE using Directly-heated Thermal Desorption (DTD) technology has been prepared and will be submitted to the DoP in draft form in November. The scope of the EA includes only remediation of the contaminated material contained at the CPWE as there is a requirement to treat this material as soon as practicable because of uncertainty on the long-term durability of the encapsulation liner. A timeline for the remediation of the CPWE is also stated in Orica's Environment Protection Licence (EPL No. 2148).

The decision to use DTD technology to treat the CPWE evolved from a detailed review of remediation options and discussion with the CPRC and the wider community on these options. Orica had originally identified bioremediation as the treatment option for the CPWE, with DTD nominated as a backup technology. Recent information from the bioremediation research project indicated that bioremediation was found to be unsuitable because of technical uncertainty and the extended timeframe required to treat the contaminants at the CPWE. Therefore, Orica nominated DTD technology for remediation of the CPWE and also made a commitment to continue funding the bioremediation research project.

Orica's examination and assessment of these technologies was conducted to assist Orica in ensuring that the CPWE is remediated. It is possible that DTD technology may be able to be used to remediate other areas of known or suspected soil contaminated with Scheduled Chemical Waste (SCW) from the past storage of HCB waste, or the soil which was identified for treatment in the EIS proposal for the HCB waste destruction facility in 2001 (Nb. that proposal was not approved). These areas include the Pacific National and Denison Street Stockpiles and the Main HCB Stores. In recent investigations, SCW contamination has also been identified at Southlands. Further descriptions of these areas are provided in Section 4.2.

The DTD proposal only applies to the CPWE. In order for Orica to assess the suitability of DTD technology for treatment of these other areas, a series of actions would need to be undertaken, which are further discussed in Section 4.3. It is not our intention to vary the scope of the EA to include these other potentially contaminated areas. Should DTD technology be suitable for remediating these other areas, consultation and environmental assessment would be required and a formal amendment to any approval for the EA for the remediation of the CPWE would be need to be submitted to the DoP. In other words, the process for approval and treatment of the CPWE will continue independently of the consideration of these other potentially contaminated areas.

4.2 Potential for Treatment of Other Waste

The areas of known or suspected soil contamination which are related to past storage of HCB waste and those areas which were identified during the preparation of the EIS for the HCB waste destruction facility are described as follows and shown on the attached Figure 1.

- *Pacific National Stockpile*[2]

Approximately 6,000 m3 of soil contaminated with SCW such as HCB and HCBD is located on railway land, owned by Pacific National, directly adjacent to the south western boundary of Botany Industrial Park (BIP). Pacific National manages the stockpile in accordance with its Environmentally Hazardous Chemicals Act 1985 Licence.

The agreement of Pacific National is required for any decisions regarding investigation or remediation of the stockpile.

- *Denison Street Stockpile*[2]

Approximately 3,000 m3 of soil contaminated with SCW, such as HCB and HCBD, is located on land owned by both Sydney Water and Orica near the eastern boundary of the BIP. It is situated primarily on top of the Southern and Western Suburbs Ocean Outfall System (SWSOOS).

This stockpile of soil was transferred to its current location as part of the Denison Street landscaping project in 1980. This was low level contaminated soil (identified through laboratory analyses) removed from the former drum storage area, where the Qenos Olefines Plant currently exists, during the construction of the CPWE. Given the low level of contamination, it was considered acceptable to be reused as landscaping material.

- *HCB Stores*

The location of the Main HCB Stores A, B and C was originally used as an open drum storage area for HCB wastes. Some preliminary analyses conducted to the south of Stores A, B and C has identified the presence of HCB and HCBD in the soil. We understand that drummed HCB and HCBD waste was not historically stored at the current location of stores D to I however, future investigations will provide information.

- *Southlands*

Soil contamination has been identified during the current investigations at Southlands and is believed to have been related to previous dewatering of services trenches near the boundary of Southlands Block 1.

4.3 Issues to Consider for Treatment of Other HCB Waste Contaminated Soil

In order to determine whether the other areas of contaminated soil noted above would be appropriate for treatment using DTD technology, Orica will need to undertake a series of actions, such as:

- seeking agreement with owners of soil on property not owned by Orica to enable investigation and potential treatment to occur
- sampling and analysis of each of these areas of contaminated soil
- assessing the suitability of DTD technology to treat this soil, including consideration of the timing of DTD plant operation

[2] Soil previously identified for treatment in the proposed Geomelt Plant - URS Australia Pty Ltd (2001), *Environmental Impact Statement: Proposed HCB Waste Destruction Facility at Botany, July 2001.*

- consideration of alternate technologies such as bioremediation (if this technology is proven in the future)
- involving the community in discussion on the project as investigations progress
- detailed assessment of the impacts associated with treatment of other soil
- applying for a modification to the DTD approval to treat the additional soil.

An update on the status on the above listed actions will be provided at the CPRC meeting.

Potential Impacts of Treating the Additional Soil
In the event that these areas noted above are suitable for treatment using DTD technology, the operating term of the plant could be increased. However, this would be dependent on the volume of additional soil to be treated and regulatory approval.

Given the size of the BIP site and amount of manufacturing that has occurred over the decades, other areas of soil contamination on the BIP may be identified over time. Orica would like to clarify that treatment of contaminated soil using DTD is being considered for only the areas noted above. It is not proposed that DTD be used to clean up other potential contamination identified at BIP. There are other ongoing projects, related mainly to the Botany Groundwater Cleanup Project, which are considering remediation of contamination at the BIP – such as the 'DNAPL Source Area Removal Trials'. Additionally, should the Environmental Biotechnology Cooperative Research Centre (EBCRC) bioremediation project be successful, this may also be a suitable remediation technology for treatment of other contamination that may be identified at the BIP.

Benefits of Treating the Additional Soil
The ability to treat the additional areas of contaminated soil in the DTD plant would enable Orica to remediate these areas more quickly; using a proven technology that would remove all contamination.

4.4 Conclusion

A decision regarding the additional areas of contaminated soil cannot be made until further information, including a better understanding of the chemical contaminants and the most appropriate means of eliminating them, is available. Orica intends to continue to gather information and will provide regular updates on this to the CPRC for further discussion. We look forward to hearing your thoughts on these investigations at the November CPRC meeting.

5. COMMUNITY CONSULTATION

Since the August CPRC meeting Orica has undertaken the following community consultation:

- CPWE draft EA workshops on 19 and 22 August (including distribution of flyers to the community and newspaper advertisement)
- Consultation with adjacent industry on the CPWE project
- Updated the BIP Community Consultative Committee on the HCB projects at its meeting on 16 August
- Provided updates to the community on the HCB and related waste projects through the August/September CPRC Newsletter
- Provided updates on the HCB projects through monthly columns in the local newspapers
- Provided e-mails to BIP employees updating them on the HCB Waste Repackaging Plant progress
- Updated the HCB website with relevant material
- Provided update e-mails to the CPRC
- Responded to community queries on the HCB projects

Orica greatly values and appreciates the time and commitment that the CPRC has contributed during the period and the regular feedback which we receive. Feedback is recorded in minutes and workshop notes and helps to shape our projects and plans going forward. Suggestions for how we continue consultation with the CPRC and wider community are always welcomed.

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About ENSR

HLA ENSR is the Australian arm of ENSR, a leading worldwide environmental firm, serving industrial clients and government agencies with 2,500 employees from 90 global offices. HLA ENSR serves clients from nine locations throughout Australia, providing comprehensive consulting, engineering, remediation, environmental, health and safety (EHS) management solutions. ENSR is the recipient of numerous industry, client EHS, business achievement and organizational innovation awards. ENSR is part of the AECOM family of companies. For more information, please visit:
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