Visy Pulp and Paper, Tumut Emission Testing Report - Q1 Testing Report Number R013282-1

ektimo.com.au



#### **Document Information**

Template Version 190722

Client Name:	Visy Pulp and Paper
Report Number:	R013282-1
Date of Issue:	29 July 2022
Attention:	Matthew O`Donovan
Address:	1302 Snowy Mountains Highway Tumut NSW 2720
Testing Laboratory:	Ektimo Pty Ltd, ABN 86 600 381 413

#### **Report Authorisation**

Aaron Davis Senior Air Monitoring Consultant



NATA Accredited Laboratory No. 14601

Accredited for compliance with ISO/IEC 17025 - Testing. NATA is a signatory to the ILAC mutual recognition arrangement for the mutual recognition of the equivalence of testing, calibration, and inspection reports.

This document is confidential and is prepared for the exclusive use of Visy Pulp and Paper and those granted permission by Visy Pulp and Paper. The report shall not be reproduced except in full.

Please note that only numerical results pertaining to measurements conducted directly by Ektimo are covered by Ektimo's terms of NATA accreditation as described in the Test Methods table. This does not include calculations that use data supplied by third-parties, comments, conclusions, or recommendations based upon the results. Refer to 'Test Methods' for full details of testing covered by NATA accreditation.





#### **Table of Contents**

1	E	xecutive Summary4
	1.1	Background4
	1.2	Project Objective4
2	F	esults5
	2.1	EPA 1 – Main Stack 15
	2.2	EPA 22 – Main Stack 26
	2.3	Cooling Pond 3A7
	2.4	Cooling Pond 3B8
	2.5	Cooling Tower 1 (#1 Paper Machine Side)9
	2.6	Cooling Tower 2 (#2 Paper Machine Side)10
	2.7	Vacuum Pump 3 – (790 Couch)11
	2.8	Vacuum Pump 7 – (794 First Bottom)12
	2.9	Vacuum Pump 9 – (Paper Machine Hood Vent Exhaust)13
	2.10	Vacuum Pump 10 – (Paper Machine Hood Vent Exhaust)14
3	P	Plant Operating Conditions
4	Т	est Methods
5	C	Quality Assurance/Quality Control Information15
6	۵	Definitions
7	A	Appendix 1: Site Photos



#### **1** Executive Summary

#### 1.1 Background

Ektimo was engaged by Visy Pulp and Paper to perform an odour monitoring survey at their Tumut facility. The program incorporated both point source and area source (flux hood) monitoring.

#### 1.2 Project Objective

The objective of the project was to conduct a monitoring program to quantify emissions from multiple discharge points.

Monitoring was performed as follows:

Location	Test Date	Test Parameters*
EPA 1 – Main Stack 1		
EPA 22 – Main Stack 2		
Cooling Pond 3A		
Cooling Pond 3B		
Cooling Tower 1 (#1 Paper Machine Side)	19 July 2022	Odour (duplicate)
Cooling Tower 2 (#2 Paper Machine Side)	19 July 2022	
Vacuum Pump 3 – (790 Couch)		
Vacuum Pump 7 – (794 First Bottom)		
Vacuum Pump 9 – (Paper Machine Hood Vent Exhaust)		
Vacuum Pump 10 – (Paper Machine Hood Vent Exhaust)		

\* Flow rate, velocity, temperature, and moisture were also determined.

All results are reported on a dry basis at STP (except odour wet – STP).



#### 2 Results

#### 2.1 EPA 1 – Main Stack 1

Date	19/07/2022	Client	Visy Pulp and Paper	
Report	R013282-1	Stack ID	EPA 1 - Main Stack 1	
Licence No.	10252	Location	Tumut	
Ektimo Staff	Aaron Davis / Scott Woods	State	NSW	
Process Conditions	Please refer to client records			220701
Sampling Plane Deta	ils			
Sampling plane dimension	ons	2660 mm		
Sampling plane area		5.56 m²		
Sampling port size, num	ber	4" Flange (x2)		
Access & height of ports		Lift & fixed ladder 90 m		
Duct orientation & shap	be	Vertical Circular		
Downstream disturbanc	e	Exit 5 D		
Upstream disturbance		Junction 20 D		
No. traverses & points s	ampled	2 24		
Sample plane conforma	nce to AS 4323.1	Ideal sampling plane		
Stack Parameters				
Moisture content, %v/v		23		
Gas molecular weight, g	/g mole	27.8 (wet)	30.6 (dry)	
Gas density at STP, kg/m	3	1.24 (wet)	1.37 (dry)	
Gas density at discharge	conditions, kg/m <sup>3</sup>	0.70		
Gas Flow Parameters	5			
Flow measurement time	e(s) (hhmm)	1045 & 1115		
Temperature, °C	-	188		
Temperature, K		462		
Velocity at sampling pla	ne, m/s	31		
Volumetric flow rate, ac	tual, m³/s	170		
Volumetric flow rate (w	et STP), m³/s	97		
Volumetric flow rate (dr	y STP), m³/s	75		
Mass flow rate (wet bas	is), kg/hour	430000		

Odour	Aver	age	Tes	it 1	Te	st 2
Sampling time			1050 -	1100	1100	- 1110
		Odourant Flow		Odourant Flow		Odourant Flow
	Concentration	Rate	Concentration	Rate	Concentration	Rate
	ou	oum³/min	ou	oum <sup>3</sup> /min	ou	oum³/min
Results	990	5800000	1000	6000000	950	5600000
Lower uncertainty limit	780		730		670	
Upper uncertainty limit	1300		1500		1400	
Analysis date & time			20/07/22, 0	0950-1012	20/07/22,	0950-1012
Holding time			23 h	ours	23	nours
Dilution factor			1	L		1
Bag material			Nalo	phan	Nalo	phan
Butanol threshold (ppb)	52	2				
Laboratory temp (°C)	22	2				
Last calibration date	Octobe	r 2021				



#### 2.2 EPA 22 – Main Stack 2

Date 19/07	/2022			Client	Visy Pulp and Pa	aper	
Report R0132	82-1			Stack ID	EPA 22 - Main S	Stack 2	
Licence No. 10252				Location	Tumut		
Ektimo Staff Aaron	Davis / Scott Woo	ds		State	NSW		
Process Conditions Please	refer to client rec	ords					220701
Sampling Plane Details							
Sampling plane dimensions			2450	) mm			
Sampling plane area			4.7	1 m²			
Sampling port size, number			4" Flar	ige (x2)			
Access & height of ports			Stairs	30 m			
Duct orientation & shape			Vertical	Circular			
Downstream disturbance			Exit	10 D			
Upstream disturbance			Junction	5 D			
No. traverses & points sampled				20			
Sample plane conformance to AS 43	323.1		Conforming	out non-ideal			
			5				
The sampling plane is deemed to b	e non-ideal due to	o the following	reasons:				
The sampling plane is too near to th	e upstream disturb	oance but is grea	ater than or equ	al to 2D			
Stack Parameters							
Moisture content, %v/v			20				
Gas molecular weight, g/g mole			27.8 (wet)		30.2 (dry)		
Gas density at STP, kg/m <sup>3</sup>			1.24 (wet)		1.35 (dry)		
Gas density at discharge conditions,	kg/m³		0.72				
Gas Flow Parameters							
Flow measurement time(s) (hhmm)			1000 & 1030				
Temperature, °C			175				
Temperature, K			448				
Velocity at sampling plane, m/s			22				
Volumetric flow rate, actual, m <sup>3</sup> /s			100				
Volumetric flow rate (wet STP), m <sup>3</sup> /	S		60				
Volumetric flow rate (dry STP), m <sup>3</sup> /s			48				
Mass flow rate (wet basis), kg/hour			270000				
, , , , , , , , , , , , , , , , , , ,							
Odour		Ave	rage	Te	st 1	Те	st 2
	Sampling time		-	1005	- 1010	1010	- 1020
			Odourant Flow		Odourant Flow		Odourant Flow
		Concentration	Rate	Concentration	Rate	Concentration	Rate
		ou	oum³/min	ou	oum³/min	ou	oum <sup>3</sup> /min
Results		920	3300000	880	3200000	950	3400000
Lower uncertainty limit		720		620		670	

1200

44 24

October 2021

1200

20/07/22, 1040-1255

24 hours

1

Nalophan



Upper uncertainty limit

Butanol threshold (ppb)

Laboratory temp (°C) Last calibration date

Analysis date & time

Holding time

Dilution factor

Bag material

1400

20/07/22, 1040-1255

24 hours

1

Nalophan

#### 2.3 Cooling Pond 3A

Client	Visy Pulp and Paper	Test Location	Cooling Pond 3A		
Date	19/07/2022	Plant/Site	Tumut		
Report No.	R013282-1		Tumut, NSW		
Ektimo Staff	Scott Woods / Aaron Davis		211014		
Test Location	Details				
Location Desc	cription	Brown liqu	uid, aerating, filling up		
Surface Desci	ription	Ste	amy and foamy		
Area Classification			Industrial		
Source dimensions (L x W), m			50 x 32		
Source area, r	m <sup>2</sup>		1600		
Sampling Met	hod	As	54323.4 (Flux)		
Sampling Res	sults	Test 1	Test 2		
Sampling time	e, hrs	0915 - 0925	0925 - 0935		
Sample dilutio	on	1	1		
Odour concen	tration, ou	810	880		
Average Odou	ur Concentration, ou		840		
95% Confidence	e Interval	660 - 1100			
Odour Flux Ra	ate, ou/m²/min	24			
Odourant flow	v rate, oum³/min		38000		
Flux Testing F	Parameters				
Equilibration t	ime, hrs		0850 - 0914		
Sweep Rate @	) STP, L/min	3.58			
Penetration D	epth, mm	10			
Static Pressure, Pa		10			
Surface tempe	erature, °C	8			
Chamber tem	perature, °C		12		
Ambient temp	erature, °C		9		



#### 2.4 Cooling Pond 3B

Client	Visy Pulp and Paper	Test Location	Cooling Pond 3B		
Date	19/07/2022	Plant/Site	Tumut		
Report No.	R013282-1		Tumut, NSW		
Ektimo Staff	Scott Woods / Aaron Davis		21101-		
Test Location	Details				
Location Desc	cription	Brown liquid	d, aerating, not filling up		
Surface Desci	ription	Generally	/ clear, slightly cloudy		
Area Classification			Industrial		
Source dimensions (L x W), m			50 x 32		
Source area, m <sup>2</sup>			1600		
Sampling Met	hod	As	54323.4 (Flux)		
Sampling Res	sults	Test 1	Test 2		
Sampling time	e, hrs	0955 - 1005	1005 - 1015		
Sample dilutio	on	1	1		
Odour concen	tration, ou	240	260		
Average Odou	ur Concentration, ou		250		
95% Confidence	e Interval	190 - 320			
Odour Flux Ra	ate, ou/m²/min		6.9		
Odourant flow	v rate, oum³/min	11000			
Flux Testing F	Parameters				
Equilibration t	ime, hrs		0930 - 0954		
Sweep Rate @	) STP, L/min		3.53		
Penetration D	epth, mm	10			
Static Pressure, Pa		10			
Surface tempe	erature, °C		9		
Chamber tem	perature, °C		14		
Ambient temp	erature, °C		10		





#### 2.5 Cooling Tower 1 (#1 Paper Machine Side)

Date	19/07/2022		Client	Visy Pulp and	Paper
Report	R013282-1		Stack ID	Cooling Towe	r 1 (#1 Paper Machine Side
Licence No.	10252		Location	Tumut	
Ektimo Staff	Aaron Davis / Scott W	oods	State	NSW	
Process Conditions	Please refer to client	records			220701
Sampling Plane Detail	s				
Sampling plane dime	nsions	Exit diameter could	not be mea	asured mm	
Sampling plane area			NA		
Sampling port size, nu	umber	Sample	ed at exit		
Access & height of po	rts	Stairs	40 m		
Duct orientation & sh	nape	Vertical			
Downstream disturba	nce	Exit	0 D		
Upstream disturbance	2	Change in diameter	0 D		
No. traverses & points	sampled	1	1		
Sample plane conforr	mance to AS 4323.1	Non-coi	nforming		
Comments					
	ric flowrate measurement	is could not be taken			
,	ses sampled is less than				
	·	•			
The discharge is assu	med to be composed of c	iry air and moisture			
The sampling plane is d	eemed to be non-conformin	g due to the following reaso	ns:		
The downstream dist	urbance is <1D from the s	ampling plane			
The upstream disturb	ance is <2D from the sam	pling plane			
The stack or duct does	s not have the required n	umber of access holes (po	orts)		
			. <u></u>		
Odour		Average		Test 1	Test 2
	Samplingtime		11	125 - 1130	1130 - 1135
		Concentration	Con	centration	Concentration
		ou		ou	ou
Results		710	1	680	740

560

910

44

24

October 2021



Lower uncertainty limit

Upper uncertainty limit

Analysis date & time

Butanol threshold (ppb)

Laboratory temp (°C)

Last calibration date

Holding time

Dilution factor

Bag material

480

960

20/07/22, 1040-1255

23 hours

1

Nalophan

520

1100

20/07/22, 1040-1255

23 hours

1

Nalophan

#### 2.6 Cooling Tower 2 (#2 Paper Machine Side)

Date	19/07/2022	Client	Visy Pulp and Paper
Report	R013282-1	Stack ID	Cooling Tower 2 (#2 Paper Machine Side
Licence No.	10252	Location	Tumut
Ektimo Staff	Aaron Davis / Scott Woo	ds State	NSW
Process Conditions	Please refer to client re	cords	220701
Sampling Plane Deta	ils		
Sampling plane dim	ensions	Exit diameter could not be mea	sured mm
Sampling plane area	3	NA	
Sampling port size,	number	Sampled at exit	
Access & height of p	orts	Stairs 40 m	
Duct orientation & s	hape	Vertical	
Downstream disturb	ance	Exit 0 D	
Upstream disturban	ce	Change in diameter 0 D	
No. traverses & poin	ts sampled	1 1	
Sample plane confo	rmance to AS 4323.1	Non-conforming	
Comments			
Velocity and volume	tric flowrate measurements	could not be taken	
The number of trave	rses sampled is less than th	e requirement	
The discharge is ass	umed to be composed of dry	air and moisture	
The sampling plane is	deemed to be non-conforming o	lue to the following reasons:	
The downstream dis	turbance is <1D from the san	npling plane	
The upstream distur	bance is <2D from the sampl	ing plane	
The stack or duct do	es not have the required nun	ber of access holes (ports)	

Odour	Average	Test 1	Test 2
Sampling time		1140 - 1145	1145 - 1150
	Concentration ou	Concentration ou	Concentration ou
Results	650	680	620
Lower uncertainty limit	510	480	440
Upper uncertainty limit	830	960	880
Analysis date & time		20/07/22, 1040-1255	20/07/22, 1040-1255
Holding time		23 hours	22 hours
Dilution factor		1	1
Bag material		Nalophan	Nalophan
Butanol threshold (ppb)	44		
Laboratory temp (°C)	24		
Last calibration date	October 2021		





#### 2.7 Vacuum Pump 3 – (790 Couch)

Date	19/07/2022			Client	Visy Pulp an	d Paper	
Report	R013282-1			Stack ID		ıp 3 (790 Couch)	
Licence No.	10252			Location	Tumut		
Ektimo Staff	Aaron Davis / Scott V	Voods		State	NSW		
Process Conditions	Please refer to clien						22070
Sampling Plane Deta			100/	·			
Sampling plane dim				5 mm			
Sampling plane area				15 m²			
Sampling port size, I Access & height of p			Sampre Stairs	d at exit			
Duct orientation & s				Circular			
Downstream disturb				0 D			
Upstream disturban				0 D			
No. traverses & poin				1			
	rmance to AS 4323.1			forming			
Comments							
	rses sampled is less thar	-					
	ts sampled is less than th						
-	sumed to be composed of	-					
The gas temperature	e of the sampling plane is	below the de	w point				
The sampling plane is	deemed to be non-conformi	ng due to the fo	llowing reaso	nc•			
	sturbance is <1D from the	-	-				
	rbance is <2D from the sar		e				
	es not have the required i		ss holes (no	arts)			
			.33 110103 (pt	100			
Stack Parameters							
Moisture content, %	v/v	1	3 (saturated	)			
Gas molecular weig	ht, g/g mole		27.5 (wet)		29.0 (dry)		
Gas density at STP, k	-		1.23 (wet)		1.29 (dry)		
Gas density at disch	arge conditions, kg/m <sup>3</sup>		0.99				
Gas Flow Parameter	rs.						
Flow measurement			1255				
Temperature, °C			51				
Temperature, K			324				
Velocity at sampling	nlane m/s		7.6				
Volumetric flow rate			6				
Volumetric flow rate			4.8				
Volumetric flow rate			4.2				
Mass flow rate (wet			21000				
		I		1		I	
Odour		Aver	age		st 1	Test	
	Samplingtime			1300	-1305	1305 -	
			Odourant		Odourant		Odourant
		Concentration	Flow Rate	Concentration	Flow Rate	Concentration	Flow Rate
		ou	oum³/min	ou	oum³/min	ou	oum³/min
Results		24000	7000000	26000	7700000	22000	6400000
_ower uncertainty limit		19000		19000		16000	
Jpper uncertainty limit		31000		38000		31000	
Analysis date & time					1040-1255	20/07/22, 1	
Holding time					nours	21 h	ours
Dilution factor					5	5	
Bag material				Nalo	phan	Nalop	han
Butanol threshold (ppb)		44	L				
_aboratory temp (°C)		24					
		24					

October 2021





Last calibration date

#### 2.8 Vacuum Pump 7 – (794 First Bottom)

	19/07/2022			Client	Visy Pulp and	d Paper	
ate 19/07/2022 eport R013282-1				Stack ID	Vacuum Pump 7 (794 First Bottom)		
Licence No.	10252			Location	Tumut	p / (/ 5 /	
Ektimo Staff	Aaron Davis / Scott V	loods		State	NSW		
Process Conditions	Please refer to client			State	143 14		220701
Trocess conditions	Theuse telef to their						220707
Sampling Plane Details	;						
Sampling plane dimen	isions		906	mm			
Sampling plane area			0.64	5 m²			
Sampling port size, nui	mber		Sample	d at exit			
Access & height of port	ts		Stairs	20 m			
Duct orientation & sha	аре		Vertical	Circular			
Downstream disturban	nce		Exit	0 D			
Upstream disturbance			Exit	0 D			
No. traverses & points	sampled		1	1			
Sample plane conform	ance to AS 4323.1		Non-cor	Iforming			
Comments	ac complete la la sale d	the require	. nt				
	es sampled is less than sampled is less than th	•					
	sampled is less than th	-					
5	med to be composed of If the sampling plane is						
ine gas temperature o	or the sampling plane is	below the de	wpoint				
The sampling plane is de	emed to be non-conformi	ng due to the fo	llowing reaso	ns:			
	rbance is <1D from the	-	-				
	ince is <2D from the sar		C				
•	not have the required r		ss holes (no	rts)			
	not nave the required i			100			
Stack Parameters							
Moisture content, %v/v	1	1	2 (saturated	)			
Gas molecular weight,	g/g mole		27.6 (wet)		29.0 (dry)		
Gas density at STP, kg/	m³		1.23 (wet)		1.29 (dry)		
Gas density at dischar	ge conditions, kg/m³		1.00				
Gas Flow Parameters							
Flow measurement tim	ne(s) (hhmm)		1310				
Temperature, °C			49				
Temperature, K	. ,		322				
Velocity at sampling pl			7				
har and a second							
Volumetric flow rate, a			4.5				
Volumetric flow rate (v	wet STP), m³/s		3.7				
Volumetric flow rate (v Volumetric flow rate (d	wet STP), m³/s dry STP), m³/s		3.7 3.2				
Volumetric flow rate (v	wet STP), m³/s dry STP), m³/s		3.7				
Volumetric flow rate (v Volumetric flow rate (d Mass flow rate (wet ba	wet STP), m³/s dry STP), m³/s	Aver:	3.7 3.2 16000	Теч	st 1	Tes	2
Volumetric flow rate (v Volumetric flow rate (d	vet STP), m³/s dry STP), m³/s asis), kg/hour	Avera	3.7 3.2 16000		st 1	Tes:	
Volumetric flow rate (v Volumetric flow rate (d Mass flow rate (wet ba	wet STP), m³/s dry STP), m³/s	Avera	3.7 3.2 16000		- 1320	Tes <sup>.</sup> 1320 -	1325
Volumetric flow rate (v Volumetric flow rate (d Mass flow rate (wet ba	vet STP), m³/s dry STP), m³/s asis), kg/hour	Avera	3.7 3.2 16000				
Volumetric flow rate (v Volumetric flow rate (d Mass flow rate (wet ba	vet STP), m³/s dry STP), m³/s asis), kg/hour		3.7 3.2 16000 age Odourant	1315	- 1320 Odourant	1320 -	1325 Odourant
Volumetric flow rate (v Volumetric flow rate (d Mass flow rate (wet ba	vet STP), m³/s dry STP), m³/s asis), kg/hour	Concentration	3.7 3.2 16000 age Odourant Flow Rate	1315 Concentration	- 1320 Odourant Flow Rate	1320 - Concentration	1325 Odourant Flow Rate
Volumetric flow rate (v Volumetric flow rate (d Mass flow rate (wet ba Odour Results	vet STP), m³/s dry STP), m³/s asis), kg/hour	Concentration ou	3.7 3.2 16000 age Odourant Flow Rate oum³/min	1315 Concentration ou	- 1320 Odourant Flow Rate oum³/min	1320 - Concentration ou	1325 Odourant Flow Rate oum³/min
Volumetric flow rate (v Volumetric flow rate (d Mass flow rate (wet ba Odour Results Lower uncertainty limit	vet STP), m³/s dry STP), m³/s asis), kg/hour	Concentration ou 19000	3.7 3.2 16000 age Odourant Flow Rate oum³/min	1315 Concentration ou 20000	- 1320 Odourant Flow Rate oum³/min	1320 - Concentration ou 18000	1325 Odourant Flow Rate oum³/min
Volumetric flow rate (v Volumetric flow rate (d Mass flow rate (wet ba Odour Results Lower uncertainty limit Upper uncertainty limit	vet STP), m³/s dry STP), m³/s asis), kg/hour	Concentration ou 19000 15000	3.7 3.2 16000 age Odourant Flow Rate oum³/min	1315 Concentration ou 20000 14000 28000	- 1320 Odourant Flow Rate oum <sup>3</sup> /min 4400000	1320 - Concentration ou 18000 13000 26000	1325 Odourant Flow Rate oum <sup>3</sup> /min 4000000
Volumetric flow rate (v Volumetric flow rate (d Mass flow rate (wet ba Odour Results Lower uncertainty limit Upper uncertainty limit Analysis date & time	vet STP), m³/s dry STP), m³/s asis), kg/hour	Concentration ou 19000 15000	3.7 3.2 16000 age Odourant Flow Rate oum³/min	1315 Concentration ou 20000 14000 28000 20/07/22,	- 1320 Odourant Flow Rate oum³/min	1320 - Concentration ou 18000 13000 26000 20/07/22, 1	1325 Odourant Flow Rate oum³/min 4000000
Volumetric flow rate (v Volumetric flow rate (d Mass flow rate (wet ba Odour Results Lower uncertainty limit Upper uncertainty limit Analysis date & time Holding time	vet STP), m³/s dry STP), m³/s asis), kg/hour	Concentration ou 19000 15000	3.7 3.2 16000 age Odourant Flow Rate oum³/min	1315 Concentration ou 20000 14000 28000 20/07/22, 21	- 1320 Odourant Flow Rate oum <sup>3</sup> /min 4400000 1040-1255 hours	1320 - Concentration ou 18000 13000 26000 20/07/22, 1 21 ho	1325 Odourant Flow Rate oum³/min 4000000
Volumetric flow rate (v Volumetric flow rate (d Mass flow rate (wet ba Odour Results Lower uncertainty limit Upper uncertainty limit Analysis date & time Holding time Dilution factor	vet STP), m³/s dry STP), m³/s asis), kg/hour	Concentration ou 19000 15000	3.7 3.2 16000 age Odourant Flow Rate oum³/min	1315 Concentration ou 20000 14000 28000 20/07/22, 21	- 1320 Odourant Flow Rate oum <sup>3</sup> /min 4400000 1040-1255 hours 5	1320 - Concentration ou 18000 13000 26000 20/07/22, 1 21 h 5	1325 Odourant Flow Rate oum <sup>3</sup> /min 4000000 040-1255 ours
Volumetric flow rate (v Volumetric flow rate (d Mass flow rate (wet ba Odour Results Lower uncertainty limit Upper uncertainty limit Analysis date & time Holding time	vet STP), m³/s dry STP), m³/s asis), kg/hour	Concentration ou 19000 15000	3.7 3.2 16000 age Odourant Flow Rate oum³/min	1315 Concentration ou 20000 14000 28000 20/07/22, 21	- 1320 Odourant Flow Rate oum <sup>3</sup> /min 4400000 1040-1255 hours	1320 - Concentration ou 18000 13000 26000 20/07/22, 1 21 ho	1325 Odourant Flow Rate oum <sup>3</sup> /min 4000000 040-1255 ours
Volumetric flow rate (v Volumetric flow rate (d Mass flow rate (wet ba Odour Results Lower uncertainty limit Upper uncertainty limit Analysis date & time Holding time Dilution factor	vet STP), m³/s dry STP), m³/s asis), kg/hour	Concentration ou 19000 15000	3.7 3.2 16000 age Odourant Flow Rate oum <sup>3</sup> /min 4200000	1315 Concentration ou 20000 14000 28000 20/07/22, 21	- 1320 Odourant Flow Rate oum <sup>3</sup> /min 4400000 1040-1255 hours 5	1320 - Concentration ou 18000 13000 26000 20/07/22, 1 21 h 5	1325 Odourant Flow Rate oum <sup>3</sup> /min 4000000 040-1255 ours
Volumetric flow rate (v Volumetric flow rate (d Mass flow rate (wet ba Odour Results Lower uncertainty limit Upper uncertainty limit Analysis date & time Holding time Dilution factor Bag material	vet STP), m³/s dry STP), m³/s asis), kg/hour	Concentration ou 19000 15000 25000	3.7 3.2 16000 age Odourant Flow Rate oum <sup>a</sup> /min 4200000	1315 Concentration ou 20000 14000 28000 20/07/22, 21	- 1320 Odourant Flow Rate oum <sup>3</sup> /min 4400000 1040-1255 hours 5	1320 - Concentration ou 18000 13000 26000 20/07/22, 1 21 h 5	1325 Odourant Flow Rate oum <sup>3</sup> /min 4000000 040-1255 ours





Date

#### 2.9 Vacuum Pump 9 – (Paper Machine Hood Vent Exhaust)

19/07/2022

Report	R013282-1			Stack ID	Vacuum Pum	p 9	
Licence No.	10252			Location	Tumut		
Ektimo Staff	Aaron Davis / Scott W			State	NSW		
Process Conditions	Please refer to client	t records					220701
Sampling Plane Details							
Sampling plane dimens	sions		1500 x 1	1750 mm			
Sampling plane area			2.6	3 m²			
Sampling port size, num	nber		Sample	d at exit			
Access & height of ports	5		Stairs	40 m			
Duct orientation & sha	ре		Horizontal	Rectangular			
Downstream disturband	ce		Exit	2 D			
Upstream disturbance			Junction	0.1 D			
No. traverses & points s	ampled		1	4			
Sample plane conforma	ance to AS 4323.1		Non-cor	nforming			
Comments							
The number of traverses	s sampled is less than	the requireme	ent				
The number of points sa	•						
The discharge is assum							
The gas temperature of		-					
The compline plane is de-	mod to be non-conferme	na duo to the f-	llowing reas-	201			
The sampling plane is dee The upstream disturbar		-	nowing reaso	115.			
The stack or duct does r			ss holos Inc	orte)			
The sampling plane is t					equal to 1D		
The sampling plane is t	too near to the downst	ieani uisturba	nce but is gr	ealei liidii Of	equal to ID		
Stack Parameters		_					
Moisture content, %v/v		2	4 (saturated	)			
Gas molecular weight, g			26.3 (wet)		29.0 (dry)		
Gas density at STP, kg/n			1.18 (wet)		1.29 (dry)		
Gas density at discharg	e conditions, kg/m³		0.91				
Gas Flow Parameters							
Flow measurement time	e(s) (hhmm)		1330				
Temperature, °C			63				
Temperature, K			336				
Velocity at sampling pla	ane, m/s		8.2				
Volumetric flow rate, ac			22				
Volumetric flow rate (w			17				
Volumetric flow rate (dr	ry STP), m³/s		13				
Mass flow rate (wet bas	sis), kg/hour		71000				
Odour		Avera	age	Те	st 1	Tes	t 2
	Samplingtime			1335	-1340	1340 -	1345
			Odourant		Odourant		Odourant
		Concentration	Flow Rate	Concentration		Concentration	Flow Rate
		ou	oum³/min	ou	oum³/min	ou	oum <sup>3</sup> /min
Results		5000	5000000	4800	4800000	5200	5200000
Lower uncertainty limit		3900		3400		3600	
Upper uncertainty limit		6400		6800		7300	
Analysis date & time					1040-1255	20/07/22,	1040-1255
Holding time					hours	21 h	
Dilution factor					5	5	
Bag material					ophan	Nalop	
						14610	
Butanol threshold (ppb)		44	Ļ				
Laboratory temp (°C)		24					
Last calibration date		October					
		00000					

Client

Visy Pulp and Paper





Date

#### 2.10 Vacuum Pump 10 – (Paper Machine Hood Vent Exhaust)

19/07/2022

Report R013282-1			Stack ID	Vacuum Pum		
Licence No. 10252			Location	Tumut		
Ektimo Staff Aaron Davis / Scott V			State	NSW		
Process Conditions Please refer to clien	t records					220701
Sampling Plane Details						
Sampling plane dimensions		2450 x 3	3500 mm			
Sampling plane area			8 m²			
Sampling port size, number			datexit			
Access & height of ports		Stairs				
Duct orientation & shape			Rectangular			
Downstream disturbance		Bend	-			
Upstream disturbance		Bend	0.2 D			
No. traverses & points sampled		5	25			
Sample plane conformance to AS 4323.1		Non-cor	nforming			
Comments	alas a ta si si d					
The discharge is assumed to be composed of	-					
The gas temperature of the sampling plane is	s below the dev	w point				
The sampling plane is deemed to be non-conformi	ing due to the fol	lowing reaso	ns:			
The upstream disturbance is <2D from the same	-	2				
The sampling plane is too near to the downs		nce butis gr	eater than or	equal to 1D		
Stack Parameters						
Moisture content, %v/v	8.	5 (saturated	1)			
Gas molecular weight, g/g mole	28.0 (wet)			29.0 (dry)		
Gas density at STP, kg/m <sup>3</sup>	1.25 (wet)			1.29 (dry)		
Gas density at discharge conditions, kg/m <sup>3</sup>		1.03				
Gas Flow Parameters						
Flow measurement time(s) (hhmm)		1205				
Temperature, °C		42				
Temperature, K		315				
Velocity at sampling plane, m/s	3.5					
Volumetric flow rate, actual, m <sup>3</sup> /s		30				
Volumetric flow rate (wet STP), m <sup>3</sup> /s		25				
Volumetric flow rate (dry STP), m <sup>3</sup> /s		23				
Mass flow rate (wet basis), kg/hour		110000				
	1		1			
Odour	Avera	age		st 1	Test	t 2
Sampling time			1210	-1215	1215 -	
		Odourant		Odourant		Odourant
	Concentration ou	Flow Rate oum³/min	Concentration ou	Flow Rate oum³/min	Concentration ou	Flow Rate oum³/min
Results	3000	4400000	2900	4300000	3100	4600000
	2300	4400000	2900	4300000	2200	4000000
Lower uncertainty limit			4000		4400	
Upper uncertainty limit	3800			1040 1255		040 1255
Analysis date & time Holding time				1040-1255 nours	20/07/22, 1 22 ho	
Dilution factor				5	5	013
				phan		han
Bag material			Naio	puan	Nalop	nail
Butanol threshold (ppb)	44					
Laboratory temp (°C)	24					
Last calibration date	October					
	000000		!			

Client

Visy Pulp and Paper



#### **3** Plant Operating Conditions

See Visy Pulp and Paper records for complete process conditions.

#### 4 Test Methods

All sampling and analysis performed by Ektimo unless otherwise specified. Specific details of the methods are available upon request.

				NATA accredited		
Parameter	Sampling method	Analysis method	Uncertainty*	Sampling	Analysis	
Sampling points - Selection	NSW EPA TM-1 (AS 4323.1)	NA	NA	✓	NA	
Flow rate, temperature and velocity	NSW EPA TM-2 (USEPA Method 2)	NSW EPA TM-2 (USEPA Method 2)	8%, 2%, 7%	NA	~	
Moisture content	NSW EPA TM-22 (USEPA Alt-Method 008)	NSW EPA TM-22 (USEPA Alt-Method 008)	19%	✓	~	
Odour	NSW EPA OM-7 (AS 4323.3)	NSW EPA OM-7 (AS 4323.3)	refer to results	✓	ô	
Odour from diffuse sources	NSW EPA OM-8 (AS 4323.4)	NSW EPA OM-8 (AS 4323.4)	refer to results	$\checkmark$	ô	
					22072	

\* Uncertainties cited in this table are estimated using typical values and are calculated at the 95% confidence level (coverage factor = 2).

<sup>\*</sup> Odour analysis conducted at the NSW laboratory by forced choice olfactometry, NATA accreditation number 14601. Results were reported on.

14 July 2022 in report ON-00149. 20 July 2022 in report ON-00151.

#### 5 Quality Assurance/Quality Control Information

Ektimo is accredited by the National Association of Testing Authorities (NATA) for the sampling and analysis of air pollutants from industrial sources. Unless otherwise stated test methods used are accredited with the National Association of Testing Authorities. For full details, search for Ektimo at NATA's website www.nata.com.au.

Ektimo is accredited by NATA to ISO/IEC 17025 - Testing. ISO/IEC 17025 - Testing requires that a laboratory have adequate equipment to perform the testing, as well as laboratory personnel with the competence to perform the testing. This quality assurance system is administered and maintained by the Quality Director.

NATA is a member of APAC (Asia Pacific Accreditation Co-operation) and of ILAC (International Laboratory Accreditation Co-operation). Through mutual recognition arrangements with these organisations, NATA accreditation is recognised worldwide.



#### 6 Definitions

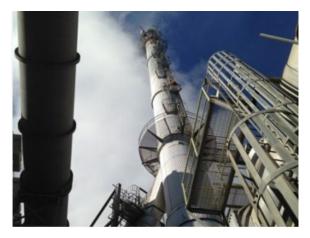
The following symbols and abbreviations may be used in this test report:

% v/v	Volume to volume ratio, dry or wet basis
~	Approximately
<	Less than
>	Greater than
2	Greater than or equal to
AS	Australian Standard
BSP	British standard pipe
CARB	Californian Air Resources Board
СТМ	Conditional test method
D	Duct diameter or equivalent duct diameter for rectangular ducts
DECC	Department of Environment & Climate Change (NSW)
Disturbance	A flow obstruction or instability in the direction of the flow which may impede accurate flow determination. This includes
	centrifugal fans, axial fans, partially closed or closed dampers, louvres, bends, connections, junctions, direction changes
	or changes in pipe diameter.
EPA	Environment Protection Authority
ISC	Intersociety Committee, Methods of Air Sampling and Analysis
ISO	International Organisation for Standardisation
ITE	Individual threshold estimate
Lower bound	When an analyte is not present above the detection limit, the result is assumed to be equal to zero.
Medium bound	When an analyte is not present above the detection limit, the result is assumed to be equal to half of the detection limit.
NA	Not applicable
NATA	National Association of Testing Authorities
NT	Not tested or results not required
OM	Other approved method
OU	Odour unit. One OU is that concentration of odorant(s) at standard conditions that elicits a physiological response from a
	panel equivalent to that elicited by one Reference Odour Mass (ROM), evaporated in one cubic metre of neutral gas at
	standard conditions.
STP	Standard temperature and pressure. Gas volumes and concentrations are expressed on a dry basis at 0 °C, at discharge
-	oxygen concentration and an absolute pressure of 101.325 kPa.
TM	Test method
USEPA	United States Environmental Protection Agency
VDI	Verein Deutscher Ingenieure (Association of German Engineers)
Velocity difference	The percentage difference between the average of initial flows and after flows.
Vic EPA	Victorian Environment Protection Authority
XRD	X-ray diffractometry
Upper bound 95% confidence interval	When an analyte is not present above the detection limit, the result is assumed to be equal to the detection limit.
95% confidence interval	Range of values that contains the true result with 95% certainty. This means there is a 5% risk that the true result is outside
	this range.

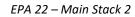


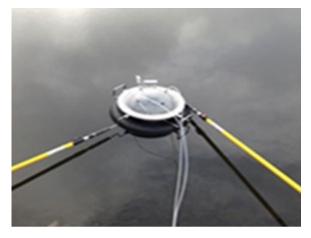


#### 7 Appendix 1: Site Photos



EPA 1 - Main Stack 1





Cooling Pond 3A



Cooling Tower (#1 Paper Machine Side)



Cooling Pond 3B



Cooling Tower (#2 Paper Machine Side)





Vacuum Pump 3 – (790 Couch)



Vacuum Pump 7 – (794 First Bottom)



Vacuum Pump 9 (Paper Machine Hood Vent Exhaust)



Vacuum Pump 10 (Paper Machine Hood Vent Exhaust)



ektimo.com.au 1300 364 005

**MELBOURNE** (Head Office) 26 Redland Drive Mitcham VIC 3132 AUSTRALIA

**SYDNEY** 6/78 Reserve Road Artarmon NSW 2064 AUSTRALIA

WOLLONGONG 1/251 Princes Highway Unanderra NSW 2526 AUSTRALIA

**PERTH** 52 Cooper Road Cockburn Central WA 6164 AUSTRALIA

**BRISBANE** 3/109 Riverside Place Morningside QLD 4170 AUSTRALIA

Visy Pulp and Paper, Tumut Emission Testing Report – Q3 Testing (Odour) Report Number R014339-1r

ektimo.com.au



#### **Document Information**

Template Version 130223

Client Name:	Visy Pulp and Paper
Report Number:	R014339-1r
Date of Issue:	21 April 2023
Attention:	Matthew O`Donovan
Address:	1302 Snowy Mountains Highway Tumut NSW 2720
Testing Laboratory:	Ektimo Pty Ltd, ABN 86 600 381 413

#### **Amendment Record**

Original Document Number	Initiator	Original Report Date	Section (s)	Reason for revision
R014339-1	Ektimo	30 March 2023	2. Results (page 5) 7 Appendix 1: Site photos (page 17)	Additional sampling location added.

#### **Report Authorisation**



**Aaron Davis Senior Air Monitoring** Consultant

No. 14601

Accredited for compliance with ISO/IEC 17025 - Testing. NATA is a signatory to the ILAC mutual recognition arrangement for the mutual recognition of the equivalence of testing, calibration, and inspection reports.

This document is confidential and is prepared for the exclusive use of Visy Pulp and Paper and those granted permission by Visy Pulp and Paper. The report shall not be reproduced except in full.

Please note that only numerical results pertaining to measurements conducted directly by Ektimo are covered by Ektimo's terms of NATA accreditation as described in the Test Methods table. This does not include calculations that use data supplied by third-parties, comments, conclusions, or recommendations based upon the results. Refer to 'Test Methods' for full details of testing covered by NATA accreditation.







#### **Table of Contents**

1	l	Executive Summary4
	1.1	Background4
	1.2	Project Objective & Overview4
2	I	Results5
	2.1	EPA 1 – Main Stack 15
	2.2	EPA 22 – Main Stack 26
	2.3	Cooling Pond 3A7
	2.4	Cooling Pond 3B8
	2.5	Cooling Tower 1 (#1 Paper Machine Side)9
	2.6	Cooling Tower 2 (#2 Paper Machine Side)10
	2.7	Vacuum Pump 3 – (790 Couch)11
	2.8	Vacuum Pump 7 – (794 First Bottom)12
	2.9	Vacuum Pump 9 – (Paper Machine Hood Vent Exhaust)13
	2.10	) Vacuum Pump 10 – (Paper Machine Hood Vent Exhaust)14
3	I	Plant Operating Conditions
4	-	۲est Methods15
5	(	Quality Assurance/Quality Control Information15
6	I	Definitions
7		Appendix 1: Site Photos



#### **1** Executive Summary

#### 1.1 Background

Ektimo was engaged by Visy Pulp and Paper to perform an odour monitoring survey at their Tumut facility. The program incorporated both point source and area source (flux hood) monitoring.

#### **1.2** *Project Objective & Overview*

The objective of the project was to conduct a monitoring program to quantify emissions from multiple discharge points.

Monitoring was performed as follows:

Location	Test Date	Test Parameters*
EPA 1 – Main Stack 1	30 March 2023	
EPA 22 – Main Stack 2		
Cooling Pond 3A		
Cooling Pond 3B		Odour (duplicate)
Cooling Tower 1 (#1 Paper Machine Side)		
Cooling Tower 2 (#2 Paper Machine Side)	23 February 2023	
Vacuum Pump 3 – (790 Couch)		
Vacuum Pump 7 – (794 First Bottom)		
Vacuum Pump 9 – (Paper Machine Hood Vent Exhaust)		
Vacuum Pump 10 – (Paper Machine Hood Vent Exhaust)		

\* Flow rate, velocity, temperature, and moisture were also determined.

All results are reported on a dry basis at STP (except odour wet – STP).



#### 2 Results

#### 2.1 EPA 1 – Main Stack 1

Date	30/03/2023	Client	Visy Pulp and Paper	
Report	R014339	Stack ID	EPA 1 - Main Stack 1	
Licence No.	10232	Location	Tumut	
Ektimo Staff	Aaron Davis/Ahmad Ramiz	State	NSW	
Process Conditions	Please refer to client records.			230328
Sampling Plane Detai	ils			
Sampling plane dime	ensions	2660 mm		
Sampling plane area		5.56 m²		
Sampling port size, n	umber	4" Flange (x2)		
Duct orientation & s	hape	Vertical Circular		
Downstream disturb	ance	Exit 5 D		
Upstream disturband	ce in the second s	Junction 20 D		
No. traverses & point	s sampled	2 24		
Sample plane confor	mance to AS 4323.1	Ideal sampling plane		
Stack Parameters				
Moisture content, %v	/v	22		
Gas molecular weigh	it, g/g mole	27.8 (wet)	30.7 (dry)	
Gas density at STP, k	g/m³	1.24 (wet)	1.37 (dry)	
Gas density at discha	arge conditions, kg/m³	0.69		
% Oxygen correction 8	& Factor	8 %	0.82	
Gas Flow Parameters	-			
Flow measurement t	ime(s) (hhmm)	1025 & 1235		
Temperature, °C		189		
Temperature, K		462		
Velocity at sampling		27		
Volumetric flow rate,		150		
Volumetric flow rate (wet STP), m³/s		84		
Volumetric flow rate	(dry STP), m³/s	65		
Mass flow rate (wet	basis), kg/hour	380000		

Ddour Average		Test 1		Test 2		
Sampling time			1110 -	1120	1135 -	1145
		Odourant		Odourant		Odourant
	Concentration ou	Flow Rate oum³/min	Concentration ou	Flow Rate oum³/min	Concentration ou	Flow Rate oum³/min
Results	790	4000000	790	4000000	790	4000000
Lower uncertainty limit	640		580		580	
Upper uncertainty limit	980		1100		1100	
Analysis date & time			31/03/23, 1	000 - 1145	31/03/23, 1	000 - 1145
Holding time			23 ho	ours	23 ho	ours
Dilution factor			1		1	
Bag material			Nalop	han	Nalop	han
Butanol threshold (ppb)	53	8				
Laboratory temp (°C)	22	2				
Last calibration date	October	2022				





#### 2.2 EPA 22 – Main Stack 2

Date	23/02/2023			Client	Visy Pulp and	d Paper	
Report	R014339-1			Stack ID	EPA 22 - Mair	n Stack 2	
Licence No.	10232			Location	Tumut		
Ektimo Staff	Zoe Parker / Aaron	Davis		State	NSW		
Process Conditions	Please refer to clie	nt records					230220
Sampling Plane Detai							
Sampling plane dime	ensions			) mm			
Sampling plane area			4.7	1 m²			
Sampling port size, n	umber			1ge (x2)			
Duct orientation & sl	nape		Vertical	Circular			
Downstream disturba	ince		Exit	10 D			
Upstream disturbanc	e		Junction	5 D			
No. traverses & point	s sampled		2	20			
Sample plane conform	mance to AS 4323.1		Conforming l	but non-ideal			
	leemed to be non-ideal du		-				
ine sampling plane i	s too near to the upstre	eam disturban	ce but is grea	ater than or e	qual to 2D		
Stack Parameters							
Moisture content, %v	/v		21				
Gas molecular weigh			28.0 (wet)		30.7 (dry)		
Gas density at STP, kg			1.25 (wet)		1.37 (dry)		
	rge conditions, kg/m <sup>3</sup>		0.74				
Gas Flow Parameters							
Flow measurement ti	me(s) (hhmm)		1005 & 1035				
Temperature, °C			172				
Temperature, K			446				
Velocity at sampling			21				
Volumetric flow rate,			97				
Volumetric flow rate	(wet STP), m³/s		58				
Volumetric flow rate	(dry STP), m³/s		45				
Mass flow rate (wet b	basis), kg/hour		260000				
Odour		٨	2.50	- T-	c+ 1	т	+ 2
	Constitution	Aver	age		st 1	Test 2	
	Sampling time		Odeurset	1010	- 1020	1021 -	
		Concentration	Odourant Flow Rate	Concentration	Odourant Flow Rate	Concentration	Odourant Flow Rate
		ou	oum <sup>3</sup> /min	ou	oum <sup>3</sup> /min	ou	oum <sup>3</sup> /min
Results		1400	4900000	1200	4200000	1600	5500000
Lower uncertainty limit		1100		910		1200	
Upper uncertainty limit		1700		1700		2200	
Analysis date & time		1700			1000-1230	22/02/23, 2	1000-1230
,					hours	24/02/23, 24 h	
Holding time					nours 1	24 no	
Dilution factor							
Bag material				Naic	phan	Nalop	nafi
Butanol threshold (ppb)		58	3				
Laboratory (tomps (%C)			, ,	1		1	

23

October 2022





Laboratory temp (°C)

Last calibration date

#### 2.3 Cooling Pond 3A

Client	Visy Pulp and Paper	Test Location	Cooling Pond 3A		
Date	23/02/2023	Plant/Site	Tumut		
Report No.	R014339-1		Tumut, NSW		
Ektimo Staff	Zoe Parker / Aaron Davis			220907	
Test Location	Details				
Location Desc	cription	Green/brown	murky liquid, filling up		
Surface Desci	ription	Clo	oudysurface		
Area Classific	ation		Industrial		
Source dimen	sions (L x W), m		50 x 32		
Source area, r	m <sup>2</sup>		1600		
Sampling Met	hod	AS4	4323.4 (Flux)		
Odour		Test 1	Test 2		
Sampling time	e, hrs	0845 - 0855	0856 - 0906		
Sample dilutio	on	1	1		
Concentration	, ou	360	260		
Average conc	centration, ou		310		
95% Confidence	e Interval	250 - 380			
Flux Emission	n Rate, ou.m³/m²/min	11			
Total area so	urce emission rate, ou.m³/min		17000		
Flux Testing F	Parameters				
Equilibration t	ime, hrs	0	820 - 0844		
Sweep Rate @	) STP, L/min		4.36		
Penetration D	epth, mm		10		
Static Pressur	re, Pa		20		
Surface tempe	erature, °C		18		
Chamber tem	perature, °C		23		
Ambient temp	erature, °C		19		



#### 2.4 Cooling Pond 3B

Client	Visy Pulp and Paper	Test Location	Cooling Pond 3B		
Date	23/02/2023	Plant/Site	Tumut		
Report No.	R014339-1		Tumut, NSW		
Ektimo Staff	Zoe Parker / Aaron Davis			220907	
Test Location	Details				
Location Desc	cription	Green murky	/liquid, not filling up		
Surface Descr	ription	Clou	udysurface		
Area Classific	ation	Ir	ndustrial		
Source dimen	sions (L x W), m		50 x 32		
Source area, r	n <sup>2</sup>		1600		
Sampling Met	hod	AS4	323.4 (Flux)		
Odour		Test 1	Test 2		
Sampling time	e, hrs	0935 - 0945	0946 - 0956		
Sample dilutio	on	1	1		
Concentration	, ou	240	260		
Average conc	entration, ou	250			
95% Confidence	e Interval	200 - 300			
Flux Emission	Rate, ou.m³/m²/min	8.6			
Total area so	urce emission rate, ou.m³/min		14000		
Flux Testing P	Parameters				
Equilibration ti	ime, hrs	09	10 - 0935		
Sweep Rate @	) STP, L/min		4.42		
Penetration De	epth, mm		10		
Static Pressur	e, Pa		10		
Surface tempe	erature, °C		20		
Chamber tem	perature, °C		25		
Ambient temp	erature, °C		21		





#### 2.5 Cooling Tower 1 (#1 Paper Machine Side)

r Machine Side)
230316

1 81		
Sampling port size, number	Sampled at exit	
Duct orientation & shape	Vertical	
Downstream disturbance	Exit 0 D	
Upstream disturbance	Change in diameter 0 D	
No. traverses & points sampled	11	
Sample plane conformance to AS 4323.1	Non-conforming	

#### Comments

Velocity and volumetric flowrate measurements could not be taken The number of traverses sampled is less than the requirement The discharge is assumed to be composed of dry air and moisture

#### The sampling plane is deemed to be non-conforming due to the following reasons:

The downstream disturbance is <1D from the sampling plane

The upstream disturbance is <2D from the sampling plane

The stack or duct does not have the required number of access holes (ports)

Odour	Average	Test 1	Test 2
Sampling time		1003 - 1014	1015 - 1024
	Concentration	Concentration	Concentration
	ou	ou	ou
Results	790	790	790
Lower uncertainty limit	640	580	580
Upper uncertainty limit	980	1100	1100
Analysis date & time		24/02/23, 1000-1230	24/02/23, 1000-1230
Holding time		24 hours	24 hours
Dilution factor		1	1
Bag material		Nalophan	Nalophan
Butanol threshold (ppb)	58		
Laboratory temp (°C)	23		
Last calibration date	October 2022		



#### 2.6 Cooling Tower 2 (#2 Paper Machine Side)

Date 23/02/2023   Report R014339-1			Client Stack ID	Visy Pulp and Paper Cooling Tower 2 (#2 Paper Machine Side		
Licence No. 10252			Location	Tumut		
Ektimo Staff	Zoe Parker / Aaron Da		State	NSW		
Process Conditions	Please refer to client	records.			230316	
Sampling Plane Deta	ails					
Sampling plane dim		Exit diameter could	I not he meas	sured mm		
Sampling plane area			NA			
Sampling port size, r		Samol	ed at exit			
Duct orientation & s		•	ertical			
Downstream disturb			it 0 D			
Upstream disturband						
		Change in diamete	11			
No. traverses & point	•	Non o				
Sample plane confo	rmance to AS 4323.1	NON-CO	onforming			
Comments						
Velocity and volume	tric flowrate measurement	ts could not be taken				
-	rses sampled is less than					
	umed to be composed of a	•				
		,				
The sampling plane is	deemed to be non-conformin	g due to the following reaso	ns:			
The downstream dis	turbance is <1D from the s	ampling plane				
The upstream distur	bance is <2D from the sam	pling plane				
The stack or duct doe	es not have the required n	umber of access holes (po	orts)			
Odour		Average		Test 1	Test 2	
	Samplingtime		1	026-1035	1036 - 1045	
		Constantion	6		Concentration	
		Concentration ou	Col	ncentration ou	Concentration ou	
Desults						
Results		1000		1000	1000	
Lower uncertainty limit		830		760	760	
Upper uncertainty limit		1300		1400	1400	
Analysis date & time				2/23, 1000-1230	24/02/23, 1000-1230	
Holding time				24 hours	24 hours	
Dilution factor				1	1	
Bag material				Nalophan	Nalophan	
Butanol threshold (ppb)		58				
Laboratory temp (°C)		23				
Last calibration date		23 October 2022				



#### 2.7 Vacuum Pump 3 – (790 Couch)

Date	23/02/2023			Client	Visy Pulp and P	aper	
Report	R014339-1			Stack ID	Vacuum Pump		
Licence No.	10252			Location	Tumut	5 (750 couch)	
Ektimo Staff	Zoe Parker / Aaron Dav	<i>i</i> is		State	NSW		
Process Conditions	Please refer to client re			State	11311		230316
Sampling Plane Details							
Sampling plane dimensions			1006	5 mm			
Sampling plane area				5 m <sup>2</sup>			
Sampling port size, number				d at exit			
Duct orientation & shape			Vertical	Circular			
Downstream disturbance			Exit	0 D			
Upstream disturbance			Exit	0 D			
No. traverses & points sam	pled		1	1			
Sample plane conformance	to AS 4323.1		Non-cor	nforming			
Comments							
The number of traverses sa	mpled is less than the rec	quirement					
The number of points samp	led is less than the requir	ement					
The discharge is assumed to	be composed of dry air	and moisture					
The gas temperature of the	sampling plane is below	the dew point					
The sampling plane is deer	med to be non-conformi	ng due to the f	ollowing reason	s:			
The downstream disturband	ce is <1D from the sampli	ng plane					
The upstream disturbance is	s <2D from the sampling	plane					
The stack or duct does not	have the required numbe	r of access hole	es (ports)				
Stack Parameters							
Moisture content, %v/v			14 (saturated)				
Gas molecular weight, g/g n	nole		27.4 (wet)		29.0 (dry)		
Gas density at STP, kg/m <sup>3</sup>			1.22 (wet)		1.29 (dry)		
Gas density at discharge co	nditions, kg/m <sup>3</sup>		0.99				
Gas Flow Parameters	(1-1		4455 8 4305				
Flow measurement time(s)	(nnmm)		1155 & 1205				
Temperature, °C			52				
Temperature, K			325				
Velocity at sampling plane,			7.7				
Volumetric flow rate, actua			6.1				
Volumetric flow rate (wet S			5				
Volumetric flow rate (dry ST			4.3				
Mass flow rate (wet basis),	ng/ 1001		22000				
Odour		Δνε	erage	Te	est 1	٩T	st 2
	Sampling time				- 1158		- 1202
	Sampling time		Odourant Flow	1150	Odourant Flow	1200	Odourant Flow
		Concentration	Rate	Concentration	Rate	Concentration	Rate
		ou	oum³/min	ou	oum <sup>3</sup> /min	ou	oum <sup>3</sup> /min
Results		4800	1400000	5600	1700000	3900	1200000
Lower uncertainty limit		3900	2.00000	4200	2.00000	2900	
Upper uncertainty limit		5900		7600		5300	
Analysis date & time		5500			, 1000-1230		1000-1230
Holding time					, 1000-1230 hours		1000-1230 nours
Dilution factor				22	5		5
					5		

58 23

October 2022



Bag material

Butanol threshold (ppb)

Laboratory temp (°C) Last calibration date Nalophan

Nalophan

#### 2.8 Vacuum Pump 7 – (794 First Bottom)

ReportRLicence No.1Ektimo Staff2	23/02/2023 2014339-1 20252 20e Parker / Aaron I 21ease refer to cliet			Client Stack ID Location State	Visy Pulp and Vacuum Pum Tumut NSW	d Paper p 7 (794 First E	ottom) 230316
Sampling Plano Datails							
Sampling Plane Details	nc		006				
Sampling plane dimensio	ns			mm I5 m <sup>2</sup>			
Sampling plane area	~ ~						
Sampling port size, number	er		-	d at exit			
Duct orientation & shape				Circular 0 D			
Downstream disturbance							
Upstream disturbance	nnlad			0 D 1			
No. traverses & points san	-						
Sample plane conformanc	e to AS 4323.1		Non-cor	nforming			
Comments The number of traverses s The number of points sam The discharge is assumed The gas temperature of th The sampling plane is deeme The downstream disturba The upstream disturbance The stack or duct does not Stack Parameters Moisture content, %v/v Gas molecular weight, g/g Gas density at STP, kg/m <sup>3</sup> Gas density at discharge of Gas Flow Parameters	appled is less than t to be composed of e sampling plane ed to be non-conform nce is <1D from the is <2D from the sa c have the required mole conditions, kg/m <sup>3</sup>	the requirement of dry air and m is below the d ning due to the f a sampling plane number of acc	nt ioisture ew point following reas ne cess holes (p .3 (saturated 27.6 (wet) 1.23 (wet) 1.00	ports)	29.0 (dry) 1.29 (dry)		
Flow measurement time(s	s) (hhmm)		1205 & 1215				
Temperature, °C			50				
Temperature, K	/		323				
Velocity at sampling plane			6.9				
Volumetric flow rate, actu			4.5				
Volumetric flow rate (wet			3.6				
Volumetric flow rate (dry S Mass flow rate (wet basis			3.2 16000				
mass now rate (wet basis	,, kg/11001		10000				
Odour		Aver	age	Те	est 1	Tes	t 2
	Samplingtime			1206	- 1208	1209 -	
		Concentration ou	Odourant Flow Rate oum³/min	Concentration ou	Odourant Flow Rate oum³/min	Concentration ou	Odourant Flow Rate oum³/min
Results		4600	1000000	5600	1200000	3600	790000
Lower uncertainty limit		3700		4200		2700	
Upper uncertainty limit		5700		7600		4900	
Analysis date & time					, 1000-1230		1000-1230
Holding time					hours	24/02/20, 22 h	
Dilution factor					5	5	
Bag material				Nalo	ophan	Nalor	
-							
Butanol threshold (ppb)		58					
Laboratory temp (°C)		23					
Last calibration date		October	2022				



Dat

#### 2.9 Vacuum Pump 9 – (Paper Machine Hood Vent Exhaust)

22/02/2022

Date	23/02/2023				Client	Visy Pulp and Pa	aper	
Report	R014339-1				Stack ID	Vacuum Pump 9	Ð	
Licence No.	10252				Location	Tumut		
Ektimo Staff	Zoe Parker / Aar	on Dav	vis		State	NSW		
Process Conditions	Please refer to c	lient re	cords.					230316
Sampling Plane Details	5							
Sampling plane dimension	S				.750 mm			
Sampling plane area				2.63	3 m <sup>2</sup>			
Sampling port size, numbe	r			Sample	d at exit			
Duct orientation & shape				Horizontal	Rectangular			
Downstream disturbance				Exit	2 D			
Upstream disturbance				Junction	0.1 D			
No. traverses & points san	npled			1	1			
Sample plane conformance	e to AS 4323.1			Non-cor	nforming			
Comments								
The number of traverses s	ampled is less than	the req	uirement					
The number of points sam	pled is less than the	requir	ement					
The discharge is assumed	to be composed of	dry air a	and moisture					
The gas temperature of th	e sampling plane is	below	the dew point					
The sampling plane is de	emed to be non-co	nformi	ng due to the f	ollowing reason	s:			
The upstream disturbance	is <2D from the sam	npling p	plane					
The stack or duct does no				s (ports)				
The sampling plane is too	-				equal to 1D			
Stack Parameters								
Moisture content, %v/v				23 (saturated)				
Gas molecular weight, g/g	mole			26.4 (wet)		29.0 (dry)		
Gas density at STP, kg/m <sup>3</sup>				1.18 (wet)	1.29 (dry)			
Gas density at discharge c	onditions, kg/m <sup>3</sup>			0.92				
Gas Flow Parameters								
Flow measurement time(s	) (hhmm)			1155 & 1210				
Temperature, °C				63				
Temperature, K				336				
Velocity at sampling plane	e, m/s			8.3				
Volumetric flow rate, actu	ual, m³/s			22				
Volumetric flow rate (wet	STP), m³/s			17				
Volumetric flow rate (dry				13				
Mass flow rate (wet basis				72000				
Odour			Ave	rage		st 1	Tes	
	Sampli	ng time			1200	- 1202	1204 -	
				Odourant Flow		Odourant Flow		Odourant Flow
			Concentration	Rate	Concentration	Rate	Concentration	Rate
			ou	oum <sup>3</sup> /min	ou	oum³/min	ou	oum <sup>3</sup> /min
Results			2700	2800000	2100	2200000	3300	3400000
			2200		1600		2500	
Lower uncertainty limit			3400		2900		4500	
•			5100			1000 1330	24/02/23, 1	000-1230
Lower uncertainty limit Upper uncertainty limit Analysis date & time			5100		24/02/23,	, 1000-1230	,,,	.000 1250
Upper uncertainty limit			5.00		22	hours	22 h	ours
Upper uncertainty limit Analysis date & time			5.00		22			ours
Upper uncertainty limit Analysis date & time Holding time Dilution factor					22	hours	22 h	ours
Upper uncertainty limit Analysis date & time Holding time				58	22	hours 5	22 h	ours
Upper uncertainty limit Analysis date & time Holding time Dilution factor Bag material			5	58 23	22	hours 5	22 h	ours



#### 2.10 Vacuum Pump 10 – (Paper Machine Hood Vent Exhaust)

Date	23/02/2023			Client	Visy Pulp and P	aper	
Report	R014339-1			Stack ID	Vacuum Pump	10	
Licence No.	10252			Location	Tumut		
Ektimo Staff	Zoe Parker / Aaron Dav	/is		State	NSW		
Process Conditions	Please refer to client re	ecords.					23031
	il						
Sampling Plane Deta			24502	<b>FOO</b>			
Sampling plane dimensio	JIIS		2450 X 3 8.58	500 mm			
Sampling plane area	h						
Sampling port size, num			•	d at exit			
Duct orientation & shap				Rectangular			
Downstream disturbanc	e		Bend				
Upstream disturbance				0.2 D			
No. traverses & points s				25			
Sample plane conforma	nce to AS 4323.1		Non-cor	nforming			
Comments							
The discharge is assume	d to be composed of dry air	and moisture					
The gas temperature of	the sampling plane is below	the dew point					
The sampling plane is d	leemed to be non-conformi	ng due to the fr	ollowing reason	s:			
	ce is <2D from the sampling	-					
	o near to the downstream d		greater than or	equal to 1D			
The sampling plane is to							
Stack Parameters							
Moisture content, %v/v			8.7 (saturated)				
Gas molecular weight, g	/g mole		28.0 (wet)		29.0 (dry)		
Gas density at STP, kg/m	1 <sup>3</sup>		1.25 (wet)		1.29 (dry)		
Gas density at discharge	e conditions, kg/m <sup>3</sup>		1.04				
Gas Flow Parameters							
Flow measurement time			1240 & 1250				
	2(5) (1111111)						
Temperature, °C			43				
Temperature, K	no mlo		316				
Velocity at sampling pla			3.6				
Volumetric flow rate, ac			31				
Volumetric flow rate (w			25				
Volumetric flow rate (dr			23				
Mass flow rate (wet bas	sis), kg/hour		110000				
Odour		Ave	rage	Te	est 1	Tes	t 2
	Sampling time		- 0-		- 1244	1245 -	
	Samping time		Odourant Flow	1242	Odourant Flow	1243	Odourant Flow
		Concentration	Rate	Concentration	Rate	Concentration	Rate
		ou	oum <sup>3</sup> /min	ou	oum <sup>3</sup> /min	ou	oum <sup>3</sup> /min
Results		4200	6400000	2800	4300000	5600	8600000
Lower uncertainty limit		3400	0400000	2100	-300000	4200	0000000
Upper uncertainty limit		5200		3800	1000 1330	7600	1000 1220
Analysis date & time					, 1000-1230	24/02/23, 2	
Holding time				22	hours	22 h	
Dilution factor					5	5	
Bag material				Na	ophan	Nalop	onan
Butanol threshold (ppb)		5	58				
Laboratory tomp (°C)		,	12				

23

October 2022



Laboratory temp (°C)

Last calibration date

#### **3** Plant Operating Conditions

See Visy Pulp and Paper records for complete process conditions.

From information received from the site operator, unless otherwise noted it is our understanding that samples were collected during normal plant operations. Unless otherwise noted all samples were collected in compliance with Ektimo's QA/QC standards.

#### 4 Test Methods

All sampling and analysis performed by Ektimo unless otherwise specified. Specific details of the methods are available upon request.

				NATA accredited	
Parameter	Sampling method	Analysis method	Uncertainty*	Sampling	Analysis
Sampling points - Selection	NSW EPA TM-1	NA	NA	✓	NA
	(AS 4323.1)				
Flow rate, temperature & velocity	NSW EPA TM-2	NSW EPA TM-2	8%, 2%, 7%	NA	$\checkmark$
· · ·	(USEPA Method 2)	(USEPA Method 2)			
Moisture content	NSW EPA TM-22	NSW EPA TM-22	19%	$\checkmark$	$\checkmark$
	(USEPA Alt-Method 008)	(USEPA Alt-Method 008)	2070		
Odour	NSW EPA OM-7	NSW EPA OM-7	refer to results	✓	✓¥
Ododi	(AS 4323.3)	(AS 4323.3)	Terer to results	•	v
Odour from diffuse sources	NSW EPA OM-8	NSW EPA OM-8	refer to results	~	✓¥
Odour from diffuse sources	(AS 4323.4)	(AS 4323.4)	refer to results	v	V
					230320

\* Uncertainties cited in this table are estimated using typical values and are calculated at the 95% confidence level (coverage factor = 2).

¥ Odour analysis conducted at the Ektimo NSW EPA laboratory by forced choice olfactometry. Results were reported to Ektimo on:

- 24 February 2023 in report ON-00184.
- 31 March 2023 in report ON-00195.

#### 5 Quality Assurance/Quality Control Information

Ektimo is accredited by the National Association of Testing Authorities (NATA) for the sampling and analysis of air pollutants from industrial sources. Unless otherwise stated test methods used are accredited with the National Association of Testing Authorities. For full details, search for Ektimo at NATA's website www.nata.com.au.

Ektimo is accredited by NATA to ISO/IEC 17025 - Testing. ISO/IEC 17025 - Testing requires that a laboratory have adequate equipment to perform the testing, as well as laboratory personnel with the competence to perform the testing. This quality assurance system is administered and maintained by the Quality Director.

NATA is a member of APAC (Asia Pacific Accreditation Co-operation) and of ILAC (International Laboratory Accreditation Co-operation). Through mutual recognition arrangements with these organisations, NATA accreditation is recognised worldwide.



#### 6 Definitions

The following symbols and abbreviations may be used in this test report:

is includes n changes
tion limit.
nse from a tral gas at
discharge
nit.
is outside





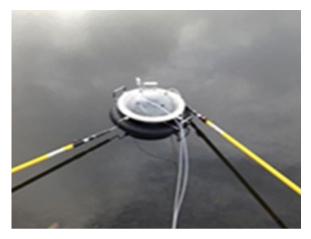
#### 7 Appendix 1: Site Photos



EPA 1 - Main Stack 1



EPA 22 – Main Stack 2



Cooling Pond 3A



Cooling Tower (#1 Paper Machine Side)



Cooling Pond 3B



Cooling Tower (#2 Paper Machine Side)





Vacuum Pump 3 – (790 Couch)



Vacuum Pump 7 – (794 First Bottom)



Vacuum Pump 9 (Paper Machine Hood Vent Exhaust)



Vacuum Pump 10 (Paper Machine Hood Vent Exhaust)



ektimo.com.au 1300 364 005

**MELBOURNE** (Head Office) 26 Redland Drive Mitcham VIC 3132 AUSTRALIA

**SYDNEY** 6/78 Reserve Road Artarmon NSW 2064 AUSTRALIA

WOLLONGONG 1/251 Princes Highway Unanderra NSW 2526 AUSTRALIA

**PERTH** 52 Cooper Road Cockburn Central WA 6164 AUSTRALIA

**BRISBANE** 3/109 Riverside Place Morningside QLD 4170 AUSTRALIA