THE ODOUR UNIT (QLD) PTY LTD

THE ODOUR UNIT

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NATA
Accreditation Number: 14974

Odour Concentration Measurement Report

The measurement was commissioned by:

Organisation	Ridley Agriproducts Pty Ltd	Telephone	07 8624 6500
Contact	David Coward	Facsimile	07 5941 0396
Sampling Site	Ridleys, Narangba	Email	david.coward@ridley.com.au
Sampling Method	ASNZS4323.3	Sampling Team	S. Munro

Order details:

Order requested by	David Coward	Order accepted by	T. Schulz
Date of order	19/06/2017	TOU Project #	Q2110_04
Order number	PPO475331	Project Manager	T. Schulz
Signed by	David Coward	Testing operator	S. Munro

Investigated Item	Odour concentration in odour units 'ou', determined by sensory odour concentration measurements, of an odour sample supplied in a sampling bag.
Identification	The odour sample bags were labelled individually. Each label recorded the testing laboratory, sample number, sampling location (or Identification), sampling date and time, dilution ratio (if dilution was used) and whether further chemical analysis was required.
Method	The odour concentration measurements were performed using dynamic olfactometry according to the Australian Standard 'Determination of Odour Concentration by Dynamic Olfactometry AS/NZS4323.3:2001. The odour perception characteristics of the panel within the presentation series for the samples were analogous to that for butanol calibration. Any deviation from the Australian standard is recorded in the 'Comments' section of this report.
Measuring Range	The measuring range of the olfactometer is $2^2 \leq \chi \leq 2^{18}$ ou. If the measuring range was insufficient the odour samples will have been pre-diluted. The machine is not calibrated beyond dilution setting 2^{17}. This is specifically mentioned with the results.
Environment	The measurements were performed in an air- and odour-conditioned room. The room temperature is maintained at 22 °C ±3 °C.
Measuring Dates	The date of each measurement is specified with the results.
Instrument Used	The olfactometer used during this testing session was: TOU-OLF-001
Instrumental Precision	The precision of this instrument (expressed as repeatability) for a sensory calibration must be $r \leq 0.477$ in accordance with the Australian Standard AS/NZS4323.3:2001. TOU-OLF-001: $r = 0.215$ (October 2016), Compliance – Yes
Instrumental Accuracy	The accuracy of this instrument for a sensory calibration must be $A \leq 0.217$ in accordance with the Australian Standard AS/NZS4323.3:2001. TOU-OLF-001: $A = 0.137$ (October 2016) Compliance – Yes
Lower Detection Limit (LDL)	The LDL for the olfactometer has been determined to be 16 ou (4 times the lowest dilution setting)
Traceability	The measurements have been performed using standards for which the traceability to the national standard has been demonstrated. The assessors are individually selected to comply with fixed criteria and are monitored in time to keep within the limits of the standard. The results from the assessors are traceable to primary standards of n-butanol in nitrogen.

NATA

Accredited for compliance with ISO/IEC 17025 - Testing.
This report shall not be reproduced, except in full.

Date: Monday, 26 June 2017

Panel Roster Number: BNE20170623_032

S. Hayes
State Manager Qld

S. Munro
Authorised Signatory

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Odour Sample Measurement Results
Panel Roster Number: BNE20170623_032

Sample Location	TOU Sample ID	Sampling Date & Time	Analysis Date & Time	Panel Size	Valid ITEs	Sample Odour Concentration (as received, in the bag) (ou)
Biofilter Surface Sample 1	BC17111	22/06/2017 13:12	23/06/2017 09:48	5	10	190
Biofilter Surface Sample 2	BC17112	22/06/2017 13:23	23/06/2017 10:15	5	10	180
Biofilter Surface Sample 3	BC17113	22/06/2017 13:35	23/06/2017 10:47	5	10	150
Biofilter Surface Sample 4	BC17114	22/06/2017 13:47	23/06/2017 11:14	5	10	170
Biofilter Inlet Sample 1	BC17115	22/06/2017 13:58	23/06/2017 14:41	5	10	16,000
Biofilter Inlet Sample 2	BC17116	22/06/2017 14:04	23/06/2017 15:12	5	10	18,000

Note: Where parties other than The Odour Unit perform the dilution of samples, the result that has been modified by the dilution factor is not covered by The Odour Unit's NATA accreditation.

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Process, Sampling and Gas Flow Conditions
Panel Roster Number: BNE20170623_032

Sample Location	TOU Sample ID	Process Condition	Sampling Position	Sampling Plane Dimensions (mm)	Gas Velocity (m/s)	Volume Flow Rate – Actual Conditions (m^3/s)	Gas Temp. (^0C)	Gas Static Pressure (Pa)	Volume Flow Rate – Standard Conditions (m^3/s)
Combined Biofilter Cell Inlet Duct	N/A	Normal	**Disturbance Up:** >6D **Type:** Bend **Disturbance Down:** >2D **Type:** Diameter Reduction **Traverse no.:** 1 **Point no.:** 6 **Compliance:** Non-compliant	900 Diameter	20.0	12.7	31.0	180	11.4
Southern Biofilter Cell Inlet Duct[*1]	N/A	Normal	**Disturbance Up:** >6D **Type:** Bend **Disturbance Down:** >2D **Type:** Bend **Traverse no.:** 1 **Point no.:** 6 **Compliance:** Non-compliant	700 Diameter	13.9	5.3	31.0	180	4.8
Northern Biofilter Cell Inlet Duct	N/A	Normal	**Disturbance Up:** >6D **Type:** Bend **Disturbance Down:** >2D **Type:** Bend **Traverse no.:** 1 **Point no.:** 6 **Compliance:** Non-compliant	700 Diameter	18.8	7.1	31.0	180	6.5

Notes:

1. **Sampling position: r**efers to location of in-duct gas velocity, temperature and static pressure sample points. Odour samples collected in-duct at ¼ diameter along a single traverse, or equivalent.
2. NATA accreditation does not cover the performance of these services;
    a. Selection of sampling positions by the methods of AS 4323.1,
    b. Measurement and calculation of volume flow rate by the methods of ISO 10780.
3. **Sampling conditions:** Daily Weather Observations for the nearest Bureau of Meteorology station are attached to this report or made available on request.

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Odour Panel Calibration Results

Reference Odorant	Reference Odorant Panel Roster Number	Concentration of Reference gas (ppb)	Panel Target Range for n-butanol (ppb)	Measured Concentration (ou)	Measured Panel Threshold (ppb)	Does this panel calibration measurement comply with AS/NZS4323.3:2001 (Yes / No)
n-butanol	BNE20170623_032	50,700	$20 \leq \chi \leq 80$	1,098	46	Yes

Comments: Flow derived by difference

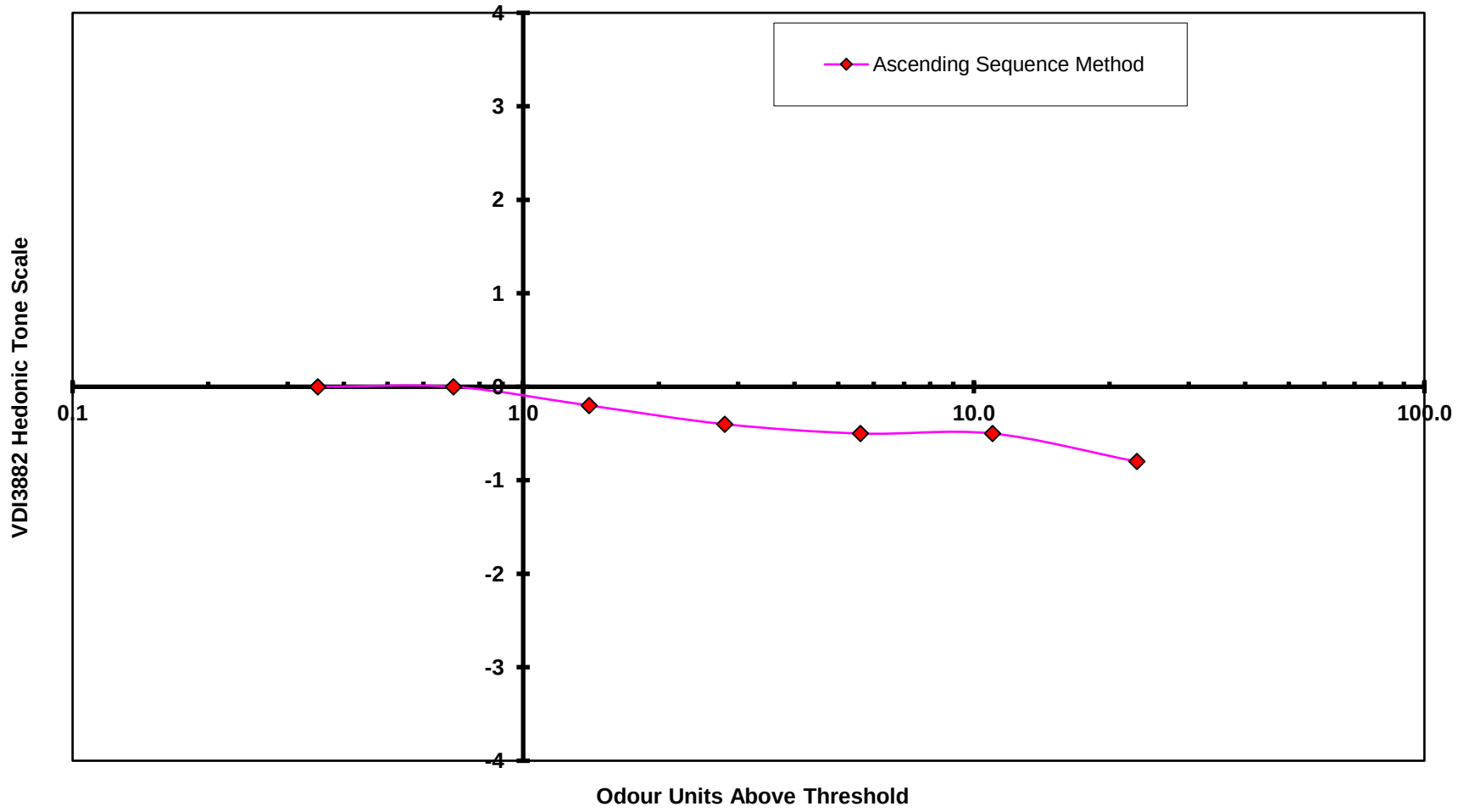
Disclaimer: Parties, other than TOU, responsible for collecting odour samples hereby certify that they have voluntarily furnished these odour samples, appropriately collected and labelled, to The Odour Unit Pty Ltd for the purpose of odour testing. The collection of odour samples by parties other than The Odour Unit Pty Ltd relinquishes The Odour Unit Pty Ltd from all responsibility for the sample collection and any effects or actions that the results from the test(s) may have.

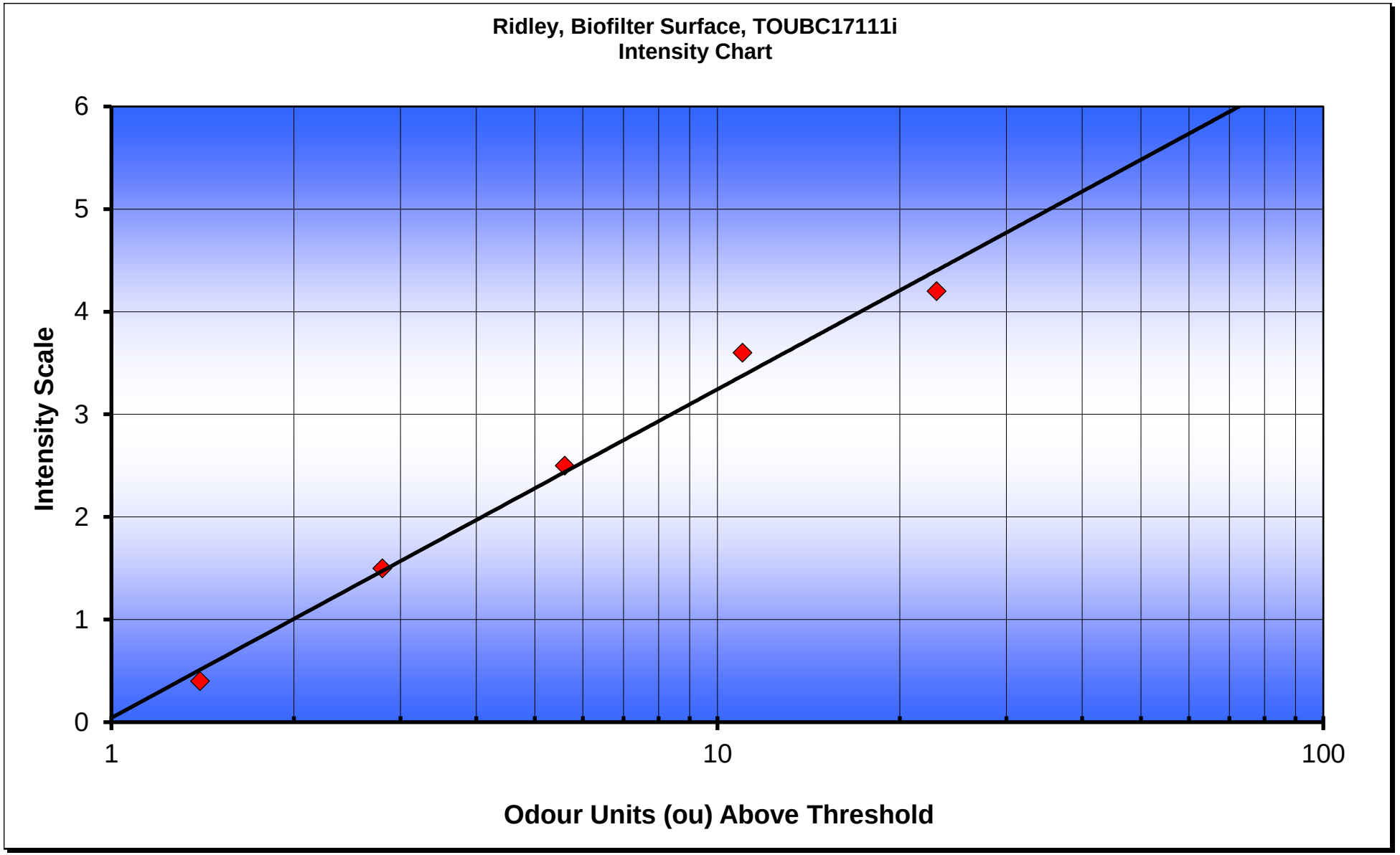
END OF DOCUMENT

Form 19 - Hedonic Tone Chart

Sample TOU BC17111h

VDI3882 Part 2 Sequentially Ascending Dilution Presentation Method

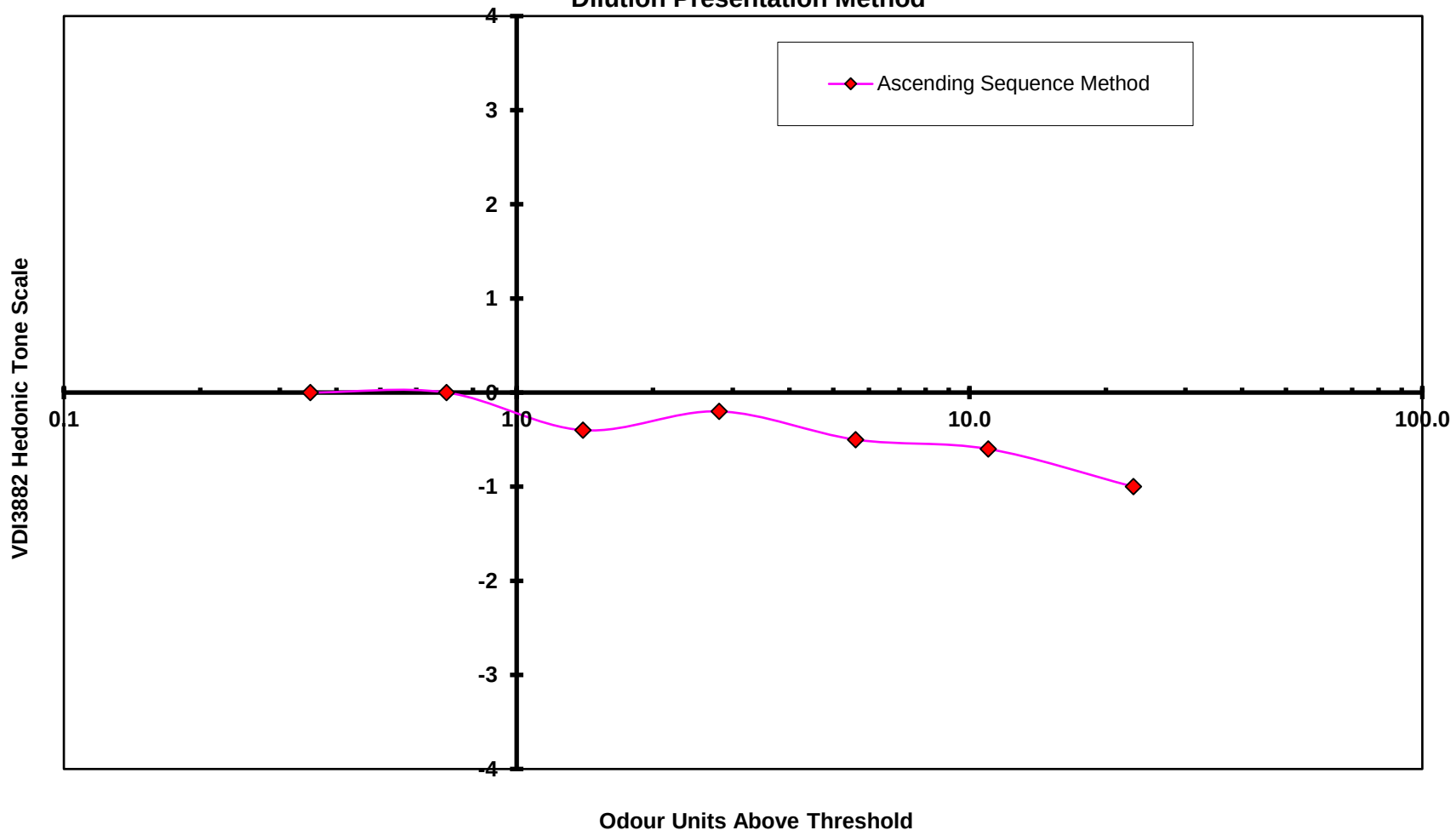


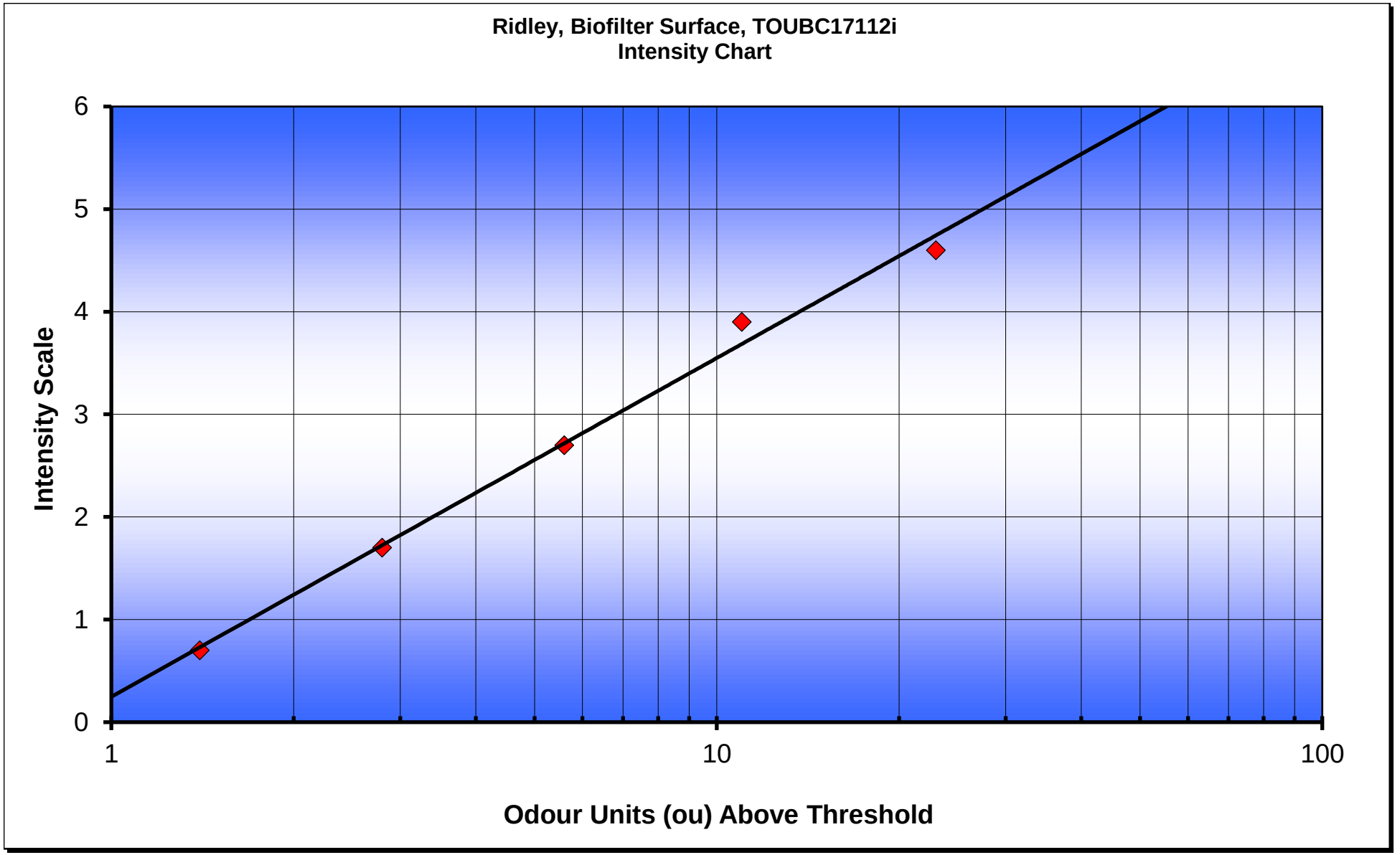

Ridley, Biofilter Surface, TOUBC17111i
Intensity Chart
Intensity Scale
0
1
2
3
4
5
6
1
10
100
Odour Units (ou) Above Threshold

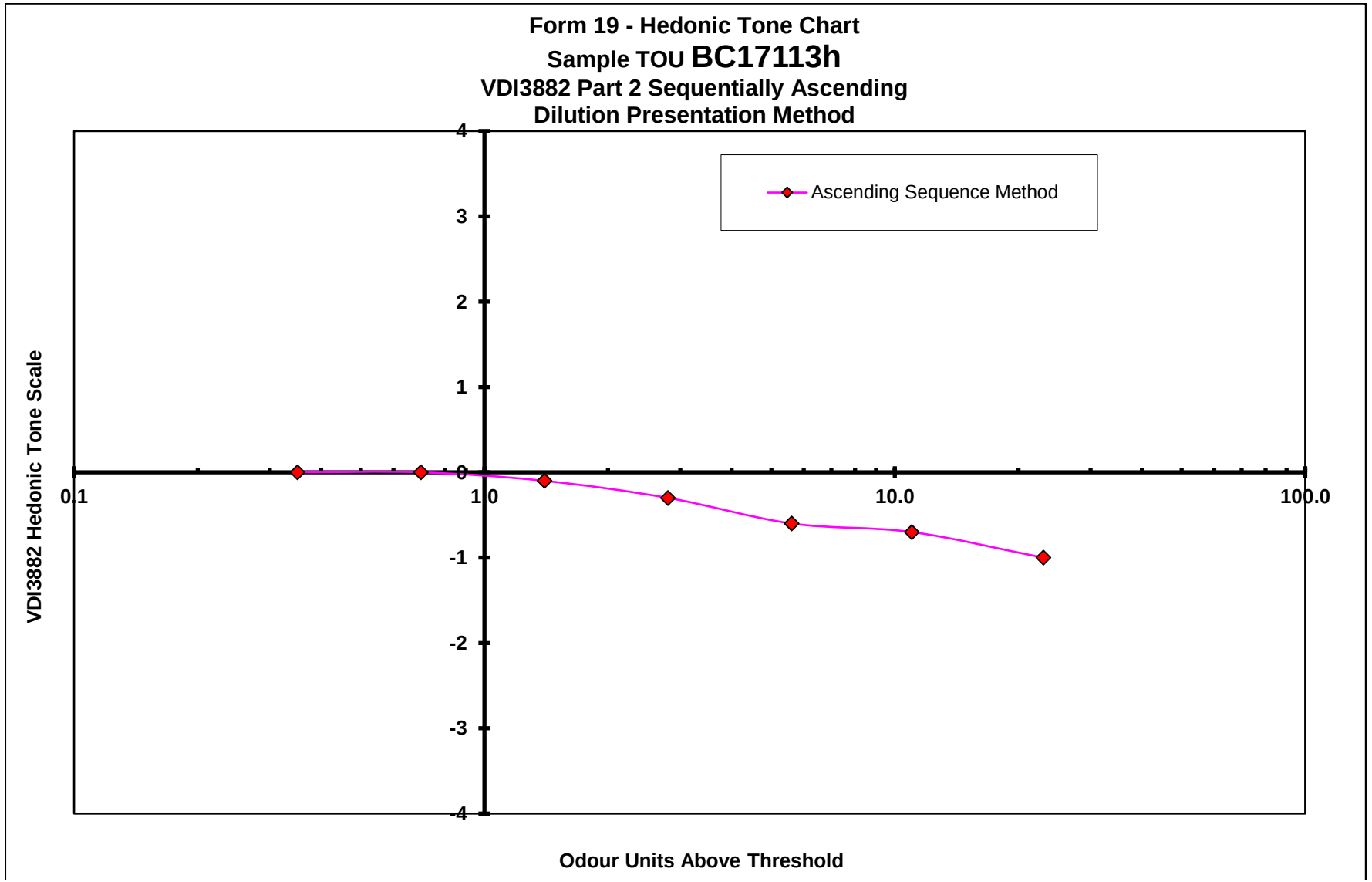
Form 19 - Hedonic Tone Chart

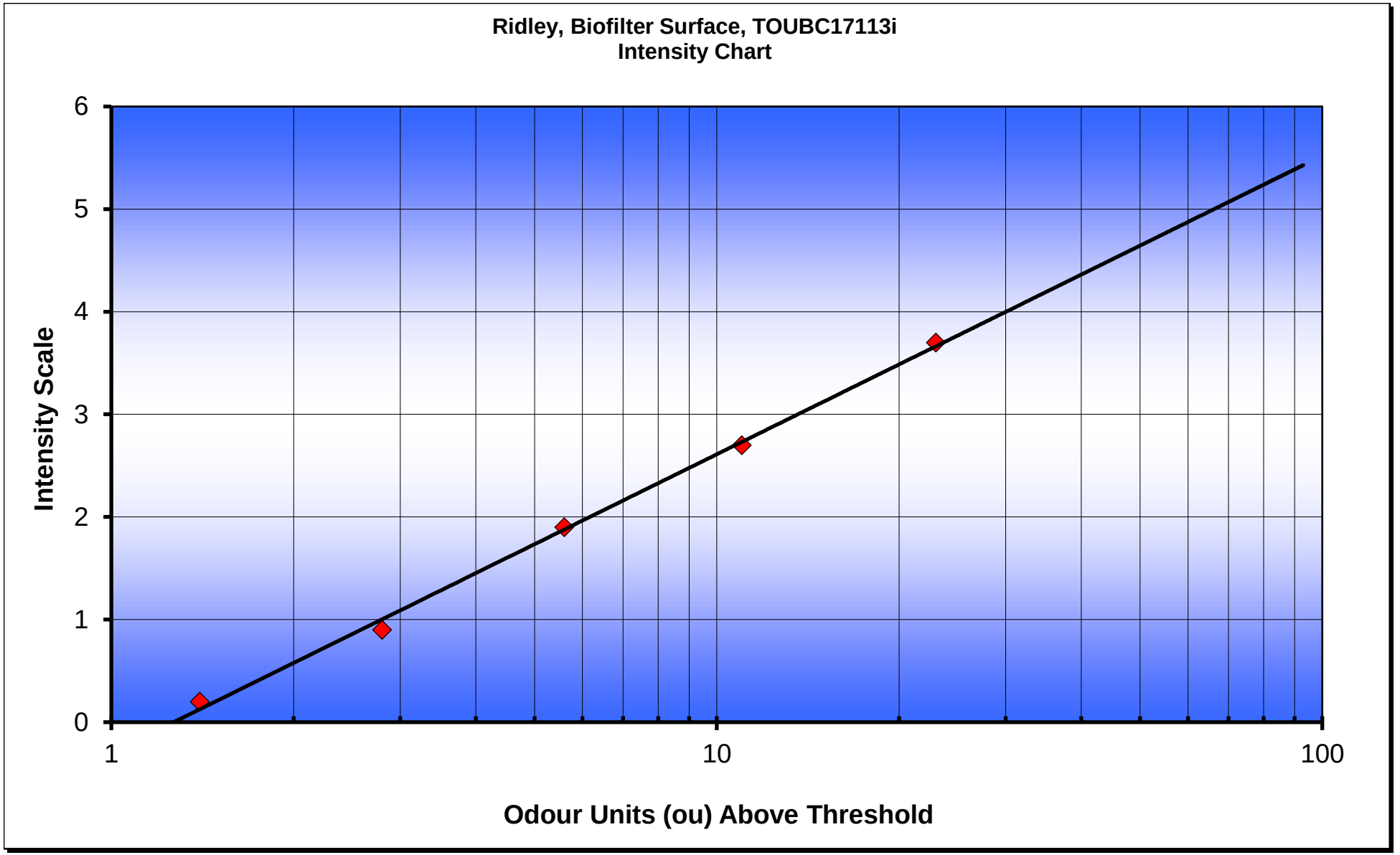
Sample TOU BC17112h

VDI3882 Part 2 Sequentially Ascending Dilution Presentation Method




Ridley, Biofilter Surface, TOUBC17112i
Intensity Chart
Intensity Scale
0
1
2
3
4
5
6
1
10
100
Odour Units (ou) Above Threshold

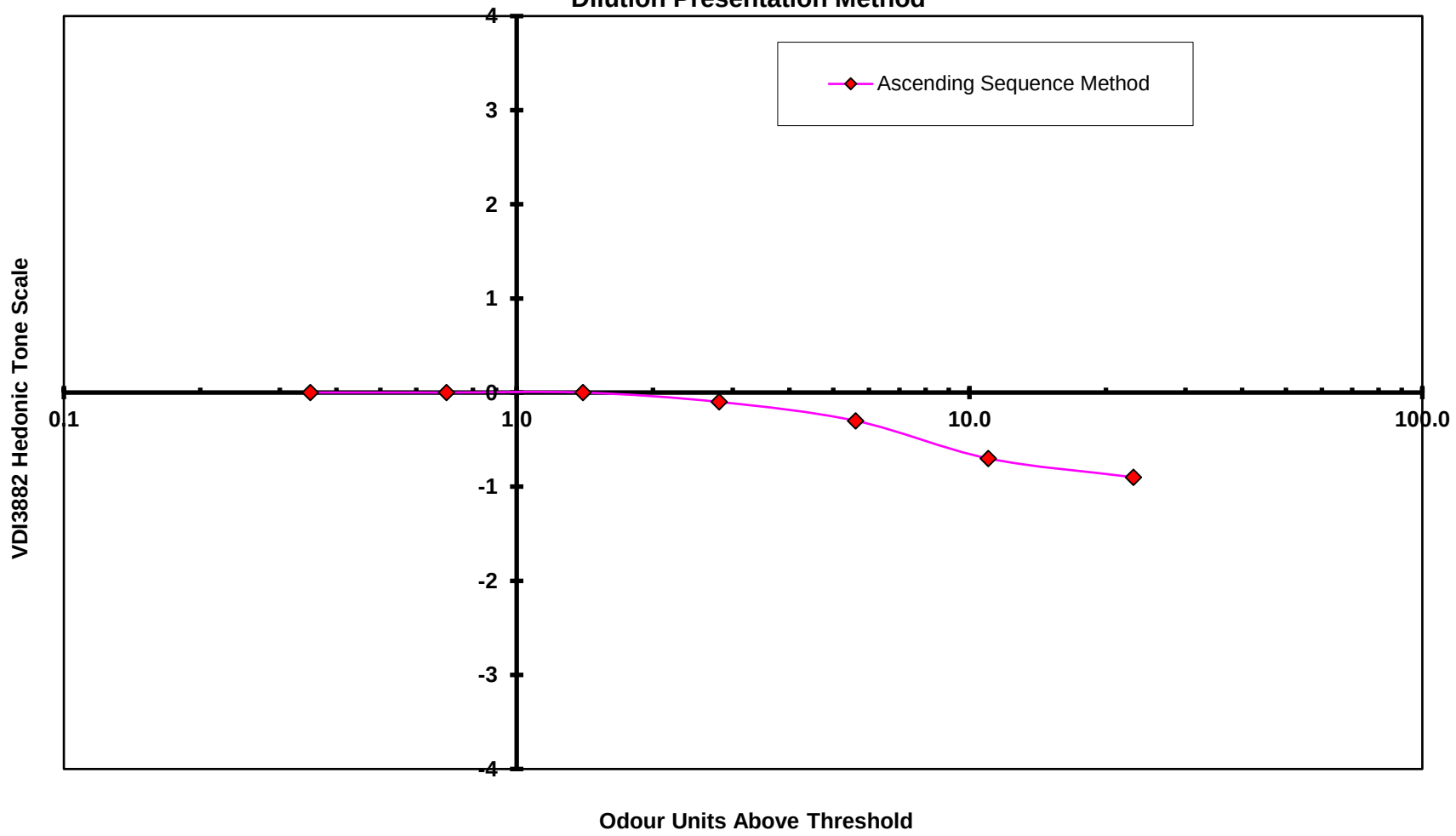

Form 19 - Hedonic Tone Chart
Sample TOU BC17113h
VDI3882 Part 2 Sequentially Ascending
Dilution Presentation Method
Ascending Sequence Method
VDI3882 Hedonic Tone Scale
4
3
2
1
0
-1
-2
-3
-4
0.1
1.0
10.0
100.0
Odour Units Above Threshold

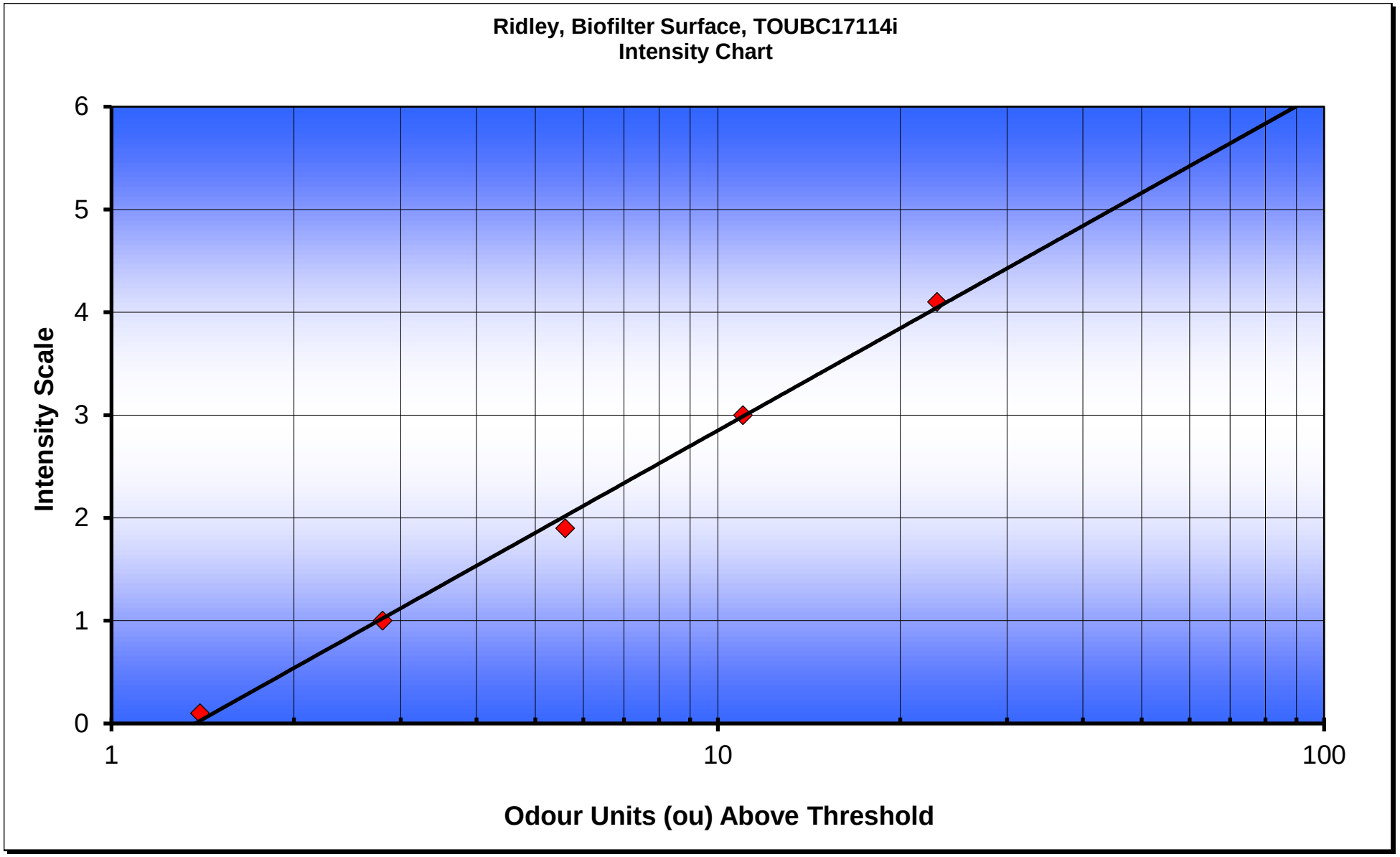

Ridley, Biofilter Surface, TOUBC17113i
Intensity Chart
Intensity Scale
0
1
2
3
4
5
6
1
10
100
Odour Units (ou) Above Threshold

Form 19 - Hedonic Tone Chart

Sample TOU BC17114h

VDI3882 Part 2 Sequentially Ascending Dilution Presentation Method




Ridley, Biofilter Surface, TOUBC17114i
Intensity Chart
Intensity Scale
0
1
2
3
4
5
6
1
10
100
Odour Units (ou) Above Threshold