WO1 - ANNEX 2
TRADE EFFLUENT DISCHARGES

Official Use Only
File Ref:

Please complete this annex if you are proposing to discharge trade effluent (this includes site drainage).

1. a) Describe in full the trade effluent and the process(es) from which it arises.

Road and yard runoff, runoff from reclaimed mine waste storage area and capacity for mine water from underground workings

b) Please state the type and number of treatment units you are proposing to use *(if site drainage please include details of oil/petrol interception facilities).*

Ultrafiltration and Low Pressure and High Pressure Reverse Osmosis (RO)

2. i) Please state the maximum quantity it is proposed to discharge in any one day. Briefly state how this figure was calculated (see note iii).

1,100 m^3/day

Modelling in support of Curraghinalt Mine Environmental Statement

ii) Please state the **maximum** rate of discharge.

12·6 Litres/sec

2.1 a) Indicate proposed means of discharge - tick as appropriate and show on plan:- (for 1, 2 & 3 please state dimensions below)

1. Pipe ☑
2. Channel ☐
3. Culvert ☐
4. Other *(please specify below)* ☐

300mm diameter pipe
Shown on attached drawing

b) Irish Grid Reference(s) of point(s) of discharge (**see note iv**)

E/257077
N/386907

(please indicate on accompanying site plans)

2.2 a) Irish Grid Reference(s) of manhole or sampling chamber.

E/257073
N/386898

(please indicate on accompanying site plans)

b) What flow measurement facilities will be provided? (see note vi)
Please give details

V-notch weir and continuous water level measurement at outflow from Water Treatment Plant. Multiple internal flow monitors within Plant

2.3 a) Type of Treatment Plant(s) to be used - tick as appropriate:-

Treatment Plant	☑	Other	☐
*Settlement System	☐	Interceptor	☐

Ultrafiltration and Low Pressure and High Pressure Reverse Osmosis

* If settlement system proposed please state dimensions:-

b) Will the treatment process involve the use of any chemicals (eg, ferric salts, polyeletrolytes) If yes, please give details. Yes ☑ No ☐

Sodium hypochlorite, citric acid, Genesys CAS antiscalant (or similar), Genesol 50 antiscalant (or similar), sulphuric acid, sodium hydroxide, sodium bisulphite, and flocculant (Magnafloc LT22S - DWI or similar)

2.4 a) Is the discharge existing ☑ or proposed ☐ If proposed:

On what date do you anticipate the discharge will commence? / /

b) If you require the consent for a limited time period please give dates; from: / /

to: / /

c) If the discharge is not continuous please detail the period/circumstances when it will occur.

Continuous, but with variation in discharge in response to rainfall and/or pumping from underground mine.

3. Receiving Medium - tick the category(s) to which the proposed discharge(s) is(are) to be made:-

1. Estuary (tidal river or stream)	☐	5. Into Land	☐
2. River or Stream (non-tidal)	☑	6. Onto Land	☐
3. Sub-Surface Irrigation System	☐	7. Directly into Groundwater	☐
4. Lake, or Pond	☐	8. Coastal Water (see note vii)	☐
		9. Waterways via sub-surface irrigation system	☐

State name of receiving waterway if known:

Curraghinalt Burn, a tributary of Owenkillew River

3.1 In the case of sub-surface irrigation systems:- N/A

(a) Is any part of the system within 5 metres of the boundary of the premises? Yes ☐ No ☐

(b) Is any part of the system within 10 metres of a watercourse? Yes ☐ No ☐

(c) Is any part of the system within 50 metres of a borehole or spring? Yes ☐ No ☐

(d) Percolation tests must be carried out in accordance with British Standard BS6297:1983. Have tests been carried out? If yes please provide details below. Yes ☐ No ☐

Date of Pre-soaking

Date of Test

Average percolation value obtained:

Minimum area of the sub-surface irrigation system will be ..... m^2.

Minimum length of irrigation drains will be ..... metres

I .....certify that the percolation test was carried out in accordance with British Standard BS 6297: 1983. (See Guidance Notes at Appendix 1.)

4. **Rainfall Dependent Discharges**

a) Will the volume be rainfall dependent? Yes ☑ No ☐

b) If yes, please give the total area drained. 11,435 m^2

c) Please give details of any activities which occur in the drainage area which could contaminate surface water (see note b).

Runoff from roads, yards and buildings, as well as reclaimed mine waste storage area. Potential for mine water from underground workings to be pumped to site for treatment.

5. **Rainfall Independent Discharges** – only under conditions where mine water is pumped for treatment. Else values are zero.

a) What is the maximum rate of discharge? 11·3 l/s

b) What is the average daily flow? 820 m^3/d

c) What is the maximum daily flow? 975 m^3/d

d) For discharges where the source of supply is other than mains water:

i) give the Irish Grid Reference of a point where the influent can be sampled. N/A.

☐/☐☐☐☐/☐☐☐☐ *(please mark on the plan)*

6. a) Will any self monitoring take place? Yes ☑ No ☐
If yes, please give details.

Treatment plant will include real-time pH, conductivity and turbidity monitoring with automatic shut-down. Internal spot sampling of full suite of regulated parameters will be undertaken for regulatory compliance and internal auditing of treatment plant performance.

b) Will automatic sampling equipment be provided? Yes ☑ No ☐
If yes, please give details of type, frequency and location (please indicate on plan)

Treatment plant will include continuous, real-time pH, conductivity and turbidity monitoring. Sampling to be undertaken within Water Treatment Plant.

7. Has an application for Authorisation been made for a 'prescribed process' under The Industrial Pollution Control (Northern Ireland) Order 1997? Yes ☐ No ☑

If yes, please complete the following:-

a) The application reference

b) Contact name of IPRI officer

8. Nature and Composition of Raw Effluent - (if known)

(i)	Biochemical Oxygen Demand (5 Days)	31·9 mg/L
(ii)	Suspended Solids (mg/litre)	50 mg/L
(iii)	pH Value.	6·6 - 9·0
(iv)	Temperature	< 20°C
(v)	Other Information	

9. a) Please indicate if any of the specified substances given below or their compounds will be present in the effluent and if so at what maximum concentration (please give values in micrograms per litre - µg/1). Please see note c.

EC DANGEROUS SUBSTANCES DIRECTIVE/UK RED LIST

LIST I

List of proposed regulated substances and concentrations provided in Table attached to this form.

			CONCENTRATION (ug/l) MAX	MIN	MEAN
1.	☑	Cadmium (~~Total and~~ dissolved) and its compounds Dissolved	1·37		
2.	☐	Carbon tetrachloride			
3.	☐	Chloroform			
4.	☐	DDT (the isomers of 1.1.1-trichloro-2,2 bis (p-chlorophentl ethane)			
5.	☐	"The Drins" (aldrin, dieldrin, endrim and isodrin)			
6.	☐	1,2-Dichloroethane (EDC)			
7.	☐	Hexachlorobenzene (HCB)			
8.	☐	Hexachlorobutadiene (HCBD)			
9.	☐	Hexachlorocyclohexane (lindane and related compounds)			
10.	☑	Mercury (~~Total and~~ dissolved ~~and its compounds~~) Dissolved	1		
11.	☐	Pentachlorophenol (PCP)			
12.	☐	Tetrachloroethylene (PER)			
13.	☐	Trichlorobenzene (1,23-TCB, 1,24-TCB, 1,3,5-TCB)			
14.	☐	Trichloroethylene (TRI)			

LIST II

			MAX	MIN	MEAN
15.	☑	Arsenic (Dissolved)	10	.....	.....
16.	☑	Boron (~~Total~~) Dissolved	1000	.....	.....
17.	☑	Chromium (~~Total and~~ dissolved) Dissolved (Cr III + Cr VI)	50	.....	.....
18.	☑	Copper (~~Total and~~ dissolved) Dissolved	120	.....	.....
19.	☐	Cyanide	.....	.....	.....
20.	☐	Cyfluthrin	.....	.....	.....
21.	☑	Iron (~~Total and~~ dissolved) Dissolved	248	.....	.....
22.	☑	Lead	.....	.....	.....
23.	☑	Nickel (~~Total and~~ dissolved) Dissolved	20	.....	.....
24.	☐	Perchloroethylene	.....	.....	.....
25.	☐	Permethrin	.....	.....	.....
26.	☐	Polychlorinated biphenyls (PCB)	.....	.....	.....
27.	☐	Organotins (tributylin & triphenyltin compounds)	.....	.....	.....
28.	☐	Vanadium	.....	.....	.....
29.	☑	Zinc (~~Total and~~ dissolved) Dissolved	348	.....	.....
30.	☐	pH if outside the range 5.5 to 9.0	.....	.....	.....
31.	☐	PCSD	.....	.....	.....
32.	☐	Sulcofuron	.....	.....	.....
33.	☐	Flucofuron	.....	.....	.....

ADDITIONAL SUBSTANCES

34.	☐	Atrazine	.....	.....	.....
35.	☐	Azinphos-ethyl	.....	.....	.....
36.	☐	Azinphos-methyl	.....	.....	.....
37.	☐	Dichlorvos	.....	.....	.....
38.	☐	Dioxins	.....	.....	.....
39.	☐	Endosulfan	.....	.....	.....
40.	☐	Fenthion	.....	.....	.....
41.	☐	Fenitrothion	.....	.....	.....
42.	☐	Malathion	.....	.....	.....
43.	☐	Parathion	.....	.....	.....
44.	☐	Parathion-methyl	.....	.....	.....
45.	☐	Simazine	.....	.....	.....
46.	☐	1,1,1 Trichloroethane	.....	.....	.....
47.	☐	Triforalin	.....	.....	.....
48.	☐	4-Chloro --methyl-phenol	.....	.....	.....
49.	☐	2-Chlorophenol	.....	.....	.....
50.	☐	2, 4-Dichlorophenol	.....	.....	.....
51.	☐	2, 4-D (ester)	.....	.....	.....
52.	☐	2, 4-D (non-ester)	.....	.....	.....
53.	☐	1, 1, 2-Trichloroethane	.....	.....	.....
54.	☐	Bentazone	.....	.....	.....
55.	☐	Benzene	.....	.....	.....
56.	☐	Biphenyl	.....	.....	.....

			MAX	MIN	MEAN
57.	☐	Chloronitrotoluenes	.....	.....	.....
58.	☐	Demeton	.....	.....	.....
59.	☐	Dimethoate	.....	.....	.....
60.	☐	Linuron	.....	.....	.....
61.	☐	Mecoprop	.....	.....	.....
62.	☐	Naphthalene	.....	.....	.....
63.	☐	Omethoate	.....	.....	.....
64.	☐	Toluene	.....	.....	.....
65.	☐	Triazaphos	.....	.....	.....
66.	☐	Xylene	.....	.....	.....
67.	☐	Alachior	.....	.....	.....
68.	☐	Anthracene	.....	.....	.....
69.	☐	Brominated diphenylether	.....	.....	.....
70.	☐	C_{10-13} -Chloroalkanes	.....	.....	.....
71.	☐	Chloropyrifes	.....	.....	.....
72.	☐	Dichloromethane	.....	.....	.....
73.	☐	Di-2-ethylhexyl phthalate (DEHP)	.....	.....	.....
74.	☐	Diuron	.....	.....	.....
75.	☐	Isoproturon	.....	.....	.....
76.	☐	Nonylphenols	.....	.....	.....
77.	☐	Octylphenols	.....	.....	.....
78.	☐	Polyaromatic hydrocarbons	.....	.....	.....

Other substance(s) that should be taken into account
– See attached table for full list

This list is applicable as at 1 November 2000.

Are there any other significant chemical components used on site which may be contained in the effluent, including biocides or additives? Yes ☐ No ☑

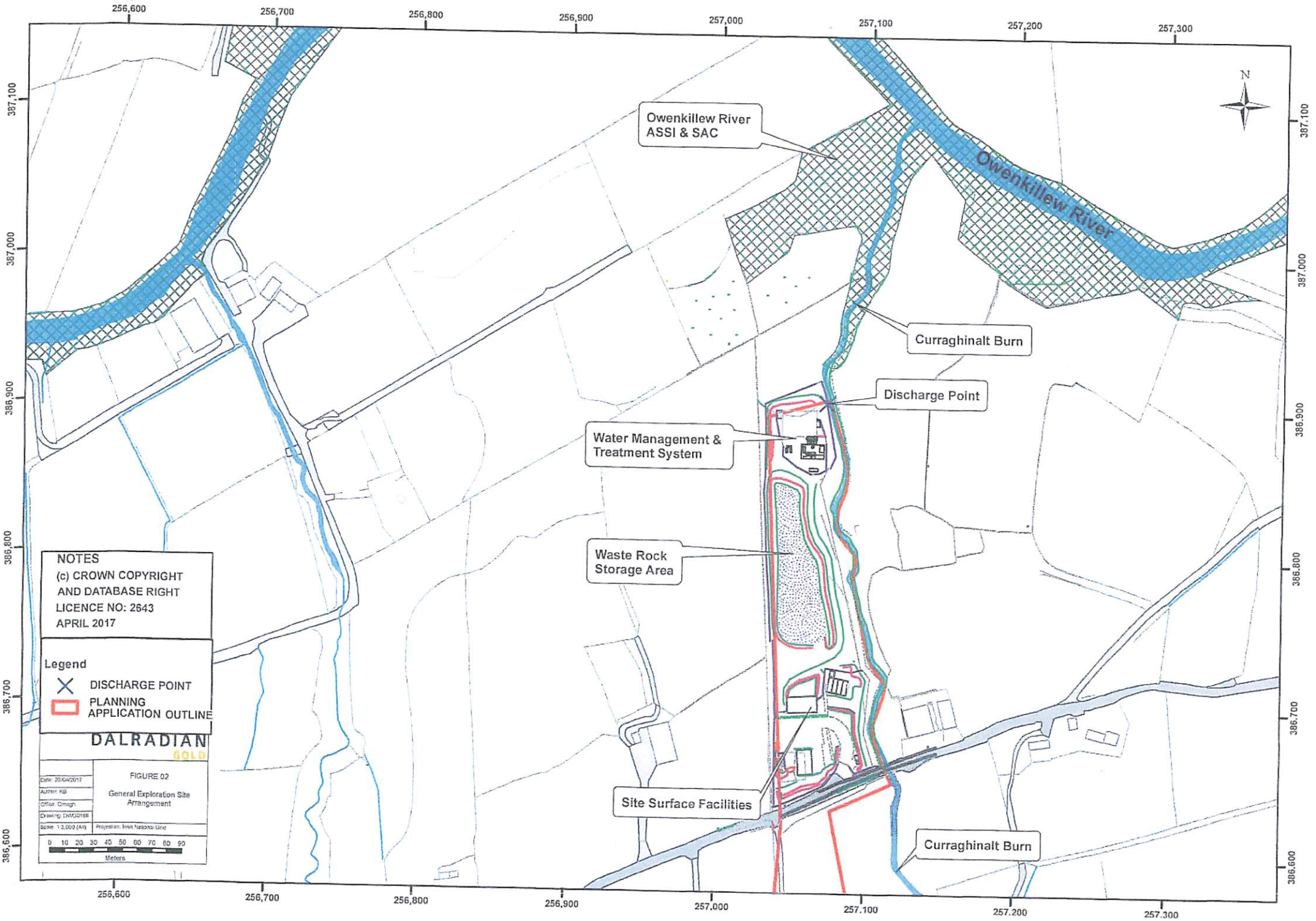
If yes, please give details

Notes (see also the notes attached to the main form):

a) *For direct trade effluent discharges, full details of the type of the effluent are required (eg, cooling water from air conditioning units), along with typical analytical details and the results of any toxicity studies on the effluent or its constituents. In certain circumstances the Department may require that specific samples be taken and tests and analysis carried out.*

b) *Possible sources of contamination include oil/chemical storage areas, vehicle loading/unloading areas, heavy vehicle parking areas and oil/petrol filling points. Any other potential sources of contamination should be detailed.*

c) *Where discharges of trade effluent take place to a sewerage system, as covered by this application, please give details of all authorised discharges of substances listed in table 7 overleaf.*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Curraghinalt Burn
Discharge Point
Water Management &
Treatment System
Waste Rock
Storage Area
Site Surface Facilities
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NOTES
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LICENCE NO: 2643
APRIL 2017
Legend
DISCHARGE POINT
PLANNING
APPLICATION OUTLINE
DALRADIAN
GOLD
FIGURE 02
General Exploration Site
Arrangement
Date: 20/04/2017
Author: KB
Office: Omagh
Drawing: DWG0168
Scale: 1:2,000 (A3)
Projection: Irish National Grid
0 10 20 30 40 50 60 70 80 90
Meters

Table: Proposed Discharge Criteria

Parameter	Unit	Proposed Discharge Criteria
Physical		
pH	-	6.6-9.0
Temperature	°C	20
TSS	mg/L	50
BOD	mg/L	31.9
Nutrients / Salts		
Total Ammonia	mg/L N	0.39
Nitrate	mg/L N	11.3
Nitrite	mg/L N	0.22
Chloride	mg/L	250
Fluoride	mg/L	1.5
Sulphate	mg/L	250
Dissolved metals		
Aluminium	µg/L	200
Antimony	µg/L	5
Arsenic	µg/L	10
Boron	mg/L	1
Cadmium	µg/L	1.37
Chromium (III)	µg/L	29
Chromium (VI)	µg/L	21
Chromium (CrIII + CrVI)	µg/L	50
Copper	µg/L	120
Iron	mg/L	2.48
Lead	µg/L	10
Manganese	µg/L	93.2
Mercury	µg/L	1
Molybdenum	µg/L	200
Nickel	µg/L	20
Selenium	µg/L	10
Silver	µg/L	5.34
Sodium	mg/L	200
Uranium	µg/L	30
Zinc	µg/L	348