Kilshannig House

Cratloe Wood

Cratloe

Co. Clare

Ms Ann Marie Donlon

Inspector,

Environmental Protection Agency

P.O Box 3000

Johnstown Castle Estate

Co. Wexford

1 August 2012

Dear Ms Donlon,

Please note the response below to the Section 90 reply sent to the Agency by the applicant on the 26 July 2012.

The Supreme Court , Ni Eili v Environmental Protection Agency (1999)IESC64 (30 July ,1999), Notice Party -Roche Ireland Ltd

According to Justice Francis D Murphy .

"First I would recall the observation made by the Chief Justice to the effect that the Appellant and other objectors performed an important public service by expressing their concern and raising specific objections to the granting of the licence by the Agency. Their participation in the hearing before Mr O'Brien no doubt helped to ensure that any possible danger to the environment or public health was frilly and properly explored".

"Finally it may be helpful to remind the Appellant and others similarly placed that the grant of a licence under the 1992 Act does not confer on the licensee the permission to cause injury to health or damage to the environment or any immunity from any other illegal process. It merely permits an activity to be carried on which would otherwise be illegal. If the conduct of the licensee in any case were to cause injury or damage or otherwise constitute a public nuisance, the persons affected would continue to have available to them a well stocked arsenal of legal and equitable remedies although one would hope that the conduct of the licensee and the supervision of the Agency would render it unnecessary to have recourse to any such remedies".

Roche Ireland Ltd, public declaration relating to its landfill

"The objectors appear to have misunderstood the design of the existing landfill which is on the planning files of Clare County Council. It does not have a concrete base. The site is laid on an alluvial clay base of low permeability covered by a layer of sand, followed by a HDPE liner, a further layer of sand and yet another HDPE liner and a third layer of sane. There is leachate collection underneath the bottom HDPE liner and between the two liners to check for liner leakage of either liner in either direction."

Roche Ireland Ltd, public declaration relating to its landfill

"No hazardous waste is landfilled on site at Clarecastle".

True Waste Classification of Roche landfill by Roche Ireland Ltd own consultants URS

"To be considered as hazardous waste category 1 wastes or the hazardous constituents of Category 11 waste must exhibit hazardous properties above threshold values as specified in Schedule 11 Part 111 of SI 10 of 1996. The wastes in the Roche landfill cells meet the criteria for consideration as hazardous wastes on the basis that they are capable of yielding substances with hazardous properties after being disposed of, such as leaching of hazardous materials and decomposition to form highly flammable gaseous substances (methane) or irritants (ammonia)"

Roche Ireland Ltd own consultants RPS on H2 area landfill

"In summary waste was initially landfilled into the H2 area between 1977 and 1980 with no control on filling processes, no lining and no leachate control mechanisms. Waste disposal took place across a relatively wide area in numerous dispersed pits, including on land close to the artificially constructed Nature Area ponds".

"Overall the H2 area is a historic hazardous waste cell, is unlined and is causing localised groundwater pollution on the Roche facility. URS estimate up to 90,000 tonnes or 60,275m3 of hazardous wastes lie in the H2 area. The H2 area constitutes a significant environmental liability for Roche ".

Roche Ireland Ltd own consultants URS on H2 area landfill

"The waste in the H2 area was deposited in unlined pits (up to 3.4m deep), with no facilities for leachate interception and collection. In some areas the wastes are emplaced below the water table (the water table was 0.85 to 2.59m below the well casing in surrounding monitoring wells in October 2004)."

Roche Ireland Ltd own consultants URS on Monitored Natural Attenuation of H2 Area

"The aim of MNA would be to document stable or improving groundwater quality around the H2 area (as was the case up to 2001) to the satisfaction of the regulators, as an alternative to active intervention. However contaminant concentrations in leachate samples taken from the 2005 trial pits continue to show elevated concentrations of volatile organics (solvents), semi-volatile organics (phenolics) and heavy metals 25 years after the cessation of landfilling in the H2 area, despite extraction of contaminated groundwater from this area for several years. It is therefore likely that MNA would have to be continued for decades in order to meet regulatory requirements, with no reduction of the risk of an unforeseen future incident, such as the drum rupture which occurred near well 216 in 2001, which could lead to future regulatory enforcement. "

Roche Ireland Ltd own consultants URS on Capping of H2 area

"Capping of the H2 area to reduce rainfall infiltration is considered to be of limited benefit, as the chemical/process waste in some areas is emplaced below the water table and there is through flow of shallow groundwater through the waste, driven by natural gradients due to the hillside to the west of the H2 area. Capping would require considerable engineering works to profile the H2 area to promote runoff and manage the drainage, but would not eliminate the release of leachate to groundwater. In addition the presence of a landfill cap would restrict the future use of the H2 area and, despite the capital investment, would not provide Roche with a reduction of liability in the event of an unforeseen future incident".

Closure Restoration and Aftercare Management Plan (CRAMP)-Roche Ireland Ltd

RPS states in (Document No MDE0573Rp0002A02, Issue Date 19.12.06 and 20.03.07), Section 2.5 under Closure Considerations:

"In order to develop a fully costed Closure Plan for the Roche facility, a number of assumptions have been made".

This includes the following assumption:

"The entire facility will be fully decontaminated and decommissioned and the site, with buildings and pipe work can be sold as development land for future industrial use".

The Agency will now be aware that no construction, industrial or otherwise can take place on the H2 hazardous waste pits.

The Agency will also be aware of the opinion of Roche own consultants URS (Job No. 45078361, 14 October 2005, Section 11.3.2)

"In terms of reducing or eliminating the long term environmental liability associated with material deposited in the unengineered H2 area, excavation and removal of the chemical/process wastes involving segregation and re-use of uncontaminated fill material overlying the chemical/process waste) is proposed as it :

- Removes the source of leachate generation and groundwater contamination of the H2 area:
- Does not require indefinite operation, maintenance and monitoring:
- Eliminates uncertainty relating to impacts of possible future incidents , or changes in regulatory approach, which affect options where the waste mass remains in-situ:
- Facilitates re-use of the H2 area for other purposes such as expansion of the plant".

Based on the above assumption I draw the conclusion that the Closure, Restoration and Aftercare Management Plan (CRAMP) as submitted to the Agency is not fit for purpose in order to develop a fully costed closure plan for the applicants site and is required to be replaced by a CRAMP reflecting the true condition of the Roche landfill and the excavation and removal of the unlined H2 hazardous waste pits.

Yours sincerely

Roger O'Mahony

Encl

Roche Ireland Ltd public declaration relating to its landfill – 6: Leachates

Roche Ireland Ltd public declaration relating to its landfill – 9.2: On Site Waste Disposal Report

URS Schematic Hydrogeological Cross Section Through Landfill Cells H2 1,3 & 4

RPS – 2: H2 Area Landfill

RPS – Roche Ireland Closure, Restoration, Aftercare Management Plan (CRAMP)

6. LEACHATES

The objectors appear to have misunderstood the origin of filter aid cakes and spent carbon. The spent carbon referred to Schedule 3(ii) is not fly ash or slag and is not connected with the incinerator.

Powdered activated carbon is utilised in the manufacturing process to decolorise final products before they are isolated dried and packaged for sale. After it is used, the "spent" carbon is filtered from the solution of product in which it has been utilised and is deposited in the landfill. There is no question of it's being contaminated with PIC's.

The filter cake referred to in Schedule 3(ii) is produced during the manufacture of an intermediate, I-06-DLA. During the synthesis of this intermediate, a stable, inert dimeric by-product is produced. This material is 6-6-dimethoxy-2-2-binaphthalene. It's CAS No. is 29619-45-2. This material is filtered off in an admixture with filter aid and is deposited in the landfill. This material has nothing to do with the incinerator. It does not contain PIC's and there is no particular reason why it should contain dioxins.

If tests required by the EPA under Condition 7.2.4 and Schedule 3(ii) of the draft licence show that any material is unsuitable for disposal by landfill, it will not be buried in the landfill.

The objectors appear to have misunderstood the design of the existing landfill which is on the planning files of Clare County Council. It does not have a concrete base. The site is laid on an alluvial clay base of low permeability covered by a layer of sand, followed by a HDPE liner, a further layer of sand and yet another HDPE liner and a third layer of sand. There is leachate collection underneath the bottom HDPE liner and between the two liners to check for liner leakage of either liner in either direction.

X

9.2 On-Site Waste Disposal Report

Licence condition Condition 7.2 and Schedule 6(i)

No hazardous waste is land filled on site at Clarecastle. The land fill site is used primarily for the burial of domestic type refuse, builders' rubble, packaging etc. The site is also used for disposal of stabilised sludge from the wastewater treatment plant.

Table 9: Non-Hazardous Waste Disposal for 1999 on-site

Waste Material	EWC code	Source	Further treatment	Dry Weight (Tonnes)	Deposit location	Contractor
Waste packaging	07-05-99	Chemicals	Residue removed	79	Site landfill	Self
WWTP Sludge	07-05-02	WWTP processing	N/A	46	Site landfill	Self

Licence Condition Condition 7.1 and Schedule 6(i)

All hazardous liquid waste was either sent off site for incineration or was incinerated on site. All solid hazardous waste was incinerated off site.

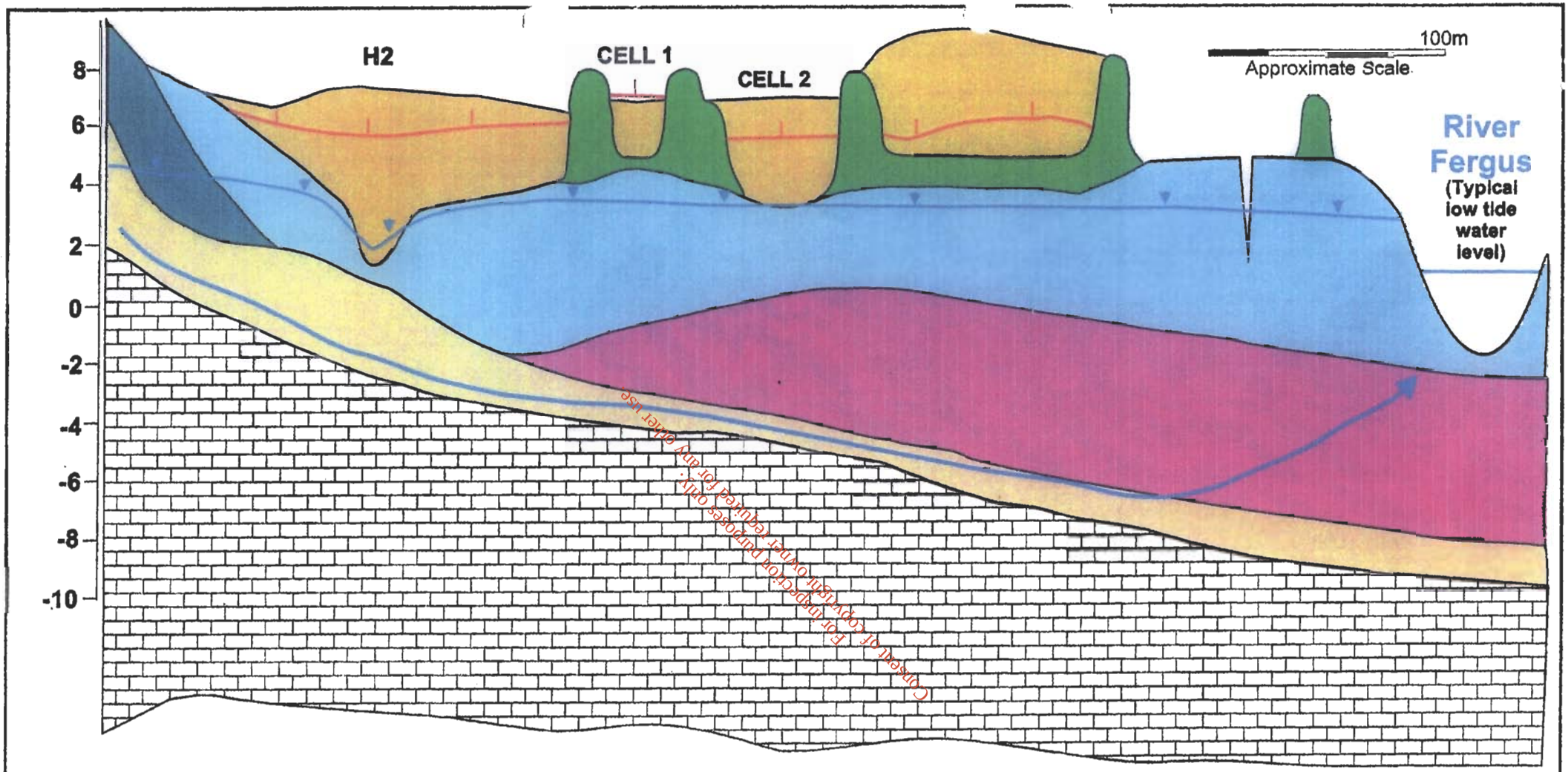
Incineration of liquid waste on-site began in on the 1st of October, 1998.

Total amount incinerated using the Roche Ireland incinerator: 2434 tonnes. The average composition of this waste is given in Table 10.

Table 10: On Site Liquid Hazardous Waste Disposal for 1999 Summary only.

Component	Methanol	Acetone	EtOAc	DCM	EtOH	Toluene	THF	Hexane	IPA	Other
Weight (Tonnes)	380.33	182.4	319.6	113.7	0	223.0	143.1	945	0	127

Total Solvent incinerated on site: 2434 tonnes



Title	SCHEMATIC HYDROGEOLOGICAL CROSS SECTION THROUGH LANDFILL CELLS H2, 1, 3 &4
Location	CLARECASTLE, CO CLARE
Client	ROCHE IRELAND

App'd	Reference	Date	
	EO'H/COR		AUG 2004
TI App'd	Job No.	Scale	
	33748-024-447		AS SHOWN

URS

FIGURE 4

Key

- Landfill Material
- Made Ground
- Soft-firm grey blue silty Clay
- Loose grey brown silty Sand
- Stiff brown gravelly Clay (Boulder Clay)
- Very dense Gravel (Broken Rock)
- Hard, grey black, fine grained fossiliferous Limestone Bedrock
- Groundwater level in Landfill Waste
- Groundwater level in shallow aquifer
- Generalised direction of groundwater flow in shallow aquifer

NW-SE Location of cross section as identified in Figure 2

2 H2 AREA LANDFILL

The URS Risk Assessment Report (Environmental Risk Assessment of *Roche* Landfill Area [Revision 1] Oct 2005) discusses the landfill and waste properties of the H2 area in detail.

In summary, waste was initially landfilled into the H2 area between 1977 and 1980 with no control on filling processes, no lining, and no leachate control mechanisms. Waste disposal took place across a relatively wide area in numerous dispersed pits, including on land close to the artificially constructed Nature Area ponds. There was also a deep (5m deep, 750m^3 capacity) trench through the centre of the area, close to well H2, in which some drummed wastes were disposed of. The H2 area is underlain by soft silty clay, underlain by peat in places, overlying rock (weathered limestone) which is considered a shallow aquifer. URS determine that the clay layer is between 0.6 and 3.0 m thick in the H2 landfill area.

Wastes disposed of in the H2 landfill included metal and plastic drums of mauser, dimer, magnesium, suspected hydrochloric acid and spent carbon, undrummed carbon waste, rubber hoses, rubble, wire, polythene sacks (formerly containing potassium hydride and dimer), undrummed white powders/pastes, cement bags, plastic sheeting, wooden pallets, timber, gloves, pipes, cables, paint tins, woven sacks, construction wastes, mesh/netting, centrifuge core mesh, aluminium cladding, fibre drums, glass sample bottles and secondary sludge. All of this waste would be collectively considered to be hazardous waste as defined by the EPA, based on the European Waste Catalogue System (EWC) of waste classification.

Leachate in the H2 cell is actively gassing (bubbling) in places (Dames & Moore 1997, URS, 2005). Trial pit grab samples of leachate/shallow groundwater in 2005 detected VOC compounds in the leachate of dichloromethane (DCM) (0.01– 110 mg/L), chloroform (0.012-5.4 mg/L) and toluene (0.098-857 mg/L). Leachate was extracted from two pumping wells within the H2 cell for several years in the 1990s, but this has now ceased.To the south of the H2 area, well 216 has historically shown elevated toluene (up to 38 mg/l in 1996) and THF (up to 84 mg/l in 1997). Drummed wastes were reported intersected during drilling of well 216 in 1996, which is screened in the shallow aquifer between 4.6 and 5.6 metres below ground.

Drilling of well 702 at the southern end of the H2 area in 2001 led to significant rises in concentration of toluene, DCM and THF in nearby wells 21 and 216, which was inferred to be due to disturbance of drummed wastes. A rise in THF concentrations has been noted in wells 514, 517 and 702 close to or downgradient of wells 21, 216 and 702 in 2003 and 2004 following this incident in 2001. The nature of construction of well 702 appears to provide a contamination pathway.

Overall, the H2 area is a historic hazardous waste cell, is unlined, and is causing localised groundwater pollution on the *Roche* facility. URS estimate up to c.90,000 tonnes or 60,275m^3 of hazardous wastes lie in the H2 area. The H2 area constitutes a significant environmental liability for *Roche*. Hence a review of the risk assessment and a determination on remediation strategy and options is required.

RPS Group

Roche Ireland
Closure, Restoration, Aftercare Management Plan

DOCUMENT CONTROL SHEET

Client	Roche Ireland Limited					
Project Title	Closure, Restoration, Aftercare Management Plan (CRAMP)					
Document Title	Closure, Restoration, Aftercare Management Plan Report					
Document No.	MDE0573Rp0002A02					
This Document Comprises	DCS	TOC	Text	List of Tables	List of Figures	No. of Appendices
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Rev.	Status	Author(s)	Reviewed By	Approved By	Office of Origin	Issue Date
D01	Draft	Martin Doherty	Malcolm Doak		West Pier	19.12.06
D01	Draft	Martin Doherty	Malcolm Doak		West Pier	20.03.07

2.5 CLOSURE CONSIDERATIONS

In order to develop a fully costed Closure Plan for the Roche facility, a number of assumptions have been made:

- The shut down date will be known in advance and that adequate resources and time will be allocated to the closure process. Any closure will therefore be a well-planned event and production schedules and raw materials purchasing and storage will be planned to reflect this.
- The entire facility will be fully decontaminated and decommissioned and the site, with buildings and pipe work can be sold as development land for future industrial use.
- The costs for dismantling of buildings and pipe work are not considered under this plan.
- This Closure Plan will be subject to annual reviews, particularly focusing on the cost and suitable financial provisions and take into account any changes in the activities carried out at the facility.

2.6 SCOPE OF CLOSURE PLAN

The Closure Plan considered most suited to the Roche facility is a 'Non-Clean Closure', due primarily to the existing landfill cells on the site.

The Closure Plan will need to include the decommissioning and decontamination of all above and belowground structures and the management and safe removal of any residuals arising as a result of decommissioning. All closure aspects will be managed by Roche as a CRAMP (see section 3), which will fulfil Condition 10.2.1 of the licence.