Proposal for Stage One Dioxin Survey in Noosa Area

Water Quality and Investigation Sciences

Introduction

This document outlines the Stage One proposal for sampling the dioxin TCDD in the Noosa River. There have been concerns raised by members of the Noosa community that historical usage of the pesticide 2,4-D and 2,4,5-T in the forestry industry in the Noosa catchment has contaminated the river with TCDD. There is some evidence that TCDD is a contaminant in 2,4-D. TCDD cannot be analysed on its own, and so a standard suite of dioxins and furans will be analysed.

Dioxins and furans are persistent organic pollutants (POPs) and are ubiquitous. They are formed by combustion process (e.g. bushfires, sugar cane burns and motor vehicle emissions) as well as being a bi-products of manufacturing (such as the production of pesticides). Dioxins are insoluble in water, and so will be found in sediments and biota in the aquatic environment. The National Dioxin Survey found the presence of dioxins in every sediment sample that was tested (Muller et al 2004).

There are guidelines for TCDD in sediments and so the best way to assess the results from this survey is to compare the dioxin results to those reported in the National Dioxin Program's *Dioxins in Aquatic Environments in Australia* (Muller et al 2004). Therefore, the sampling design and methodology outlined in this document will be followed.

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Sampling Sites

Five sites in the Noosa River are downstream of historic forestry were chosen (Figure One) as well as two control sites in the Cooloola National Park (Figure Two). Lakes were chosen as these are likely to be sinks for contaminated sediments.

Sampling Strategy

Sampling will follow that outlined in the *Dioxins in Aquatic Environments in Australia* (Muller et al 2004) technical report. Ten samples will be collected at each site using a standardised coring device comprising aluminium tubes (15 cm length, 2.8 cm diameter) attached to a sediment coring device which collected a shallow profile (10 cm depth) of surface sediment. These samples will be composited prior to sending them to the laboratory. Samples will be collected in a triangular formation and will be approximately 25 m apart. Samples will be split and three blind duplicates will be sent to the main analytical laboratory and three will be send to a second laboratory. As well as dioxins, particle size distribution and total organic carbon analysis will be undertaken on each sample.

Budget

The total budget for the sampling and analysis is $15, 633 (exc. GST) (Table One).

References

Müeller J, Muller R, Goudkamp K, Shaw M, Mortimer M, Haynes D, Paxman C, Hyne R, McTaggart A, Burniston D, Symons R & Moore M 2004, *Dioxins in Aquatic Environments in Australia*, National Dioxins Program Technical Report No. 6, Australian Government Department of the Environment and Heritage, Canberra.

Queensland Government

Table One: Budget summary

	No. Samples	Cost per sample	Total cost
Dioxin Analysis Laboratory One	10	850	8500
Dioxin Analysis Laboratory Two	3	1521	4563
PSD Analysis	10	36	360
TOC Analysis	10	21	210
Accommodation (2 nights, three people)			
Travel allowance			800
Hotels			1200
Grand total			$15, 633

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Figure One: Sites in the Noosa River Catchment downstream of historical forestry.

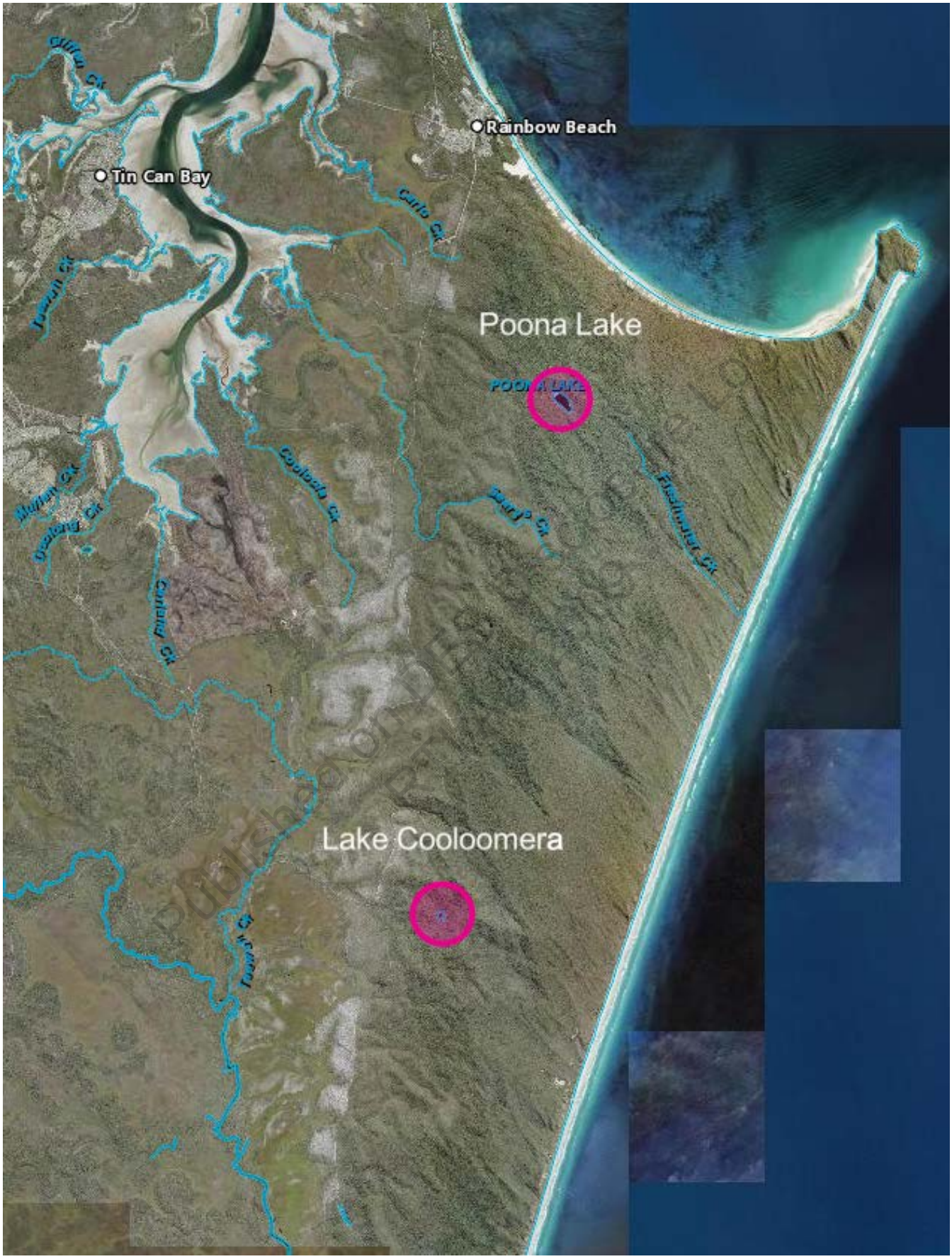

Figure Two: Control sites in the Cooloola National Park

Proposal for Stage Two Dioxin Survey in Noosa Area

Water Quality and Investigations

Introduction

This document outlines the Stage Two Proposal for sampling the dioxins in the Noosa River area. There have been concerns raised by members of the Noosa community that historical usage of the pesticide 2,4-D and 2,4,5-T in the forestry industry in the Noosa catchment has contaminated the river with TCDD. There is some evidence that TCDD is a contaminant in 2,4-D and is a known contaminant in 2,4,5-T. TCDD cannot be analysed on its own, and so a standard suite of dioxins and furans will be analysed.

Dioxins and furans are persistent organic pollutants (POPs) and are ubiquitous. They are formed by combustion process (e.g. bushfires, sugar cane burns and motor vehicle emissions) as well as being bi-products of manufacturing (such as the production of pesticides). Dioxins are insoluble in water, and so will be found in sediments and biota in the aquatic environment. The National Dioxin Survey found the presence of dioxins in every sediment sample that was tested (Müller et al. 2004).

In February 2020, a sediment sampling program was undertaken in the Noosa River area in order to investigate the community concerns about TCDD. As there are no guidelines for TCDD in sediments, sediments were collected in the same manner as outlined in the National Dioxin Program's *Dioxins in Aquatic Environments in Australia* (Mueller et al. 2004). This allowed results to be compared to those found throughout Australia during that survey.

TCDD was not measured at five of the sites surveyed, but was found around the limit of reporting at Lake Cootharaba - North (duplicates were <0.05 and 0.7 pg/g) and at higher concentrations in Lake Weyba (2.7 and 4.4 pg/g). The Toxic Equivalentsϒ at Lake Weyba were 38.77 and 77.01 pg TEQ/g. Initial results indicate that TCDD and the TEQ measured at Lake Weyba are equivalent to those found in Port Jackson and Botany Bay (Vardy in prep.). Although a preliminary assessment, these results indicate that further biota sampling should be undertaken. Oysters and fish were both collected in the National Dioxin Program, and it suggested they are collected for this program. Depending upon results, further sampling may be required.

As Lake Weyba is not in an area that has historical forestry or industry, it is believed that the elevated dioxins in this area may be due to recent fires (Figure 2). However, this further investigation is needed.

Sampling Strategy

Sampling will follow that outlined in the *Dioxins in Aquatic Environments in Australia* (Müller et al. 2004) technical report. It is suggested oysters and fish be sampled. Approximately 30 individuals or a minimum of 200 g of oyster flesh will be collected and pooled to make one composite sample for chemical analysis. Evaluation of dioxin-like chemicals in commercially available fish samples should also be sampled. Flesh from five adult fish caught in the same location will be collected. Where available, flathead (Platycephalus spp.) should be targeted, along with another one locally caught species. Commercial fishers will be approached to collect samples for this study due to limitations in field work arising from the coronovirus.

Sample sites will be confirmed in consultation with Noosa Shire Council (in regards to oysters) and with Peter Kind, DAF (in regards to fish). It is suggested Lake Weyba, Lake Cootharaba and Tewantan are sampled.

Budget

The total budget for the analysis is approximately $ 10,140.00 (exc. GST) (Table One).

ϒ Toxic Equivalents (TEQs) report the toxicity-weighted masses of mixtures of dioxins and furans. The reported value provides toxicity information about the mixture of chemicals. TEQs reported here are based on WHO methods and include half the limit of reporting.

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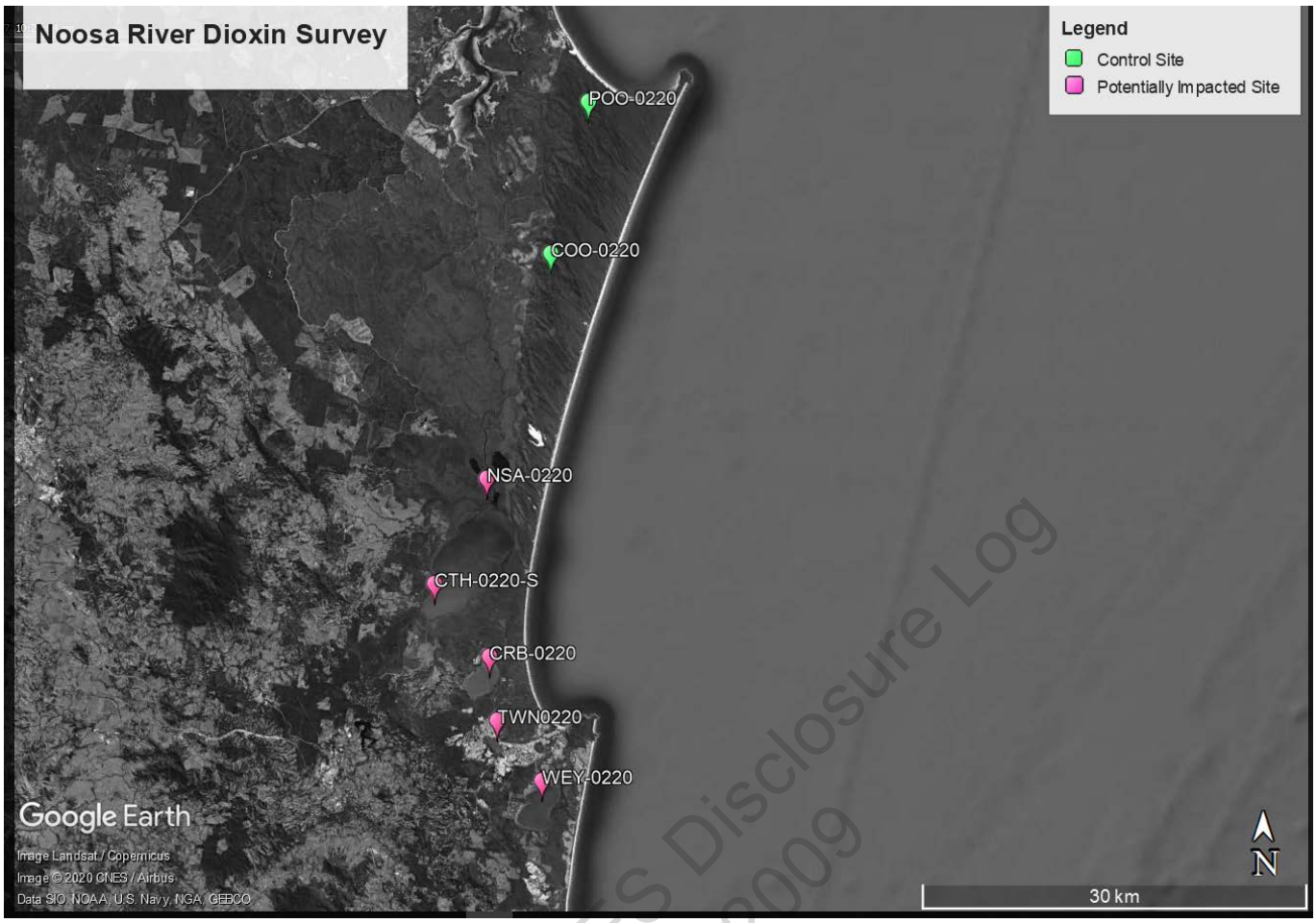

Figure One: Sites surveyed in the March 2020 Dioxin Survey in the Noosa River Area. Control sites: Lake Lake Weyba (WEY), Tewantin (TWN), Lake Cooroiba (CRB), Lake Cootharaba - South (CTH-S), Lake Cootharaba -north (NSA), Lake Poona (POO), Lake Coolamera (COO).

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References

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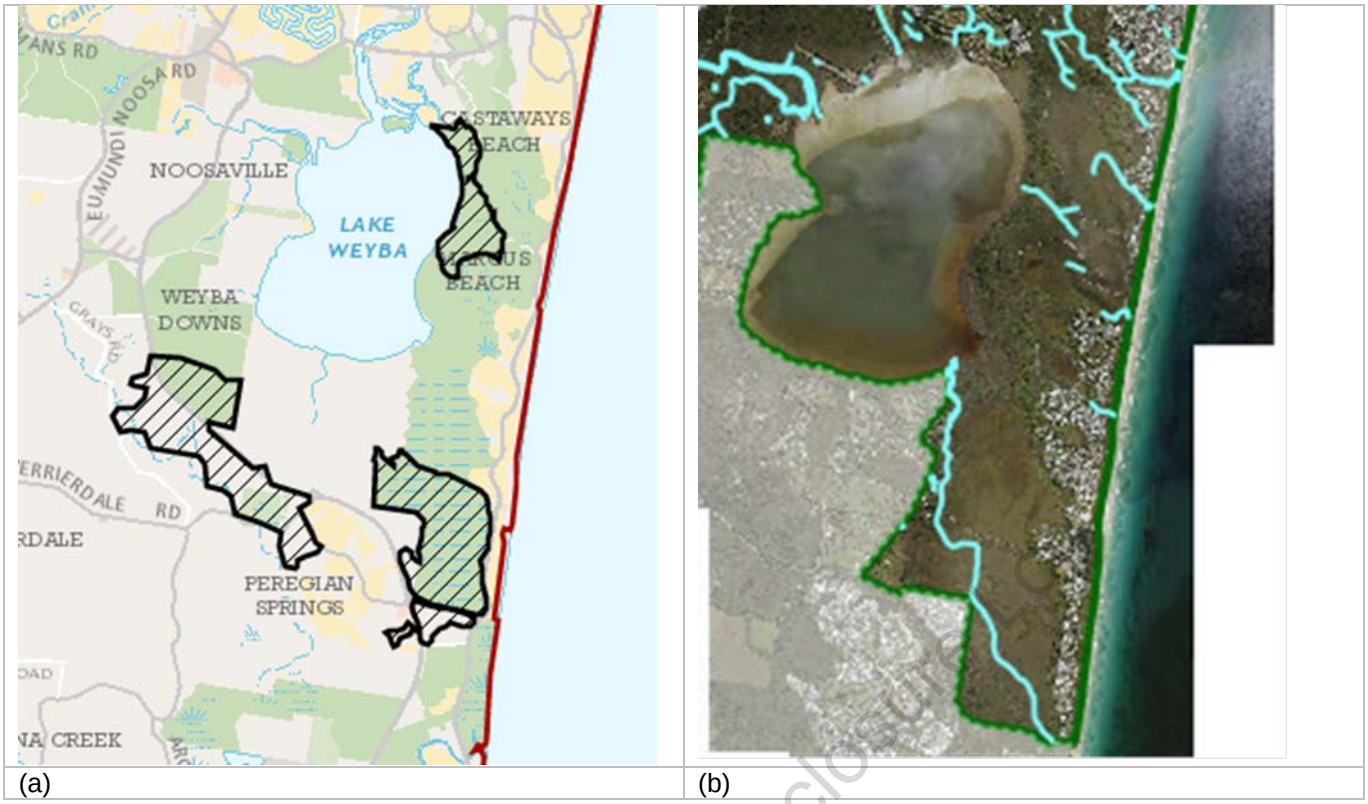

(a) (b)

Figure Two: (a) Areas known to have burnt in late 2019 around Lake Weyba and (b) a drainage line from the first Peregian Fire area flowing to Murdering Creek then Lake Weyba.

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Table One: Budget summary

	No. Samples	Cost per sample	Total cost
Analysis			
Dioxin Analysis Oysters (two sites)	2	1690	3380
Dioxin Analysis Fish One (two sites)	2	1690	3380
Dioxin Analysis Fish Two (two sites)	2	1690	3380
Grand total (excluding GST)			$ 10,140.00

Agreement

Title	Position	Signature	Date
Liz Young	Director, Sustainable Environment		
Christian Witte	Director, EMAS		

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Proposal for Stage Two Dioxin Survey in Noosa Area - Biota

Water Quality and Investigations

Introduction

This document outlines the Stage Two Proposal for sampling dioxins in the Noosa River area. There have been concerns raised by members of the Noosa community that historical usage of the pesticide 2,4-D and 2,4,5-T in the forestry industry in the Noosa catchment has contaminated the river with TCDD. There is some evidence that TCDD is a contaminant in 2,4-D and is a known contaminant in 2,4,5-T. TCDD cannot be analysed on its own, and so a standard suite of dioxins and furans will be analysed.

Dioxins and furans are persistent organic pollutants (POPs) and are ubiquitous. They are formed by combustion process (e.g. bushfires, sugar cane burns and motor vehicle emissions) as well as being bi-products of manufacturing (such as the production of pesticides). Dioxins are insoluble in water, and so will be found in sediments and biota in the aquatic environment.

In February 2020, a sediment sampling program was undertaken in the Noosa River area in order to investigate the community concerns about TCDD. As there are no guidelines for TCDD in sediments, sediments were collected in the same manner as outlined in the National Dioxin Program's *Dioxins in Aquatic Environments in Australia* (Mueller et al. 2004). This allowed results to be compared to those found throughout Australia during that survey.

TCDD was not detected at five of the sites surveyed, but was found around the limit of reporting at Lake Cootharaba - North (duplicates were <0.05 and 0.7 pg/g) and at higher concentrations in Lake Weyba (2.7 and 4.4 pg/g) (Figure One). The Toxic Equivalents ϒ at Lake Weyba were 38.77 and 77.01 pg TEQ/g. Initial results indicate that TCDD and the TEQ measured at Lake Weyba are equivalent to those found in Port Jackson and Botany Bay (Vardy in prep.). These results indicate that further biota sampling should be undertaken. Oysters and fish were both collected in the National Dioxin Program, and we recommend that they are collected for this program also. In addition, mud crabs are caught commercially in the area and as they burrow into the mud during the day are potentially exposed to the dioxins.

As Lake Weyba is not in an area that has historical forestry or industry, it is believed that the elevated dioxins in this area may be due to recent fires. However, further investigation is needed.

Sampling Strategy

Sampling will follow that outlined in the *Dioxins in Aquatic Environments in Australia* (Mueller et al. 2004) technical report. Approximately 30 individuals or a minimum of 200 g of oyster flesh will be collected and pooled to make one composite sample for chemical analysis. Flesh from five adult fish and five mud crabs caught at each location will also collected and composited. Where available, flathead (*Platycephalus* spp.) will be targeted as this species does not move around as much as some other commercial species (Peter Kind DAF) and are bottom dwelling species. Because there are current travel restriction related to COVID 19, commercial fishers will be approached to collect samples for this study. It is suggested that samples are collected from Lake Weyba, Lake Cootharaba and Lake Cooroiba as these areas are where commercial fisheries occur.

Budget

The total budget for the analysis is approximately $ 16,731 (inc. GST) (Table One).

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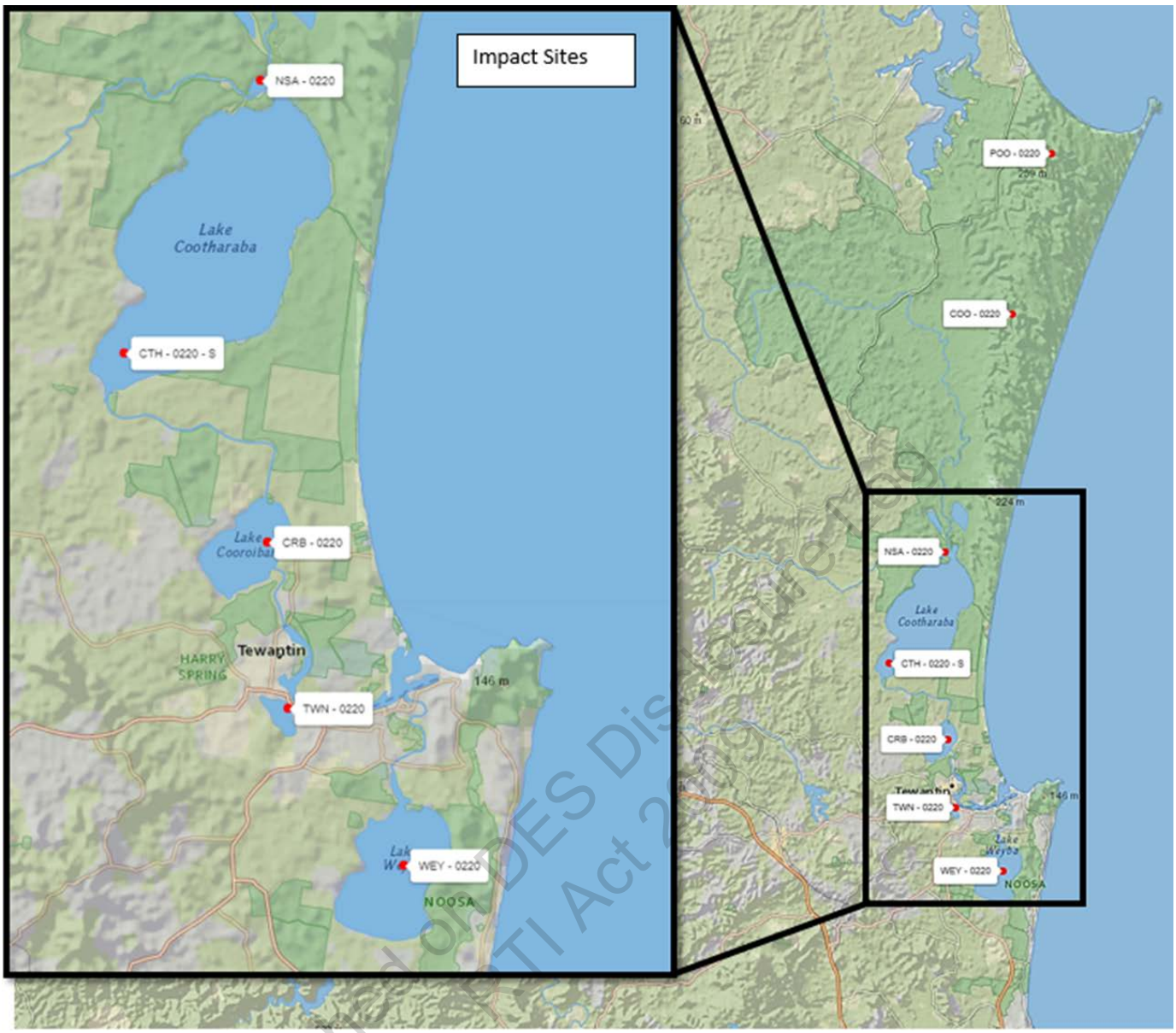

Figure One: Potentially impacted sites sampled in February 2020: Lake Weyba (WEY), Tewantin (TWN), Lake Cooroiba (CRB), Lake Cootharaba - South (CTH-S), Lake Cootharaba - north (NSA),

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Table One: Budget summary

	No. Samples	Cost per sample	Total cost
Dioxin Analysis Oysters (three sites)	3	$ 1, 690	$ 5,070
Dioxin Analysis Flathead (three sites)	3	$ 1, 690	$ 5,070
Dioxin Analysis Mud Crab (three sites)	3	$ 1, 690	$ 5,070
Grand total (excluding GST)			$ 15,210
Grand total (including GST)			$ 16,731

References

Mueller J, Muller R, Goudkamp K, Shaw M, Mortimer M, Haynes D, Paxman C, Hyne R, McTaggart A, Burniston D, Symons R & Moore M 2004, *Dioxins in Aquatic Environments in Australia*, National Dioxins Program Technical Report No. 6, Australian Government Department of the Environment and Heritage, Canberra.

Agreement

Title	Position	Signature	Date
Liz Young	Director, Sustainable Environment		
Christian Witte	Director, EMAS		

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Proposal for Stage Two Dioxin Survey in Noosa Area - Biota

Water Quality and Investigations

Introduction

This document outlines the Stage Two Proposal for sampling dioxins in the Noosa River area. There have been concerns raised by members of the Noosa community that historical usage of the pesticide 2,4-D and 2,4,5-T in the forestry industry in the Noosa catchment has contaminated the river with TCDD. There is some evidence that TCDD is a contaminant in 2,4-D and is a known contaminant in 2,4,5-T. TCDD cannot be analysed on its own, and so a standard suite of dioxins and furans will be analysed.

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TCDD was not detected at five of the sites surveyed, but was found around the limit of reporting at Lake Cootharaba - North (duplicates were <0.05 and 0.7 pg/g) and at higher concentrations in Lake Weyba (2.7 and 4.4 pg/g). The Toxic Equivalents[ϒ] at Lake Weyba were 38.77 and 77.01 pg TEQ/g. Initial results indicate that TCDD and the TEQ measured at Lake Weyba are equivalent to those found in Port Jackson and Botany Bay (Vardy in prep.). These results indicate that further biota sampling should be undertaken. Oysters and fish were both collected in the National Dioxin Program, and we recommend that they are collected for this program also. In addition, mud crabs are caught commercially in the area and as they burrow into the mud during the day are potentially exposed to the dioxins.

As Lake Weyba is not in an area that has historical forestry or industry, it is believed that the elevated dioxins in this area may be due to recent fires (Figure 2). However, further investigation is needed.

Sampling Strategy

Sampling will follow that outlined in the *Dioxins in Aquatic Environments in Australia* (Mueller et al. 2004) technical report. Approximately 30 individuals or a minimum of 200 g of oyster flesh will be collected and pooled to make one composite sample for chemical analysis. Flesh from five adult fish and five mud crabs caught at each location will also collected and composited. Where available, flathead (*Platycephalus* spp.) will be targeted as this species does not move around as much as some other commercial species (Peter Kind DAF) and are bottom dwelling species. Because there are current travel restriction related to COVID 19, commercial fishers will be approached to collect samples for this study. It is suggested that samples are collected from Lake Weyba, Lake Cootharaba and Lake Coroiba as these areas are where commercial fisheries occur.

Budget

The total budget for the analysis is approximately $ 16,731 (inc. GST) (Table One).

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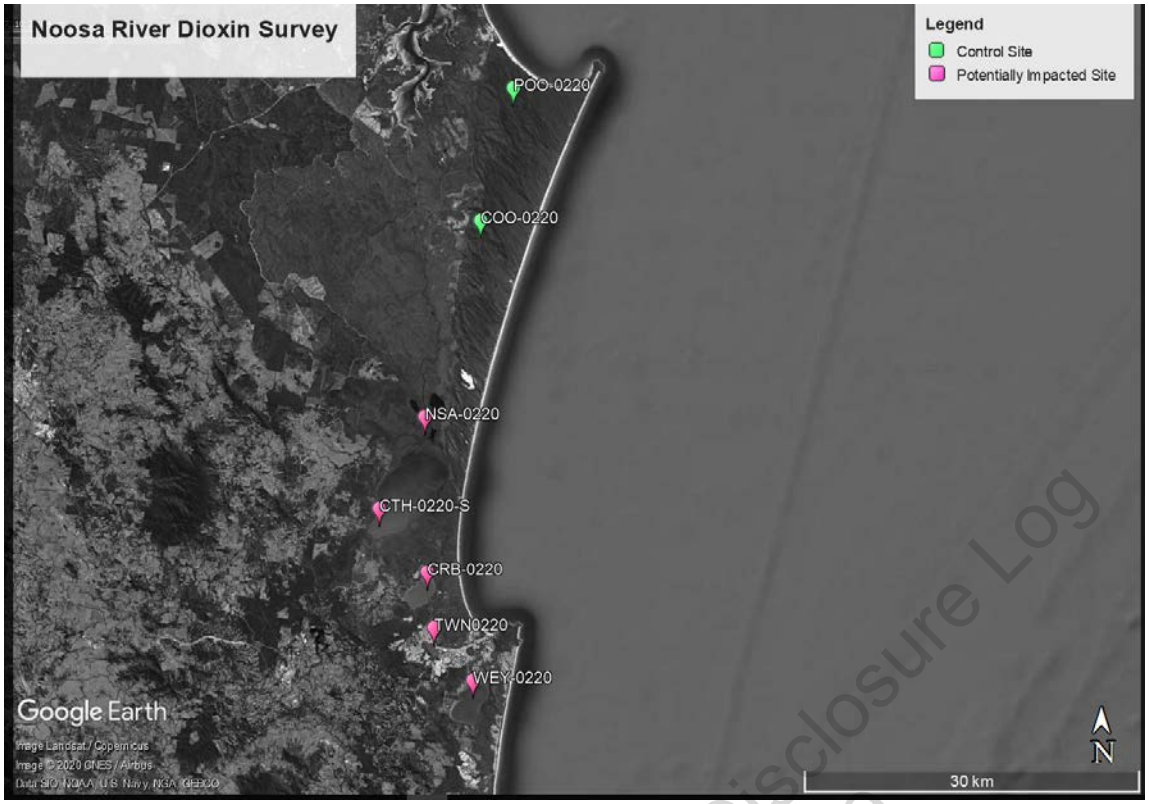

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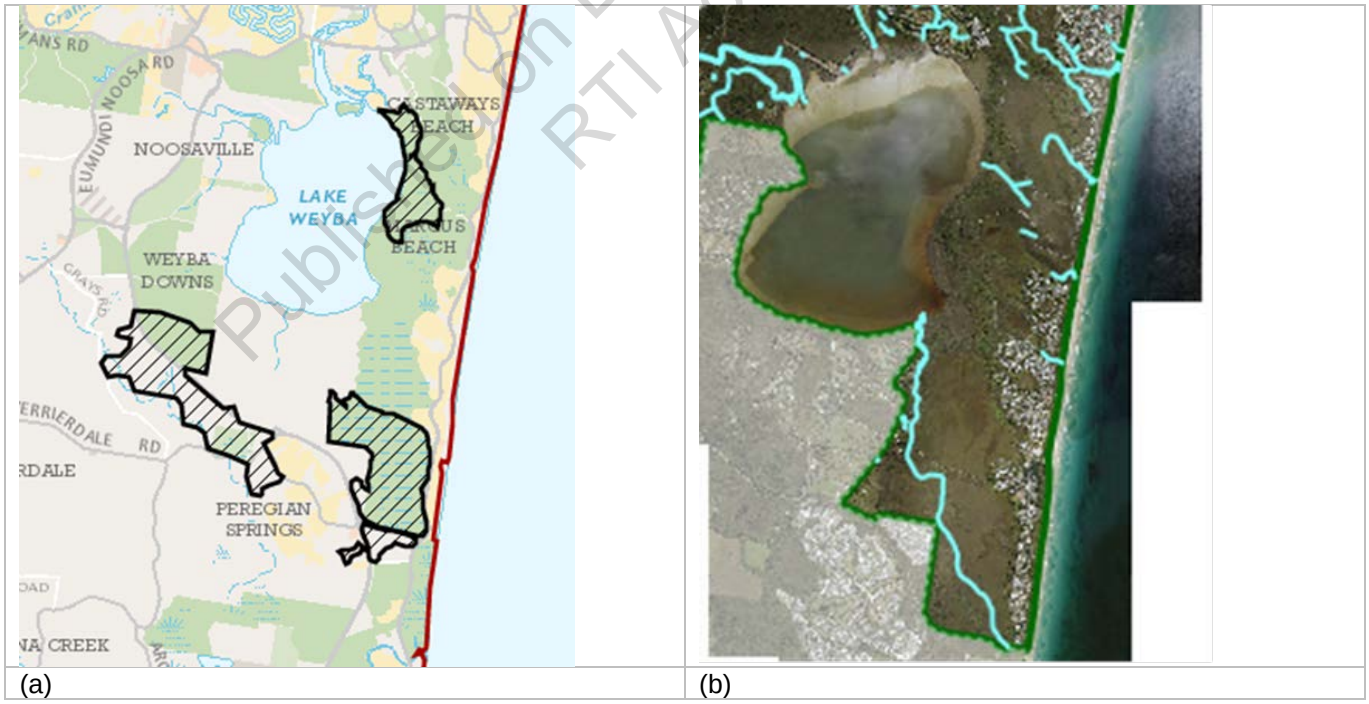

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Agreement

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Liz Young	Director, Sustainable Environment		
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Proposal for Stage Two Dioxin Survey in Noosa Area - Biota

Water Quality and Investigations

Introduction

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Sampling Strategy

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Budget

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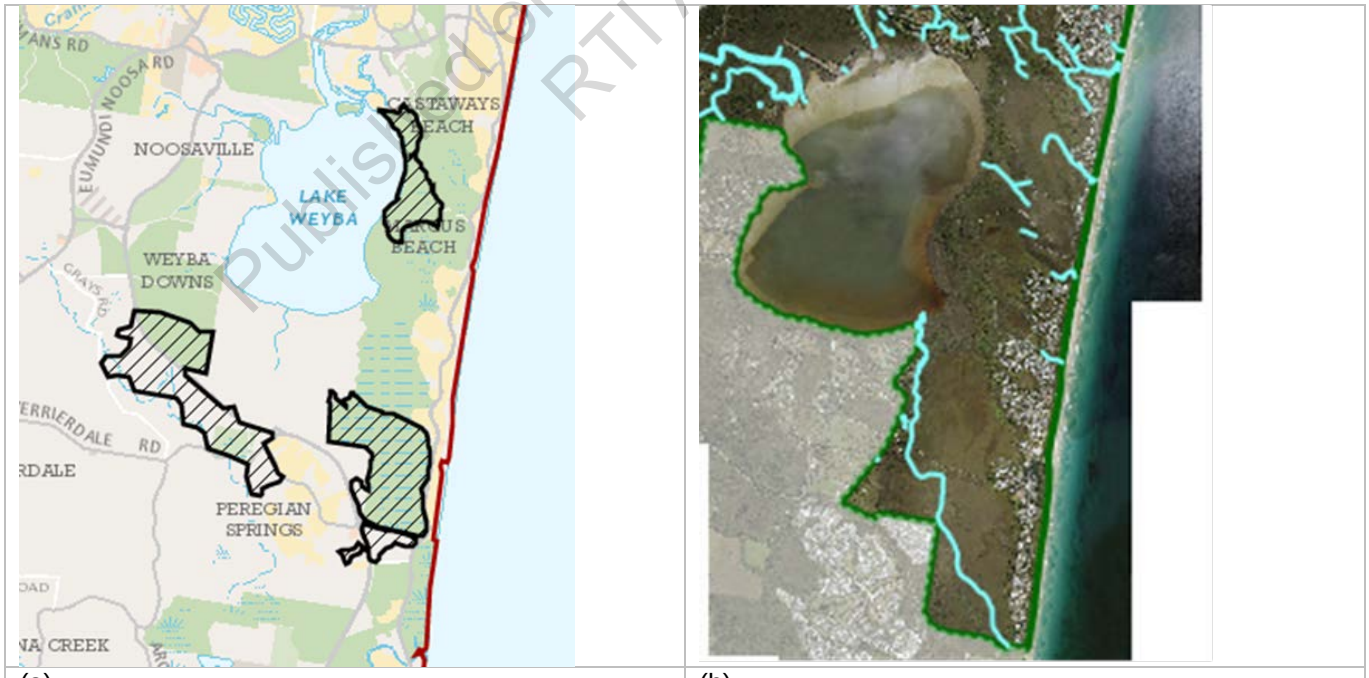

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Agreement

Title	Position	Signature	Date
Liz Young	Director, Sustainable Environment		
Christian Witte	Director, EMAS		

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Proposal for Stage Two Dioxin Survey in Noosa Area

Water Quality and Investigations

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Commented [MR1]: Is this symbol supposed to indicate the footnote - it took me a minute to work that out - perhaps superscript

Formatted: Subtle Emphasis

Commented [MR2]: I understand you want to maintain consistency with the Dioxin Survey methods, but we had discussed the collection of benthic molluscs. Is that out the window now?

Commented [MR3]: That's three sites - and the table below indicates two

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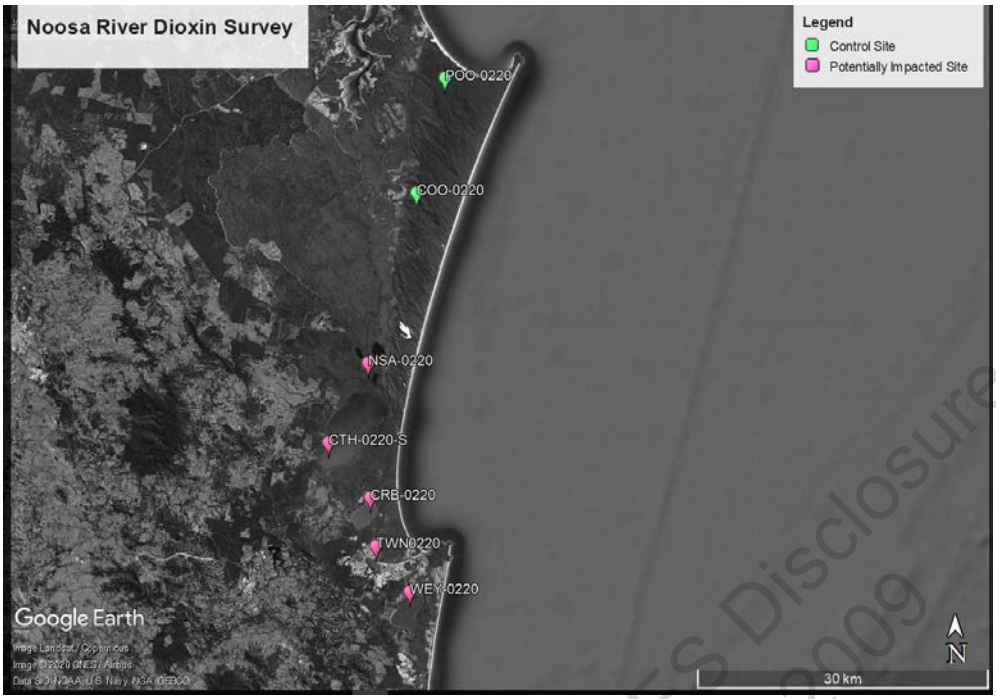

Figure One: Sites surveyed in the March 2020 Dioxin Survey in the Noosa River Area. Control sites: Lake Lake Weyba (WEY), Tewantin (TWN), Lake Cooroiba (CRB), Lake Cootharaba - South (CTH-S), Lake Cootharaba -north (NSA), Lake Poona (POO), Lake Coolamera (COO).

References

Müller J, Muller R, Goudkamp K, Shaw M, Mortimer M, Haynes D, Paxman C, Hyne R, McTaggart A, Burniston D, Symons R & Moore M 2004, *Dioxins in Aquatic Environments in Australia*, National Dioxins Program Technical Report No. 6, Australian Government Department of the Environment and Heritage, Canberra.

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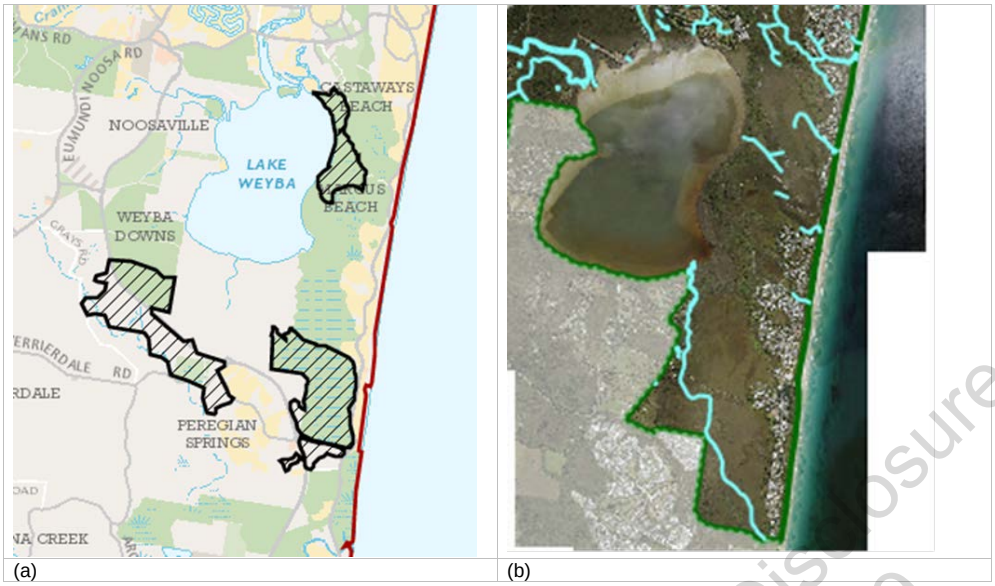

(a) (b)

Figure Two: (a) Areas known to have burnt in late 2019 around Lake Weyba and (b) a drainage line from the first Peregian Fire area flowing to Murdering Creek then Lake Weyba.

Table One: Budget summary

	No. Samples	Cost per sample	Total cost
Analysis			
Dioxin Analysis Oysters (two sites)	2	1690	3380
Dioxin Analysis Fish One (two sites)	2	1690	3380
Dioxin Analysis Fish Two (two sites)	2	1690	3380
Grand total (excluding GST)			$ 10,140.00

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Agreement

Title	Position	Signature	Date
Liz Young	Director, Sustainable Environment		
Christian Witte	Director, EMAS		

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Proposal for Stage One Dioxin Survey in Noosa Area

Water Quality and Investigation Sciences

Introduction

This document outlines the Stage One proposal for sampling the dioxin TCDD in the Noosa River. There have been concerns raised by members of the Noosa community that historical usage of the pesticide 2,4-D and 2,4,5-T in the forestry industry in the Noosa catchment has contaminated the river with TCDD. There is some evidence that TCDD is a contaminant in 2,4-D. TCDD cannot be analysed on its own, and so a standard suite of dioxins and furans will be analysed.

Dioxins and furans are persistent organic pollutants (POPs) and are ubiquitous. They are formed by combustion process (e.g. bushfires, sugar cane burns and motor vehicle emissions) as well as being a bi-products of manufacturing (such as the production of pesticides). Dioxins are insoluble in water, and so will be found in sediments and biota in the aquatic environment. The National Dioxin Survey found the presence of dioxins in every sediment sample that was tested (Muller et al 2004).

There are guidelines for TCDD in sediments and so the best way to assess the results from this survey is to compare the dioxin results to those reported in the National Dioxin Program's *Dioxins in Aquatic Environments in Australia* (Muller et al 2004). Therefore, the sampling design and methodology outlined in this document will be followed.

Sampling Sites

Five sites in the Noosa River are downstream of historic forestry were chosen (Figure One) as well as two control sites in the Cooloola National Park (Figure Two). Lakes were chosen as these are likely to be sinks for contaminated sediments.

Sampling Strategy

Sampling will follow that outlined in the *Dioxins in Aquatic Environments in Australia* (Muller et al 2004) technical report. Ten samples will be collected at each site using a standardised coring device comprising aluminium tubes (15 cm length, 2.8 cm diameter) attached to a sediment coring device which collected a shallow profile (10 cm depth) of surface sediment. These samples will be composited prior to sending them to the laboratory. Samples will be collected in a triangular formation and will be approximately 25 m apart. Samples will be split and three blind duplicates will be sent to the main analytical laboratory and three will be send to a second laboratory. As well as dioxins, particle size distribution and total organic carbon analysis will be undertaken on each sample.

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Budget

The total budget for the sampling and analysis is $15, 633 (exc. GST) (Table One).

References

Müeller J, Muller R, Goudkamp K, Shaw M, Mortimer M, Haynes D, Paxman C, Hyne R, McTaggart A, Burniston D, Symons R & Moore M 2004, *Dioxins in Aquatic Environments in Australia*, National Dioxins Program Technical Report No. 6, Australian Government Department of the Environment and Heritage, Canberra.

Figure One: Sites in the Noosa River Catchment downstream of historical forestry.

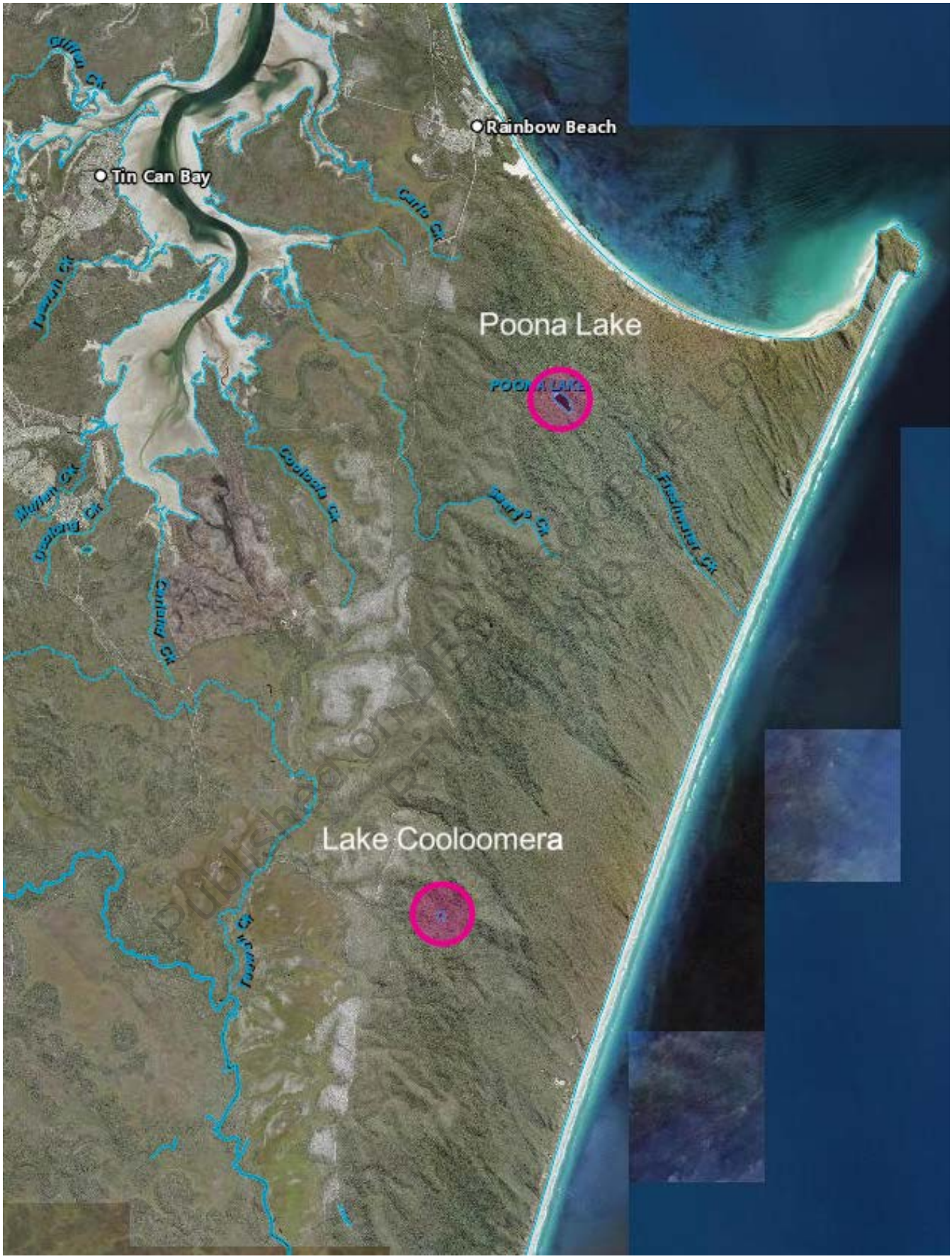

Figure Two: Control sites in the Cooloola National Park

Table One: Budget summary

	No. Samples	Cost per sample	Total cost
Dioxin Analysis Laboratory One	10	850	8500
Dioxin Analysis Laboratory Two	3	1521	4563
PSD Analysis	10	36	360
TOC Analysis	10	21	210
Accommodation (2 nights, three people)			
Travel allowance			800
Hotels			1200
Grand total			$15, 633

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Proposal for Stage One Dioxin Survey in Noosa Area

Water Quality and Investigations

Introduction

This document outlines the Stage One proposal for sampling the dioxin TCDD in the Noosa River. There have been concerns raised by members of the Noosa community that historical usage of the pesticide 2,4-D and 2,4,5-T in the forestry industry in the Noosa catchment has contaminated the river with TCDD. There is some evidence that TCDD is a contaminant in 2,4-D and is a known contaminant in 2,4,5-T. TCDD cannot be analysed on its own, and so a standard suite of dioxins and furans will be analysed.

Dioxins and furans are persistent organic pollutants (POPs) and are ubiquitous. They are formed by combustion process (e.g. bushfires, sugar cane burns and motor vehicle emissions) as well as being a bi-products of manufacturing (such as the production of pesticides). Dioxins are insoluble in water, and so will be found in sediments and biota in the aquatic environment. The National Dioxin Survey found the presence of dioxins in every sediment sample that was tested (Müller et al. 2004).

As there are no guidelines for TCDD in sediments, the best way to assess the results from this survey is to compare the dioxin results to those reported in the National Dioxin Program's *Dioxins in Aquatic Environments in Australia* (Müller et al. 2004). Therefore, the sampling design and methodology outlined in Müller et al. (2004) will be followed.

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Sampling Sites

Five sites downstream of historic forestry in the Noosa River were chosen (Figure One) for sediment sampling. Two additional control sites in the Cooloola National Park (Figure Two) were also selected. Lakes were chosen as these are likely to be sinks for contaminated sediments.

Sampling Strategy

Sampling will follow that outlined in the *Dioxins in Aquatic Environments in Australia* (Müller et al. 2004) technical report. Ten samples will be collected at each site using a standardised coring device, comprising aluminium tubes (15 cm length, 2.8 cm diameter) attached to a sediment coring device. This methods ensures the collection of sediment from a shallow profile (10 cm depth) of surface sediment. These samples will be composited prior to sending them to the laboratory. The ten samples will be collected in a triangular formation and will be approximately 25 m apart. At three sites samples will be split and sent as blind duplicates to the main analytical laboratory and to a second laboratory. As well as dioxins, particle size distribution and total organic carbon analysis will be undertaken on each sample.

Budget

The total budget for the sampling and analysis is $15, 633 (exc. GST) (Table One).

References

Müller J, Muller R, Goudkamp K, Shaw M, Mortimer M, Haynes D, Paxman C, Hyne R, McTaggart A, Burniston D, Symons R & Moore M 2004, *Dioxins in Aquatic Environments in Australia*, National Dioxins Program Technical Report No. 6, Australian Government Department of the Environment and Heritage, Canberra.

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Figure One: Sites in the Noosa River Catchment downstream of historical forestry.

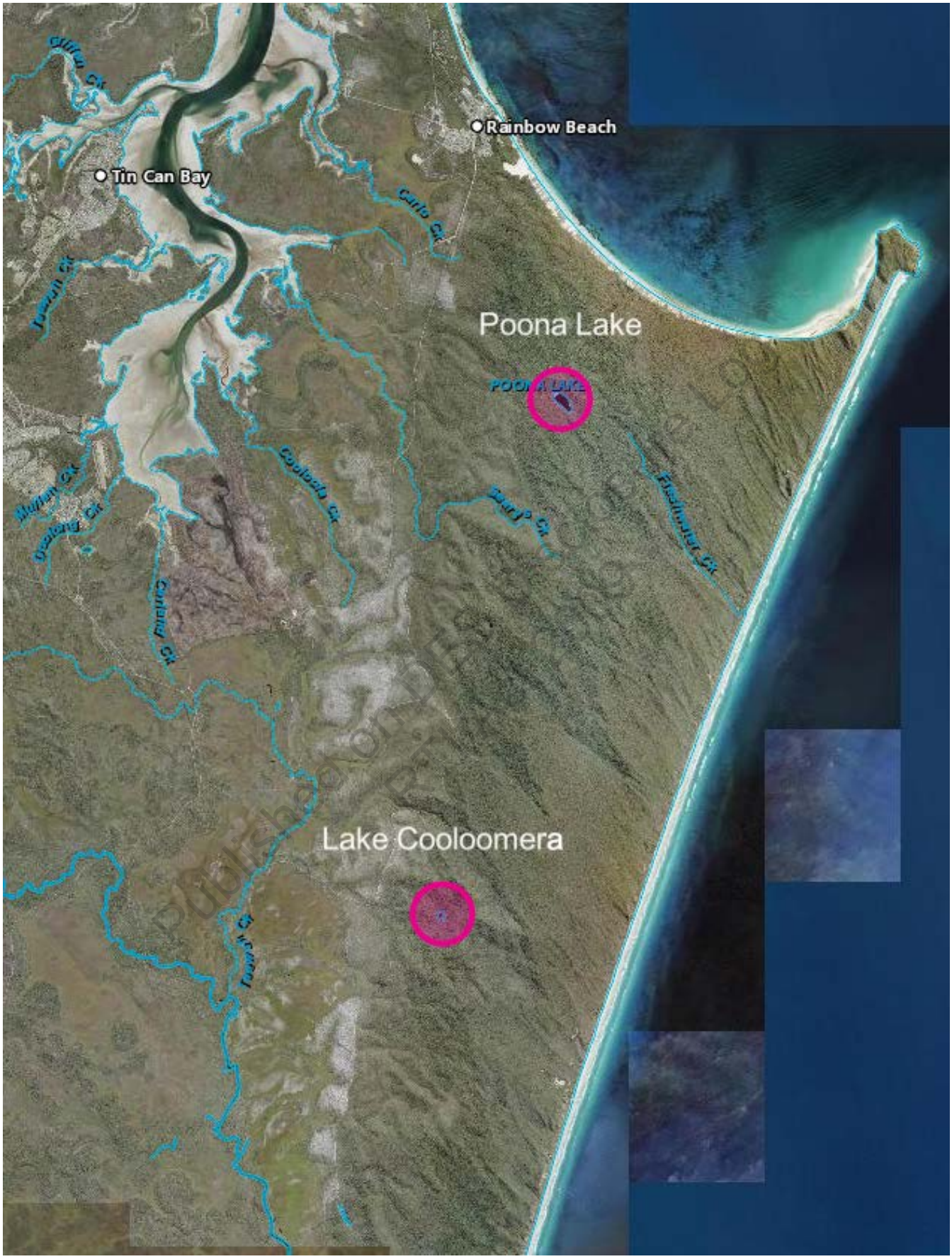

Figure Two: Control sites in the Cooloola National Park

Table One: Budget summary

	No. Samples	Cost per sample	Total cost
Dioxin Analysis Laboratory One	10	850	8500
Dioxin Analysis Laboratory Two	3	1521	4563
PSD Analysis	10	36	360
TOC Analysis	10	21	210
Accommodation (2 nights, three people)			
Travel allowance			800
Hotels			1200
Grand total			$15, 633

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Proposal for Stage One Dioxin Survey in Noosa Area

Water Quality and Investigations

Introduction

This document outlines the Stage One proposal for sampling the dioxin TCDD in the Noosa River. There have been concerns raised by members of the Noosa community that historical usage of the pesticide 2,4-D and 2,4,5-T in the forestry industry in the Noosa catchment has contaminated the river with TCDD. There is some evidence that TCDD is a contaminant in 2,4-D and is a known contaminant in 2,4,5-T. TCDD cannot be analysed on its own, and so a standard suite of dioxins and furans will be analysed.

Dioxins and furans are persistent organic pollutants (POPs) and are ubiquitous. They are formed by combustion process (e.g. bushfires, sugar cane burns and motor vehicle emissions) as well as being bi-products of manufacturing (such as the production of pesticides). Dioxins are insoluble in water, and so will be found in sediments and biota in the aquatic environment. The National Dioxin Survey found the presence of dioxins in every sediment sample that was tested (Müller et al. 2004).

As there are no guidelines for TCDD in sediments, the best way to assess the results from this survey is to compare the dioxin results to those reported in the National Dioxin Program's *Dioxins in Aquatic Environments in Australia* (Müller et al. 2004). Therefore, the sampling design and methodology outlined in Müller et al. (2004) will be followed.

Noosa council have been using methoprene for many years to control mosquitos, and the use of this chemical is also potentially of concern. Methoprene breaks down rapidly, is only sparingly soluble in water and is likely to bind to sediments. Therefore, the analysis of methoprene in sediments is also going to be undertaken during this survey.

Sampling Sites

Five sites downstream of historic forestry in the Noosa River were chosen (Figure One) for sediment sampling. Two additional control sites in the Cooloola National Park (Figure Two) were also selected. Lakes were chosen as these are likely to be sinks for contaminated sediments.

Sampling Strategy

Sampling will follow that outlined in the *Dioxins in Aquatic Environments in Australia* (Müller et al. 2004) technical report. Ten samples will be collected at each site using a standardised coring device, comprising aluminium tubes (15 cm length, 2.8 cm diameter) attached to a sediment coring device. This methods ensures the collection of sediment from a shallow profile (10 cm depth) of surface sediment. These samples will be composited prior to sending them to the laboratory. The ten samples will be collected in a triangular formation and will be approximately 25 m apart. At three sites samples will be split and sent as blind duplicates to the main analytical laboratory and to a second laboratory. As well as dioxins, particle size distribution and total organic carbon analysis will be undertaken on each sample.

Budget

The total budget for the sampling and analysis is approximately $16, 233 (exc. GST) (Table One).

References

Müller J, Muller R, Goudkamp K, Shaw M, Mortimer M, Haynes D, Paxman C, Hyne R, McTaggart A, Burniston D, Symons R & Moore M 2004, *Dioxins in Aquatic Environments in Australia*, National Dioxins Program Technical Report No. 6, Australian Government Department of the Environment and Heritage, Canberra.

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Figure One: Sites in the Noosa River Catchment downstream of historical forestry.

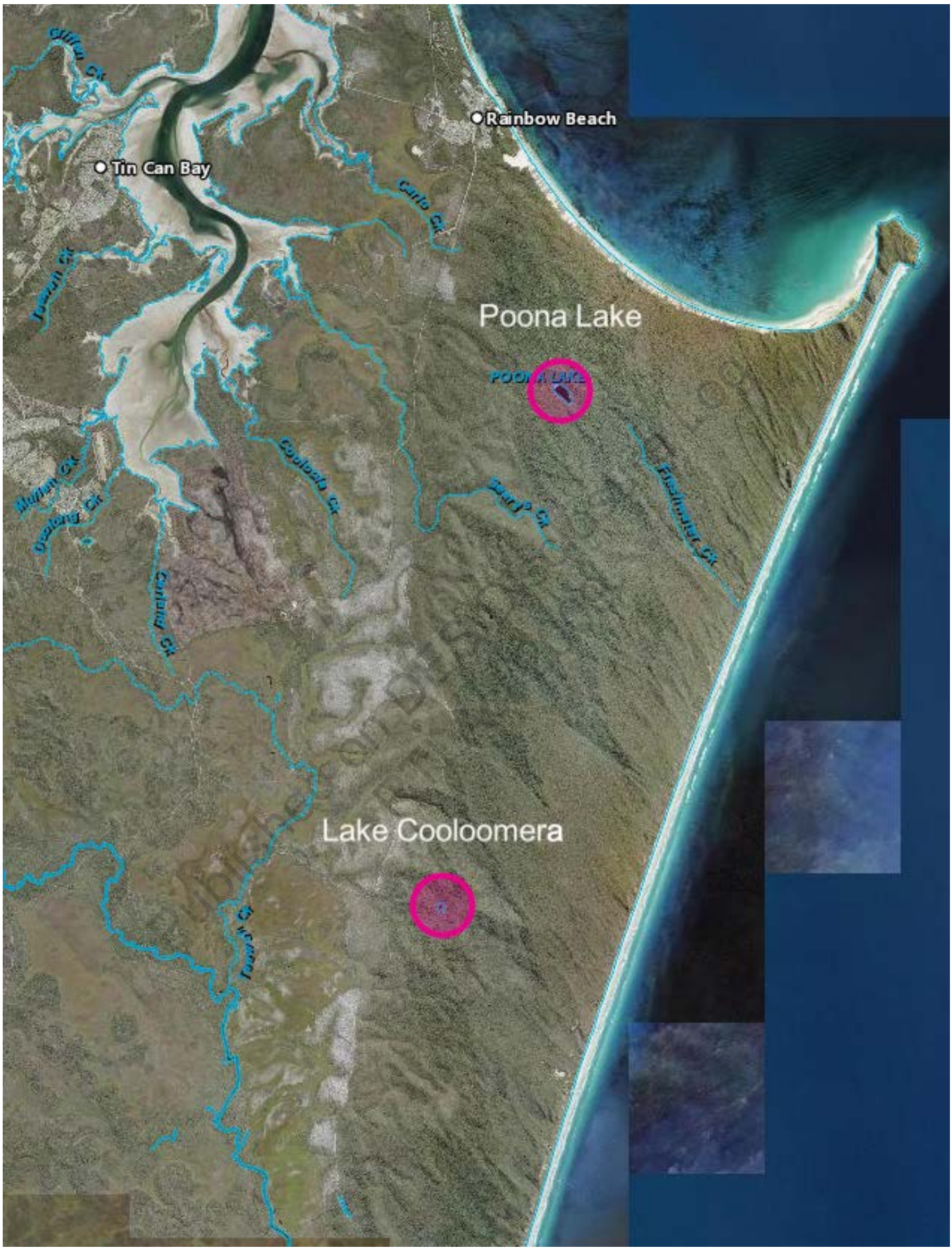

Figure Two: Control sites in the Cooloola National Park

Table One: Budget summary

	No. Samples	Cost per sample	Total cost
Analysis			
Dioxin Analysis Laboratory One	10	850	8500
Dioxin Analysis Laboratory Two	3	1521	4563
PSD Analysis	10	36	360
TOC Analysis	10	21	210
s-methoprene Laboratory One	10	40	400
s-methoprene Laboratory Two	1	200	200
Accommodation (three nights, two people)			
Travel allowance			800
Hotels			1200
Grand total			$16, 233

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Agreement

Title	Position	Signature	Date
Liz Young	Director, Sustainable Environment		
Christian Witte	Director, EMAS		