

Version No: 07 Issue Date: 21/10/2024 Portfolio: Discrete Water Quality	Horizons Regional Council	Section No: 15.7 Appendix No: 7 Page: 1 of 22
	Hydrology Operations Manual	

Water Quality Monitoring Run Guide

Whangaehu

POINT DISCHARGE

RUN1

(Monthly Sampling)

Job Hazard & Task Analysis










Hazard Identification – tick all that apply, write additional hazards identified:

The yellow highlighted hazards are known hazards at the time of compiling this document. This **does not negate** the need to assess for and potentially eliminate or isolate any hazards at *each* sample location at *every* visit

Hazard	Yes	Hazard	Yes	Hazard	Yes
Confined space	<input type="checkbox"/>	Suspended loads	<input type="checkbox"/>	Noise – plant and equipment	<input type="checkbox"/>
Difficult entry/exit	<input type="checkbox"/>	Falling objects	<input type="checkbox"/>	Communication – means of	<input type="checkbox"/>
Oxygen deficiency/excess	<input type="checkbox"/>	Working near cranes and crane runways	<input type="checkbox"/>	Remote area	<input type="checkbox"/>
Poisonous fumes/gas	<input type="checkbox"/>	Live rails-gantry cranes	<input type="checkbox"/>	Temperature extremes	<input checked="" type="checkbox"/>
Explosive gas	<input type="checkbox"/>	Trip hazards	<input checked="" type="checkbox"/>	Reduced visibility	<input type="checkbox"/>
Flammable materials	<input type="checkbox"/>	Slippery surfaces	<input checked="" type="checkbox"/>	Unauthorized persons	<input type="checkbox"/>
Combustible materials	<input type="checkbox"/>	Manual handling	<input checked="" type="checkbox"/>	High pressure water	<input type="checkbox"/>
Hazardous substances	<input type="checkbox"/>	Sharp materials	<input type="checkbox"/>	Vacuum	<input type="checkbox"/>
Drowning	<input checked="" type="checkbox"/>	Line of fire	<input type="checkbox"/>	Air emissions – dust, fumes	<input type="checkbox"/>
Engulfment	<input type="checkbox"/>	Pressurized fluids	<input type="checkbox"/>	General waste	<input type="checkbox"/>
UV Radiation	<input checked="" type="checkbox"/>	Pressurized air/gas	<input type="checkbox"/>	Hazardous waste	<input type="checkbox"/>
Electrical – low /high voltage	<input checked="" type="checkbox"/>	Traffic / vehicle movements	<input checked="" type="checkbox"/>	Hydrocarbon / chemical spill	<input type="checkbox"/>
Multiple electrical feeds	<input type="checkbox"/>	Machinery – mobile plant	<input type="checkbox"/>	Soil disturbance/erosion	<input type="checkbox"/>
Working at height	<input type="checkbox"/>	Moving parts	<input type="checkbox"/>	Habitat disruption	<input type="checkbox"/>
Ladders	<input type="checkbox"/>	Chemical reaction (Pyrophoric iron)	<input type="checkbox"/>	Lighting	<input type="checkbox"/>
Elevated work platforms	<input type="checkbox"/>	Transport of hazardous substances	<input type="checkbox"/>	Weather extremes	<input checked="" type="checkbox"/>
Potential for difficult rescue	<input type="checkbox"/>	Stock/Farm Animals	<input checked="" type="checkbox"/>		

Required PPE– tick all that apply, write additional PPE required:

The yellow highlighted PPE are known required PPE at the time of compiling this document. This **does not negate** the need to assess for the appropriate required PPE measures at each sample location per visit.

SAMPLING GLOVES	EAR PROTECTION	HARD HAT	SAFETY GLASSES / GOGGLES	WORK BOOTS (inc. WADERS)	PROTECTIVE GLOVES	PERSONAL FLOATATION DEVICE (PFD)
						
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
HI VIZ	SAFETY HARNESS					
						
<input checked="" type="checkbox"/>	<input type="checkbox"/>					

Known Hazard	Significant		Can it be Eliminated		Can it be Minimised		Method of control
	Yes	No	Yes	No	Yes	No	
Trip Hazards	✓			✓	✓		Prior to sampling staff must check area is clear of any items that pose a risk. If there is any these should only be moved if safe to do so. Sampling only to commence if the sampler is satisfied that any slip, trip or fall hazards are isolated.
Slippery Surfaces	✓			✓	✓		Pond edges can be slippery at any time. Sampling from the pond edge must always be done from stable level ground using a sample pole. PFD's must be worn by staff. Vehicles must be driven a sensible distance from any pond edges. [HMP18]
Drowning	✓			✓		✓	STP PONDS: The STP ponds can be deep, full of sediments, and have operating equipment on/within them. Sampling of the pond must always be done from stable level ground using a sample pole. PFD's must be worn by staff. Vehicles must be driven a sensible distance from any pond edges. [HMP18] RIVERS/STREAMS: PFD's must be worn by staff. Vehicles must be driven a sensible distance from any river/bank edges. In unsafe conditions sample from a safe bankside location using sample poles and clarity tubes in place of black discs
Machinery – mobile plant	✓			✓		✓	Sample sites within an operating waste water treatment plant - plant and machinery may be on-site during sampling. Staff to wear appropriate PPE, obey on site signage and instruction, and give way to all operational traffic.
Traffic Vehicle movements	✓			✓		✓	STP PONDS: council and contractor vehicles liable to be present at any time. Staff to obey on site signage and instruction. HRC Vehicle to be parked in a safe and appropriate location. [HMP 16] [HMP 20] ROADSIDE: Sample site requires parking beside a main road. The vehicle must be parked as far off of the road surface as safe and practicable to do so. Use of hazards lights must be considered. Hi-vis clothing must be worn. [HMP 16] [HMP 20]
Noise – plant and equipment	✓			✓	✓		STP PONDS: Plant operation can create high levels of noise. Ear protection to be carried in HRC vehicle at all times. Ear protection to be worn when machinery is running [HMP 4]
Hazardous Waste – treated Effluent	✓			✓	✓		Sampling activities require the collection of a sample of treated effluent. Staff must wear sampling gloves, eye protection and have access to anti-bacterial hand-gel to sample. Hepatitis B vaccinations are offered by HRC [HMP 30] [HMP 35]
General Waste		✓		✓	✓		STP PONDS: General waste can be stored on site depending on operating activity.

Known Hazard	Significant		Can it be Eliminated		Can it be Minimised		Method of control
	Yes	No	Yes	No	Yes	No	
							Sample staff have no need to interact with any waste. All waste created by HRC staff to be taken with them.
UV Radiation	✓			✓	✓		Horizons provide sunscreen and hats.
Manual Handling	✓			✓	✓		There should be no need for sample staff to move any equipment etc. in order to carry out sampling activities. Sampling activities require the collection of a sample of treated effluent. Staff must wear sampling gloves, eye protection and have access to anti-bacterial hand-gel to sample. Hepatitis B vaccinations are offered by HRC. [HMP 30] [HMP 35]
Electrical – low /high voltage	✓			✓	✓		Sampling activity does not require any interaction with live circuitry or equipment. Staff should check sample area is clear of any hazards (i.e. loose cables, live equipment etc.) before sampling. If access/safety is considered compromised sampling is aborted. [HMP 23] Live electric fences may be encountered at any time. Always assume any farm fences are live. Find alternative routes if necessary.
Stock/Farm Animals	✓			✓	✓		Although generally docile farm animals can still be hazardous. The risk should be isolated by finding alternative access routes to the sample location or contacting the owner for assistance. [HMP26]
Weather Extremes	✓			✓	✓		During the duration of a sampling run varying types and degrees of weather may be experienced. All sampling staff are to have access within their HRC vehicle of additional and appropriate clothing.
Temperature Extremes - Hypothermia: following emersion	✓			✓		✓	Staff must have access to suitable PPE and spare clothing within their vehicle. [HMP18] [HMP18]
Cuts & Abrasions - Plants		✓	✓		✓		Brambles /Vegetation – spray equipment available to keep sites and site access clear of any brambles etc. Alternative routes should also be used/considered if necessary.
Cuts & Abrasions – Barbed Wire	✓		✓		✓		Barbed Wire – Stiles/alkathene coverings can be installed at sample access locations. Temporary covers can be used on top of any barbs at time if sampling if desired. Alternative routes should also be used/considered if necessary.

Site Information

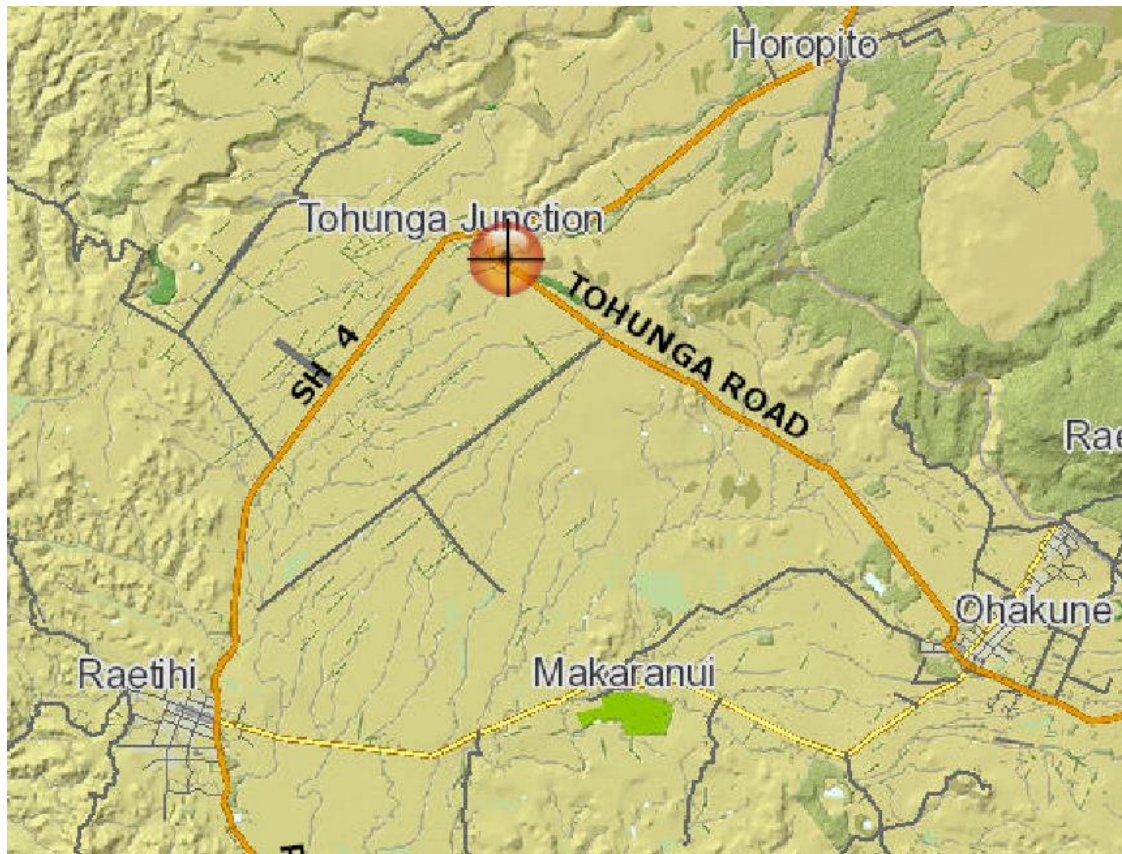
Hilltop Site Name	Easting/Longitude		Northing/Lat	Comments
Makotuku at SH49A	NZMG:	2710400	6201215	ESG on site- no telemetry
	NZTM:	1800343	5639535	
	WGS84:	175.325711	-39.370426	
Raetihi STP at Secondary Oxpond Waste	NZMG:	2706766	6193781	Key required to access ponds – see Discrete WQ portfolio holder
	NZTM:	1796712	5632098	
	WGS84:	175.285768	-39.438216	
Makotuku at Above Sewage Plant	NZMG:	2706910	6193666	
	NZTM:	1796857	5631980	
	WGS84:	175.287488	-39.439247	
Makotuku at d/s Raetihi STP	NZMG:	2715405	6196665	
	NZTM:	1805350	5634985	
	WGS84:	175.385182	-39.410213	
Mangawhero at DOC Headquarters	NZMG:	2717762	6197545	Very Public Location. ESG on site- no telemetry
	NZTM:	1807710	5635868	
	WGS84:	175.412291	-39.401701	
Ohakune STP at Secondary Oxpond	NZMG:	2715428	6196560	Key required to access ponds – see Discrete WQ portfolio holder
	NZTM:	1805375	5634881	
	WGS84:	175.385506	-39.411142	
Mangawhero at u/s Ohakune STP	NZMG:	2715313	6196683	
	NZTM:	1805260	5635004	
	WGS84:	175.384132	-39.410063	
Mangawhero at d/s Ohakune STP	NZMG:	2715313	6196683	
	NZTM:	1805260	5635004	
	WGS84:	175.384132	-39.410063	

[Contact details can be found here.](#)

Equipment Required

Sample Bottles	<p style="text-align: center;">EIGHT (8) sample bottle sets - refer to http://tgm.horizons.govt.nz/Hydrology/SOPs/cd_om_15.4_Appendix_4_ELS%20Bottle%20Guide.xlsx</p>
Sample number	<p>EIGHT (8)</p>
Equipment	<ul style="list-style-type: none"> • Handheld multi-parameter instrument (calibrated) – including iPad/screen • Black disc, viewer, tape measure • Clarity Tube • Sampling pole • Chilly bins and ice-packs • Bags for isolating samples • Disinfectant equipment for sampling equipment • Field sampling books • Sampling ID labels (created using Hilltop Sampler) • Use gloves for wastewater and effluent samples • Alcohol gel
Miscellaneous	<ul style="list-style-type: none"> • Makotuku at SH49A – sample above weir • Makotuku at SH49A – Brambles can be prolific • Raetihi STP at Secondary oxpond waste – Ruapehu District Council key needed at entrance to race and entrance to pond compound. • Ohakune STP at Secondary oxpond waste – 636 key needed at entrance to race and entrance to pond compound.
Additional Comments/ Instructions	<ul style="list-style-type: none"> • Mangawhero at DOC Headquarters This is a very public site, be prepared for a discussion with interested passers-by as to what you are doing. • In sampler/field book the order is slightly different. The 'Makotuku at SH49A' site is first in these instead of forth as in the run guide. Please pay attention when filling out the field book.




SITE LOCATION MAP – Makotuku at SH49A



POSSIBLE SITE HAZARDS (this does not negate undertaking a hazard review prior to sampling on the day):

Drowning – River	Traffic / vehicle movements – access from state highway	Slippery surfaces – mud, periphyton, weir structure	Cuts/Abrasions – barbed wire, brambles
Trip hazards – cobbles uneven paddock/ground	UV Radiation	Electrocution – electric fence	

REQUIRED PPE (in accordance with above hazards – this does not negate undertaking a hazard review prior to sampling on the day and/or using additional PPE if deemed necessary):

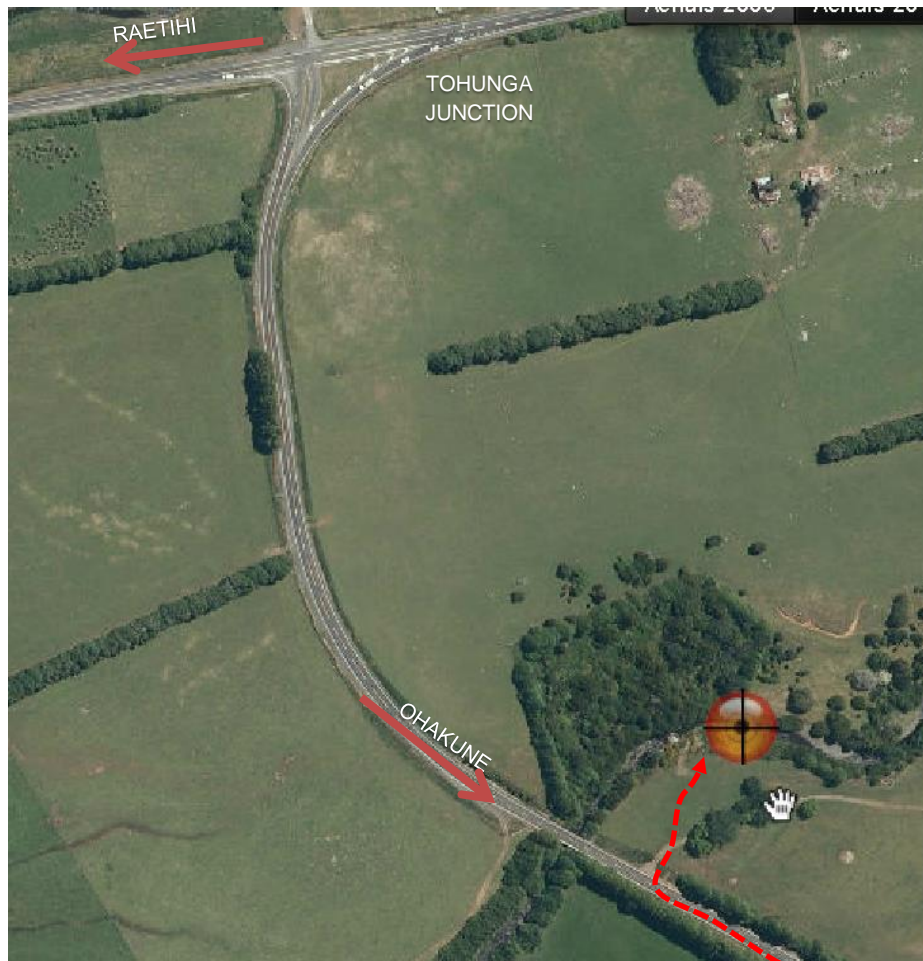
WORK BOOTS/ WADERS	HI VIZ	PFD					
							

DIRECTIONS:

- From the Palmerston North office head to Waiouru via SH1
- At Waiouru turn left onto SH49 toward Ohakune.
- Stay on SH49 through Ohakune and out the other side.
- The driveway for the site is 7.8km past the 100kph signs on the right. It is just before a bridge.

ACCESS:

- Go through the gate and across the field to the back left corner
- Climb the fence at the stile and follow the beaten path to the weir
- Sample in flow upstream of the weir

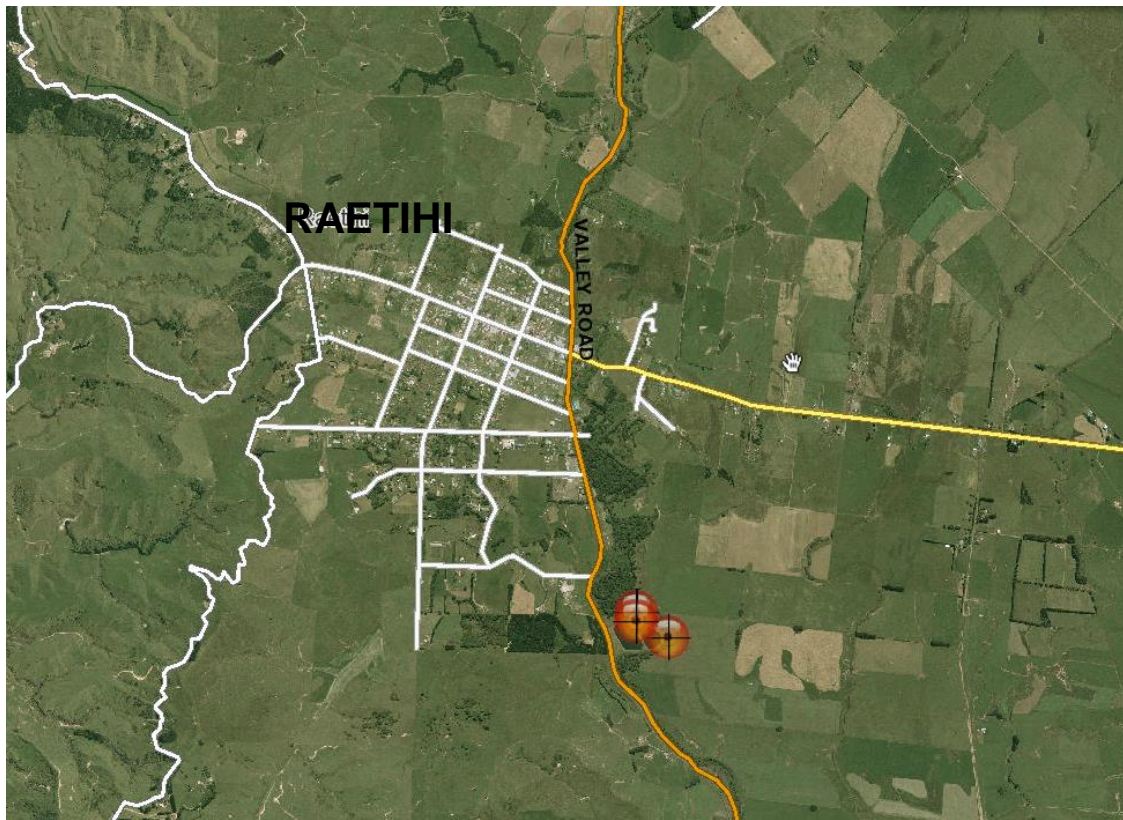


Makotuku at SH49a – Detail Maps



Makotuku at SH49a – Sample Location

SITE LOCATION MAP – Raetihi STP at Secondary Oxpond Waste; Makotuku at Above Sewage Plant; Makotuku at d/s Raetihi STP



Overview map








Map of Raetihi STP Sample Sites

Raetihi STP at Secondary Oxpond Waste

POSSIBLE SITE HAZARDS (this does not negate undertaking a hazard review prior to sampling on the day):

Drowning – Ponds	Traffic / vehicle movements – access from state highway	Slippery surfaces – pond edges, pipes	
Trip hazards – cobbles uneven paddock/ground	UV Radiation		

REQUIRED PPE (in accordance with above hazards – this does not negate undertaking a hazard review prior to sampling on the day and/or using additional PPE if deemed necessary):

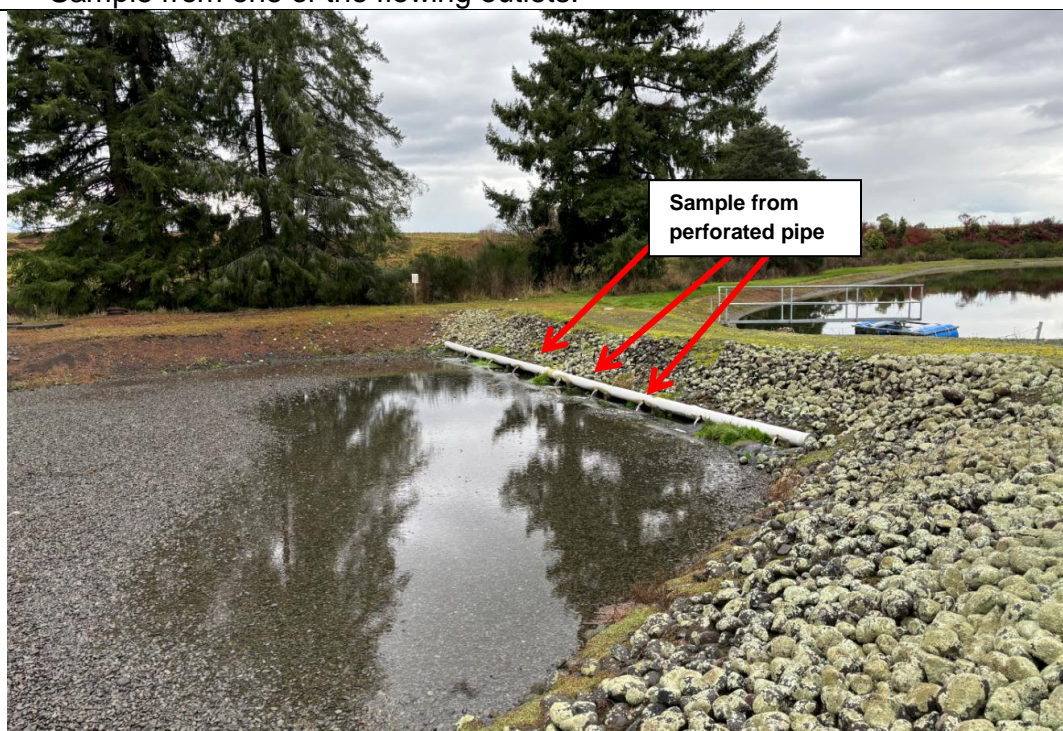
WORK BOOTS/ WADERS	HI VIZ	PFD	SAMPLING GLOVES	SAFETY GLASSES / GOGGLES			
							

DIRECTIONS:

- From Makotuku at SH49A head right back onto SH49.
- You will come to Tahunga Junction, turn left here towards Raetihi, SH4.
- Follow this to Raetihi, drive through to the other side of Raetihi.
- About 800m after the cemetery (on the left) the ponds are to your left (hard left).
- Access is via a locked double gate (see Discrete WQ Portfolio holder for key)

ACCESS:

- Wear appropriate PPE and obey all signage on site.
- Drive around the ponds and park up by the discharge point – this is a third ‘pond’ filled with gravels and a discharging perforated pipe.
- Sample from one of the flowing outlets.






View of Raetihi Discharge Sample Point – The discharge pond is often dry looking and just a small flow coming out of the perforations in the pipe.

Makotuku at Above Sewage Plant

POSSIBLE SITE HAZARDS (this does not negate undertaking a hazard review prior to sampling on the day):

Drowning – River	Cuts/Abrasions –brambles	Slippery surfaces – mud, periphyton, banks	
Trip hazards – cobbles uneven paddock/ground	UV Radiation		

REQUIRED PPE (in accordance with above hazards – this does not negate undertaking a hazard review prior to sampling on the day and/or using additional PPE if deemed necessary):

WORK BOOTS/ WADERS	HI VIZ	PFD					
							

ACCESS:

- From the discharge sample point walk upstream (you will see a small metal bridge – cross this)
Sample around 10m above the bridge



View of bridge at Makotuku at Above Sewage Plant Sample Point looking downstream







View of Makotuku at Above Sewage Plant Sample Point

Makotuku at d/s Raetihi STP

POSSIBLE SITE HAZARDS (this does not negate undertaking a hazard review prior to sampling on the day):

Drowning – River	Cuts/Abrasions –brambles	Slippery surfaces – mud, periphyton, banks	
Trip hazards – cobbles uneven paddock/ground	UV Radiation		

REQUIRED PPE (in accordance with above hazards – this does not negate undertaking a hazard review prior to sampling on the day and/or using additional PPE if deemed necessary):

WORK BOOTS/ WADERS	HI VIZ	PFD	SAMPLING GLOVES				
							

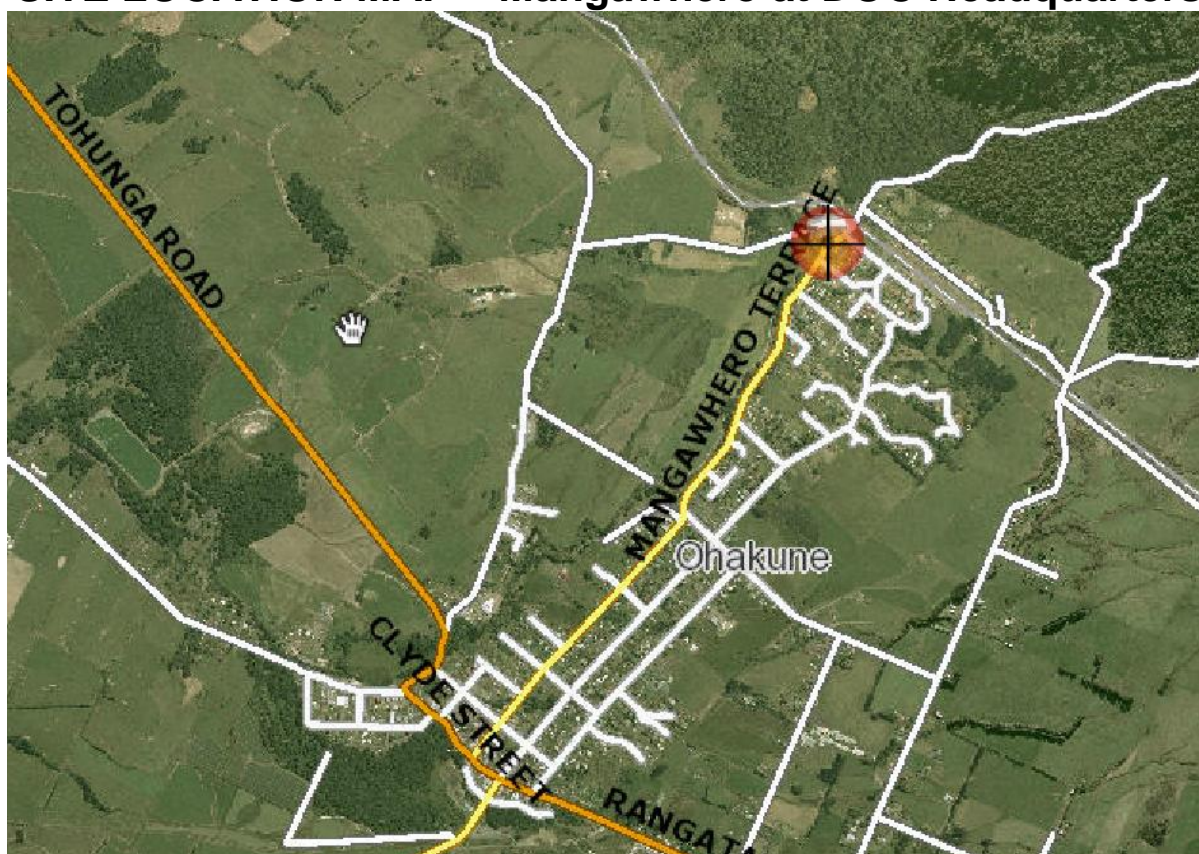
ACCESS:

- From the Discharge sample location walk approx. 100m downstream to the downstream site.
- Be careful along the pond edge.
- The site is marked by a warratah and there should be a small track leading to the river.
- Sample here.



Makotuku at d/s Raetihi STP Sample Point - warratah marker




SITE LOCATION MAP – Mangawhero at DOC Headquarters



POSSIBLE SITE HAZARDS (this does not negate undertaking a hazard review prior to sampling on the day):

Drowning – River	Traffic / vehicle movements – access from road	Slippery surfaces – mud, periphyton, weir structure	
Trip hazards – cobbles uneven paddock/ground	UV Radiation	Members of the public	

REQUIRED PPE (in accordance with above hazards – this does not negate undertaking a hazard review prior to sampling on the day and/or using additional PPE if deemed necessary):

WORK BOOTS/ WADERS	HI VIZ	PFD					
							

DIRECTIONS:

- Head back into Raetihi, take a right at Raetihi Ohakune Road/Seddon Street (signs for Ohakune/Waiouru)
- Continue into Ohakune. Go straight over the intersection onto Miro Street.
- Continue until the roundabout at Shannon Street, turn left here.
- At the T-junction with Mangawhero Terrace take a right.
- Continue on this road, it becomes Ohakune Mountain Road.
- Park in the car-parking on the left before the 80km signs.

ACCESS:

- The site is across the grass area where there is a Staff Gauge on the far bank.

- This is a very public site, be prepared for a discussion with interested passers-by as to what you are doing

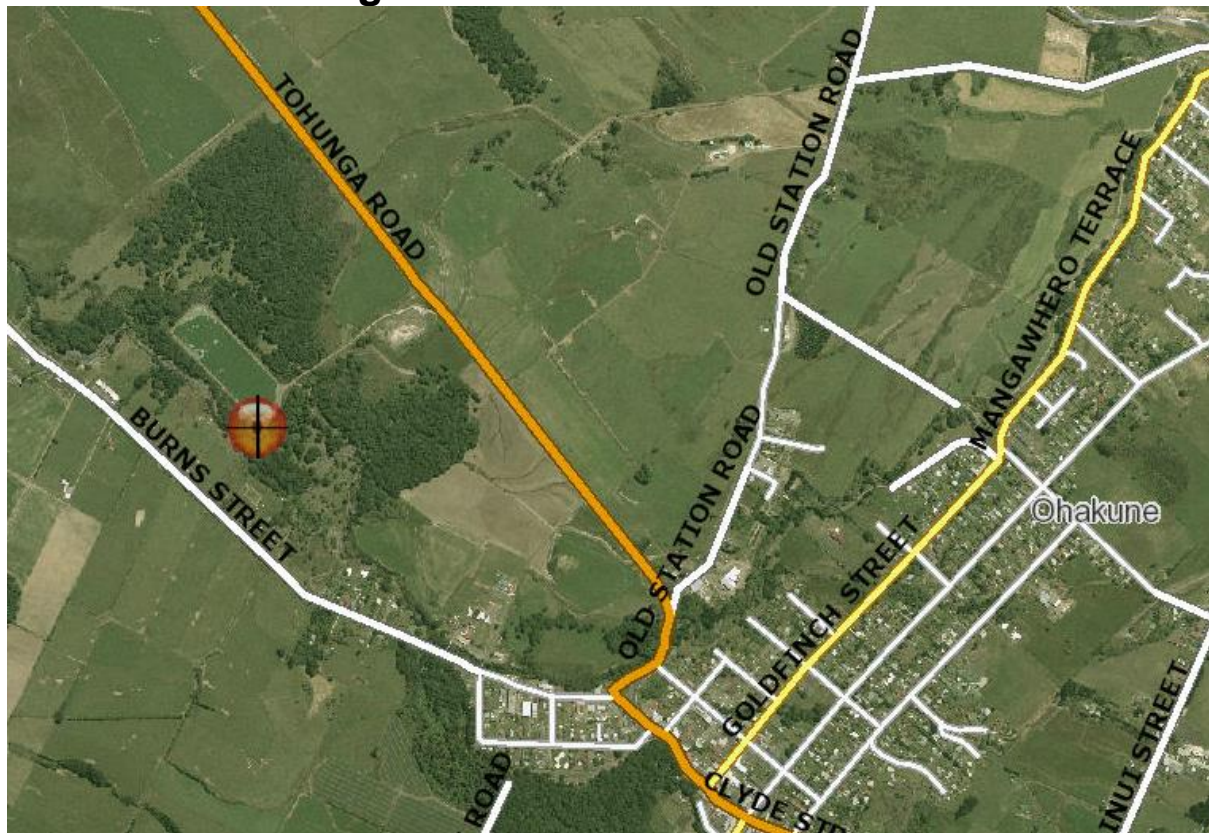


Mangawhero at DOC Headquarters – Detail Maps



Mangawhero at DOC Headquarters – Sample Site

**SITE LOCATION MAP – Ohakune STP at Secondary
Oxpond Waste; Mangawhero at u/s Ohakune STP;
Mangawhero at d/s Ohakune STP**



Overview map



Map of Raetihi STP Sample sites

Ohakune STP at Secondary Oxpond Waste

POSSIBLE SITE HAZARDS (this does not negate undertaking a hazard review prior to sampling on the day):

Drowning – Ponds	Traffic / vehicle movements – access from state highway	Slippery surfaces – pond edges, pipes	
Trip hazards – cobbles uneven paddock/ground	UV Radiation	Traffic / vehicle movements – site works traffic	

REQUIRED PPE (in accordance with above hazards – this does not negate undertaking a hazard review prior to sampling on the day and/or using additional PPE if deemed necessary):

WORK BOOTS/ WADERS	HI VIZ	PFD	SAMPLING GLOVES	SAFETY GLASSES / GOGGLES			
							

DIRECTIONS:

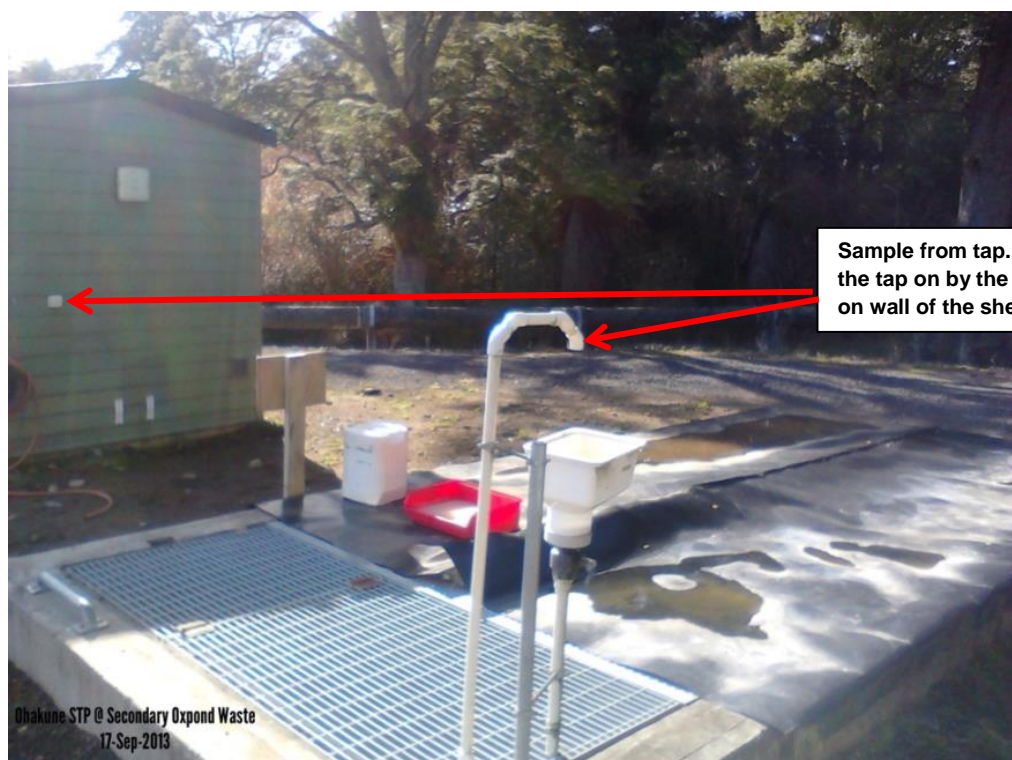
- Head back the way you came on Ohakune Mountain Road as it becomes Mangawhero Terrace and then Goldfinch Street.
- At the roundabout at Ayr Street turn right.
- Follow Ayr Street to the end, turn right onto SH49.
- Approx. 1.1km outside of Ohakune on the left is the access to the STP.

ACCESS:

- Follow the track and go through the first gate (usually left open).
- Go through the second gate – this is usually locked use either a '636' or the U channelled key (see discrete WQ Portfolio holder for this open) to gain access.
- Drive into the pond compound, drive along the left side of the ponds and park up in the gravel space before the pipework.
- Wear appropriate PPE and obey all signage on site.
- Sample from the pipework/sink combo. To get the sample flowing press the switch on the back of the shed and collect sample.






Street view of the driveway entrance to the STP



Ohakune STP at Secondary Oxpond Waste Sample Tap

Mangawhero at u/s Ohakune STP

POSSIBLE SITE HAZARDS (this does not negate undertaking a hazard review prior to sampling on the day):							
Drowning – River		Cuts/Abrasions –brambles		Slippery surfaces – mud, periphyton, banks			
Trip hazards – cobbles uneven paddock/ground, river bank		UV Radiation					
REQUIRED PPE (in accordance with above hazards – this does not negate undertaking a hazard review prior to sampling on the day and/or using additional PPE if deemed necessary):							
WORK BOOTS/ WADERS	HI VIZ	PFD					
							
ACCESS:							
<ul style="list-style-type: none">• From the sample tap walk upstream to the sample location.• Duck under the pipework and turn right to follow a track leading to the Mangawhero (the pipework is in the middle distance of the above photo).• The bank is quite steep and a couple meters up from the river. Use a sample pole from the top or carefully climb down the stone culvert. The stone culvert is falling apart and can be slippery so proceed with caution.• This culvert sometimes is discharging and is NOT the STP discharge – avoid sampling this!• Downstream of you should be pipework spanning the river.							







Aerial view showing approx. path through trees to U/S site.



View of Mangawhero at u/s Ohakune STP Sample Point looking downstream from top of bank. The broken stone culvert is visible in the bottom of the image.

Mangawhero at d/s Ohakune STP

POSSIBLE SITE HAZARDS (this does not negate undertaking a hazard review prior to sampling on the day):							
Drowning – River		Cuts/Abrasions –brambles		Slippery surfaces – mud, periphyton, banks			
Trip hazards – cobbles uneven paddock/ground		UV Radiation					
REQUIRED PPE (in accordance with above hazards – this does not negate undertaking a hazard review prior to sampling on the day and/or using additional PPE if deemed necessary):							
WORK BOOTS/ WADERS	HI VIZ	PFD	SAMPLING GLOVES				
							
ACCESS:							
<ul style="list-style-type: none">• The sample location is approx.100m downstream of the discharge sample tap.• Carefully walk along the pond edge• The site is marked by a warratah – follow the short track through the tree line to the river and sample here.							



View of Mangawhero at d/s Ohakune STP Sample Point warratah – note shed/discharge sample point in the background



View of Mangawhero at d/s Ohakune STP Sample Point from water's edge looking D/S – sample here