4.2. AN ASSESSMENT OF POTENTIAL SIGNIFICANT LONG-TERM EFFECTS OF THE EXISTENCE AND OPERATION OF THE PROPOSED DEVELOPMENT ON AQUATIC INVERTEBRATE FAUNA, FLORA, FISH AND HABITATS.

4.2.1. Potential pollution by surface water draining from non-process area of the site e.g. car parking, roofs, access roads, paths etc.

The main pollutant of concern in the runoff from paved areas not accessed by vehicles transporting waste material would be petrol, fuel oils, lubricating oils and hydraulic fluids. In unmodified form these are liquid, virtually insoluble and lighter than water. EIFAC - The European Inland Fisheries Advisory Commission (Svobodova *et al* 1993) states that "*a sensory assessment is preferred to toxicological analysis in determining the highest admissible amounts of oil and oil products that can be present in water; on this basis the highest admissible concentrations are in the range of 0.002 to 0.025 mg per litre*".

Harmful effects include:

- The prevention of gaseous exchange at the water surface, leading to reduced dissolved oxygen in the underlying water (Solbe 1988)

- In the case of turbulent waters the oil becomes dispersed as droplets into the water. In such cases, the gills of fish can become mechanically contaminated and their respiratory capacity reduced (Svobodova *et al* 1993).

- Oil products may contain various highly toxic substances, such as benzene, toluene, naphthenic acids and xylene which are to some extent soluble in water; these penetrate into the fish and can have a direct toxic effect. It is generally agreed that the lighter oil fractions (including kerosene, petrol,

benzene, toluene and xylene) are much more toxic to fish than the heavy fractions (heavy paraffins and tars) (Svobodova *et al* 1993).

4.2.2. Potential pollution by effluent from toilet, wash facilities, canteen etc. in the absence of adequate mitigation

4.2.2.1. Organic Pollution

Following the introduction of untreated or poorly treated sewage effluent to a stream, conditions of existence for many organisms becomes substantially degraded. Increased turbidity in the water will reduce light penetration, which in turn will reduce the volume of water capable of supporting photosynthesizing plants. Particulate matter in settling will flocculate small floating plants and animals from the water. As the material settles, sludge beds may be formed on the stream bed, and many of the areas that formerly could have been inhabited by bottom dwelling organisms become covered and uninhabitable. Within the zone of active decomposition the breakdown of organic products by bacteria may consume all available dissolved oxygen, resulting in the river becoming uninhabitable by fish and many other aquatic species.

4.2.2.2. Eutrophication: Phosphorus

The most serious threat to water quality of lakes and rivers in Ireland is eutrophication, defined as the enrichment of waters, beyond natural levels, principally by the nutrient phosphorus (P). This enrichment commonly results in excessive production of cyanobacteria (formerly referred to as blue-green algae), planktonic algae and rooted plants in such waters. Eutrophication of aquatic ecosystems also results in loss of biodiversity and degradation of aquatic habitats of high ecological quality (EPA 1997).

It is now EPA policy that except in exceptional circumstances the appropriate Environmental Quality Standard to be applied to all Irish freshwaters would be for salmonid water quality (EPA 1997). This means that the long term target is to attain a Q4 rating or higher (unpolluted status/Class A) under EPA biological

quality classification system or a median Molybdate Reactive Phosphorus concentration of 0.03 mg/l.

4.2.3. Potential pollution from process area and ancillary structures and facilities in the absence of adequate mitigation

It is proposed that the facility will accept only waste classified as non-hazardous consisting of:

- Construction & demolition waste
- Mixed municipal waste
- Organic waste (kitchen and canteen waste only)
- Dry recyclable wastes (cardboard and packaging waste, paper, plastic bottles, plastic film, metals, timber, glass).

Currently the total annual intake is 16,500 tonnes; the proposed annual total intake would be 40,000 tonnes. Any hazardous waste will be placed in separate bins for disposal to an appropriate licensed facility.

Classification of waste as non-hazardous under the Waste Management Act 1996 is based largely on hazards to human health. Many substances classified as non-hazardous are potentially damaging to the aquatic environment, for instance:

- Any food stuffs or decomposable organic material
- All fats, greases & oils, whether of mineral or food origin
- Most household, garden and commercial chemicals
- Inert rubbles containing fine mineral particles
- A wide range of chemicals contained in small and large domestic and office appliances, batteries etc.

All biodegradable organic wastes such as food waste, garden waste, paper and cardboard products, animal products, treated or painted wood waste, and a

range of commercial and industrial wastes, if exposed to rain will produce runoff detrimental to the aquatic environment.

Given the wide range of potential pollutants contained in the wastes processed at the plant, the potential exists for significant contamination of surface waters from waste material exposed to rain, accidental spillages, etc. The most serious risk posed would be from accidental spillages of materials with high B.O.D. or other polluting potential.

Pollution could potentially arise from a range of sources e.g.:

- The processing area
- Storage areas for recovered waste etc. (skips and hardstanding)
- Fuel storage tanks
- Weighbridge
- Waste delivery area

4.3. SIGNIFICANCE OF POTENTIAL IMPACTS IN THE ABSENCE OF MITIGATION

In the absence of mitigation the potential impact of the proposed facility on the Glanooragh River system would be moderate during the construction phase and major during the operational phase.

5. MITIGATION MEASURES

5.1. REDUCTION AND PREVENTION OF POLLUTION DURING THE CONSTRUCTION PROCESS

i. Release of suspended solids to the stream should be kept to a minimum. The key factors in erosion and sediment control are to intercept and manage off- and on-site runoff. This limits the potential for soils to be eroded and enter the streams in runoff. Runoff and surface erosion control is more effective and less expensive than sediment control with sediment control ponds only. Sediment control ponds should be designed for a minimum retention time of 15 hours.

ii. To prevent damage to spawning and early juvenile fish, activities with a high risk of suspended solids pollution to surface waters should not be carried out between the end of September and the end of April without prior consultation with the South Western Regional Fisheries Board.

iii. Raw or uncured waste concrete should be disposed of by removal from the site or by burial on the site in a location and in a manner that will not impact on the watercourse.

iv. Wash down water from exposed aggregate surfaces, cast-in-place concrete and from concrete trucks should be trapped on-site to allow sediment to settle out and reach neutral pH before clarified water is released to the stream or drain system or allowed to percolate into the ground.

v. Fuels, lubricants and hydraulic fluids for equipment used on the construction site should be carefully handled to avoid spillage, properly secured against unauthorised access or vandalism, and provided with spill containment according to codes of practice.

vi. Fuelling and lubrication of equipment should not be carried out close to the watercourse.

vii. Any spillage of fuels, lubricants of hydraulic oils should be immediately contained and the contaminated soil removed from the site and properly disposed of.

viii. Waste oils and hydraulic fluids should be collected in leak-proof containers and removed from the site for disposal or re-cycling.

ix. Prior to any instream work ensure that all construction equipment is mechanically sound to avoid leaks of oil, fuel, hydraulic fluids and grease.

x. Foul drainage from site offices etc. should be removed to a suitable treatment facility or discharged to a septic tank system constructed in accordance with EPA guidelines. A septic tank is in use on site and a Puraflo system is proposed, which will be designed to cater for 12 people at 180l per person per day. This equates to a discharge quantity of 2.16 cubic metres per day to be treated by the system.

5.2. REDUCTION AND PREVENTION OF POLLUTION FROM THE COMPLETED DEVELOPMENT

5.2.1. Mitigation of potential pollution of surface waters with effluent from the waste processing facility

All waste delivery, storage and processing areas should be fully roofed against rain, bunded to contain any accidental spillages, and drained on an impervious surface to a holding tank for tankering to a waste treatment facility. As leachate may arise from deliveries particularly of municipal wastes, delivery trucks should drive across the weighbridge and unload the waste into a housed delivery area which drains to the effluent storage tank.

The EPA are in the process of drawing up a groundwater protection response which will include guidelines for above ground and underground storage tanks (M.F. Rochford, EPA, pers comm.) Pending the completion of EOA guidelines, any underground effluent storage tanks should be double-skinned (that is, have an inner and outer skin) and have an interstitial monitoring device with automatic alarms. All USTs should be provided with overfill prevention. Any above ground fuel or effluent storage tanks should comply with current regulations and be bunded.

5.2.2. Mitigation of potential pollution by surface water draining from non-process area of the site e.g. car parking, roofs, access roads, paths etc.

A drainage system should be installed which can be sealed off to contain a major spillage and oil interceptors of suitable size should be placed on all discharges to surface waters. An interceptor for oil and solids separation is currently in operation; the interceptor is 13.5m^3 capacity to provide average 2 days retention time (Information supplied by RPS-MCOS). It is also proposed to direct surface drainage via a lagoon to a constructed wetland and then to a

percolation area; the lagoon, constructed wetland and percolation area are currently under construction (Information supplied by RPS-MCOS).

5.2.3. Mitigation of potential pollution by effluent from toilet, wash facilities, canteen etc.

A treatment system should be installed following the guidelines contained in the EPA wastewater treatment manual – "Treatment systems for small communities, businesses, leisure centres and hotels". A septic tank is in use on site and a Puraflo system is proposed, which will be designed to cater for 12 people at 180l per person per day. This equates to a discharge quantity of 2.16 cubic metres per day to be treated by the system (Information supplied by RPS-MCOS).

5.3. RESIDUAL IMPACTS

If all mitigation measures are fully implemented the impact of the facility would be minor or insignificant.

6. NON-TECHNICAL SUMMARY

6.1. WATERCOURSES POTENTIALLY AFFECTED BY THE PROPOSED DEVELOPMENT

The KWD Ltd. site is located on a drain which flows to one of the headwater tributaries of the Glanooragh River c. 0.5km downstream of the facility. The drain, though moderately or slightly polluted c.200m upstream of the facility, is seriously polluted at the point where it enters the site. At the time of this assessment, the drain was receiving effluent as it flowed through the site and remained seriously polluted at the downstream end of the site. The drain has no significant aquatic habitat value in the immediate vicinity of the site. However, the lowest c.450 m of the drain has some potential value as salmonid nursery habitat. At the point where it joins the Glanooragh River the drain is moderately polluted; no fish were recorded at this location.

The Glanooragh River was assessed for c.4km downstream of the drain confluence. The river is moderately polluted at all sites assessed. The biological assessment contains no evidence of an impact on the river from the Aghacureen Drain. Moderately polluted conditions and good populations of juvenile brown trout were recorded immediately upstream and downstream of the confluence with the drain. Juvenile salmon at very low densities were recorded 1km and 4km downstream of the drain confluence. Salmonid habitat is generally of a modest quality due to the low diversity of flow and the generally heavily silted substrate. None of the channel assessed was classified as good or better as adult or spawning habitat. Good salmonid nursery habitat comprised 26% of the channel assessed. The most significant habitat consisted of c.900m of good nursery habitat in Sections 3, 4, 7 & 12, and c.1km of fair – good spawning habitat in Sections 4 & 9. It is notable that approximately half of the fair – good spawning habitat is in Section 4, and most good nursery habitat is in Sections 3 & 4, which are immediately downstream of the confluence with the Aghacureen Drain.

6.2. THE PRINCIPAL POTENTIAL IMPACTS OF THE PROPOSED DEVELOPMENT ON AQUATIC INVERTEBRATE FAUNA, FLORA, FISH AND HABITATS IN THE ABSENCE OF MITIGATION

1. Pollution of the stream with suspended solids due to runoff of soil from construction areas

2. Pollution of the stream, during construction phase, with other substances such as fuels, lubricants, waste concrete, waste water from site toilet and wash facilities, etc.

3. Pollution by effluent from the waste processing area and ancillary structures and facilities

4. Pollution by surface water draining from non process area of the site e.g. car parking, roofs, access roads, paths etc.

5. Pollution by effluent from toilet, wash facilities, canteen etc.

6.3. RECOMMENDED MITIGATION MEASURES

i. Rigorous measures should be implemented to minimise suspended solids and other pollutants entering surface waters during the construction.

ii. To prevent damage to spawning and early juvenile fish, activities with a high risk of suspended solids pollution to surface waters should not be carried out between the end of September and the end of April without prior consultation with the South Western Regional Fisheries Board.

iii. All waste delivery, storage and processing areas should be fully roofed against rain, bunded to contain any accidental spillages, and drained on an impervious surface to a holding tank for tankering to a waste treatment facility. As leachate may arise from deliveries particularly of municipal wastes, delivery trucks should drive across the weighbridge and unload the waste into a housed delivery area which drains to the effluent storage tank.

iv. Any underground effluent storage tanks should be double-skinned (that is, have an inner and outer skin) and have an interstitial monitoring device with automatic alarms. All USTs should be provided with overfill prevention. Any above ground fuel or effluent storage tanks should comply with current regulations and be bunded.

v. A drainage system should be installed in the non-process area of the site which can be sealed off to contain a major spillage, and oil interceptors of suitable size should be placed on all discharges to surface waters. An interceptor for oil and solids separation is currently in operation; the interceptor is 13.5m^3 capacity to provide average 2 days retention time (Information supplied by RPS-MCOS). It is also proposed to direct surface drainage via a lagoon to a constructed wetland and then to a percolation area; the lagoon, constructed wetland and percolation area are currently under construction (Information supplied by RPS-MCOS).

vi. A treatment system for effluent from toilet, wash facilities, canteen etc should be installed following the guidelines contained in the EPA wastewater treatment manual – "Treatment systems for small communities, businesses, leisure centres and hotels". A septic tank is in use on site and a Puraflo system is proposed, which will be designed to cater for 12 people at 180l per person per day. This equates to a discharge quantity of 2.16 cubic metres per day to be treated by the system (Information supplied by RPS-MCOS).

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