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Our Ref: S187G/010e
Date: 1 October 2014

Nagindar Singh
Environmental Projects Coordinator - West
Centennial Coal Company Limited
Lidsdale House
1384 Castlereagh Highway
LIDSDALE NSW 2790

Dear Nagindar,

RE: ANGUS PLACE COLLIERY LDP001 SSTV ASSESSMENT

1. INTRODUCTION

This document forms a technical Appendix to the Response to Submissions regarding the Angus Place Colliery Extension Project *Environmental Impact Statement* and specifically addresses concerns raised regarding the quality of the discharge water with respect to ANZECC and ARMCANZ (2000) guideline (the Guidelines) values.

The management of mine inflows at Angus Place Colliery occurs primarily via dewatering bore 940 (connected to the Springvale Delta Water Transfer Scheme (SDWTS)) and LDP001 (not connected to the SDWTS). Bore 940 transfers water, using a surface to seam pumping system, directly into the SDWTS for subsequent discharge into Coxs River via Springvale Mine's LDP009 (EPL 3607). Mine water is also transferred to Angus Place's LDP001 (EPL 467), using an in-seam pumping system, for discharge to Kangaroo Creek. Surplus mine water not required as process water from the Pit Top Collection system is also discharged into Kangaroo Creek via LDP001.

The purpose of this document is to assess the appropriateness of the ANZECC and ARMCANZ (2000) default guideline trigger values for application to the receiving waters of the LDP001 discharge. Site Specific Trigger Values (SSTV) may then be derived for the water quality downstream of LDP001 in accordance with the ANZECC and ARMCANZ (2000) methodology.

Trigger values focus on environmental protection and are effective tools in the early detection of potential impacts and provide guideline water quality criteria to be met downstream of a mixing zone.

Figure 1 presents the water bodies and monitoring locations of relevance to this document.

1.1 ANZECC & ARMCANZ 2000 Guidelines

The ANZECC guidelines provide a framework for assessing water quality, based on whether the physical, chemical and biological characteristics of a waterway support community environmental values and help to define the water quality needed to protect these values.

Trigger values are conservative assessment levels for the early identification of potential risk to environmental values. Local conditions vary naturally between waterways and it is usually necessary to tailor trigger values to local conditions or 'local guideline levels'. ANZECC and ARMCANZ (2000) provide a process for the establishment of suitable SSTV.

The application of trigger values is not appropriate at the point of discharge or within the mixing zone of the receiving waters. Mixing zones are often defined as explicit areas around effluent discharges where the management goals of the ambient waters do not need to be achieved and hence the designated environmental values may not be protected. Trigger values should be applied downstream of the mixing zone.

2. METHODOLOGY

ANZECC and ARMCANZ (2000) have provided an assessment methodology (Figure 2) that summarises the documented methodology for the determination of appropriate guideline trigger values.

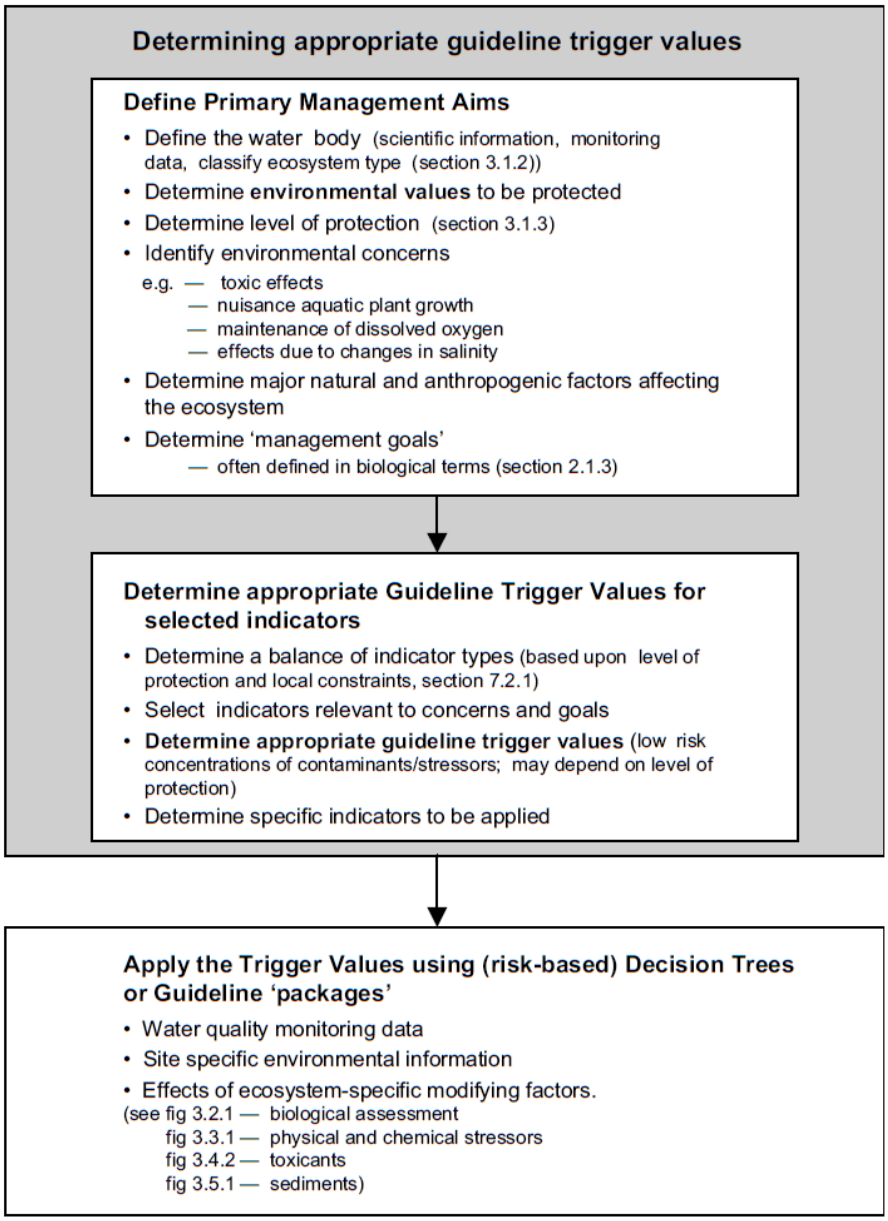


Figure 2: Flow chart for the Determination of Appropriate Guideline Trigger Values

2.1 Waterbody Definition

The assessment methodology first requires the definition of the waterbody in question so the correct set of values can be considered. This process requires assessment against the six ecosystem types that are outlined in the Guidelines. These are as follows:

- Upland rivers and streams (>150 mAHD)
- Lowland rivers (<150 mAHD)

- Freshwater lakes and reservoirs
- Wetlands
- Estuaries
- Coastal and marine.

The altitude of LDP001 is approximately 950 mAHD, therefore the upland river and streams values are to be used for consideration in this assessment.

2.2 Environmental Values

The environmental values that are to be protected must then be determined. The Guidelines define environmental values as the "particular values or uses of the environment that are important for a healthy ecosystem or for public benefit, welfare, safety or health and that require protection from the effects of pollution, waste discharges and deposits. Several environmental values may be designated for a specific waterbody".

The Guidelines recognises the following environmental values:

- Aquatic ecosystems
- Primary industries (irrigation and general water uses, stock drinking water, aquaculture and human consumption of aquatic foods)
- Recreation and aesthetics
- Drinking water
- Industrial water (no water quality guidelines are provided for this environmental value)
- Cultural and spiritual values (no water quality guidelines are provided for this environmental value).

Given the industrial and agricultural activity within the Coxs River Catchment, along with the downstream situation of water supply reservoirs, there are a number of the stated environmental values that may apply to the catchment. Where this is the case the Guidelines advise a conservative approach by adopting the Guideline values of the most sensitive of the applicable environmental values.

On that basis the Guideline values for Aquatic Ecosystems are considered the most appropriate for use within the catchment containing LDP001.

2.3 Level of Protection

Determination of the 'level of protection' addresses the current condition of the ecosystem and what level of change would be regarded as acceptable. The Guidelines propose the following three levels of ecosystem condition as a basis for application:

- **High conservation/ecological value systems –** Effectively unmodified or other highly-valued ecosystems, typically (but not always) occurring in national parks, conservation reserves or in remote and/or inaccessible locations. While there are no aquatic ecosystems in Australia and New Zealand that are entirely without some human influence, the ecological integrity of high conservation/ecological value systems is regarded as intact.
- **Slightly to moderately disturbed systems –** Ecosystems in which aquatic biological diversity may have been adversely affected to a relatively small but measurable degree by human activity. The biological communities remain in a healthy condition and ecosystem integrity is largely retained. Typically, freshwater systems would have slightly to moderately cleared catchments and/or reasonably intact riparian vegetation. Slightly–moderately disturbed systems could include rural streams receiving runoff from land disturbed to varying degrees by grazing or pastoralism.
- **Highly disturbed systems –** These are measurably degraded ecosystems of lower ecological value. Examples of highly disturbed systems would be some shipping ports and sections of harbours serving coastal cities, urban streams receiving road and stormwater runoff, or rural streams receiving runoff from intensive horticulture.

Considering the environmental values within the local vicinity and downstream catchment of LDP001, the designation of 'slightly to moderately disturbed ecosystem' has been applied to this assessment. One of the submissions commented on some reaches of the system being highly degraded, however, in trying to raise the overall condition of the system the slightly to moderate level is considered more appropriate.

The trigger values provided in the Guidelines have been derived using a statistical distribution approach to estimate the concentrations of a variety of physical and chemical stressors that would protect a predetermined percentage of species.

The 95% protection level is most commonly applied to ecosystems that could be classified as slightly to moderately disturbed. A complete table of guideline trigger values is provided in Appendix A.

2.4 Assessing the Requirement for SSTV

The documented methodology for the application of the Guideline trigger values incorporates a degree of tailoring to the nature of the catchment where the discharge is taking place. However the Guidelines recognise that there can be significant variation in physical, chemical and biological characteristics between and within catchments which may require the derivation of SSTVs.

Following establishment of the appropriate Guideline trigger values for the waterbody in question, these values must be compared against water quality data collected upstream of the discharge point to understand background concentrations.

Where background values exceed Guideline trigger values, the 80th percentile concentration of the background data may be adopted as the SSTV.

2.5 Hardness Modified Trigger Values

Water hardness is known to influence the bioavailability of certain metals to aquatic organisms. The reduction in bioavailability of Cd, Cr(III), Cu, Ni, Pb and Zn as a function of hardness is described mathematically and presented in the Guidelines. Hardness Modified Trigger Values (HMTV) have been calculated, where applicable, in this investigation.

2.6 Dilution Analysis

In the circumstance where downstream median data does not always comply with the adopted trigger values due to the influence of a discharge then a dilution analysis can be carried out.

The dilution analysis considers flow and water quality data of the upstream and discharged water to assess the likelihood that the discharge would be sufficiently diluted by the upstream water such that trigger values are met downstream. This analysis can also be extrapolated to approximate discharge volumes that would maintain the downstream water quality within the adopted trigger values.

2.7 Application to LDP001

The SSTV methodology has been applied to Angus Place LDP001 through consideration of LDP001 discharging into Kangaroo Creek and sets SSTVs for median concentrations at the confluence of Kangaroo Creek and Coxs River.

A further scenario has been considered whereby no mine water discharge occurs at Angus Place LDP001 and the majority of mine inflows at Angus Place Colliery are diverted to Springvale Mine's LDP009 via the SDWTS. LDP009 discharges to Coxs River, at a location further downstream from LDP001. This scenario is discussed in the Springvale Mine LDP009 SSTV assessment (RPS 2014).

3. LDP001 DISCHARGING INTO KANGAROO CREEK

The following monitoring locations have been used in this assessment:

- Upstream Site: Kangaroo Creek U/S
- Discharge Site: LDP001
- Downstream Site: Kangaroo Creek & Coxs River Confluence.

3.1 Analyte Selection

The concentrations of a range of physical and chemical analytes are measured routinely at all monitoring locations shown on Figure 1. The median and 80th percentile concentrations are shown in Table 1 for the

LDP001 discharge and the upstream and downstream monitoring locations. The numbers shown in bold represent concentrations exceeding the ANZECC 95% species protection trigger values. For reference, the raw water supply agreements from Warragamba Dam to Prospect Water Filtration Plant (WFP) and the Australian Drinking Water Guideline values have been included.

Analytes that show elevated concentrations in the upstream dataset require SSTV analysis. Electrical conductivity (EC) has also been considered as this water quality parameter has been raised as a key concern within the catchment.

Based on Table 1, the following parameters / analytes have been considered further:

- Electrical conductivity (EC)
- Aluminium (Al)
- Iron (Fe)
- Zinc (Zn)
- Copper (Cu).

Exemptions

The Guideline value for silver concentration (0.00005 mg/L) is below the detection limit (0.001 mg/L) of the current laboratory analysis. There have only been two samples analysed in the downstream dataset and one in the upstream dataset, all of which have been below the detection limit, therefore this data has not been considered.

Table 1: Summary Statistics for Relevant Water Quality Monitoring Locations

Analyte Concentration	Kangaroo Ck (US)				LDP001				Kangaroo Creek & Coxs River Confluence				Guideline Values				
	Median	20th Percentile	80th percentile	Count	Median	20th percentile	80th percentile	Count	Median	20th percentile	80th percentile	Sample Count	ANZECC (95%)	Prospect WFP		ADWG (mg/L)	
														Min	Max	Min	Max
pH (pH Unit)	6.4	5.9	6.8	65	7.9	7.6	8.3	115	8.3	8.0	8.6	55		6.3	7.9	6.5	8.5
TSS	5	1.7	10	62	4	2	6	99	3.6	2	5.2	55					
TDS	60.5	35	82.6	54	681.5	641	722	56	604	272.4	667	55					600
EC (µS/cm)	69	53	89	65	**1050**	**898**	**1130**	83	**759**	**442**	**1070**	55	350				
Oil & Grease	5	5	5	62	5	5	5	83	5	5	5	55					
Manganese Filtered	0.1165	0.0352	0.4526	60	0.034	0.008	0.071	61	0.016	0.01	0.0274	55	1.9		1.4		0.5
Iron Filtered	**0.975**	**0.464**	**4.002**	60	0.05	0.05	0.08	61	0.08	0.05	0.206	55	0.3*		3.5		
Turbidity (NTU)	7	2	19.2	55	10	2	19.8	57	8	3.8	17.2	55			40		5
Aluminium	**0.12**	**0.07**	**0.204**	54	0.02	0.01	0.05	58	0.05	0.02	**0.08**	55	0.055		2.6		
Arsenic	0 001	0.001	0.001	54	0.001	0.001	0.002	59	0.001	0.001	0.001	55	0.013				0.01
Barium	0.025	0.0176	0.0368	54	0.103	0.085	0.124	61	0.078	0.0588	0.0952	55					2
Boron Filtered	0.05	0.05	0.05	49	0.07	0.06	0.08	56	0.06	0.05	0.07	49	0.37				4
Cadmium Filtered	0.0001	0.0001	0.0001	54	0.0001	0.0001	0.0001	60	0.0001	0.0001	0.0001	55	0.0002				0.002
Calcium	1	1	2	53	23	20	26	57	18	12.6	22.4	54					
Total Chromium Filtered	0.001	0.001	0.001	3	0.001	0.001	0.001	6				0	0.001				0.05
Chloride	9	7	10.4	54	8	7	9	61	8	7	9	55					
Cobalt	0.0035	0.002	0.005	2	0.001	0.001	0.001	8				0					
Copper	**0.002**	0.001	**0.004**	50	0.001	0.001	**0.0038**	57	**0.002**	0.001	**0.005**	50	0.0014				2
Cyanide Total	0.004	0.004	0.004	50	0.004	0.004	0.004	54	0.004	0.004	0.004	50	0.007				0.08
Lead	0.001	0.001	0.001	54	0.001	0.001	0.001	60	0.001	0.001	0.001	55	0.0034				0.01
Magnesium	1	1	2	54	14	12	18	57	11	7	15	55					
Nickel Filtered	0.001	0.001	0.002	54	0.003	0.002	0.004	60	0.002	0.001	0.003	55	0.011				0.02
Potassium	2	1	2	54	31	27	36	57	24	18.8	30	55					

Analyte Concentration	Kangaroo Ck (US)				LDP001				Kangaroo Creek & Coxs River Confluence				Guideline Values				
	Median	20th Percentile	80th percentile	Count	Median	20th percentile	80th percentile	Count	Median	20th percentile	80th percentile	Sample Count	ANZECC (95%)	Prospect WFP		ADWG (mg/L)	
														Min	Max	Min	Max
Selenium	0.01	0.01	0.01	2	0.01	0.01	0.01	11				0	0.011				0.01
Silver	**0.001**	**0.001**	**0.001**	2	**0**	**0.001**	**0.001**	11				0	0.00005				0.1
Sodium	7.5	6	8.4	54	215	194.2	238.8	57	192	93.2	221.4	55					
Total Sulphur (Sulphate)	2	1	6	57	66	47	82	61	52	30	70	55					500
Uranium	0.001	0.001	0.001	54	0.003	0.002	0.003	61	0.002	0.001	0.003	55					0.017
Zinc Filt	**0.01**	0.006	**0.019**	56	**0.04**	**0.016**	**0.056**	61	**0.016**	**0.01**	**0.021**	55	0.008				
Nitrogen (Ammonia)	0.02	0.01	0.03	52	0.05	0.01	0.25	59	0.02	0.01	0.03	55					
Nitrite as N	0.01	0.01	0.01	52	0.01	0.01	0.01	54	0.01	0.01	0.01	55					
Nitrate as N	0.01	0.01	0.03	52	0.64	0.37	**0.93**	53	0.33	0.01	**0.906**	55	0.7				50
Nitrate + Nitrite	0.01	0.01	0.03	52	0.64	0.37	0.93	59	0.33	0.01	0.906	55					3
Total Nitrogen as N	0.4	0.2	0.6	52	1	0.56	1.78	59	0.7	0.3	1.7	55					
Total Phosphorous	0.02	0.01	0.06	52	0.01	0.01	0.03	59	0.01	0.01	0.032	55					
Carbonate Alkalinity	1	1	1	54	12	1	38	57	26	1	42	55					
Bicarbonate Alkalinity	11.5	5.6	20.8	54	500	462	552.8	57	399	269	492.8	55					
Hydroxide	1	1	1	54	1	1	1	56	1	1	1	55		15	60		
Total Alkalinity	11.5	5.6	20.8	54	518	480.6	563. 4	57	437	269	522.2	55					
Total Hardness	7	1	13	54	122	101	132. 8	55	86	65	116	55		25	70		
Total Fluoride	0.1	0.1	0.1	51	1	0.9	1.08	57	0.8	0.2	1	54					1.5

All units are in mg/L unless otherwise stated

* Low reliability trigger value due to insufficient data (ANZECC and ARMCANZ, 2000. Section 8.3.7)

3.2 Analysis

Table 2 shows median concentrations of the selected analytes at the discharge and downstream monitoring locations and the 80th percentile background concentrations from the upstream data set. The numbers shown in bold represent concentrations exceeding the ANZECC 95% species protection trigger values.

The 80th percentile background concentrations have been compared to the Guideline values (95% species protection) and the maximum value taken as the trigger value for the downstream median concentrations. The numbers shown in bold represent concentrations exceeding the ANZECC 95% species protection trigger values.

When appropriate, ANZECC trigger values for Zinc and Copper are modified for hardness according to the following algorithms:

Zinc: $HMTV = TV\ (H/30)^{0.89}$

Copper: $HMTV = TV\ (H/30)^{0.85}$

Where:

HMTV = Hardness Modified Trigger Value

TV = Trigger Value

H = Hardness of water at downstream site

The results of the analysis are presented in Table 2.

Table 2: SSTV Analysis Results

Analyte	Median		80th Percentile	ANZECC 95%	TV	HMTV	Adopted TV
	Kangaroo Creek & Coxs River Confluence	LDP001	Kangaroo Creek U/S				
EC (µS/cm)	**759**	**1050**	89	350	350	n/a	350
Al (mg/L)	0.05	0.02	**0.2**	0.055	0.2	n/a	0.2
Fe (mg/L)	0.08	0.05	**4.0**	0.3	4. 0	n/a	4.0
Zn (mg/L)	**0.016**	**0.04**	**0.019**	0.008	0.019	n/a	0.019
Cu (mg/L)	**0.002**	0.001	**0.004**	0.0014	0.004	n/a	0.004

NB: Values in bold exceed ANZECC guideline value for 95% species protection.

Table 2 shows that concentrations of Aluminium, Iron, Zinc and Copper are elevated in the background data so the upstream 80th percentile concentrations have been adopted as SSTVs in place of the Guideline trigger values. As Guideline trigger values for Zinc and Copper were not adopted the hardness modified values are not appropriate.

The downstream concentrations of Zinc and Copper exceed the Guideline trigger value but fall below the adopted trigger value.

The EC of the LDP001 discharge exceeds the Guideline trigger value (350 µS/cm). Whilst in the upstream dataset, EC falls below the ANZECC trigger value. A component of dilution is therefore required to enable the trigger values for Zinc and EC to be met for the median conditions downstream.

Dilution Requirements

The 80th percentile upstream EC value is less than the Guideline value (350 µS/cm), therefore the Guideline value has been adopted as the most appropriate trigger value.

As shown in Table 2, the discharge median EC at LDP001 is greater than 350 µS/cm. It is therefore necessary to calculate the potential for discharged water to be diluted by Kangaroo Creek upstream water such that the water quality criteria are met and the downstream EC is maintained within the adopted trigger value. This is also the case for the median concentration of Zinc at LDP001.

A dilution factor analysis uses flow data to calculate the ratio of discharged water to background flows and, to ensure the methodology is conservative, considers the 80th percentile discharge concentrations being diluted by median upstream water concentrations.

Table 3 shows the discharge and upstream concentrations, the water quality criteria (Adopted TV) and the dilution factor required such that the downstream water quality meets the water quality criteria. Where the 80th percentile discharge concentration is less than the adopted trigger value and hence within the downstream water quality criteria there is no requirement for dilution.

Table 3: Dilution Factor Analysis

Analyte	80%ile LDP001	Median Kangaroo Creek U/S	Adopted TV	Dilution Required
EC (µS/cm)	1130	69	350	2.8
Al (mg/L)	0.05	0.12	0.2	n/a
Fe (mg/L)	0.08	0.98	4.0	n/a
Zn (mg/L)	0.056	0.01	0.019	4.2
Cu (mg/L)	0.0038	0.002	0.004	n/a

Table 3 shows that to meet the water quality criteria for EC, the discharged water requires dilution by upstream water at the ratio of 2.8:1 (units upstream water to units discharge water) and to meet the water quality criteria for zinc, the discharged water requires dilution at a ratio of 4.2:1.

The likelihood of meeting this criteria based on flow data can be considered. The following analysis considers the likelihood of achieving a dilution factor of 2.8 i.e. the likelihood that the discharge quantity at LDP001 will make up approximately 26% and the background flow will make up approximately 74% of the total flow at the downstream site.

Available flow data indicates that median flow in Kangaroo Creek is typically an order of magnitude less than LDP001 discharge:

- Median flow in Kangaroo Creek: 0.66 ML/d (actual data July 2011 to July 2012)
- Median discharge from LDP001: 3.3 ML/d (actual data Jan 2010 to July 2012).

Based on flow data; the degree to which discharge at LDP001 is diluted by Kangaroo Creek is shown in Figure 3.

The results demonstrate that a dilution factor of 2.8 is achieved approximately 5% of the time therefore the water quality criteria for EC will not be met 95% of the time. For zinc, a dilution factor of 4.2 is only achieved 3.5% of the time, therefore the water quality criteria for Zinc will not be met 96.5% of the time.

Where dilution is insufficient, the mixing zone criteria are not met in that the mixing zone extends from bank to bank. In this circumstance ANZECC/ARMCANZ (2000) recommends performing a 'biological effects assessment' (e.g. Direct Toxicity Assessment (DTA)). A DTA is currently being undertaken for discharge at Kangaroo Creek.

It is worth noting that research undertaken by Hart *et al* (1991) shows that the Total Dissolved Solids (TDS) concentration needs to be above 1000 mg/L before it can lead to toxic effects, this equates to an EC of approximately 1500 µS/cm.

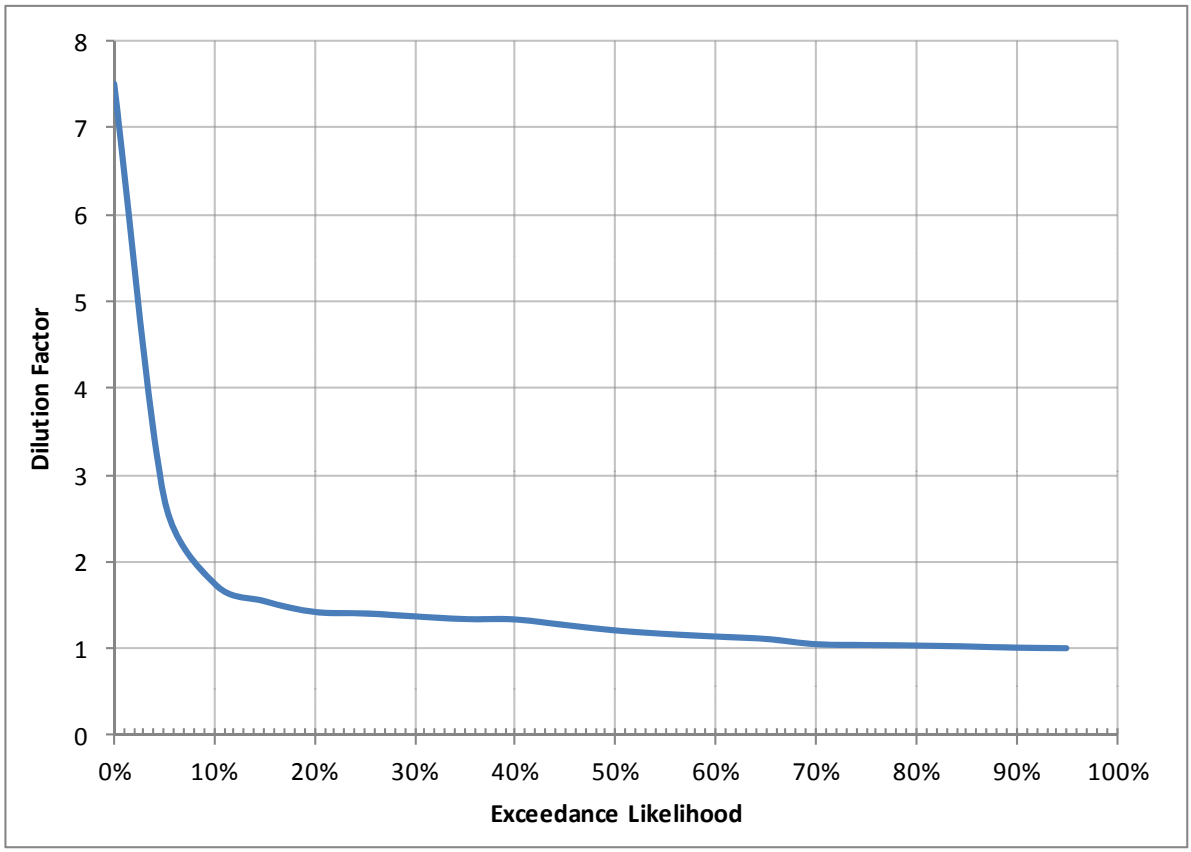


Figure 3: Dilution Facotor Exceedance Statistics

4. REFERENCES

ANZECC/ARMCANZ, 2000, *National Water Quality Management Strategy: Australian Guidelines for Fresh and Marine Water Quality*.

Hart *et al*, 1991. *A review of the salt sensitivity of the Australian freshwater biota*. Hydrobiologia, March 1991, Volume 210, Issue 1-2, pp 105-144.

RPS, 2014. Springvale Mine LDP009 SSTV Assessment. Consultant Report Prepared for Centennial Coal Company Ltd, Reference No. S188H/004c.

Yours sincerely
RPS Water

Sean

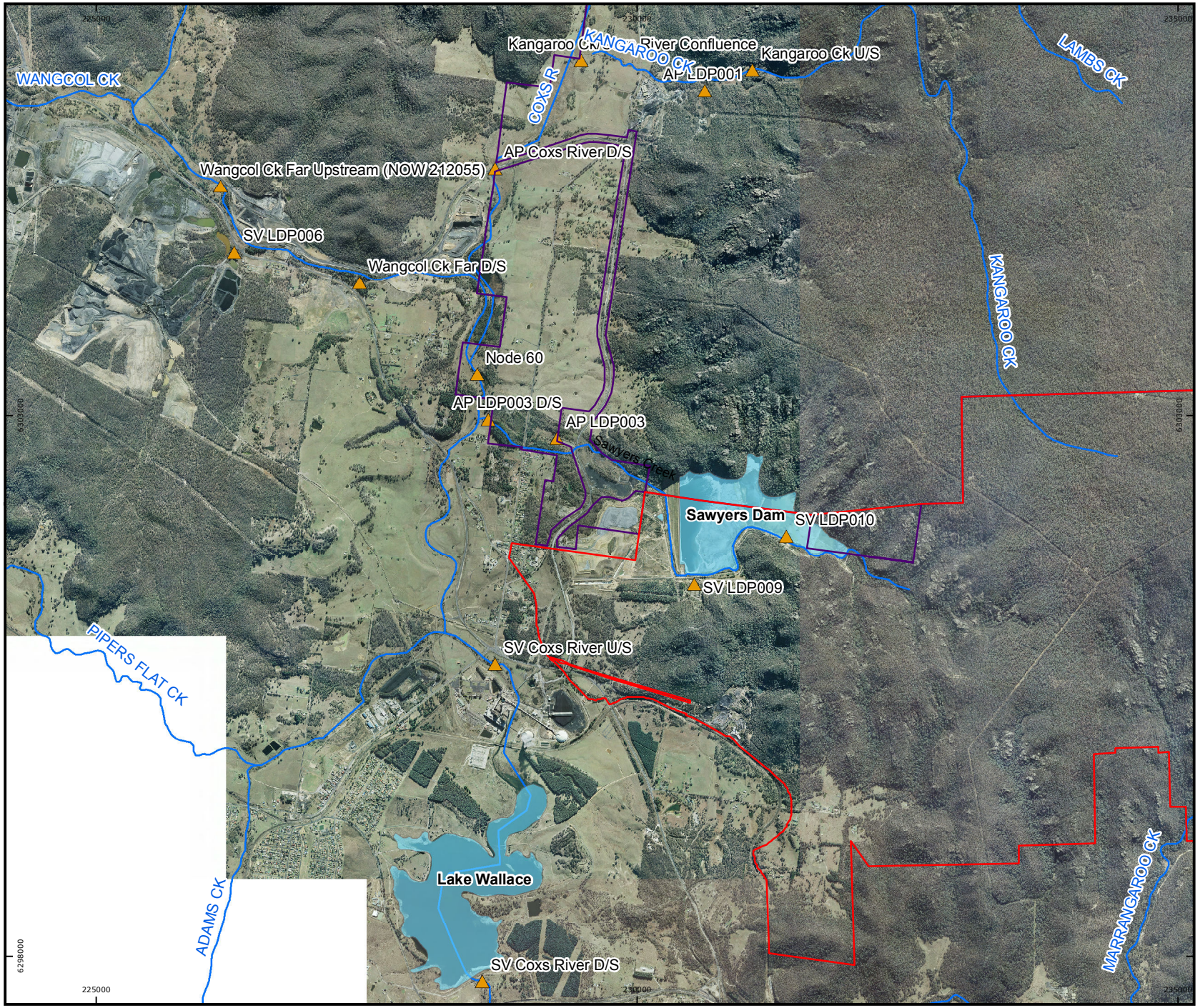
Sean Daykin
Senior Hydrogeologist

Greg

Greg Sheppard
Principal Hydrogeologist

enc:
Figure 1: SSTV Analysis Surface Water Monitoring Locations
Appendix A: ANZECC and ARMCANZ, 2000. Guideline Trigger Values

FIGURES



LEGEND

- Springvale Project Application Area
- Angus Place Project Application Area
- Centennial Surface Water Monitoring Location
- River/Creek
- Lake/Dam

N

500 0 500 1,000

Metres

APPROX SCALE 1:50,000 @ A4

GDA 1994 MGA Zone 56

DATA SOURCES:
Centennial Coal
Australia/MapConnect
Land and Property Management Authority

RPS

Figure 1

Surface Water Monitoring Locations

S188H_004d_D001_All_SW_Monitoring_Locations.mxd Produced: JB Reviewed: JB Date: 28/08/2014

APPENDIX A:
TRIGGER VALUES

Table 3.4.1 Trigger values for toxicants at alternative levels of protection. Values in grey shading are the trigger values applying to typical *slightly–moderately disturbed systems*; see table 3.4.2 and Section 3.4.2.4 for guidance on applying these levels to different ecosystem conditions.

Chemical		Trigger values for freshwater (μgL^{-1})				Trigger values for marine water (μgL^{-1})			
		Level of protection (% species)				Level of protection (% species)			
		99%	95%	90%	80%	99%	95%	90%	80%
METALS & METALLOIDS									
Aluminium	pH >6.5	27	55	80	150	ID	ID	ID	ID
Aluminium	pH <6.5	ID	ID	ID	ID	ID	ID	ID	ID
Antimony		ID	ID	ID	ID	ID	ID	ID	ID
Arsenic (As III)		1	24	94 [C]	360 [C]	ID	ID	ID	ID
Arsenic (AsV)		0.8	13	42	140 [C]	ID	ID	ID	ID
Beryllium		ID	ID	ID	ID	ID	ID	ID	ID
Bismuth		ID	ID	ID	ID	ID	ID	ID	ID
Boron		90	370 [C]	680 [C]	1300 [C]	ID	ID	ID	ID
Cadmium	H	0.06	0.2	0.4	0.8 [C]	0.7 [B]	5.5 [B, C]	14 [B, C]	36 [B, A]
Chromium (Cr III)	H	ID	ID	ID	ID	7.7	27.4	48.6	90.6
Chromium (CrVI)		0.01	1.0 [C]	6 [A]	40 [A]	0.14	4.4	20 [C]	85 [C]
Cobalt		ID	ID	ID	ID	0.005	1	14	150 [C]
Copper	H	1.0	1.4	1.8 [C]	2.5 [C]	0.3	1.3	3 [C]	8 [A]
Gallium		ID	ID	ID	ID	ID	ID	ID	ID
Iron		ID	ID	ID	ID	ID	ID	ID	ID
Lanthanum		ID	ID	ID	ID	ID	ID	ID	ID
Lead	H	1.0	3.4	5.6	9.4 [C]	2.2	4.4	6.6 [C]	12 [C]
Manganese		1200	1900[C]	2500[C]	3600[C]	ID	ID	ID	ID
Mercury (inorganic)	B	0.06	0.6	1.9 [C]	5.4 [A]	0.1	0.4 [C]	0.7 [C]	1.4 [C]
Mercury (methyl)		ID	ID	ID	ID	ID	ID	ID	ID
Molybdenum		ID	ID	ID	ID	ID	ID	ID	ID
Nickel	H	8	11	13	17 [C]	7	70 [C]	200 [A]	560[A]
Selenium (Total)	B	5	11	18	34	ID	ID	ID	ID
Selenium (SeIV)	B	ID	ID	ID	ID	ID	ID	ID	ID
Silver		0.02	0.05	0.1	0.2 [C]	0.8	1.4	1.8	2.6 [C]
Thallium		ID	ID	ID	ID	ID	ID	ID	ID
Tin (inorganic, SnIV)		ID	ID	ID	ID	ID	ID	ID	ID
Tributyltin (as µg/L Sn)		ID	ID	ID	ID	0.0004	0.006 [C]	0.02 [C]	0.05 [C]
Uranium		ID	ID	ID	ID	ID	ID	ID	ID
Vanadium		ID	ID	ID	ID	50	100	160	280
Zinc	H	2.4	8.0 [C]	15 [C]	31 [C]	7	15 [C]	23 [C]	43 [C]
NON-METALLIC INORGANICS									
Ammonia	D	320	900 [C]	1430 [C]	2300 [A]	500	910	1200	1700
Chlorine	E	0.4	3	6 [A]	13 [A]	ID	ID	ID	ID
Cyanide	F	4	7	11	18	2	4	7	14
Nitrate	J	17	700	3400 [C]	17000 [A]	ID	ID	ID	ID
Hydrogen sulfide	G	0.5	1.0	1.5	2.6	ID	ID	ID	ID
ORGANIC ALCOHOLS									
Ethanol		400	1400	2400 [C]	4000 [C]	ID	ID	ID	ID
Ethylene glycol		ID	ID	ID	ID	ID	ID	ID	ID
Isopropyl alcohol		ID	ID	ID	ID	ID	ID	ID	ID
CHLORINATED ALKANES									
Chloromethanes									
Dichloromethane		ID	ID	ID	ID	ID	ID	ID	ID
Chloroform		ID	ID	ID	ID	ID	ID	ID	ID
Carbon tetrachloride		ID	ID	ID	ID	ID	ID	ID	ID
Chloroethanes									
1,2-dichloroethane		ID	ID	ID	ID	ID	ID	ID	ID
1,1,1-trichloroethane		ID	ID	ID	ID	ID	ID	ID	ID

Chemical	Trigger values for freshwater (μgL^{-1})				Trigger values for marine water (μgL^{-1})			
	Level of protection (% species)				Level of protection (% species)			
	99%	**95%**	**90%**	**80%**	**99%**	**95%**	**90%**	**80%**
1,1,2-trichloroethane	5400	6500	7300	8400	140	1900	5800 [C]	18000 [C]
1,1,2,2-tetrachloroethane	ID	ID	ID	ID	ID	ID	ID	ID
Pentachloroethane	ID	ID	ID	ID	ID	ID	ID	ID
Hexachloroethane B	290	360	420	500	ID	ID	ID	ID
Chloropropanes								
1,1-dichloropropane	ID	ID	ID	ID	ID	ID	ID	ID
1,2-dichloropropane	ID	ID	ID	ID	ID	ID	ID	ID
1,3-dichloropropane	ID	ID	ID	ID	ID	ID	ID	ID
CHLORINATED ALKENES								
Chloroethylene	ID	ID	ID	ID	ID	ID	ID	ID
1,1-dichloroethylene	ID	ID	ID	ID	ID	ID	ID	ID
1,1,2-trichloroethylene	ID	ID	ID	ID	ID	ID	ID	ID
1,1,2,2-tetrachloroethylene	ID	ID	ID	ID	ID	ID	ID	ID
3-chloropropene	ID	ID	ID	ID	ID	ID	ID	ID
1,3-dichloropropene	ID	ID	ID	ID	ID	ID	ID	ID
ANILINES								
Aniline	8	250 [A]	1100 [A]	4800 [A]	ID	ID	ID	ID
2,4-dichloroaniline	0.6	7	20	60 [C]	ID	ID	ID	ID
2,5-dichloroaniline	ID	ID	ID	ID	ID	ID	ID	ID
3,4-dichloroaniline	1.3	3	6 [C]	13 [C]	85	150	190	260
3,5-dichloroaniline	ID	ID	ID	ID	ID	ID	ID	ID
Benzidine	ID	ID	ID	ID	ID	ID	ID	ID
Dichlorobenzidine	ID	ID	ID	ID	ID	ID	ID	ID
AROMATIC HYDROCARBONS								
Benzene	600	950	1300	2000	500 [C]	700 [C]	900 [C]	1300 [C]
Toluene	ID	ID	ID	ID	ID	ID	ID	ID
Ethylbenzene	ID	ID	ID	ID	ID	ID	ID	ID
o-xylene	200	350	470	640	ID	ID	ID	ID
m-xylene	ID	ID	ID	ID	ID	ID	ID	ID
p-xylene	140	200	250	340	ID	ID	ID	ID
m+*p*-xylene	ID	ID	ID	ID	ID	ID	ID	ID
Cumene	ID	ID	ID	ID	ID	ID	ID	ID
Polycyclic Aromatic Hydrocarbons								
Naphthalene	2.5	16	37	85	50 [C]	70 [C]	90 [C]	120 [C]
Anthracene B	ID	ID	ID	ID	ID	ID	ID	ID
Phenanthrene B	ID	ID	ID	ID	ID	ID	ID	ID
Fluoranthene B	ID	ID	ID	ID	ID	ID	ID	ID
Benzo(a)pyrene B	ID	ID	ID	ID	ID	ID	ID	ID
Nitrobenzenes								
Nitrobenzene	230	550	820	1300	ID	ID	ID	ID
1,2-dinitrobenzene	ID	ID	ID	ID	ID	ID	ID	ID
1,3-dinitrobenzene	ID	ID	ID	ID	ID	ID	ID	ID
1,4-dinitrobenzene	ID	ID	ID	ID	ID	ID	ID	ID
1,3,5-trinitrobenzene	ID	ID	ID	ID	ID	ID	ID	ID
1-methoxy-2-nitrobenzene	ID	ID	ID	ID	ID	ID	ID	ID
1-methoxy-4-nitrobenzene	ID	ID	ID	ID	ID	ID	ID	ID
1-chloro-2-nitrobenzene	ID	ID	ID	ID	ID	ID	ID	ID
1-chloro-3-nitrobenzene	ID	ID	ID	ID	ID	ID	ID	ID
1-chloro-4-nitrobenzene	ID	ID	ID	ID	ID	ID	ID	ID
1-chloro-2,4-dinitrobenzene	ID	ID	ID	ID	ID	ID	ID	ID
1,2-dichloro-3-nitrobenzene	ID	ID	ID	ID	ID	ID	ID	ID
1,3-dichloro-5-nitrobenzene	ID	ID	ID	ID	ID	ID	ID	ID
1,4-dichloro-2-nitrobenzene	ID	ID	ID	ID	ID	ID	ID	ID
2,4-dichloro-2-nitrobenzene	ID	ID	ID	ID	ID	ID	ID	ID

Chemical		Trigger values for freshwater (μgL^{-1})				Trigger values for marine water (μgL^{-1})			
		Level of protection (% species)				Level of protection (% species)			
		99%	95%	90%	80%	99%	95%	90%	80%
1,2,4,5-tetrachloro-3-nitrobenzene		ID	ID	ID	ID	ID	ID	ID	ID
1,5-dichloro-2,4-dinitrobenzene		ID	ID	ID	ID	ID	ID	ID	ID
1,3,5-trichloro-2,4-dinitrobenzene		ID	ID	ID	ID	ID	ID	ID	ID
1-fluoro-4-nitrobenzene		ID	ID	ID	ID	ID	ID	ID	ID
Nitrotoluenes									
2-nitrotoluene		ID	ID	ID	ID	ID	ID	ID	ID
3-nitrotoluene		ID	ID	ID	ID	ID	ID	ID	ID
4-nitrotoluene		ID	ID	ID	ID	ID	ID	ID	ID
2,3-dinitrotoluene		ID	ID	ID	ID	ID	ID	ID	ID
2,4-dinitrotoluene		16	65 [C]	130 [C]	250 [C]	ID	ID	ID	ID
2,4,6-trinitrotoluene		100	140	160	210	ID	ID	ID	ID
1,2-dimethyl-3-nitrobenzene		ID	ID	ID	ID	ID	ID	ID	ID
1,2-dimethyl-4-nitrobenzene		ID	ID	ID	ID	ID	ID	ID	ID
4-chloro-3-nitrotoluene		ID	ID	ID	ID	ID	ID	ID	ID
Chlorobenzenes and Chloronaphthalenes									
Monochlorobenzene		ID	ID	ID	ID	ID	ID	ID	ID
1,2-dichlorobenzene		120	160	200	270	ID	ID	ID	ID
1,3-dichlorobenzene		160	260	350	520 [C]	ID	ID	ID	ID
1,4-dichlorobenzene		40	60	75	100	ID	ID	ID	ID
1,2,3-trichlorobenzene	B	3	10	16	30 [C]	ID	ID	ID	ID
1,2,4-trichlorobenzene	B	85	170[C]	220[C]	300[C]	20	80	140	240
1,3,5-trichlorobenzene	B	ID	ID	ID	ID	ID	ID	ID	ID
1,2,3,4-tetrachlorobenzene	B	ID	ID	ID	ID	ID	ID	ID	ID
1,2,3,5-tetrachlorobenzene	B	ID	ID	ID	ID	ID	ID	ID	ID
1,2,4,5-tetrachlorobenzene	B	ID	ID	ID	ID	ID	ID	ID	ID
Pentachlorobenzene	B	ID	ID	ID	ID	ID	ID	ID	ID
Hexachlorobenzene	B	ID	ID	ID	ID	ID	ID	ID	ID
1-chloronaphthalene		ID	ID	ID	ID	ID	ID	ID	ID
Polychlorinated Biphenyls (PCBs) & Dioxins									
Capacitor 21	B	ID	ID	ID	ID	ID	ID	ID	ID
Aroclor 1016	B	ID	ID	ID	ID	ID	ID	ID	ID
Aroclor 1221	B	ID	ID	ID	ID	ID	ID	ID	ID
Aroclor 1232	B	ID	ID	ID	ID	ID	ID	ID	ID
Aroclor 1242	B	0.3	0.6	1.0	1.7	ID	ID	ID	ID
Aroclor 1248	B	ID	ID	ID	ID	ID	ID	ID	ID
Aroclor 1254	B	0.01	0.03	0.07	0.2	ID	ID	ID	ID
Aroclor 1260	B	ID	ID	ID	ID	ID	ID	ID	ID
Aroclor 1262	B	ID	ID	ID	ID	ID	ID	ID	ID
Aroclor 1268	B	ID	ID	ID	ID	ID	ID	ID	ID
2,3,4'-trichlorobiphenyl	B	ID	ID	ID	ID	ID	ID	ID	ID
4,4'-dichlorobiphenyl	B	ID	ID	ID	ID	ID	ID	ID	ID
2,2',4,5,5'-pentachloro-1,1'-biphenyl	B	ID	ID	ID	ID	ID	ID	ID	ID
2,4,6,2',4',6'-hexachlorobiphenyl	B	ID	ID	ID	ID	ID	ID	ID	ID
Total PCBs	B	ID	ID	ID	ID	ID	ID	ID	ID
2,3,7,8-TCDD	B	ID	ID	ID	ID	ID	ID	ID	ID
PHENOLS and XYLENOLS									
Phenol		85	320	600	1200 [C]	270	400	520	720
2,4-dimethylphenol		ID	ID	ID	ID	ID	ID	ID	ID
Nonylphenol		ID	ID	ID	ID	ID	ID	ID	ID
2-chlorophenol	T	340 [C]	490 [C]	630 [C]	870 [C]	ID	ID	ID	ID
3-chlorophenol	T	ID	ID	ID	ID	ID	ID	ID	ID
4-chlorophenol	T	160	220	280 [C]	360 [C]	ID	ID	ID	ID
2,3-dichlorophenol	T	ID	ID	ID	ID	ID	ID	ID	ID
2,4-dichlorophenol	T	120	160 [C]	200 [C]	270 [C]	ID	ID	ID	ID

Chemical		Trigger values for freshwater (μgL^{-1})				Trigger values for marine water (μgL^{-1})			
		Level of protection (% species)				Level of protection (% species)			
		99%	95%	90%	80%	99%	95%	90%	80%
2,5-dichlorophenol	T	ID	ID	ID	ID	ID	ID	ID	ID
2,6-dichlorophenol	T	ID	ID	ID	ID	ID	ID	ID	ID
3,4-dichlorophenol	T	ID	ID	ID	ID	ID	ID	ID	ID
3,5-dichlorophenol	T	ID	ID	ID	ID	ID	ID	ID	ID
2,3,4-trichlorophenol	T	ID	ID	ID	ID	ID	ID	ID	ID
2,3,5-trichlorophenol	T	ID	ID	ID	ID	ID	ID	ID	ID
2,3,6-trichlorophenol	T	ID	ID	ID	ID	ID	ID	ID	ID
2,4,5-trichlorophenol	T,B	ID	ID	ID	ID	ID	ID	ID	ID
2,4,6-trichlorophenol	T,B	3	20	40	95	ID	ID	ID	ID
2,3,4,5-tetrachlorophenol	T,B	ID	ID	ID	ID	ID	ID	ID	ID
2,3,4,6- tetrachlorophenol	T,B	10	20	25	30	ID	ID	ID	ID
2,3,5,6- tetrachlorophenol	T,B	ID	ID	ID	ID	ID	ID	ID	ID
Pentachlorophenol	T,B	3.6	10	17	27 [A]	11	22	33	55 [A]
Nitrophenols									
2-nitrophenol		ID	ID	ID	ID	ID	ID	ID	ID
3-nitrophenol		ID	ID	ID	ID	ID	ID	ID	ID
4-nitrophenol		ID	ID	ID	ID	ID	ID	ID	ID
2,4-dinitrophenol		13	45	80	140	ID	ID	ID	ID
2,4,6-trinitrophenol		ID	ID	ID	ID	ID	ID	ID	ID
ORGANIC SULFUR COMPOUNDS									
Carbon disulfide		ID	ID	ID	ID	ID	ID	ID	ID
Isopropyl disulfide		ID	ID	ID	ID	ID	ID	ID	ID
n-propyl sulfide		ID	ID	ID	ID	ID	ID	ID	ID
Propyl disulfide		ID	ID	ID	ID	ID	ID	ID	ID
Tert-butyl sulfide		ID	ID	ID	ID	ID	ID	ID	ID
Phenyl disulfide		ID	ID	ID	ID	ID	ID	ID	ID
Bis(dimethylthiocarbamyl)sulfide		ID	ID	ID	ID	ID	ID	ID	ID
Bis(diethylthiocarbamyl)disulfide		ID	ID	ID	ID	ID	ID	ID	ID
2-methoxy-4H-1,3,2-benzodioxaphosphorium-2-sulfide		ID	ID	ID	ID	ID	ID	ID	ID
Xanthates									
Potassium amyl xanthate		ID	ID	ID	ID	ID	ID	ID	ID
Potassium ethyl xanthate		ID	ID	ID	ID	ID	ID	ID	ID
Potassium hexyl xanthate		ID	ID	ID	ID	ID	ID	ID	ID
Potassium isopropyl xanthate		ID	ID	ID	ID	ID	ID	ID	ID
Sodium ethyl xanthate		ID	ID	ID	ID	ID	ID	ID	ID
Sodium isobutyl xanthate		ID	ID	ID	ID	ID	ID	ID	ID
Sodium isopropyl xanthate		ID	ID	ID	ID	ID	ID	ID	ID
Sodium sec-butyl xanthate		ID	ID	ID	ID	ID	ID	ID	ID
PHTHALATES									
Dimethylphthalate		3000	3700	4300	5100	ID	ID	ID	ID
Diethylphthalate		900	1000	1100	1300	ID	ID	ID	ID
Dibutylphthalate	B	9.9	26	40.2	64.6	ID	ID	ID	ID
Di(2-ethylhexyl)phthalate	B	ID	ID	ID	ID	ID	ID	ID	ID
MISCELLANEOUS INDUSTRIAL CHEMICALS									
Acetonitrile		ID	ID	ID	ID	ID	ID	ID	ID
Acrylonitrile		ID	ID	ID	ID	ID	ID	ID	ID
Poly(acrylonitrile-co-butadiene-co-styrene)		200	530	800 [C]	1200 [C]	200	250	280	340
Dimethylformamide		ID	ID	ID	ID	ID	ID	ID	ID
1,2-diphenylhydrazine		ID	ID	ID	ID	ID	ID	ID	ID
Diphenylnitrosamine		ID	ID	ID	ID	ID	ID	ID	ID
Hexachlorobutadiene		ID	ID	ID	ID	ID	ID	ID	ID
Hexachlorocyclopentadiene		ID	ID	ID	ID	ID	ID	ID	ID

Chemical		Trigger values for freshwater (µgL^{-1})				Trigger values for marine water (µgL^{-1})			
		Level of protection (% species)				Level of protection (% species)			
		99%	95%	90%	80%	99%	95%	90%	80%
Isophorone		ID	ID	ID	ID	ID	ID	ID	ID
ORGANOCHLORINE PESTICIDES									
Aldrin	B	ID	ID	ID	ID	ID	ID	ID	ID
Chlordane	B	0.03	0.08	0.14	0.27 [C]	ID	ID	ID	ID
DDE	B	ID	ID	ID	ID	ID	ID	ID	ID
DDT	B	0.006	0.01	0.02	0.04	ID	ID	ID	ID
Dicofol	B	ID	ID	ID	ID	ID	ID	ID	ID
Dieldrin	B	ID	ID	ID	ID	ID	ID	ID	ID
Endosulfan	B	0.03	0.2 [A]	0.6 [A]	1.8 [A]	0.005	0.01	0.02	0.05 [A]
Endosulfan alpha	B	ID	ID	ID	ID	ID	ID	ID	ID
Endosulfan beta	B	ID	ID	ID	ID	ID	ID	ID	ID
Endrin	B	0.01	0.02	0.04 [C]	0.06 [A]	0.004	0.008	0.01	0.02
Heptachlor	B	0.01	0.09	0.25	0.7 [A]	ID	ID	ID	ID
Lindane		0.07	0.2	0.4	1.0 [A]	ID	ID	ID	ID
Methoxychlor	B	ID	ID	ID	ID	ID	ID	ID	ID
Mirex	B	ID	ID	ID	ID	ID	ID	ID	ID
Toxaphene	B	0.1	0.2	0.3	0.5	ID	ID	ID	ID
ORGANOPHOSPHORUS PESTICIDES									
Azinphos methyl		0.01	0.02	0.05	0.11 [A]	ID	ID	ID	ID
Chlorpyrifos	B	0.00004	0.01	0.11 [A]	1.2 [A]	0.0005	0.009	0.04[A]	0.3 [A]
Demeton		ID	ID	ID	ID	ID	ID	ID	ID
Demeton-S-methyl		ID	ID	ID	ID	ID	ID	ID	ID
Diazinon		0.00003	0.01	0.2 [A]	2 [A]	ID	ID	ID	ID
Dimethoate		0.1	0.15	0.2	0.3	ID	ID	ID	ID
Fenitrothion		0.1	0.2	0.3	0.4	ID	ID	ID	ID
Malathion		0.002	0.05	0.2	1.1 [A]	ID	ID	ID	ID
Parathion		0.0007	0.004 [C]	0.01 [C]	0.04 [A]	ID	ID	ID	ID
Profenofos	B	ID	ID	ID	ID	ID	ID	ID	ID
Temephos	B	ID	ID	ID	ID	0.0004	0.05	0.4	3.6 [A]
CARBAMATE & OTHER PESTICIDES									
Carbofuran		0.06	1.2 [A]	4 [A]	15 [A]	ID	ID	ID	ID
Methomyl		0.5	3.5	9.5	23	ID	ID	ID	ID
S-methoprene		ID	ID	ID	ID	ID	ID	ID	ID
PYRETHROIDS									
Deltamethrin		ID	ID	ID	ID	ID	ID	ID	ID
Esfenvalerate		ID	0.001*	ID	ID	ID	ID	ID	ID
HERBICIDES & FUNGICIDES									
Bypyridilium herbicides									
Diquat		0.01	1.4	10	80 [A]	ID	ID	ID	ID
Paraquat		ID	ID	ID	ID	ID	ID	ID	ID
Phenoxyacetic acid herbicides									
MCPA		ID	ID	ID	ID	ID	ID	ID	ID
2,4-D		140	280	450	830	ID	ID	ID	ID
2,4,5-T		3	36	100	290 [A]	ID	ID	ID	ID
Sulfonylurea herbicides									
Bensulfuron		ID	ID	ID	ID	ID	ID	ID	ID
Metsulfuron		ID	ID	ID	ID	ID	ID	ID	ID
Thiocarbamate herbicides									
Molinate		0.1	3.4	14	57	ID	ID	ID	ID
Thiobencarb		1	2.8	4.6	8 [C]	ID	ID	ID	ID
Thiram		0.01	0.2	0.8 [C]	3 [A]	ID	ID	ID	ID
Triazine herbicides									
Amitrole		ID	ID	ID	ID	ID	ID	ID	ID
Atrazine		0.7	13	45 [C]	150 [C]	ID	ID	ID	ID

Chemical	Trigger values for freshwater (μgL^{-1})				Trigger values for marine water (μgL^{-1})			
	Level of protection (% species)				Level of protection (% species)			
	99%	95%	90%	80%	99%	95%	90%	80%
Hexazinone	ID	ID	ID	ID	ID	ID	ID	ID
Simazine	0.2	3.2	11	35	ID	ID	ID	ID
Urea herbicides								
Diuron	ID	ID	ID	ID	ID	ID	ID	ID
Tebuthiuron	0.02	2.2	20	160 C	ID	ID	ID	ID
Miscellaneous herbicides								
Acrolein	ID	ID	ID	ID	ID	ID	ID	ID
Bromacil	ID	ID	ID	ID	ID	ID	ID	ID
Glyphosate	370	1200	2000	3600 A	ID	ID	ID	ID
Imazethapyr	ID	ID	ID	ID	ID	ID	ID	ID
Ioxynil	ID	ID	ID	ID	ID	ID	ID	ID
Metolachlor	ID	ID	ID	ID	ID	ID	ID	ID
Sethoxydim	ID	ID	ID	ID	ID	ID	ID	ID
Trifluralin B	2.6	4.4	6	9 A	ID	ID	ID	ID
GENERIC GROUPS OF CHEMICALS								
Surfactants								
Linear alkylbenzene sulfonates (LAS)	65	280	520 C	1000 C	ID	ID	ID	ID
Alcohol ethoxyolated sulfate (AES)	340	650	850 C	1100 C	ID	ID	ID	ID
Alcohol ethoxylated surfactants (AE)	50	140	220	360 C	ID	ID	ID	ID
Oils & Petroleum Hydrocarbons	ID	ID	ID	ID	ID	ID	ID	ID
Oil Spill Dispersants								
BP 1100X	ID	ID	ID	ID	ID	ID	ID	ID
Corexit 7664	ID	ID	ID	ID	ID	ID	ID	ID
Corexit 8667		ID	ID	ID	ID	ID	ID	ID
Corexit 9527	ID	ID	ID	ID	230	1100	2200	4400 A
Corexit 9550	ID	ID	ID	ID	ID	ID	ID	ID

Notes: Where the final water quality guideline to be applied to a site is below current analytical practical quantitation limits, see Section 3.4.3.3 for guidance.

Most trigger values listed here for metals and metalloids are *High reliability* figures, derived from field or chronic NOEC data (see 3.4.2.3 for reference to Volume 2). The exceptions are *Moderate reliability* for freshwater aluminium (pH >6.5), manganese and marine chromium (III).

Most trigger values listed here for non-metallic inorganics and organic chemicals are *Moderate reliability* figures, derived from acute LC_{50} data (see 3.4.2.3 for reference to Volume 2). The exceptions are *High reliability* for freshwater ammonia, 3,4-DCA, endosulfan, chlorpyrifos, esfenvalerate, tebuthiuron, three surfactants and marine for 1,1,2-TCE and chlorpyrifos.

* = *High reliability* figure for esfenvalerate derived from mesocosm NOEC data (no alternative protection levels available).

A = Figure may not protect key test species from acute toxicity (and chronic) — check Section 8.3.7 for spread of data and its significance. 'A' indicates that trigger value > acute toxicity figure; note that trigger value should be <1/3 of acute figure (Section 8.3.4.4).

B = Chemicals for which possible bioaccumulation and secondary poisoning effects should be considered (see Sections 8.3.3.4 and 8.3.5.7).

C = Figure may not protect key test species from chronic toxicity (this refers to experimental chronic figures or geometric mean for species) — check Section 8.3.7 for spread of data and its significance. Where grey shading and 'C' coincide, refer to text in Section 8.3.7.

D = Ammonia as TOTAL ammonia as [NH_3-N] at pH 8. For changes in trigger value with pH refer to Section 8.3.7.2.

E = Chlorine as total chlorine, as [Cl]; see Section 8.3.7.2.

F = Cyanide as un-ionised HCN, measured as [CN]; see Section 8.3.7.2.

G = Sulfide as un-ionised H_2S, measured as [S]; see Section 8.3.7.2.

H = Chemicals for which algorithms have been provided in table 3.4.3 to account for the effects of hardness. The values have been calculated using a hardness of 30 mg/L $CaCO_3$. These should be adjusted to the site-specific hardness (see Section 3.4.3).

J = Figures protect against toxicity and do not relate to eutrophication issues. Refer to Section 3.3 if eutrophication is the issue of concern.

ID = Insufficient data to derive a reliable trigger value. Users advised to check if a low reliability value or an ECL is given in Section 8.3.7.

T = Tainting or flavour impairment of fish flesh may possibly occur at concentrations below the trigger value. See Sections 4.4.5.3/3 and 8.3.7.