DAM DEWATERING REPORT

PROJECT:	**264-270 Mount Vernon Road, Mount Vernon**
CLIENT:	**BATHLA GROUP**
DATE:	**28/09/21**
REPORT No.:	**NE1039**

GEOTESTA

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Contents

1. INTRODUCTION

Geotesta was engaged by BATHLA GROUP to undertake an assessment for decommissioning of one (1) existing farm dam at 264-270 Mount Vernon Road, Mount Vernon NSW 2178.

As a part of the development plan, the decommissioning/dewatering and removal of the existing farm dam is required to provide suitable ground for residential development.

The dam was constructed by cutting into the ground and stockpiling/filling the excavated materials on the side of the dam. The dam was filled with the rain and the site run-off water.

The aim of this report is to ensure the decommissioning/dewatering of the dam undertaken in a safe manner and remove any threat posed by the dam following the relevant legislations and guidelines.

2. SCOPE AND OBJECTIVES

This study was conducted in general accordance with the ANCOLD guidelines, Australian Standards, and relevant NSW legislations.

The following scope of works was undertaken to achieve the objectives of the assessment:

- A review of the **geological** information for the area
- A site inspection
- Water sample quality information
- A summary report outlining the decommissioning considerations including:

  - **Functionality and safety** – assessing the dam's current functionality and safety, future development, as well as obligations, such as dam safety.
  - **Economic** – assessing the financial costs to decommission the dam.
  - **Social** – considering the community and the potential concerns caused by decommissioning.
  - **Environmental and heritage** – looking at impacts of decommissioning on natural flow regimes and water quality.
  - **Historical significance and Indigenous culture**.
  - **Legal requirements and governance** – recognising any legal obligations of the existing dam and adhering to regulatory processes and approvals.

- **Technical feasibility** – considering the ease and efficiency of proposed decommissioning methods and related construction impacts.

3. SITE DESCRIPTIONS

3.1 Site Topography

The proposed site at 264-270 Mount Vernon Road, Mount Vernon NSW 2178 covers an area of 51,812 m^2. The site is covered with horticultural plants and is an almost flat land with a slope less than 5%. The site is occupied with one single-story dwelling, one double story dwelling and small storage sheds in the southern portion of the site. The site is located within the local government area of the Blacktown City Council. A dam with an area of approximately 345m^2 is located in the central part of the site and is full of water. The dam forms part of the First Ponds Creek.

The dam is formed by cut and fill operation. The site location is shown in Figure 1.

Available topographical maps indicate that the site lies at an elevation of approximately 41 to 49 metres above sea level reference to Australian Height Datum (AHD) (http://en-au.topographic-map.com).

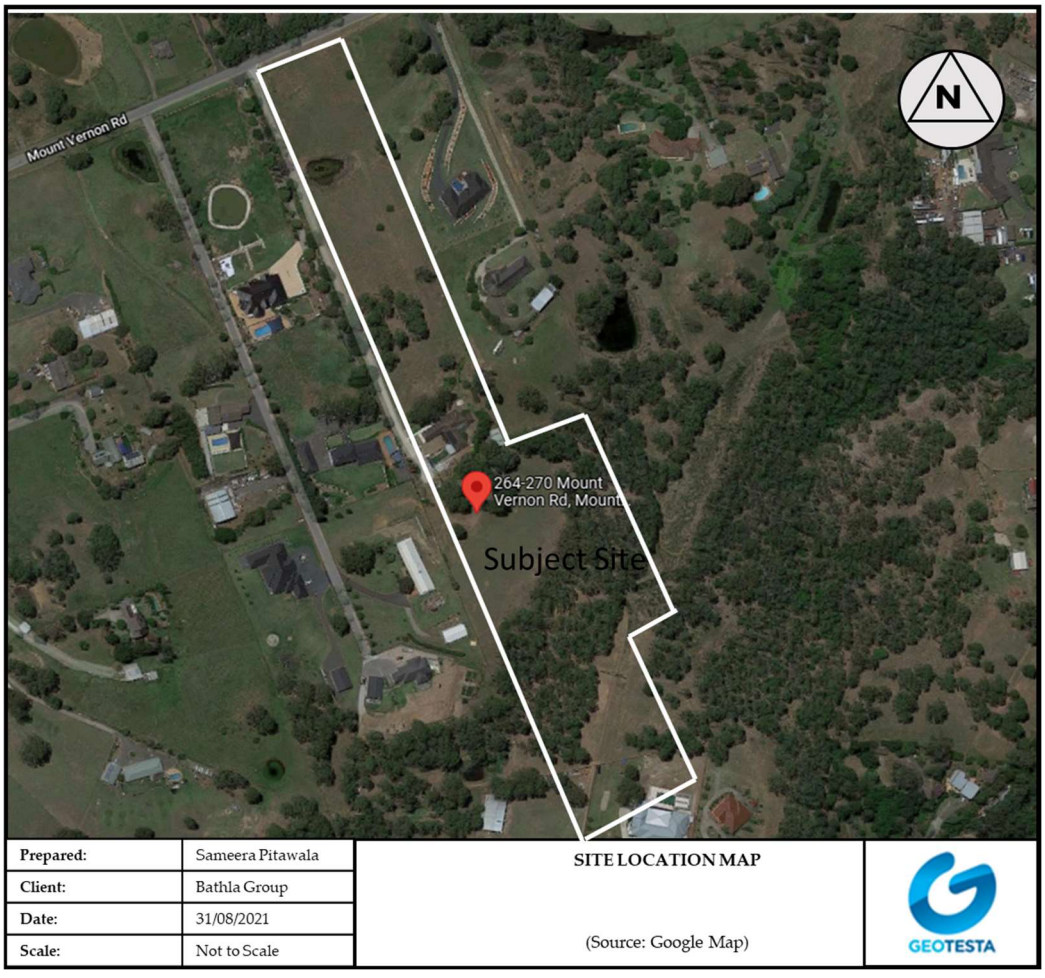

Figure 1: Site Plan and features

3.2 Geology

The geological origin of the soil profile was identified from our visual examination of the soil samples, geotechnical experience, and reference to geological maps of the area. The geological map of the area indicates that the site is underlain by the Ashfield Shale of the Wianamatta Group and comprises dark-grey to black claystone-siltstone and fine sandstone-siltstone laminite (Penrith, 1:100 000, Geological Sheet 9030).

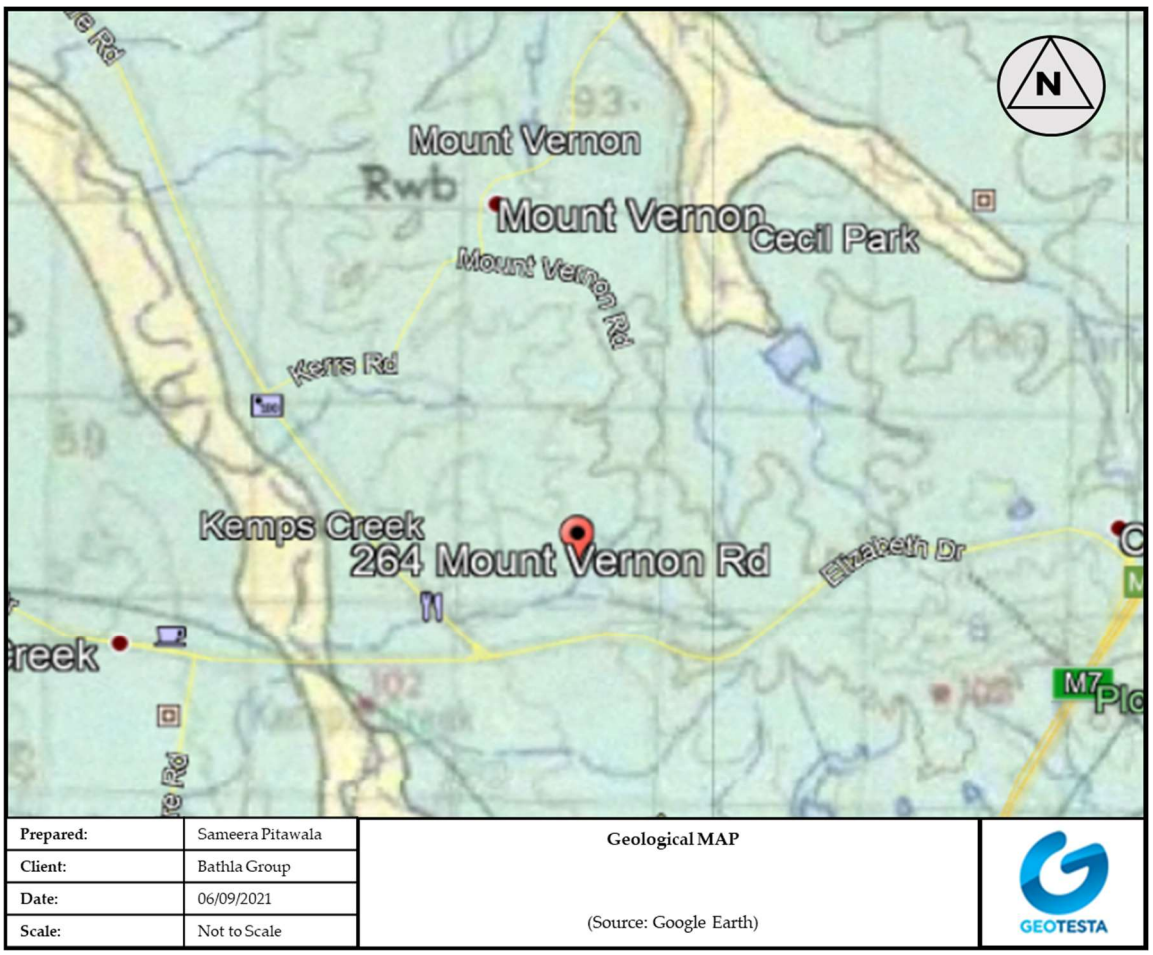

Figure 2. Geology map of the site and surrounding area ***(Source: Geological Survey of NSW)***

3.3 Site Hydrology

The study area is defined as the catchment of First Ponds Creek. Figure 3 shows the water bodies in the vicinity to the site.

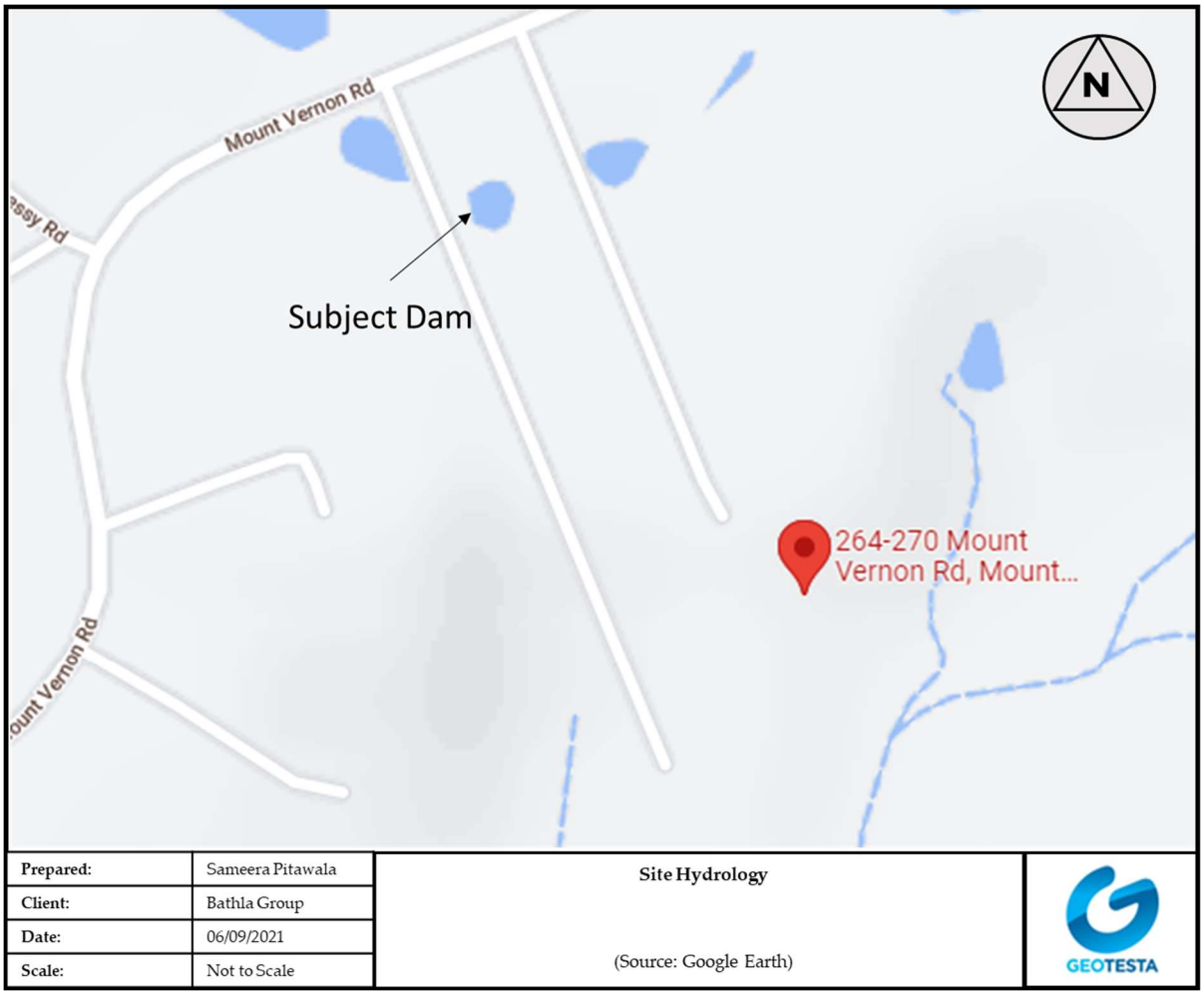

Figure 3. Site Locality

3.4 Salinity

The Salinity Potential in Western Sydney Map (2002) shows the site to be in an area of high salinity potential.

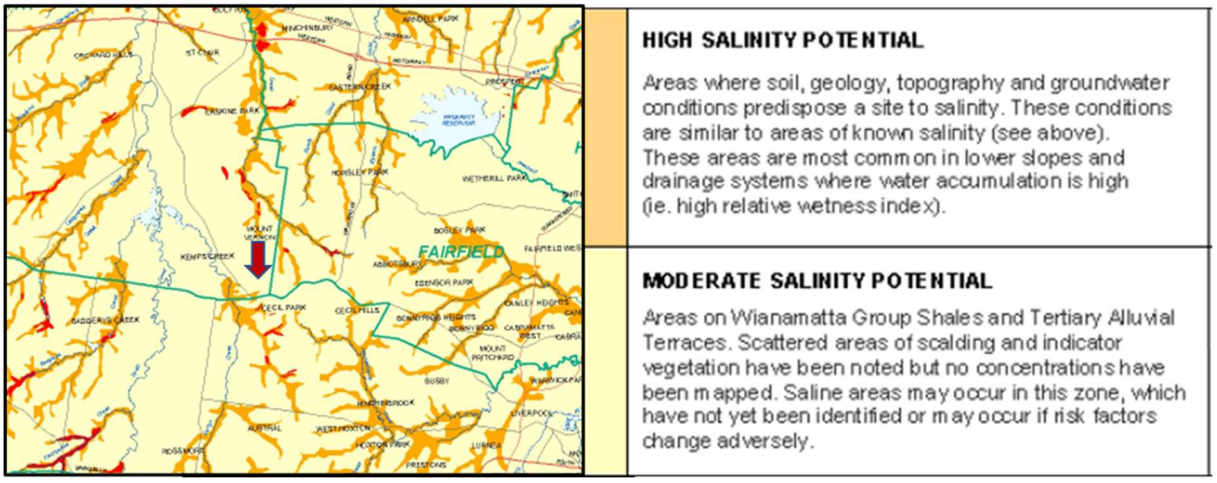

Figure 4: Salinity Potential in Western Sydney map (source: Department of Infrastructure, Planning and Natural Resources)

3.5 Dams Category

The dam is considered a small dam considering:

- The embankment height is less than 5m.
- The reservoir capacity of the dams is less than 20 megalitres.

The ANCOLD guidelines provide guidance on the definition of the severity of damage and loss in relation to several assets. The severity of damage and loss caused by the dam failure is considered fulfilling the definition of Minor as specified in ANCOLD (2012) Consequence Category Guidelines. This is based on the risk matrix provided in Table 1.

Table 1: ANCOLD Consequence Categories based on Population at Risk (PAR); Source: ANCOLD (2012)

Population at Risk (PAR)	Severity of damage and loss			
	Minor	Medium	Major	Catastrophic
<1	Very Low	Low	Significant	High C
≥1 to 10	Significant*	Significant*	High C	High B
>10 to 100	High C	High C	High B	High A
>100 to 1,000		High B	High A	Extreme
>1,000			Extreme	Extreme

4. DECOMMISSIONING CONSIDERATIONS

4.1 Legal Requirements and Governance

Dams Safety Act 2015 (repealed the 1978 Dams Safety Act) is enacted to constitute the Dam Safety Committee and to confer and impose on the Committee functions relating to the safety of certain dams. The Committee represents the Crown and its mission is to "ensure the safety of dams".

The decommissioning procedure is to follow ANCOLD's "Guidelines on Dam Safety Management (2003)".

4.2 Economic Evaluation and Social Aspect

Decommissioning can be defined in one of the following ways:

- Retaining the dam but using it for a different purpose with or without modification.
- Partially removing the dam structure.
- Fully removing the dam structure.

Considering the land occupied is in private property, the economic analysis of the decommissioning options is decided by the landowner and is not discussed as part of this study.

4.3 Environmental and Ecological Considerations

EPA and the local council environmental guidelines are available for disposing the dam water.

4.4 Quality Assessment

4.4.1 Water Quality Assessment Criteria

Water Quality within the dams was assessed against the ANZECC Guidelines for Fresh and Marine Water Quality (2000). The assessment criteria are shown in Table 2.

Table 2: Water Quality Trigger Values

Parameter	Freshwater (95% Level of protection)[1]
Faecal Coliforms	**1000 /100mL[2]**
Enterococci Organisms	**230 /100mL[2]**
pH	**6.5 – 8.0**
Copper	**1.4µg/L**

Arsenic		**13µg/L**
Cadmium		**0.2µg/L**
Chromium		**1.0µg/L**
Lead		**3.4µg/L**
Mercury		**0.6µg/L**
Zinc		**8.0µg/L**
Nickel		**11µg/L**
Turbidity		**6 – 50 ntu**
Salinity		**200 – 300 µScm^{-1}**
Total Phosphorous		**50 µg P/L**
Total Nitrogen		**500 µg N/L**
Diazinon		**0.001µg/L**
Chlordanes		**0.08µg/L**
Dissolved Oxygen	Lower	**85%**
	Upper	**110%**

1 - Taken from Section 3.3.2 , in the ANZECC Guidelines: Aquatic Ecosystems , Table 3.3.2 Default trigger values for physical and chemical stressors for south-east Australia. 2 - Taken from section 5.2.3 in the ANZECC Guidelines: Guidelines for Recreational Purposes

Within the ANZECC Guidelines for Fresh and Marine Water Quality, trigger values for Biochemical Oxygen Demand (BOD) with regards to Aquatic Ecosystems and Recreational uses are not present as these trigger values must be ascertained through an appropriate reference system or subject site.

4.4.2 Threatened Species Conservation

The contractor is required to conserve any threatened species under "NSW Legislations: Threatened Species Conservation Act 1995 No 101".

Any impact from the construction activities shall be managed to aim at:

- No injuries or mortality of threatened species as a result of dewatering activities.
- Low rate of injuries to threatened species during clearing works.
- No injuries to threatened species during construction as a result of vehicle collisions.
- No injuries to threatened species need to be handled.

4.4.3 Environmental Awareness Training

The Contractor shall ensure that personnel responsible for supervising dewatering and earthwork (i.e. foremen, supervisors and managers) undergo environmental awareness training. This training shall occur prior to the commencement of work at any stage and

shall be given by a suitably qualified and experienced person certified by the manager to deliver practical on-site training.

4.4.4 Roles and responsibilities

The Site Manager has the responsibility for supporting the implementation of all required ecological mitigation, monitoring, reporting and communicating any issues to the project team.

The dewatering program and details shall be consulted with a "Ecologist". The ecologist is required to be present onsite prior to commencing the dewatering.

The role of the "Ecologist" includes:

- Supports Site Manager and provides leadership to ensure all staff comply with environmental management;
- Coordinates the preparation of Ecological Management Plan for Green and Golden Bell Frog (and any other likely fauna identified onsite by the ecologist);
- Coordinates all site monitoring including but not limited to water quality and ecological constraints;
- Ensures staff on-site are always aware of environmental requirements; and
- Trains staff in site specific environmental procedures.

Within 14 days of the completion of the de-watering, the ecologist is to prepare a brief report to be provided to council summarising the results of the dam dewatering supervision.

4.4.5 Site Hygiene Management

The accidental introduction or spread of pathogens has the potential to adversely affect frog populations. A technical manual is presented in Appendix B to provide standard operating procedures for hygiene protocols when handling amphibians to reduce the risk of disease and parasite transmission between populations during authorised activities.

4.4.6 Relocation Procedures for aquatic animals (fish, freshwater reptiles, wetland birds)

During dewatering, an aquatic ecologist should be on site to handle aquatic fauna. This would only be performed by a person with the following licenses/approvals: Section 37 Fisheries Management Act 1994 (for fish); Section 120 – General License National Parks and Wildlife Act 1974 (for turtles, frogs, wetland birds) (may not be required if the DA Conditions specify an Aquatic Ecologist is to be involved); and an Animal Research Authority (issued by the Secretary's Animal Care & Ethic Committee). The likely aquatic fauna handling procedures are:

I. NOTICE: The Aquatic Ecologist is to notify DPI Fisheries of the activity 48 hours prior to fish relocation (unless an agreement is in place), including locations of dewatered and relocation sites (see regional office contacts www.dpi.nsw.gov.au/aboutus/about/office). Fisheries require permits to be carried by the licensed ecologist; who should also present a sign clearly showing licence number (if working in public areas, especially when releasing fauna to local creek).

II. PLANNING: The dewatering schedule should allow time for fish rescue, especially during the final 0.3 – 0.5 m water depth (to be advised by Aquatic Ecologist). Fauna should be captured in one day, so pumps need to be of an adequate size and placed in an area free from mud and debris (e.g. inside excavator bucket or screened sump pit). If wetland birds are observed nesting, or young birds (chicks) are using the dam, advise the Aquatic Ecologist immediately for advice. Depending on species and age, birds may be able to relocate themselves. Chicks will need temporary refuge during dewatering; or works may need to be postponed.

III. CAPTURE: Fish are to be collected by hand nets during the final day of dewatering. This is most effective when the water is <0.3 m deep. Dissolved oxygen concentration will drop rapidly as water volume decreases, especially in warm water or if lots of fish are present. Larger bodied fish should be targeted first. Wetland birds will scavenge for small fish in the shallows (e.g. Gambusia). Most small fauna will likely remain uncaptured in the dam until the water becomes very shallow (especially eels and turtles). Eels are best captured by large hand nets when the water is <0.3 m deep. When the water is extremely low, turtles and fish may head towards the intake pump (placed in deepest part). This area should be monitored to intercept fauna (e.g. stand in water next to intake). Turtles will burrow into mud and may require observation and rescue the following morning but can also move themselves to suitable nearby habitat if an escape ramp is graded. For safety, at least two people are required when wading and handling heavy tubs of water/fish up banks (excavator can dig access steps/ramp).

IV. RELOCATE: Native fish healthy enough for relocation are to be contained and transported in an aerated tub/bucket/tank to an appropriate dam/lake/waterhole /creek. DPI Fisheries advise that the host location should be large enough to accommodate additional fish, especially predatory eels. Additional release sites may be needed. Do not overstock tubs or leave in direct sun for extended periods. Aeration can be provided by battery aquarium pumps or manual turbulence if only stored for a brief period. Turtles can be transported in a shaded tub with a wet hessian bag placed inside for moisture and support during transport. Tadpoles can be transported in small buckets.

V. RELEASE: Water from the receiving waterbody should be mixed slowly over 5-10 minutes with the tank water to allow fish to acclimatise to the new water quality. Care should be taken when releasing fauna not to also transfer weeds or invasive species (e.g. Carp eggs and Gambusia). Transfer animals via hand nets, rather than tipping the tub with water. Eels can be released on land a few metres from edge and pointed towards the water.

VI. PESTS: Exotic fish (e.g. Carp, Gambusia, Goldfish, Redfin Perch, Spotted Livebearer) are to be intercepted, euthanised and disposed of in accordance with the ecologist's Animal Research Authority (issued by the Secretary's Animal Care & Ethic Committee). Exotic Trachemys scripta (Red-eared Slider Turtle) are to be contained humanly and OEH immediately notified (Environment Line - 131 555). They will collect the live turtle from the ecologist.

VII. POST-DEWATERING: An escape ramp should be graded to allow trapped fauna to escape overnight. Sediment should be left up to two nights to allow hidden fauna to emerge, unless the ecologist confirms there are no fauna remaining (site specific assessment). Earthworks staff should notify the appointed aquatic ecologist if stranded fish or turtles are observed post-dewatering.

4.4.7 Green and Golden Bell Frog Relocation Procedures

In the event a frog is observed within the Project site and is thought to be a Green and Golden Bell Frog, the following relocation procedure will be initiated:

I. The observer will notify the Ecologist of the frog's location.

II. Considering the frog is likely to be harmed by dewatering, the ecologist will capture the frog. If the Ecologist is not a suitably qualified and licensed ecologist, the Ecologist will contact a suitably qualified and licensed ecologist to capture the frog.

III. If the frog appears to be healthy, an approved release location will be determined by the ecologist in consultation with the relevant landholder. The frog will be released into the relocation area.

IV. If the frog appears to be sick or is dead, the procedures outlined below:

- Disposable gloves will be worn when handling sick or dead frogs.
- To prevent cross-contamination, new gloves and a clean plastic bag will be used for each frog specimen.
- Sick frogs likely to survive transportation will be placed into either a moistened cloth bag with some damp leaf litter or into a partially inflated plastic bag with damp leaf litter and before sealing. All frogs will be kept separate during transportation.

- Dead frogs will be kept cool and preserved as soon as possible. The belly of the frog will be cut open and the specimen placed in preservative (approximately 10 times the volume of the specimen). Specimens will be preserved in either 65% ethanol or 10% buffered formalin.
- The recipient of the sick or dead frog will be contacted to confirm the appropriate procedure prior to transport.
- Containers will be labelled and will provide the following details: date, location and species (if known).
- A standardised collection form will be filled out and a copy sent with the specimen.
- Individual containers will be used for each specimen.
- Details of sick or dead Green and Golden Bell Frogs found at the Project will be recorded and reported in the Annual Environmental Management Report (AEMR).

4.4.8 Heritage

A search of the heritage database provided by the NSW government indicated that the site is not listed in the heritage database.

5. CONCLUSIONS

5.1 Dewatering

The dam dewatering method of irrigation onto the adjacent land within the property boundaries is proposed for this dam. This is the preferred method according to the available guidelines and regulations and provided satisfactory results.

One (1) Water sample was collected from the dam onsite on 10th August 2021 and tested for the following:

Test for Water

- Salinity, pH, and Electrical Conductivity
- Turbidity
- Heavy Metals
- Escherichia coli (E-Coli) Bacteria
- Dissolved Oxygen (mg/L and % saturation)
- Biochemical Oxygen Demand (BOD)
- Nutrients and Faecal coliforms
- Organochlorine and Organophosphorus Pesticides

The testing results are shown below in Table 3.

Table 3: Water Quality Testing Parameters

Parameter	W1	Freshwater (95%)[2]	Yes
Faecal Coliforms (MPN/100ml)	5100	**1000 /100mL[1]**	**Yes**
Enterococci Organisms (MPN/100ml)	360	**230 /100mL[1]**	**Yes**
pH(at 25 ^{0})	8	**6.5 – 8.0**	**-**
Copper (mg/L)	0.005	**1.4µg/L**	**Yes**
Arsenic(mg/L)	< 0.001	**13µg/L**	**-**
Cadmium(mg/L)	< 0.0002	**0.2µg/L**	**Below LOR**
Chromium(mg/L)	0.003	**1.0µg/L**	**Yes**
Lead(mg/L)	0.002	**3.4µg/L**	**-**
Mercury(mg/L)	< 0.0001	**0.6µg/L**	**-**
Nickel(mg/L)	0.002	**8.0µg/L**	**-**
Zinc(mg/L)	0.062	**11µg/L**	**Yes**
Turbidity(NTU)	20	**6 – 50 ntu**	**-**

Salinity(mg/L)	360	**200 – 300 μScm^{-1}**	**Yes**
Total Phosphate (mg/L)	0.08	**50 μg P/L**	**Yes**
Total Nitrogen(mg/L)	1.3	**500 μg N/L**	**Yes**
Dissolved Oxygen(%)	93	**85% - 110%**	**-**
Biochemical Oxygen Demand[1] (mg/L)	< 5	**15 (mg/L)**	**-**
Diazinon(mg/L)	< 0.002	**0.001μg/L**	**Below LOR**
Chlordanes(mg/L)	< 0.002	**0.08μg/L**	**Below LOR**

1 – Taken from section 5.2.3 in the ANZECC Guidelines: Guidelines for Recreational Purposes
2 – Taken from Section 3.3.2 , in the ANZECC Guidelines: Aquatic Ecosystems , Table 3.3.2 Default trigger values for physical and chemical stressors for south-east Australia

As can be seen in the results presented in Table 3, the water samples taken from the subject dam exceeds the trigger values stated within the ANZECC Guidelines for Freshwater Aquatic Ecosystems for Faecal coliforms, E.coli, pH, Copper, Zink, Salinity, and Total Phosphorous.

From the results obtained, the following can be concluded:

- Water within all samples cannot be discharged into creeks or freshwater aquatic ecosystems.
- The water within the dam should not be used for recreational purposes.
- The preferred method of dam dewatering is via irrigation within the site boundaries.

5.1.1 Irrigation within the property boundaries

The proposed area adjacent to the dam include cleared areas, and earthy ground. The irrigation area for dewatering of dam is approximately 9322 m^2 (Figure 5). Earth bunds and silt fences should be installed at the locations shown to ensure no water is discharged out of the site boundaries with a potential to flow into nearby sensitive environments. Considering the soil profile, a conservative percolation rate of 50 mm/hour (characteristic of clayey soils) is considered suitable for the site. Based on measurements performed on the most recent Google map image (taken on 13/09/2021), the dam has an approximate surface area of 345m^2 (Figure 6). If an average depth of 1.0m for dam is assumed, the water volume estimated is 345,000L. Considering the volume of the dam water and the use of a standard water pump with an average flow of 600L/min (i.e. 10 L/sec=q), the dam would be discharged in about 9.5 hours. By using suitable sprinklers disposed to cover the whole surface of the proposed irrigation area, such method would introduce water to the adjacent soil with a rate of 3.861mm/hour

(https://www.irrigationbox.com.au/water-application-rate-calculator) (AR=q/A=10L/S/(9322m²=3.861mm/hr). This value is well below the percolation rate of the soil (50 mm/hour), thus with negligible influence on oversaturation and soil erosion. Details on the proposed dam dewatering method via irrigation are presented in Table 4.

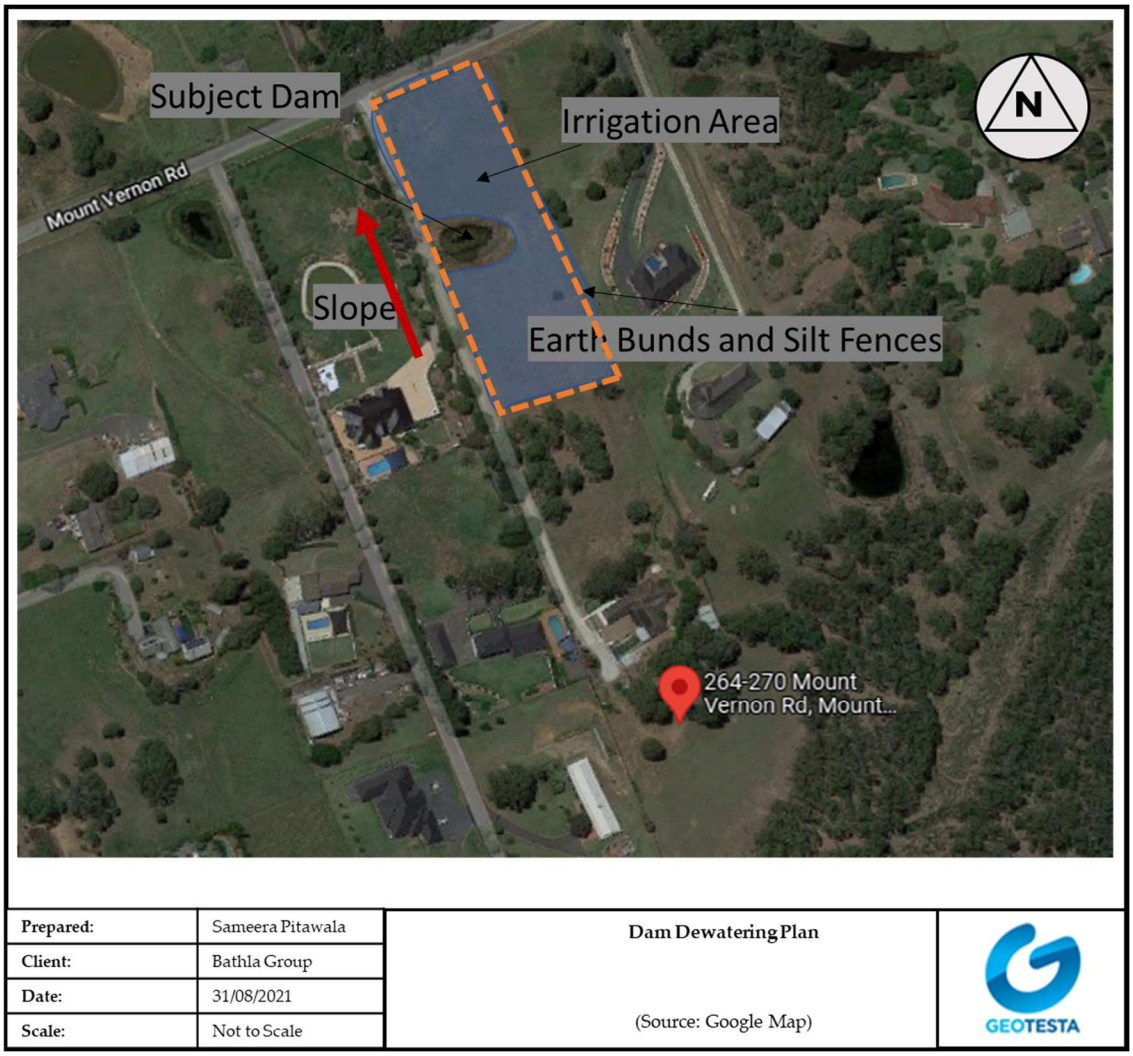

Figure 5 Water Dam Dewatering Plan via Irrigation within the Property Boundaries

Figure 6 Measurement of surface area for the Dam (From google map image taken on 23/08/2021)

Table 4 - Details on the proposed dam dewatering method via irrigation within property boundaries

Irrigation Area	Typical Percolation Rate for Clay	Flow Rate	Irrigation Rate[1]	Volume of Water [2]	Time to discharge Dam
9322 m^2	50 mm/hour	10 L/sec	3.861 mm/hour	345,000L	9.5 hrs

[1]https://www.irrigationbox.com.au/water-application-rate-calculator

[2]Estimated by assuming 3052 m^2 of water surface area and 1.0 m depth for Dam

5.2 Land Use

Where the backfilling has been carried out, the earthwork details including surface clean up, compaction process and all relevant earthwork details shall be recorded to allow safe and economical land use after backfilling.

5.3 Landform and Earthwork

After the dewatering, the earthwork will be undertaken as part the decommissioning process. The dam floor will be fully excavated to natural soil strata exposing in situ hard clay and weathered shale fragment. This is considered suitable for development of the residential properties or other land use.

The erosion and sediment control need to be integrated as part of the overall site earth work and construction management plan.

5.4 Hydrological Consideration

As the subject dam forms part of the Kemps Creek and Ropes Creek catchment area, consideration will have to be made following its decommissioning. Dams to the north of the property, downstream, will likely be subject to decreased water intake following decommission of the dam. This may adversely affect the northern dams chemically and biologically. Following periods of heavy rain, sites to the south of the subject dam may flood and dams upstream may overflow.

DOCUMENT CONTROL

Date	Version	Report Prepared By:	Report Reviewed and issued by:
28 September 2021	NE1034	**Sameera Pitawala** BSc. Eng (Hons), MEng, PhD, MIEAust Environmental Engineer	**Dr. Mohammad Hossein Bazyar** BEng MEng Ph.D MIEAust CPEng NER Senior Consultant

References

- ANCOLD 2003a, Guidelines on Dam Safety Management, Australian National Committee on Large Dams Incorporated, Australia
- ANCOLD 2003b, Guidelines on Risk Assessment, Australian National Committee on Large Dams Incorporated, Australia National Environment Protection Council, December 1999 National Environment Protection (Assessment of Site Contamination) Measure.
- Australian and New Zealand Guidelines for Fresh and Marine Water Quality (Volume 1 and Volume 2), October 2000
- USBR 2008, A Unified Method for Estimating Probabilities of Failure of Embankment dams by Internal Erosion and Piping, Guidance and Supporting Documents,
- USBR, USACE, UNSW, URS, August 2008
- Standards Australia, 2005. Guide to the sampling and Investigation of Potentially Contaminated Soil, Part 1: Non-volatile and Semi-volatile compounds. AS 4482.1
- DERM, 2007, Guidelines on Acceptable Flood Capacity for Dams, February 2007
- Department of Environment and Resource Management (Formerly Natural Resources and Water)
- New South Wales Consolidated Acts, "Dams Safety Act 2015 Schedule 1"
- The Blacktown City Council "Guidelines for Preparing a Dam Dewatering Report"
- Victorian Government Department of Environment, Land, Water and Planning "Decommissioning dams, A guide for dam owners", December 2016
- ANCOLD (2012), "Guidelines on the Consequences Categories of Dams"
- ANCOLD 2003, "Guidelines on Dam Safety Management (2003)"
- DECC (2009) Threatened species survey and assessment guidelines: field survey method for fauna: amphibians. Department of Environment and Climate Change, April 2009
- DEWHA (2010) Survey guidelines for Australia's threatened frogs: Guidelines for detecting frogs listed as threatened under the Environment Protection and Biodiversity Conservation Act 1999. Department of Environment, Water, Heritage and the Arts.
- NSW Fisheries Management Act 1994 No 38.
- NSW National Parks and Wildlife Act 1974 No 80.
- ANZECC Guidelines for Fresh and Marine Water Quality (2000)

Appendix A

Water Quality Testing

Geotesta Pty Ltd (NSW)
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Seven Hills
NSW 2147

Attention: **- Mohammad Hossein Bazyar**

Report **819666-S**
Project name 264-270 MOUNT VERNON ROAD MOUNT VERNON
Project ID NE1039
Received Date Aug 25, 2021

Client Sample ID			**S1**
Sample Matrix			**Soil**
Eurofins Sample No.			**S21-Au47873**
Date Sampled			**Aug 25, 2021**
Test/Reference	LOR	Unit	
Polycyclic Aromatic Hydrocarbons			
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2
Acenaphthene	0.5	mg/kg	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5
Anthracene	0.5	mg/kg	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5
Chrysene	0.5	mg/kg	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5
Fluorene	0.5	mg/kg	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5
Naphthalene	0.5	mg/kg	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5
Pyrene	0.5	mg/kg	< 0.5
Total PAH*	0.5	mg/kg	< 0.5
2-Fluorobiphenyl (surr.)	1	%	62
p-Terphenyl-d14 (surr.)	1	%	52
Organochlorine Pesticides			
Chlordanes - Total	0.1	mg/kg	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05
a-HCH	0.05	mg/kg	< 0.05
Aldrin	0.05	mg/kg	< 0.05
b-HCH	0.05	mg/kg	< 0.05
d-HCH	0.05	mg/kg	< 0.05
Dieldrin	0.05	mg/kg	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05

Client Sample ID			S1
Sample Matrix			Soil
Eurofins Sample No.			S21-Au47873
Date Sampled			Aug 25, 2021
Test/Reference	LOR	Unit	
Organochlorine Pesticides			
Endrin	0.05	mg/kg	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05
g-HCH (Lindane)	0.05	mg/kg	< 0.05
Heptachlor	0.05	mg/kg	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05
Methoxychlor	0.05	mg/kg	< 0.05
Toxaphene	0.5	mg/kg	< 0.5
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1
Dibutylchlorendate (surr.)	1	%	70
Tetrachloro-m-xylene (surr.)	1	%	69
Organophosphorus Pesticides			
Azinphos-methyl	0.2	mg/kg	< 0.2
Bolstar	0.2	mg/kg	< 0.2
Chlorfenvinphos	0.2	mg/kg	< 0.2
Chlorpyrifos	0.2	mg/kg	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2
Coumaphos	2	mg/kg	< 2
Demeton-S	0.2	mg/kg	< 0.2
Demeton-O	0.2	mg/kg	< 0.2
Diazinon	0.2	mg/kg	< 0.2
Dichlorvos	0.2	mg/kg	< 0.2
Dimethoate	0.2	mg/kg	< 0.2
Disulfoton	0.2	mg/kg	< 0.2
EPN	0.2	mg/kg	< 0.2
Ethion	0.2	mg/kg	< 0.2
Ethoprop	0.2	mg/kg	< 0.2
Ethyl parathion	0.2	mg/kg	< 0.2
Fenitrothion	0.2	mg/kg	< 0.2
Fensulfothion	0.2	mg/kg	< 0.2
Fenthion	0.2	mg/kg	< 0.2
Malathion	0.2	mg/kg	< 0.2
Merphos	0.2	mg/kg	< 0.2
Methyl parathion	0.2	mg/kg	< 0.2
Mevinphos	0.2	mg/kg	< 0.2
Monocrotophos	2	mg/kg	< 2
Naled	0.2	mg/kg	< 0.2
Omethoate	2	mg/kg	< 2
Phorate	0.2	mg/kg	< 0.2
Pirimiphos-methyl	0.2	mg/kg	< 0.2
Pyrazophos	0.2	mg/kg	< 0.2
Ronnel	0.2	mg/kg	< 0.2
Terbufos	0.2	mg/kg	< 0.2
Tetrachlorvinphos	0.2	mg/kg	< 0.2
Tokuthion	0.2	mg/kg	< 0.2

Client Sample ID			S1
Sample Matrix			**Soil**
Eurofins Sample No.			**S21-Au47873**
Date Sampled			**Aug 25, 2021**
Test/Reference	LOR	Unit	
Organophosphorus Pesticides			
Trichloronate	0.2	mg/kg	< 0.2
Triphenylphosphate (surr.)	1	%	93
Ammonia (as N)	5	mg/kg	< 5
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	230
Nitrate & Nitrite (as N)	5	mg/kg	< 5
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	6.5
Salinity (determined from EC)*	20	mg/kg	110
Total Kjeldahl Nitrogen (as N)	10	mg/kg	2100
Total Nitrogen (as N)*	10	mg/kg	2100
Total Organic Carbon	0.1	%	0.3
Phosphorus	5	mg/kg	510
% Moisture	1	%	44
Heavy Metals			
Arsenic	2	mg/kg	7.5
Cadmium	0.4	mg/kg	< 0.4
Chromium	5	mg/kg	15
Copper	5	mg/kg	44
Lead	5	mg/kg	27
Mercury	0.1	mg/kg	< 0.1
Nickel	5	mg/kg	19
Zinc	5	mg/kg	100

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Polycyclic Aromatic Hydrocarbons	Melbourne	Aug 30, 2021	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Ammonia (as N)	Melbourne	Aug 30, 2021	28 Days
- Method: APHA 4500-NH3 Ammonia Nitrogen by FIA			
Conductivity (1:5 aqueous extract at 25°C as rec.)	Melbourne	Aug 30, 2021	7 Days
- Method: LTM-INO-4030 Conductivity			
pH (1:5 Aqueous extract at 25°C as rec.)	Melbourne	Aug 30, 2021	7 Days
- Method: LTM-GEN-7090 pH in soil by ISE			
Salinity (determined from EC)*	Melbourne	Aug 30, 2021	0 Days
- Method: LTM-INO-4030			
Total Organic Carbon	Melbourne	Aug 31, 2021	28 Days
- Method: LTM-INO-4060 Total Organic Carbon in water and soil			
Metals M8	Melbourne	Aug 30, 2021	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Suite B14: OCP/OPP			
Organochlorine Pesticides	Melbourne	Aug 30, 2021	14 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water (USEPA 8270)			
Organophosphorus Pesticides	Melbourne	Aug 30, 2021	14 Days
- Method: LTM-ORG-2200 Organophosphorus Pesticides by GC-MS (USEPA 8270)			
Total Nitrogen Set (as N)			
Nitrate & Nitrite (as N)	Melbourne	Aug 30, 2021	28 Days
- Method: LTM-INO-4120 Analysis of NOx NO2 NH3 by FIA			
Total Kjeldahl Nitrogen (as N)	Melbourne	Aug 30, 2021	28 Days
- Method: APHA 4500-Norg B,D Total Kjeldahl Nitrogen by FIA			
Eurofins Suite B19A: Total N (TKN, NOx), Total P			
Phosphorus	Melbourne	Aug 30, 2021	180 Days
- Method: LTM-MET-3010 Alkali Metals Sulfur Silicon and Phosphorus by ICP-AES			
% Moisture	Melbourne	Aug 25, 2021	14 Days
- Method: LTM-GEN-7080 Moisture			

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Company Name: Geotesta Pty Ltd (NSW)
Address: Unit 6, 20/22 Foundry Road
Seven Hills
NSW 2147

Project Name: 264-270 MOUNT VERNON ROAD MOUNT VERNON
Project ID: NE1039

Order No.:
Report #: 819666
Phone: 1300852 216
Fax:

Received: Aug 25, 2021 6:10 PM
Due: Sep 1, 2021
Priority: 5 Day
Contact Name: - Mohammad Hossein Bazyar

Eurofins Analytical Services Manager : Asim Khan

Sample Detail						Ammonia (as N)	Conductivity (1:5 aqueous extract at 25°C as rec.)	pH (1:5 Aqueous extract at 25°C as rec.)	Salinity (determined from EC)*	Total Organic Carbon	Polycyclic Aromatic Hydrocarbons	Metals M8	Suite B14: OCP/OPP	Moisture Set	Eurofins Suite B19A: Total N (TKN, NOx), Total P
Melbourne Laboratory - NATA Site # 1254						X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217															
Brisbane Laboratory - NATA Site # 20794															
Perth Laboratory - NATA Site # 23736															
Mayfield Laboratory - NATA Site # 25079															
External Laboratory															
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**										
1	S1	Aug 25, 2021		Soil	S21-Au47873	X	X	X	X	X	X	X	X	X	X
Test Counts						1	1	1	1	1	1	1	1	1	1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
ug/L: micrograms per litre
ppm: Parts per million
ppb: Parts per billion
%: Percentage
org/100mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4.4'-DDD	mg/kg	< 0.05			0.05	Pass	
4.4'-DDE	mg/kg	< 0.05			0.05	Pass	
4.4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-HCH	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-HCH	mg/kg	< 0.05			0.05	Pass	
d-HCH	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-HCH (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.05			0.05	Pass	
Toxaphene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organophosphorus Pesticides							
Azinphos-methyl	mg/kg	< 0.2			0.2	Pass	
Bolstar	mg/kg	< 0.2			0.2	Pass	
Chlorfenvinphos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos-methyl	mg/kg	< 0.2			0.2	Pass	
Coumaphos	mg/kg	< 2			2	Pass	
Demeton-S	mg/kg	< 0.2			0.2	Pass	
Demeton-O	mg/kg	< 0.2			0.2	Pass	
Diazinon	mg/kg	< 0.2			0.2	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Dichlorvos	mg/kg	< 0.2			0.2	Pass	
Dimethoate	mg/kg	< 0.2			0.2	Pass	
Disulfoton	mg/kg	< 0.2			0.2	Pass	
EPN	mg/kg	< 0.2			0.2	Pass	
Ethion	mg/kg	< 0.2			0.2	Pass	
Ethoprop	mg/kg	< 0.2			0.2	Pass	
Ethyl parathion	mg/kg	< 0.2			0.2	Pass	
Fenitrothion	mg/kg	< 0.2			0.2	Pass	
Fensulfothion	mg/kg	< 0.2			0.2	Pass	
Fenthion	mg/kg	< 0.2			0.2	Pass	
Malathion	mg/kg	< 0.2			0.2	Pass	
Merphos	mg/kg	< 0.2			0.2	Pass	
Methyl parathion	mg/kg	< 0.2			0.2	Pass	
Mevinphos	mg/kg	< 0.2			0.2	Pass	
Monocrotophos	mg/kg	< 2			2	Pass	
Naled	mg/kg	< 0.2			0.2	Pass	
Omethoate	mg/kg	< 2			2	Pass	
Phorate	mg/kg	< 0.2			0.2	Pass	
Pirimiphos-methyl	mg/kg	< 0.2			0.2	Pass	
Pyrazophos	mg/kg	< 0.2			0.2	Pass	
Ronnel	mg/kg	< 0.2			0.2	Pass	
Terbufos	mg/kg	< 0.2			0.2	Pass	
Tetrachlorvinphos	mg/kg	< 0.2			0.2	Pass	
Tokuthion	mg/kg	< 0.2			0.2	Pass	
Trichloronate	mg/kg	< 0.2			0.2	Pass	
Method Blank							
Conductivity (1:5 aqueous extract at 25°C as rec.)	uS/cm	< 10			10	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	102			70-130	Pass	
Acenaphthylene	%	115			70-130	Pass	
Anthracene	%	106			70-130	Pass	
Benz(a)anthracene	%	98			70-130	Pass	
Benzo(a)pyrene	%	80			70-130	Pass	
Benzo(b&j)fluoranthene	%	88			70-130	Pass	
Benzo(g.h.i)perylene	%	105			70-130	Pass	
Benzo(k)fluoranthene	%	93			70-130	Pass	
Chrysene	%	110			70-130	Pass	
Dibenz(a.h)anthracene	%	79			70-130	Pass	
Fluoranthene	%	89			70-130	Pass	
Fluorene	%	109			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	80			70-130	Pass	
Naphthalene	%	103			70-130	Pass	
Phenanthrene	%	85			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Pyrene	%	96			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	111			70-130	Pass	
4.4'-DDD	%	109			70-130	Pass	
4.4'-DDE	%	121			70-130	Pass	
4.4'-DDT	%	102			70-130	Pass	
a-HCH	%	105			70-130	Pass	
Aldrin	%	110			70-130	Pass	
b-HCH	%	99			70-130	Pass	
d-HCH	%	97			70-130	Pass	
Dieldrin	%	107			70-130	Pass	
Endosulfan I	%	127			70-130	Pass	
Endosulfan II	%	106			70-130	Pass	
Endosulfan sulphate	%	98			70-130	Pass	
Endrin	%	100			70-130	Pass	
Endrin aldehyde	%	86			70-130	Pass	
Endrin ketone	%	124			70-130	Pass	
g-HCH (Lindane)	%	103			70-130	Pass	
Heptachlor	%	86			70-130	Pass	
Heptachlor epoxide	%	117			70-130	Pass	
Methoxychlor	%	84			70-130	Pass	
LCS - % Recovery							
Organophosphorus Pesticides							
Diazinon	%	117			70-130	Pass	
Dimethoate	%	72			70-130	Pass	
Ethion	%	80			70-130	Pass	
Fenitrothion	%	90			70-130	Pass	
Methyl parathion	%	99			70-130	Pass	
Mevinphos	%	95			70-130	Pass	
LCS - % Recovery							
Conductivity (1:5 aqueous extract at 25°C as rec.)	%	112			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	108			80-120	Pass	
Cadmium	%	100			80-120	Pass	
Chromium	%	106			80-120	Pass	
Copper	%	108			80-120	Pass	
Lead	%	112			80-120	Pass	
Mercury	%	104			80-120	Pass	
Nickel	%	105			80-120	Pass	
Zinc	%	105			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	M21-Au50478	NCP	%	74			70-130	Pass	
Acenaphthylene	M21-Au50478	NCP	%	82			70-130	Pass	
Anthracene	M21-Au50478	NCP	%	79			70-130	Pass	
Benz(a)anthracene	M21-Au50478	NCP	%	74			70-130	Pass	
Benzo(a)pyrene	M21-Au50478	NCP	%	76			70-130	Pass	
Benzo(b&j)fluoranthene	M21-Au50478	NCP	%	78			70-130	Pass	
Benzo(g.h.i)perylene	M21-Au50478	NCP	%	82			70-130	Pass	
Benzo(k)fluoranthene	M21-Au50478	NCP	%	71			70-130	Pass	
Chrysene	M21-Au50478	NCP	%	80			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Dibenz(a.h)anthracene	M21-Au50478	NCP	%	84			70-130	Pass	
Fluoranthene	M21-Au50478	NCP	%	78			70-130	Pass	
Fluorene	M21-Au50478	NCP	%	80			70-130	Pass	
Indeno(1.2.3-cd)pyrene	M21-Au50478	NCP	%	84			70-130	Pass	
Naphthalene	M21-Au50478	NCP	%	74			70-130	Pass	
Phenanthrene	M21-Au50478	NCP	%	72			70-130	Pass	
Pyrene	M21-Au50478	NCP	%	81			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
Chlordanes - Total	M21-Au50454	NCP	%	105			70-130	Pass	
4.4'-DDD	M21-Au50454	NCP	%	114			70-130	Pass	
4.4'-DDE	M21-Au50454	NCP	%	118			70-130	Pass	
4.4'-DDT	M21-Au50454	NCP	%	87			70-130	Pass	
a-HCH	M21-Au50454	NCP	%	108			70-130	Pass	
Aldrin	M21-Au50454	NCP	%	128			70-130	Pass	
b-HCH	M21-Au50454	NCP	%	85			70-130	Pass	
d-HCH	M21-Au50454	NCP	%	104			70-130	Pass	
Dieldrin	M21-Au50454	NCP	%	115			70-130	Pass	
Endosulfan I	M21-Au50454	NCP	%	118			70-130	Pass	
Endosulfan II	M21-Au50454	NCP	%	109			70-130	Pass	
Endosulfan sulphate	M21-Au50454	NCP	%	76			70-130	Pass	
Endrin	M21-Au50454	NCP	%	104			70-130	Pass	
Endrin aldehyde	M21-Au50454	NCP	%	116			70-130	Pass	
Endrin ketone	M21-Au50454	NCP	%	113			70-130	Pass	
g-HCH (Lindane)	M21-Au50454	NCP	%	98			70-130	Pass	
Heptachlor	M21-Au50454	NCP	%	103			70-130	Pass	
Heptachlor epoxide	M21-Au50454	NCP	%	121			70-130	Pass	
Hexachlorobenzene	M21-Au50454	NCP	%	92			70-130	Pass	
Methoxychlor	M21-Au50454	NCP	%	103			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	M21-Au55063	NCP	%	97			75-125	Pass	
Cadmium	M21-Au55063	NCP	%	99			75-125	Pass	
Chromium	M21-Au55063	NCP	%	262			75-125	Fail	Q08
Copper	M21-Au55063	NCP	%	103			75-125	Pass	
Lead	M21-Au55063	NCP	%	114			75-125	Pass	
Mercury	M21-Au55063	NCP	%	102			75-125	Pass	
Nickel	M21-Au55063	NCP	%	118			75-125	Pass	
Zinc	M21-Au55063	NCP	%	102			75-125	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	M21-Au55430	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	M21-Au55430	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	M21-Au55430	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	M21-Au55430	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	M21-Au55430	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	M21-Au55430	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	M21-Au55430	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	M21-Au55430	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	M21-Au55430	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	M21-Au55430	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	M21-Au55430	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	M21-Au55430	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Indeno(1.2.3-cd)pyrene	M21-Au55430	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	M21-Au55430	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	M21-Au55430	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	M21-Au55430	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	B21-Au49280	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	B21-Au49280	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	B21-Au49280	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	B21-Au49280	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-HCH	B21-Au49280	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	B21-Au49280	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-HCH	B21-Au49280	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-HCH	B21-Au49280	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	B21-Au49280	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	B21-Au49280	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	B21-Au49280	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	B21-Au49280	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	B21-Au49280	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	B21-Au49280	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	B21-Au49280	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-HCH (Lindane)	B21-Au49280	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	B21-Au49280	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	B21-Au49280	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	B21-Au49280	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Toxaphene	M21-Au55430	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Organophosphorus Pesticides				Result 1	Result 2	RPD			
Azinphos-methyl	B21-Au49280	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Bolstar	B21-Au49280	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorfenvinphos	B21-Au49280	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos	B21-Au49280	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos-methyl	B21-Au49280	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Coumaphos	B21-Au49280	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Demeton-S	B21-Au49280	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Demeton-O	B21-Au49280	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Diazinon	B21-Au49280	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dichlorvos	B21-Au49280	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dimethoate	B21-Au49280	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Disulfoton	B21-Au49280	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
EPN	B21-Au49280	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethion	B21-Au49280	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethoprop	B21-Au49280	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethyl parathion	B21-Au49280	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenitrothion	B21-Au49280	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fensulfothion	B21-Au49280	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenthion	B21-Au49280	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Malathion	B21-Au49280	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Merphos	B21-Au49280	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Methyl parathion	B21-Au49280	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Mevinphos	B21-Au49280	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Monocrotophos	B21-Au49280	NCP	mg/kg	< 2	< 2	<1	30%	Pass	

Duplicate									
Organophosphorus Pesticides				Result 1	Result 2	RPD			
Naled	B21-Au49280	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Omethoate	B21-Au49280	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Phorate	B21-Au49280	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pirimiphos-methyl	B21-Au49280	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pyrazophos	B21-Au49280	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ronnel	B21-Au49280	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Terbufos	B21-Au49280	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tetrachlorvinphos	B21-Au49280	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tokuthion	B21-Au49280	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Trichloronate	B21-Au49280	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Ammonia (as N)	S21-Au47872	NCP	mg/kg	< 10	< 10	<1	30%	Pass	
Conductivity (1:5 aqueous extract at 25°C as rec.)	B21-Au49274	NCP	uS/cm	230	230	1.3	30%	Pass	
Nitrate & Nitrite (as N)	S21-Au47872	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
pH (1:5 Aqueous extract at 25°C as rec.)	B21-Au49274	NCP	pH Units	5.9	5.7	pass	30%	Pass	
Salinity (determined from EC)*	B21-Au49274	NCP	mg/kg	110	110	1.3	30%	Pass	
% Moisture	B21-Au48251	NCP	%	9.2	9.7	5.0	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	M21-Au55063	NCP	mg/kg	4.4	4.6	4.0	30%	Pass	
Cadmium	M21-Au55063	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	M21-Au55063	NCP	mg/kg	100	100	1.0	30%	Pass	
Copper	M21-Au55063	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
Lead	M21-Au55063	NCP	mg/kg	24	24	<1	30%	Pass	
Mercury	M21-Au55063	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	M21-Au55063	NCP	mg/kg	14	14	3.0	30%	Pass	
Zinc	M21-Au55063	NCP	mg/kg	12	12	1.0	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q08	The matrix spike recovery is outside of the recommended acceptance criteria. An acceptable recovery was obtained for the laboratory control sample indicating a sample matrix interference.

Authorised by:

Asim Khan	Analytical Services Manager
Scott Beddoes	Senior Analyst-Inorganic (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)
Emily Rosenberg	Senior Analyst-Metal (VIC)

Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

Geotesta Pty Ltd (NSW)
Unit 6, 20/22 Foundry Road
Seven Hills
NSW 2147

Attention: **- Mohammad Hossein Bazyar**

Report **819664-W**
Project name 264-270 MOUNT VERNON ROAD MOUNT VERNON
Project ID NE1039
Received Date Aug 25, 2021

Client Sample ID			**W-1**
Sample Matrix			**Water**
Eurofins Sample No.			**S21-Au47871**
Date Sampled			**Aug 25, 2021**
Test/Reference	LOR	Unit	
Total Recoverable Hydrocarbons			
TRH C6-C9	0.02	mg/L	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1
TRH C10-C36 (Total)	0.1	mg/L	< 0.1
Naphthalene[N02]	0.01	mg/L	< 0.01
TRH C6-C10	0.02	mg/L	< 0.02
TRH C6-C10 less BTEX (F1)[N04]	0.02	mg/L	< 0.02
TRH >C10-C16	0.05	mg/L	< 0.05
TRH >C10-C16 less Naphthalene (F2)[N01]	0.05	mg/L	< 0.05
TRH >C16-C34	0.1	mg/L	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1
TRH >C10-C40 (total)*	0.1	mg/L	< 0.1
Organochlorine Pesticides			
Chlordanes - Total	0.002	mg/L	< 0.002
4.4'-DDD	0.0002	mg/L	< 0.0002
4.4'-DDE	0.0002	mg/L	< 0.0002
4.4'-DDT	0.0002	mg/L	< 0.0002
a-HCH	0.0002	mg/L	< 0.0002
Aldrin	0.0002	mg/L	< 0.0002
b-HCH	0.0002	mg/L	< 0.0002
d-HCH	0.0002	mg/L	< 0.0002
Dieldrin	0.0002	mg/L	< 0.0002
Endosulfan I	0.0002	mg/L	< 0.0002
Endosulfan II	0.0002	mg/L	< 0.0002
Endosulfan sulphate	0.0002	mg/L	< 0.0002
Endrin	0.0002	mg/L	< 0.0002
Endrin aldehyde	0.0002	mg/L	< 0.0002
Endrin ketone	0.0002	mg/L	< 0.0002
g-HCH (Lindane)	0.0002	mg/L	< 0.0002
Heptachlor	0.0002	mg/L	< 0.0002
Heptachlor epoxide	0.0002	mg/L	< 0.0002
Hexachlorobenzene	0.0002	mg/L	< 0.0002
Methoxychlor	0.0002	mg/L	< 0.0002
Toxaphene	0.005	mg/L	< 0.005

Client Sample ID			W-1
Sample Matrix			Water
Eurofins Sample No.			S21-Au47871
Date Sampled			Aug 25, 2021
Test/Reference	LOR	Unit	
Organochlorine Pesticides			
Aldrin and Dieldrin (Total)*	0.0002	mg/L	< 0.0002
DDT + DDE + DDD (Total)*	0.0002	mg/L	< 0.0002
Vic EPA IWRG 621 OCP (Total)*	0.002	mg/L	< 0.002
Vic EPA IWRG 621 Other OCP (Total)*	0.002	mg/L	< 0.002
Dibutylchlorendate (surr.)	1	%	72
Tetrachloro-m-xylene (surr.)	1	%	81
Organophosphorus Pesticides			
Azinphos-methyl	0.002	mg/L	< 0.002
Bolstar	0.002	mg/L	< 0.002
Chlorfenvinphos	0.02	mg/L	< 0.02
Chlorpyrifos	0.002	mg/L	< 0.002
Chlorpyrifos-methyl	0.002	mg/L	< 0.002
Coumaphos	0.02	mg/L	< 0.02
Demeton-S	0.002	mg/L	< 0.002
Demeton-O	0.002	mg/L	< 0.002
Diazinon	0.002	mg/L	< 0.002
Dichlorvos	0.002	mg/L	< 0.002
Dimethoate	0.002	mg/L	< 0.002
Disulfoton	0.002	mg/L	< 0.002
EPN	0.002	mg/L	< 0.002
Ethion	0.002	mg/L	< 0.002
Ethoprop	0.002	mg/L	< 0.002
Ethyl parathion	0.002	mg/L	< 0.002
Fenitrothion	0.002	mg/L	< 0.002
Fensulfothion	0.002	mg/L	< 0.002
Fenthion	0.002	mg/L	< 0.002
Malathion	0.002	mg/L	< 0.002
Merphos	0.002	mg/L	< 0.002
Methyl parathion	0.002	mg/L	< 0.002
Mevinphos	0.002	mg/L	< 0.002
Monocrotophos	0.002	mg/L	< 0.002
Naled	0.002	mg/L	< 0.002
Omethoate	0.02	mg/L	< 0.02
Phorate	0.002	mg/L	< 0.002
Pirimiphos-methyl	0.02	mg/L	< 0.02
Pyrazophos	0.002	mg/L	< 0.002
Ronnel	0.002	mg/L	< 0.002
Terbufos	0.002	mg/L	< 0.002
Tetrachlorvinphos	0.002	mg/L	< 0.002
Tokuthion	0.002	mg/L	< 0.002
Trichloronate	0.002	mg/L	< 0.002
Triphenylphosphate (surr.)	1	%	66
Biochemical Oxygen Demand (BOD-5 Day)	5	mg/L	< 5
Conductivity (at 25°C)	10	uS/cm	600
Dissolved Oxygen	0.01	mg/L	8.5
Dissolved Oxygen (% Saturation)		%	93
Nitrate & Nitrite (as N)	0.05	mg/L	< 0.05
pH (at 25 °C)	0.1	pH Units	8.0

Client Sample ID			W-1
Sample Matrix			**Water**
Eurofins Sample No.			**S21-Au47871**
Date Sampled			**Aug 25, 2021**
Test/Reference	LOR	Unit	
Phosphate total (as P)	0.01	mg/L	0.08
Salinity (determined from EC)*	20	mg/L	360
Total Kjeldahl Nitrogen (as N)	0.2	mg/L	1.3
Total Nitrogen (as N)*	0.2	mg/L	1.3
Turbidity	1	NTU	20
Thermotolerant Coliforms	1	cfu/100mL	[N06]see attached
Heavy Metals			
Arsenic	0.001	mg/L	< 0.001
Cadmium	0.0002	mg/L	< 0.0002
Chromium	0.001	mg/L	0.003
Copper	0.001	mg/L	0.005
Lead	0.001	mg/L	0.002
Mercury	0.0001	mg/L	< 0.0001
Nickel	0.001	mg/L	0.002
Zinc	0.005	mg/L	0.062
Pathogens			
E.coli (MPN)	1	MPN/100mL	[N06]see attached

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	Aug 27, 2021	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Aug 27, 2021	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Aug 27, 2021	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Suite B14: OCP/OPP			
Organochlorine Pesticides	Melbourne	Aug 27, 2021	7 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water (USEPA 8270)			
Organophosphorus Pesticides	Melbourne	Aug 27, 2021	7 Days
- Method: LTM-ORG-2200 Organophosphorus Pesticides by GC-MS (USEPA 8270)			
Biochemical Oxygen Demand (BOD-5 Day)	Melbourne	Aug 27, 2021	2 Days
- Method: LTM-INO-4010 Biochemical Oxygen Demand (BOD5) in Water			
Conductivity (at 25°C)	Melbourne	Aug 27, 2021	28 Days
- Method: LTM-INO-4030 Conductivity			
Dissolved Oxygen	Melbourne	Aug 30, 2021	28 Days
- Method: LTM-INO-4130 Determination of Dissolved Oxygen using a DO meter			
Dissolved Oxygen (% Saturation)	Melbourne	Aug 30, 2021	1 Days
- Method: LTM-INO-4130 Determination of Dissolved Oxygen using a DO meter			
pH (at 25 °C)	Melbourne	Aug 27, 2021	0 Hours
- Method: LTM-GEN-7090 pH in water by ISE			
Salinity (determined from EC)*	Melbourne	Aug 27, 2021	0 Days
- Method: LTM-INO-4030			
Turbidity	Melbourne	Aug 30, 2021	28 Days
- Method: Turbidity by classical using APHA 2130B (LTM-INO-4140)			
Metals M8	Melbourne	Aug 30, 2021	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Total Nitrogen Set (as N)			
Nitrate & Nitrite (as N)	Melbourne	Aug 27, 2021	28 Days
- Method: LTM-INO-4120 Analysis of NOx NO2 NH3 by FIA			
Total Kjeldahl Nitrogen (as N)	Melbourne	Aug 27, 2021	28 Days
- Method: APHA 4500-Norg B,D Total Kjeldahl Nitrogen by FIA			
Eurofins Suite B19A: Total N (TKN, NOx), Total P			
Phosphate total (as P)	Melbourne	Aug 27, 2021	28 Days
- Method: LTM-INO-4040 Phosphate by CFA			

eurofins | Environment Testing

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IANZ # 1290

Company Name: Geotesta Pty Ltd (NSW)
Address: Unit 6, 20/22 Foundry Road
Seven Hills
NSW 2147

Project Name: 264-270 MOUNT VERNON ROAD MOUNT VERNON
Project ID: NE1039

Order No.:
Report #: 819664
Phone: 1300852 216
Fax:

Received: Aug 25, 2021 6:10 PM
Due: Sep 1, 2021
Priority: 5 Day
Contact Name: - Mohammad Hossein Bazyar

Eurofins Analytical Services Manager : Asim Khan

Sample Detail						Biochemical Oxygen Demand (BOD-5 Day)	Conductivity (at 25°C)	Dissolved Oxygen	Dissolved Oxygen (% Saturation)	E.coli (MPN)	pH (at 25 °C)	Salinity (determined from EC)*	Thermotolerant Coliforms	Turbidity	Metals M8	Suite B14: OCP/OPP	Total Recoverable Hydrocarbons	Eurofins Suite B19A: Total N (TKN, NOx), Total P
Melbourne Laboratory - NATA Site # 1254						X	X	X	X		X	X		X	X	X	X	X
Sydney Laboratory - NATA Site # 18217																		
Brisbane Laboratory - NATA Site # 20794																		
Perth Laboratory - NATA Site # 23736																		
Mayfield Laboratory - NATA Site # 25079																		
External Laboratory										X			X					
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**													
1	W-1	Aug 25, 2021		Water	S21-Au47871	X	X	X	X	X	X	X	X	X	X	X	X	X
Test Counts						1	1	1	1	1	1	1	1	1	1	1	1	1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
ug/L: micrograms per litre
ppm: Parts per million
ppb: Parts per billion
%: Percentage
org/100mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons							
TRH C6-C9	mg/L	< 0.02			0.02	Pass	
TRH C10-C14	mg/L	< 0.05			0.05	Pass	
TRH C15-C28	mg/L	< 0.1			0.1	Pass	
TRH C29-C36	mg/L	< 0.1			0.1	Pass	
Naphthalene	mg/L	< 0.01			0.01	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
TRH >C10-C16	mg/L	< 0.05			0.05	Pass	
TRH >C16-C34	mg/L	< 0.1			0.1	Pass	
TRH >C34-C40	mg/L	< 0.1			0.1	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/L	< 0.002			0.002	Pass	
4.4'-DDD	mg/L	< 0.0002			0.0002	Pass	
4.4'-DDE	mg/L	< 0.0002			0.0002	Pass	
4.4'-DDT	mg/L	< 0.0002			0.0002	Pass	
a-HCH	mg/L	< 0.0002			0.0002	Pass	
Aldrin	mg/L	< 0.0002			0.0002	Pass	
b-HCH	mg/L	< 0.0002			0.0002	Pass	
d-HCH	mg/L	< 0.0002			0.0002	Pass	
Dieldrin	mg/L	< 0.0002			0.0002	Pass	
Endosulfan I	mg/L	< 0.0002			0.0002	Pass	
Endosulfan II	mg/L	< 0.0002			0.0002	Pass	
Endosulfan sulphate	mg/L	< 0.0002			0.0002	Pass	
Endrin	mg/L	< 0.0002			0.0002	Pass	
Endrin aldehyde	mg/L	< 0.0002			0.0002	Pass	
Endrin ketone	mg/L	< 0.0002			0.0002	Pass	
g-HCH (Lindane)	mg/L	< 0.0002			0.0002	Pass	
Heptachlor	mg/L	< 0.0002			0.0002	Pass	
Heptachlor epoxide	mg/L	< 0.0002			0.0002	Pass	
Hexachlorobenzene	mg/L	< 0.0002			0.0002	Pass	
Methoxychlor	mg/L	< 0.0002			0.0002	Pass	
Toxaphene	mg/L	< 0.005			0.005	Pass	
Method Blank							
Organophosphorus Pesticides							
Azinphos-methyl	mg/L	< 0.002			0.002	Pass	
Bolstar	mg/L	< 0.002			0.002	Pass	
Chlorfenvinphos	mg/L	< 0.02			0.02	Pass	
Chlorpyrifos	mg/L	< 0.002			0.002	Pass	
Chlorpyrifos-methyl	mg/L	< 0.002			0.002	Pass	
Coumaphos	mg/L	< 0.02			0.02	Pass	
Demeton-S	mg/L	< 0.002			0.002	Pass	
Demeton-O	mg/L	< 0.002			0.002	Pass	
Diazinon	mg/L	< 0.002			0.002	Pass	
Dichlorvos	mg/L	< 0.002			0.002	Pass	
Dimethoate	mg/L	< 0.002			0.002	Pass	
Disulfoton	mg/L	< 0.002			0.002	Pass	
EPN	mg/L	< 0.002			0.002	Pass	
Ethion	mg/L	< 0.002			0.002	Pass	
Ethoprop	mg/L	< 0.002			0.002	Pass	
Ethyl parathion	mg/L	< 0.002			0.002	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Fenitrothion	mg/L	< 0.002			0.002	Pass	
Fensulfothion	mg/L	< 0.002			0.002	Pass	
Fenthion	mg/L	< 0.002			0.002	Pass	
Malathion	mg/L	< 0.002			0.002	Pass	
Merphos	mg/L	< 0.002			0.002	Pass	
Methyl parathion	mg/L	< 0.002			0.002	Pass	
Mevinphos	mg/L	< 0.002			0.002	Pass	
Monocrotophos	mg/L	< 0.002			0.002	Pass	
Naled	mg/L	< 0.002			0.002	Pass	
Omethoate	mg/L	< 0.02			0.02	Pass	
Phorate	mg/L	< 0.002			0.002	Pass	
Pirimiphos-methyl	mg/L	< 0.02			0.02	Pass	
Pyrazophos	mg/L	< 0.002			0.002	Pass	
Ronnel	mg/L	< 0.002			0.002	Pass	
Terbufos	mg/L	< 0.002			0.002	Pass	
Tetrachlorvinphos	mg/L	< 0.002			0.002	Pass	
Tokuthion	mg/L	< 0.002			0.002	Pass	
Trichloronate	mg/L	< 0.002			0.002	Pass	
Method Blank							
Biochemical Oxygen Demand (BOD-5 Day)	mg/L	< 5			5	Pass	
Conductivity (at 25°C)	uS/cm	< 10			10	Pass	
Dissolved Oxygen (% Saturation)	%	100				N/A	
Nitrate & Nitrite (as N)	mg/L	< 0.05			0.05	Pass	
Phosphate total (as P)	mg/L	< 0.01			0.01	Pass	
Total Kjeldahl Nitrogen (as N)	mg/L	< 0.2			0.2	Pass	
Turbidity	NTU	< 1			1	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/L	< 0.001			0.001	Pass	
Cadmium	mg/L	< 0.0002			0.0002	Pass	
Chromium	mg/L	< 0.001			0.001	Pass	
Copper	mg/L	< 0.001			0.001	Pass	
Lead	mg/L	< 0.001			0.001	Pass	
Mercury	mg/L	< 0.0001			0.0001	Pass	
Nickel	mg/L	< 0.001			0.001	Pass	
Zinc	mg/L	< 0.005			0.005	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons							
TRH C6-C9	%	124			70-130	Pass	
TRH C10-C14	%	86			70-130	Pass	
Naphthalene	%	120			70-130	Pass	
TRH C6-C10	%	119			70-130	Pass	
TRH >C10-C16	%	85			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	85			70-130	Pass	
4.4'-DDD	%	99			70-130	Pass	
4.4'-DDE	%	79			70-130	Pass	
4.4'-DDT	%	95			70-130	Pass	
a-HCH	%	97			70-130	Pass	
Aldrin	%	103			70-130	Pass	
b-HCH	%	98			70-130	Pass	
d-HCH	%	82			70-130	Pass	
Dieldrin	%	76			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endosulfan I	%	73			70-130	Pass	
Endosulfan II	%	72			70-130	Pass	
Endosulfan sulphate	%	104			70-130	Pass	
Endrin	%	123			70-130	Pass	
Endrin aldehyde	%	94			70-130	Pass	
Endrin ketone	%	88			70-130	Pass	
g-HCH (Lindane)	%	95			70-130	Pass	
Heptachlor	%	75			70-130	Pass	
Heptachlor epoxide	%	98			70-130	Pass	
Methoxychlor	%	86			70-130	Pass	
LCS - % Recovery							
Biochemical Oxygen Demand (BOD-5 Day)	%	113			70-130	Pass	
Conductivity (at 25°C)	%	96			70-130	Pass	
Nitrate & Nitrite (as N)	%	112			70-130	Pass	
Phosphate total (as P)	%	100			70-130	Pass	
Total Kjeldahl Nitrogen (as N)	%	96			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	101			80-120	Pass	
Cadmium	%	102			80-120	Pass	
Chromium	%	100			80-120	Pass	
Copper	%	100			80-120	Pass	
Lead	%	100			80-120	Pass	
Mercury	%	88			80-120	Pass	
Nickel	%	99			80-120	Pass	
Zinc	%	100			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons				Result 1					
TRH C6-C9	M21-Au49660	NCP	%	117			70-130	Pass	
TRH C10-C14	B21-Au51282	NCP	%	111			70-130	Pass	
Naphthalene	M21-Au49660	NCP	%	103			70-130	Pass	
TRH C6-C10	M21-Au49660	NCP	%	110			70-130	Pass	
TRH >C10-C16	B21-Au51282	NCP	%	113			70-130	Pass	
Spike - % Recovery									
				Result 1					
Nitrate & Nitrite (as N)	B21-Au49098	NCP	%	95			70-130	Pass	
Phosphate total (as P)	M21-Au49642	NCP	%	87			70-130	Pass	
Total Kjeldahl Nitrogen (as N)	M21-Au49196	NCP	%	110			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S21-Au49016	NCP	%	101			75-125	Pass	
Cadmium	S21-Au49016	NCP	%	100			75-125	Pass	
Chromium	S21-Au49016	NCP	%	99			75-125	Pass	
Copper	S21-Au49016	NCP	%	98			75-125	Pass	
Lead	S21-Au49016	NCP	%	99			75-125	Pass	
Mercury	S21-Au49016	NCP	%	90			75-125	Pass	
Nickel	S21-Au49016	NCP	%	99			75-125	Pass	
Zinc	S21-Au49016	NCP	%	98			75-125	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Total Recoverable Hydrocarbons				Result 1	Result 2	RPD			
TRH C6-C9	M21-Au49649	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
TRH C10-C14	M21-Au52378	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH C15-C28	M21-Au52378	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH C29-C36	M21-Au52378	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Naphthalene	M21-Au49649	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
TRH C6-C10	M21-Au49649	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
TRH >C10-C16	M21-Au52378	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH >C16-C34	M21-Au52378	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH >C34-C40	M21-Au52378	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	B21-Au39361	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
4.4'-DDD	B21-Au39361	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
4.4'-DDE	B21-Au39361	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
4.4'-DDT	B21-Au39361	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
a-HCH	B21-Au39361	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Aldrin	B21-Au39361	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
b-HCH	B21-Au39361	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
d-HCH	B21-Au39361	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Dieldrin	B21-Au39361	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Endosulfan I	B21-Au39361	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Endosulfan II	B21-Au39361	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Endosulfan sulphate	B21-Au39361	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Endrin	B21-Au39361	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Endrin aldehyde	B21-Au39361	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Endrin ketone	B21-Au39361	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
g-HCH (Lindane)	B21-Au39361	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Heptachlor	B21-Au39361	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Hexachlorobenzene	B21-Au39361	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Methoxychlor	B21-Au39361	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Toxaphene	B21-Au39361	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Duplicate									
Organophosphorus Pesticides				Result 1	Result 2	RPD			
Azinphos-methyl	B21-Au39361	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Bolstar	B21-Au39361	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Chlorfenvinphos	B21-Au39361	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Chlorpyrifos	B21-Au39361	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Chlorpyrifos-methyl	B21-Au39361	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Coumaphos	B21-Au39361	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Demeton-S	B21-Au39361	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Demeton-O	B21-Au39361	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Diazinon	B21-Au39361	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Dichlorvos	B21-Au39361	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Dimethoate	B21-Au39361	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Disulfoton	B21-Au39361	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
EPN	B21-Au39361	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Ethion	B21-Au39361	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Ethoprop	B21-Au39361	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Ethyl parathion	B21-Au39361	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Fenitrothion	B21-Au39361	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Fensulfothion	B21-Au39361	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Fenthion	B21-Au39361	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	

Duplicate									
Organophosphorus Pesticides				Result 1	Result 2	RPD			
Malathion	B21-Au39361	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Merphos	B21-Au39361	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Methyl parathion	B21-Au39361	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Mevinphos	B21-Au39361	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Monocrotophos	B21-Au39361	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Naled	B21-Au39361	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Omethoate	B21-Au39361	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Phorate	B21-Au39361	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Pirimiphos-methyl	B21-Au39361	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Pyrazophos	B21-Au39361	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Ronnel	B21-Au39361	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Terbufos	B21-Au39361	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Tetrachlorvinphos	B21-Au39361	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Tokuthion	B21-Au39361	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Trichloronate	B21-Au39361	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Biochemical Oxygen Demand (BOD-5 Day)	M21-Au49638	NCP	mg/L	< 5	< 5	<1	30%	Pass	
Conductivity (at 25°C)	M21-Au48678	NCP	uS/cm	6400	6200	1.0	30%	Pass	
Dissolved Oxygen	S21-Au49016	NCP	mg/L	8.7	8.9	2.0	30%	Pass	
Dissolved Oxygen (% Saturation)	S21-Au47856	NCP	%	96	94	2.0	30%	Pass	
Nitrate & Nitrite (as N)	B21-Au50228	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
Phosphate total (as P)	M21-Au49683	NCP	mg/L	0.18	0.18	<1	30%	Pass	
Total Kjeldahl Nitrogen (as N)	M21-Au49195	NCP	mg/L	< 0.2	0.6	200	30%	Fail	Q15
Turbidity	M21-Au46568	NCP	NTU	2.6	2.9	11	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S21-Au49016	NCP	mg/L	0.003	0.003	3.0	30%	Pass	
Cadmium	S21-Au49016	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium	S21-Au49016	NCP	mg/L	0.006	0.006	6.0	30%	Pass	
Copper	S21-Au49016	NCP	mg/L	0.013	0.013	2.0	30%	Pass	
Lead	S21-Au49016	NCP	mg/L	0.008	0.008	4.0	30%	Pass	
Mercury	S21-Au49016	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Nickel	S21-Au49016	NCP	mg/L	0.005	0.005	4.0	30%	Pass	
Zinc	S21-Au49016	NCP	mg/L	0.038	0.039	2.0	30%	Pass	

Comments

E.Coli and Faecal Coliforms analysed by: Eurofins| ams, NATA accreditation number 15773, report reference AAQ47556.

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	Yes

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N06	This result has been produced by a third-party laboratory and is not covered by Eurofins | Environment Testing lab ISO/IEC 17025 accreditation.
Q15	The RPD reported passes Eurofins Environment Testing's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised by:

Asim Khan	Analytical Services Manager
Vivian Wang	Senior Analyst-Volatile (VIC)
Scott Beddoes	Senior Analyst-Inorganic (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)
Emily Rosenberg	Senior Analyst-Metal (VIC)

Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

Analytical Report: AAQ47556
Eurofins Sample Number: NJ21AB0956-2
Version: 1

Eurofins Environment Testing Australia
PO BOX 276 OAKLEIGH VIC 3166
VIC,
AU

Client Account Number: A00493042GS3
Eurofins Quote Number: AGW3PH19000708

Eurofins Sample Number NJ21AB0956-2

Collected On: 25-Aug-2021
Original Received Date: 26-Aug-2021
Description: Water; Client ID: W-1; Eurofins/MGT ID: S21-Au47871
Containers Submitted: 1 Bottle(s)

General Method Reference: AS4276.7,TMW 141

Analysis	Result	Unit
# Faecal Coliform Count		
Faecal Coliform Count	5.1 x 10^3	CFU/100 mL
Analysis Date: 26-Aug-2021		
# E.coli Count		
E.coli Count	3.6 x 10^2	CFU/100 mL
Analysis Date: 26-Aug-2021		

Supplemental Information

Sampleswereretestedasreceived.

Specifications(if) reportedareasprovidedbytheclient.

Accredited for compliance with ISO/IEC 17025:2017- Testing. NATA Accreditation Number 15773.

Contracted Company: Eurofins ams Laboratories (Sydney)

8, Rachael Close, Silverwater, NSW 2128 Australia
SampleReceiptAMS@eurofins.com

TGA Licence No: MI-15112007-LI-002191-11 APVMA Licence No: 6139
Questions about this report should be directed to your project manager or the general email listed above.

Analytical Report: AAQ47556

Eurofins Sample Number: NJ21AB0956-2

Version: 1

Reviewed and electronically signed for Data Reviewer Approval by
Eva Rubazewicz, DEPARTMENT MANAGER - NSPT
for Eurofins ams Laboratories Pty Ltd, on 27-Aug-2021 16:10:19 UTC+10:00

Appendix B

Hygiene Protocol for Handling Amphibians

Technical Manual

Wildlife management

Interim hygiene protocol for handling amphibians

This technical manual aims to outline standard measures to be followed to prevent or reduce the spread of disease causing pathogens being transferred within and between frog populations. These hygiene protocols can be applied in both a scientific and general public capacity.

Table of Contents

Purpose

The purpose of this document is to provide standard operating procedures for hygiene protocols when handling amphibians to reduce the risk of disease and parasite transmission between populations during authorised activities. It is recognised that there is a 'natural' or background level of disease and parasite transmission within and between amphibian populations. Applicants and assessors need to evaluate the proposed activities to determine the relative risk of disease transmission, above background levels, and implement appropriate strategies to minimise this risk.

Background

The past 30 years has seen alarming declines in amphibian populations and the extinction of numerous amphibian species the world over. Many of these declines and extinctions appear attributable to recently-emerged infectious diseases, in particular chytridiomycosis and ranaviral disease. While the subject of conjecture, the emergence of these diseases is most likely attributable to the spread of novel (i.e. exotic) pathogens to new areas where amphibians have little or no immunity to infection. Human activities that target amphibians or their habitats have the potential to spread disease and parasites both within and amongst amphibian populations.

Queensland's native wildlife is protected under the *Nature Conservation Act 1992*. Under the Act persons are required to hold licences, permits or authorities to take, use or interfere with native amphibians in many situations. The *Nature Conservation (Wildlife Management) Regulation 2006* outlines these provisions. This policy relates to the following licence and permit types under the regulation:

- Commercial wildlife licence (wildlife interaction)
- Commercial wildlife harvesting licences
- Educational purposes permit
- Museum licence
- Recreational wildlife harvesting licences
- Rehabilitation permit (endorsed for spotter catcher activities)
- Scientific purposes permit

In the course of undertaking activities with native amphibians under these permits or licences the licensee has the potential to increase risk of disease and parasite transmission within and between wild populations and thus threaten the conservation of wild populations.

The *Nature Conservation (Wildlife Management) Regulation 2006* ensures that the granting of such licences does not adversely affect the conservation of the animals and allows the chief executive to limit and regulate the activities of the licensee.

Site Hygiene Management

Frog populations can be very sensitive to any introduced foreign pathogens, so every caution should be taken to minimise the potential risk of contamination transferred between sites. It is for this reason that defining the boundaries between each site, while difficult, is an important recognition to make. Given the possible locations of frog populations, boundaries will be different within each site, some more obvious than others. These boundaries may be natural, such as a body of water, or constructed, such as a road or track. As a guiding principle, each individual water body should be defined as a separate site. When working along the same water body, or series of connected water bodies, this can usually be treated as one site. However, if the water body is

fed through several catchments or tributaries, or if there is a clear break or partition, they should be treated as separate sites.

Above the natural and background transmission rate of disease spread, factors likely to increase the risk of infection include:

- the remoteness of the chosen site
- activities prior to entering the site
- activities being undertaken in the site
- status of disease in the site and surrounding area

Requirements for managing disease in the field and between sites

There is no scientific evidence that the amphibian chytrid fungus or other pathogens of amphibians have been transmitted between water catchments by vehicles, footwear or clothing. There is an absence of hard data on amphibian disease epidemiology and transmission. As a result of this 'data deficiency' a precautionary approach has been taken in developing requirements to manage disease in the field. It is assumed that some human activities may unintentionally increase the risk of spreading diseases between sites.

Hygiene and disease are controlled to a large extent by proper cleaning, disinfecting and/or sterilising:

Cleaning involves the physical removal of organic and inorganic matter from items. Cleaning will not remove pathogens from the items, but it is a necessary step that allows the disinfecting agent to come into direct contact with pathogens on the actual surface of the item. Disinfecting an item by washing it with a proper chemical agent (see Table 1) will reduce the bacteria load to a point where they will not serve as a source of infection, but will continue to persist at low levels on the item.

Sterilisation through the use of heat, chemicals or radiation will remove all life from the item. Disinfection of items should always be done at a safe distance from bodies of water so that the solution infiltrates the soil rather than runs directly into the water. When travelling from site to site, the following hygiene precautions must be taken to minimise the transfer of disease.

Gloves

Delicate species such as frogs may be placed at greater risk when gloves are used because of a loss of tactile sensitivity by the handler. If frogs are handled using bare hands it is extremely important to ensure that the handler has not applied insect repellents, perfumes, lotions, or other potentially toxic substances that might be absorbed through highly permeable amphibian skin.

There is evidence that wearing disposable gloves when handling amphibians will protect the animals' skin from abrasion, chemicals and the spread of infection. However, gloves containing talc should not be worn as they could irritate the amphibian's skin. Gloves should be non-powdered and talc-free or rinsed in warm water prior to use. Vinyl and nitrile gloves are preferred, as latex has been shown to have toxicity towards frog embryos and tadpoles. When handling highly toxic amphibians, gloves should always be worn to protect the handler and contact with bare skin or mucus membranes avoided.

Footwear

- Footwear must be thoroughly cleaned and disinfected at the beginning of fieldwork and between each sampling site.

This is done by:

  – Scraping boots clear of mud and standing the soles in an approved disinfecting solution (refer Table 1).

- The remainder of the boot should be rinsed or sprayed with an approved disinfecting solution (refer Table 1).
    - Disinfecting solutions should be prevented from entering any water bodies.
    - Rubber boots such as ‘gum boots’ or ‘Wellingtons’ are recommended because of the ease with which they can be cleaned and disinfected.
- Several changes of footwear bagged between sites is an alternative to cleaning.

Equipment

Care must be taken to avoid removal of the protective mucus layer covering the skin of amphibians. If nets are used, they should be made of soft cloth materials. Animals should be handled gently and transported in containers that protect them from trauma and injury.

- Equipment such as nets, balances, callipers, bags, scalpels, headlamps, torches, wetsuits and waders that are used at one site must be cleaned and disinfected before re-use at another site. Refer to Table 1 for recommended disinfectants and procedures.
- If equipment is to be used immediately at another site it should be dried out completely before reuse. This can be achieved by having two sets of gear, one of which is drying while the other is in use. Nets and other equipment should be thoroughly rinsed off as even trace amounts of residual bleach can adversely affect aquatic life on contact.
- Disposable items should be used where possible. Non-disposable equipment should be used only once during a particular field exercise and disinfected later or disinfected at the site between uses.
- In the field, bleach solutions should be disposed of far from any water body by pouring over a hard surface (such as concrete or bitumen) where it can break down in sunlight and evaporate. If no hard substrates are available, it can be disposed of into the soil away from water bodies.
- For future consideration in a laboratory or research situation, there is an automatic waste-water disinfection system available for complete and proper disposal of chlorinated water.

Vehicles

- Transmission of disease from vehicles is unlikely. However, if a vehicle is used to travel through a known frog site, which could result in mud and water being transferred to other bodies of water or frog sites, then wheels and tyres should undergo cleaning and disinfection.
- Vehicle cleaning should be carried out at a distance from water bodies that allows the disinfecting solution to infiltrate soil rather than run-off into a nearby water body.
- Vehicle tyres should be sprayed/flushed with a disinfecting solution (refer Table 1) in high-risk areas.
- Ideally, if location and time permits, vehicles should be washed at a carwash between sites.

Handling of amphibians in the wild

The spread of disease, such as the chytrid fungus, may occur as a result of handling frogs. Unnecessary handling should be avoided and the specimen released as soon as possible. The duration of handling should be as short as possible as handling procedures that are quick, even if they are potentially painful, may have less affect on stress levels than longer, less invasive procedures.

Amphibian handling guidelines:

Passive Integrated Transponder (PIT):

- Toe clipping or PIT tagging is likely to increase the risk of transmitting disease between frogs due to the possibility of directly introducing pathogens into the frogs' system.
- When handling amphibians, the handler should wear unused disposable gloves (refer to section on Gloves p.3) or capture and handle frogs in single use lightweight plastic bags.
- Bare hands may be used provided they are wiped before each capture with a sterilising alcohol-based hand disinfectant.

This can be minimised by:

  - using disposable sterile instruments;
  - using instruments disinfected previously and used once;
  - using instruments disinfected in between each frog (refer Table 1);
  - sealing open wounds from toe clipping and PIT tagging with a cyanoacrylate compound such as *Vetbond*™ to reduce the likelihood of entry of pathogens;
  - applying topical anaesthetic *Xylocaine*™ cream and an iodine-based disinfectant solution before and after any surgical procedure is recommended. This should then be followed by the wound sealant;
  - storing all used disinfecting solutions, gloves and other disposable items in a waste container and disposed appropriately at the completion of fieldwork.

- Disinfecting solutions must not come into contact with frogs or be permitted to contaminate any water bodies.

Recommended disinfection strategies (refer Table 1) are available for a range of purposes to reduce risks associated with the amphibian chytrid fungus and ranaviruses.

Swabbing protocol:

Frogs are susceptible to handling stress, which is most likely due to changes in their body temperature. The following techniques are recommended to be followed when swabbing:

- Capture the frog by hand using sterile gloves, clean hands or clean plastic (freezer) bags, with minimal handling time (no more than 30 seconds).
- Transfer the frog into a clean, small plastic clip-seal bag, insert the swab, and close the seal as far as possible. At all times, handle the bag by the corners to minimise heat-transfer from the captor's hands to the frog.
- As the frogs will typically climb upwards, invert the bag.
- Coax the frog into one of the top corners using the swab.
- Swab the frog by rubbing firmly with the swab the body areas to be sampled (*e.g.* venter, underside of legs, hands and feet).

If, at any time, the frog shows signs of undue stress, such as loss or reduction of limb function, seal the bag in which it is housed and cease handling immediately. Keep the animal under observation in a safe place until it recovers. Once the animal appears healthy, release it without further handling.

Disinfecting procedures

Equipment such as wetsuits, waders, footwear, nets, buckets, vehicles and surgical equipment may act as carriers of disease, particularly if used in multiple sites.

Household bleach (refer Table 1) is recommended for disinfection as it is widely available and is easy to dispose of under field conditions if proper precautions are followed (refer p4). There are other disinfectants as outlined in Table 1 that have been tested and shown to kill target pathogens. It is important to ensure that disinfectants do not leave any residue on equipment, as the residue can be harmful to frogs and their environment.

Table 1: Disinfecting procedures

Application	Disinfectant	Concentration	Time	Method Target	Pathogen
Surgical equipment	Benzalkonium chloride	2mg/ml	1 min	Immerse	*B.dendrobatidis*
	Ethanol	70%	1 min	Immerse	*B.dendrobatidis* Ranaviruses
Collection containers, equipment, vehicles	Sodium hypochlorite* (bleach)	4%	15 min	Immerse	Ranaviruses
	Sodium hypochlorite* (bleach)	1%	1 min	Immerse	*B. dendrobatidis*
	Didecyl dimethyl ammonium chloride	1 in 500 dilution	0.5 min	Immerse	*B. dendrobatidis*
	TriGene™	1 in 5000 dilution	1 min	Immerse	*B. dendrobatidis*
	F10™ #	1 in 1500 dilution	1 min	Immerse	*B. dendrobatidis*
	Virkon™	2 mg/ml	1 min	Immerse	*B. dendrobatidis* Ranaviruses
	Complete drying		>3 hr		*B. dendrobatidis*
	Heat	60^{o}C	30 min		*B. dendrobatidis* Ranaviruses
	Heat	37^{o}C	8 hr		*B. dendrobatidis*
	Sterilising UV light		1 min		Ranaviruses only
Footwear	Sodium hypochlorite* (bleach)	1%	1 min	Scrub/spray footwear	*B. dendrobatidis*
	Sodium hypochlorite* (bleach)	4%	15 min	Immerse footwear	Ranaviruses
	Didecyl dimethyl ammonium chloride	1 in 500 dilution	0.5 min	Scrub/spray footwear	*B. dendrobatidis*
	TriGene™	1 in 5000 dilution	1 min	Scrub footwear	*B. dendrobatidis*
	F10™ #	1 in 1500 dilution	1 min	Scrub footwear	*B. dendrobatidis*
	Complete drying		>3 hr		*B. dendrobatidis*
Cloth (e.g. carry bags)	Hot wash	60^{o}C or greater	30 min		*B. dendrobatidis* Ranaviruses

*See Equipment section (p4) for recommended in-field disposal methods for bleach.

F10 has been used to treat fungal infections in reptiles and birds, but there does not appear to be data on its safety for amphibians. Caution is recommended when using this product.

Handling of captive amphibians

The greatest risk of transmission of infectious agents is when amphibians are placed

1) together in contact,
2) in the same container or
3) in reused containers without disinfection between animals.

When it is necessary for frogs or tadpoles to be collected and held for a period of time, the following measures must be undertaken:

- Animals obtained at different sites are to be kept isolated from each other and from other captive animals;
- Aquaria set up to hold frogs should not share water, equipment or any filtration system.
- Splashes of water from adjacent enclosures or drops of water on nets may transfer pathogens between enclosures;
- Prior to housing frogs or tadpoles, ensure that tanks, aquaria and any associated equipment are disinfected;
- Tanks (and associated equipment) must be sterilised, disinfected and dried immediately after frogs/tadpoles are removed; and
- All equipment must be thoroughly sterilised (or discarded if disposable) between animals when dealing with animals from different enclosures.
- If there is no water available for washing hands between amphibians, the handler should wear unused disposable gloves, or wear an unused plastic bag, or wipe their hands with a sterilising alcohol-based hand disinfectant between amphibians. Ideally, new gloves should be worn for each specimen, as disinfecting will not harm the pathogens DNA, producing potentially false-positive results if testing for disease.
- No more than one terrestrial individual should be held in the same container simultaneously.
- Tadpoles for release should not be held with batches of tadpoles collected from other sites in the same or different water bodies.
- Dead amphibians or amphibians that are obviously ill should be regarded as a higher infection risk than clinically normal amphibians and should be handled with gloves or plastic bags.

Basic guidelines for captive amphibians

The risk levels vary according to the conditions in which the frogs are kept. Some examples are:

- Low risk level: single indoors frog cage.
- Higher risk: frog cages in the house, frog pond outside.
- Very high risk: frog cages indoors, frog pond outside; also trading/swapping/conducting frog rescue/quarantine.

Whichever scenario applies, some basic principles to follow are:

- Keep your frogs at a continually reasonable level of quarantine by having a two-way isolation between cages, and between them and your garden.
- Have an intensive level of quarantine for new frogs and for cages in which a frog has become ill or died.
- Service the least likely to be infected cages first, as spreading even a droplet of water from an infected cage to a healthy one is all that it takes for disease transmission.
- Limit the number of frogs you collect and keep your hands out of their cages as much as possible. Look for screw-on or plug-in food jars which can be changed outside of the cage.
- Keep ants out of the frog enclosures as they have the potential to transport pathogens.
- Do not empty waste water from the enclosures into stormwater drains or onto your garden. Pour into the toilet and wrap solid waste and put into the bin.
- Maintain your frogs' health and resistance to disease by looking after them properly.

Sick or dead frogs

Frogs may be diagnosed by using some basic identifiers in the following table:

TEST	HEALTHY	SICK
Gently touch with finger	Frog will blink	Frog will not blink above the eye
Turn frog on its back	Frog will flip back over	Frog will remain on its back
Hold frog gently by its mouth	Frog will use its forelimbs to try to remove grip	No response from frog

Sick or dead frogs found in the wild should be collected and disposed of using the following procedures described below:

- Use disposable gloves or plastic bags and avoid handling food or touching your mouth or eyes.
- New gloves or plastic bags should be used for each frog specimen.
- If the frog is dead, keep the specimen cool and preserve as soon as possible to slow decomposition
- If the frog is alive but unlikely to survive transportation, euthanize the frog and place in a freezer. Once frozen, it is ready for transportation to the appropriate officials for diagnosis.
- If the frog is alive and likely to survive transportation, place it in a moistened cloth bag with some damp leaf litter and transport to the appropriate officials for diagnosis.

When in doubt, the precautionary principle should be used, along with the highest standard of cleanliness possible. Additional time spent ensuring proper disinfecting of equipment is always recommended.

Literature cited

Berger L. Diseases in Australian Frogs [PhD thesis]. Townsville, Australia. James Cook University: Townsville. 2001.

Brem, F., Mendelson III J.R. and Lips, K.R. (2007) Field sampling protocol for Batrachochytrium dendrobatidis from living amphibianS, using alcohol preserved swabs. Version 1.0 918 July 2007) Electronic document available at http://amphibians.org Conservation International, Arlington, Virginia, USA.

Ecosystems Branch, Ministry of Environment, British Columbia (2008) Standard Operating Procedures: Hygiene protocols for amphibian fieldwork. Accessed online at http://www.env.gov.bc.ca/wld/documents/wldhealth/BC on 5th September 2008.

Johnson M, Berger L, Philips L, Speare R. Fungicidal effects of chemical disinfectants, UV light, dessication and heat on the amphibian chytrid, Batrachochytrium dendrobatidis. Diseases of Aquatic Organisms 2003;57:255-260.

Fallon, M. (year unknown) Working with Amphibians in a Research Setting. Accessed online at http://www.researchtraining.org on 5th September 2008.

Langdon JS. Experimental transmission and pathogenicity of epizootic haematopoietic necrosis virus (EHNV) in red fin perch, Perca fluviatilis L., and 11 other teleosts. Journal of Fish Diseases 1989;12:295-310.

Miocevic I, Smith J, Owens L, Speare R. Ultraviolet sterilisation of model viruses important to finfish aquaculture in Australia. Australian Veterinary Journal 1993;70:25-27.

NSW National Parks and Wildlife Service (2001). Hygiene protocol for the control of disease in frogs. Information Circular Number 6. NSW NPWS, Hurstville NSW

Queensland Frog Society Inc. Information accessed online at http://www.qldfrogs.asn.au/ on September 5th 2008.

Spear, R., Berger, L., Skerratt, LF., Alford, R., Mendez, D., Cashins, S., Kenyon, N., Hauselberger, K. and Rowley, J (2004). Hygiene protocol for handling amphibians in field studies, Amphibian Diseases Group, James Cook University, Townsville.

Voigt, L. (2006). Frog hygiene for captive frogs. The frog and tadpole study group of New South Wales Inc. (FATS GROUP), Rockdale, New South Wales.

Webb R, Mendez D, Berger L, Speare R. Additional disinfectants effective against the amphibian chytrid fungus Batrachochytrium dendrobatidis. Diseases of Aquatic Organisms 2007;74:13-16.