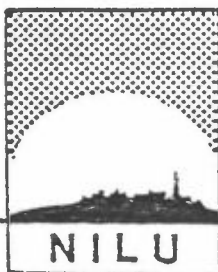


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DATO : JANUAR 1986

**SPREDNING AV TUNG GASS
UTDRAG AV MÅLEDATA FRA THORNEY ISLAND
FORSØKENE. FASE 2.**

Yngvar Gotaas og Ivar Haugsbakk



NORWEGIAN INSTITUTE FOR AIR RESEARCH

ROYAL NORWEGIAN COUNCIL FOR SCIENTIFIC AND INDUSTRIAL RESEARCH

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UTDRAG AV MÅLEDATA FRA THORNEY ISLAND
FORSØKENE. FASE 2*

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NORSK INSTITUTT FOR LUFTFORSKNING
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**SPREDNING AV TUNG GASS.
UTDRAG AV MÅLEDATA FRA THORNEY ISLAND-FORSØKENE.
FASE 2.**

1 GENERELT OM FORSØKENE

Norsk institutt for luftforskning (NILU) har tidligere presentert utdrag av måledata fra Thorney Island, fase 1 (Gotaas, Bøhler og Haugsbakk, 1984). Denne rapporten gir en enkel oversikt og et sammendrag av forsøkene som ble gjennomført i fase 2.

Registreringer av gasskonsentrasjoner og meteorologiske variable ble som under fase 1 gjort hvert 1/20 sekund for alle parametre, selv om tidsoppløsningen for de fleste konsentrasjonsmålinger bare var på 1 sekund. Fra den store mengde av kontrollerte data har "Health and Safety Executive" utarbeidet rapporter for hvert enkelt forsøk. Måledataene er presentert i form av figurer med midlingstid 0.6 sekunder. Hver rapport er på 100-150 sider, slik at ytterligere forenkling er nødvendig for å få en oversikt der de enkelte forsøkene kan sammenlignes.

Vedlagt følger en kort oversikt over de enkelte forsøk som omfatter følgende:

- Gasskonsentrasjoner (% av utslipp)
- Vindstyrke og vindretning
- Røykmåling (lysspredning)
- Temperatur i luft og ved bakken
- Solinnstråling
- Turbulens

Dessuten angis for hvert forsøk

- Relativ tetthet ved utslipp
- Skydekke
- Atmosfærisk stabilitet (estimert ved flere metoder)

Inndeling i stabilitet fra A til G er henholdsvis fra meget ustabil til meget stabil, der C og D beskriver nær nøytrale forhold.

Fra de mottatte diagrammer er det i tillegg estimert maksimumkonsentrasjon, middelkonsentrasjon og passasjetidspunkter for gasskyen. Konsentrasjonsfordeling i gitte tidspunkt er også gitt for hvert forsøk. Selv om de gitte verdier beror på et visst skjønn, bør det kunne gi et godt bilde av konsentrasjonsfordelingen. For å få mer nøyaktige resultater må rådataene behandles.

Forklaring til dataene:

X, Y : Koordinator (m) (NB! Utslippspunktet: X = 400, Y = 200)*

H : Høyde over bakken (m)

CM : Maksimumskonsentrasjoner (%)

C : Midlere konsentrasjon (%)

T₁, T₂ : Tidspunkter for skypassasje (s)

HGAS : Sensor med 1/10 sekunds oppløsning. (Der det er to sett konsentrasjoner i samme posisjon, kommer den siste fra HGAS-sensor.)

* Gjelder ikke forsøkene 45, 46 og 47 som har utslippspunkt:

X = 450 Y = 200

Tabell 1: Fase 2 - Thorney Island - "instantane" utslipp med hindringer.

Forsøk nr.	Type hindring	Relativ tetthet	Vindhast (m/s)	Stabilitet	Merknader
20	Vegg 5 m høy ↓	1.92	5.7	N	Front delvis rundt - gass holdes tilbake
21		2.02	3.9	LS	Som 20 - forsterket
22		4.2	5.9	LS	Utslippsproblemer - ikke synlig på video
25		1.95	1.4	LS	Meget markerte effekter
23	Gjennom- trengelige skjermer	1.92	5.8	N	2 rekker - små effekter
24		2.03	6.8	S	4 rekker - gass delvis holdt tilbake
26	Bygning ↓	2.00	1.9	U	Skyfront opp vegg
27		4.20	2.2	LS	Skjev vindretning
28		2.00	9.0	N	Utslippsproblemer
29	Bygning (oppstrøms)	2.00	5.6	N	O.K., men lite lys for foto/video

Table 2: Fase 2 - Thorney Island - "kontinuerlige" utslipp uten hindringer.

Forsøk nr.	Relativ tetthet	Vindkast m/s	Stabilitet	Merknader
45	2.00	2.1	S	O.K.
46	2.00	3.2	N	Skjev vindretning
47	2.05	1.5	S	Variabel vindretning

Kommentarer til figurer 1-3.

Figur 1: Plassering av målepunkter og hindringer i feltet.

Figur 2: Rader av skjermer, gjennomtrengelige med målepunkter, forsøkene 23 og 24.

Figur 3: Bygning med målepunkter - forsøkene 26, 27, 28. Under forsøk 29 var bygningen plassert oppstrøms.

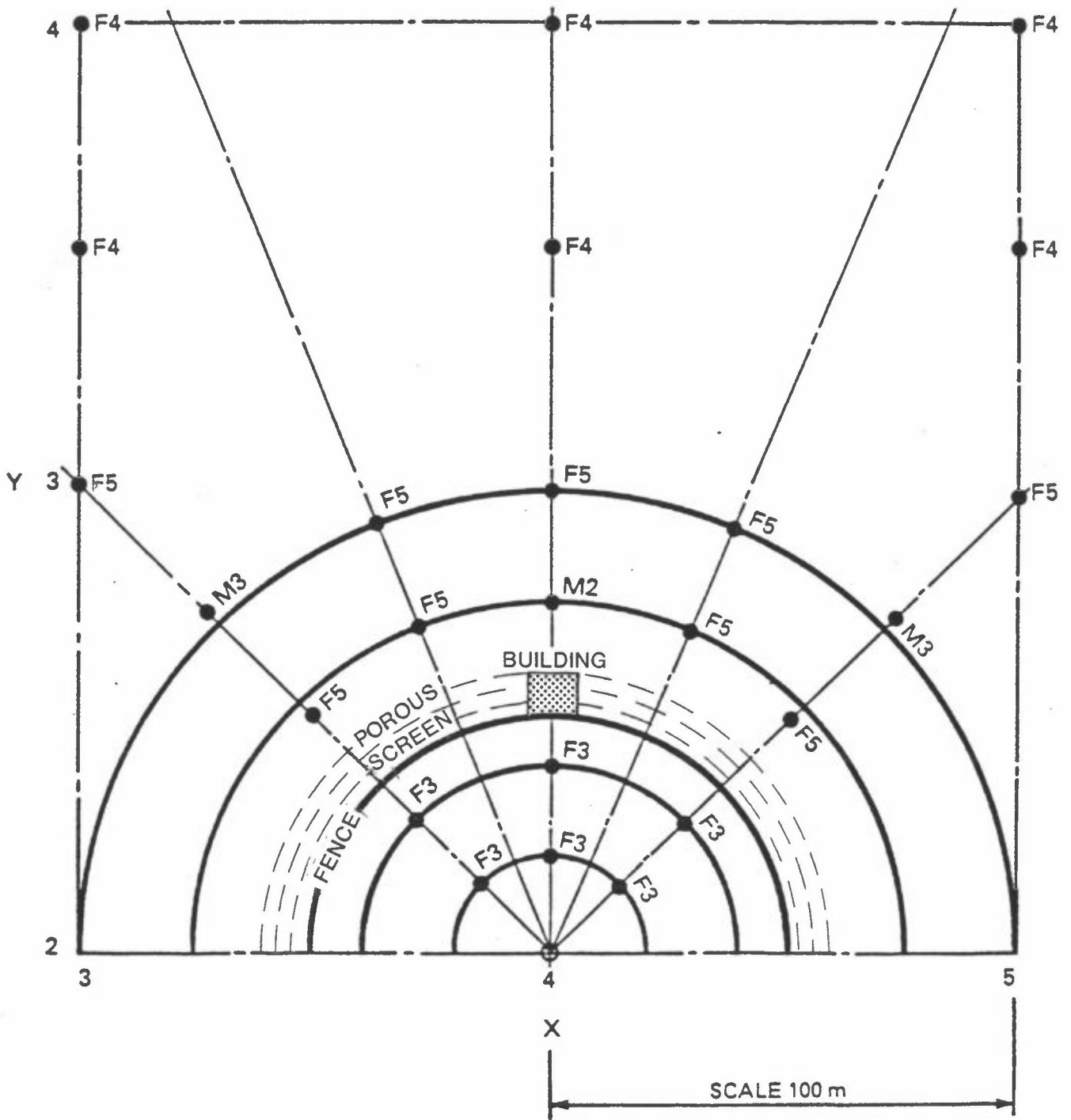
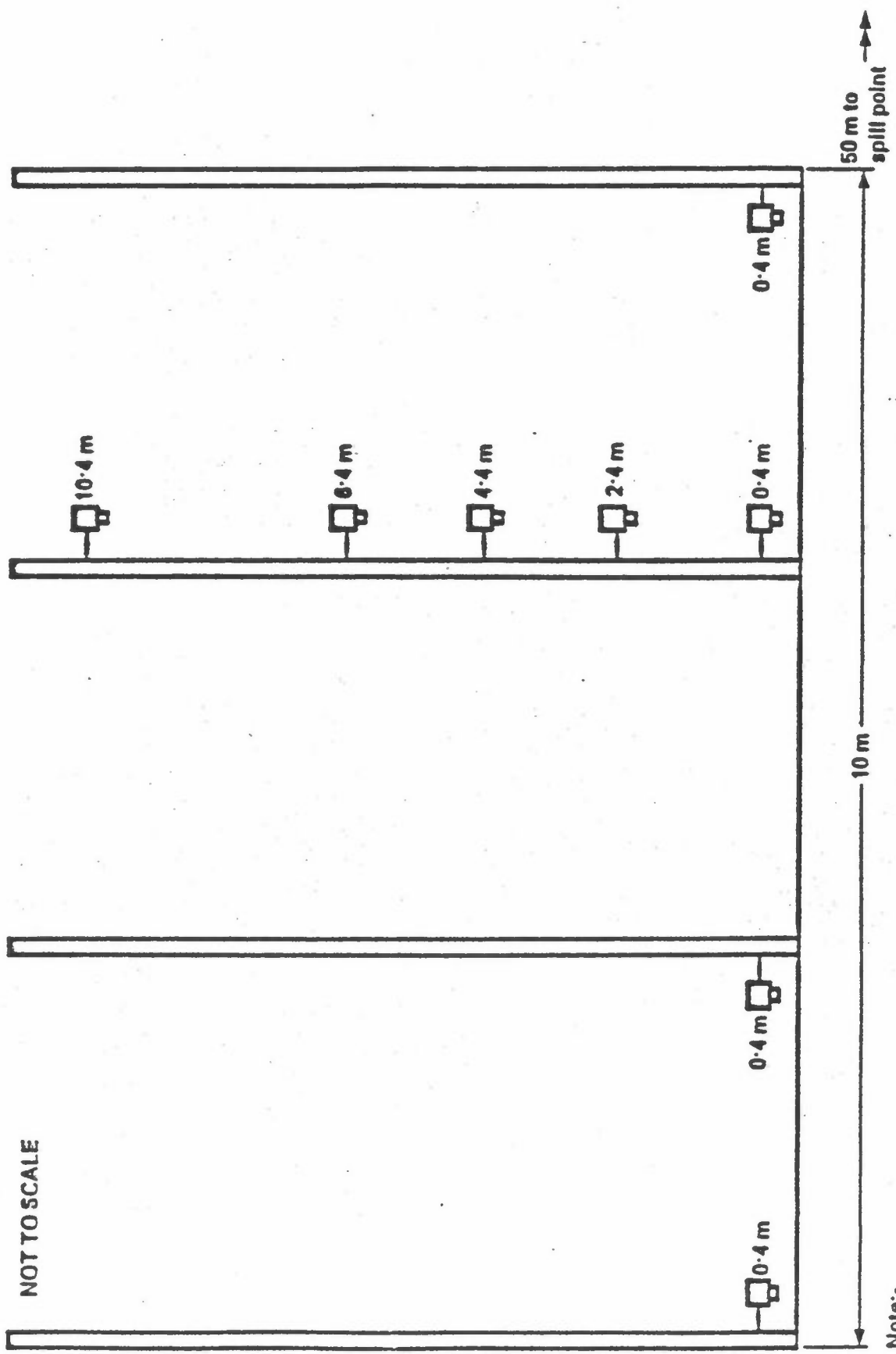


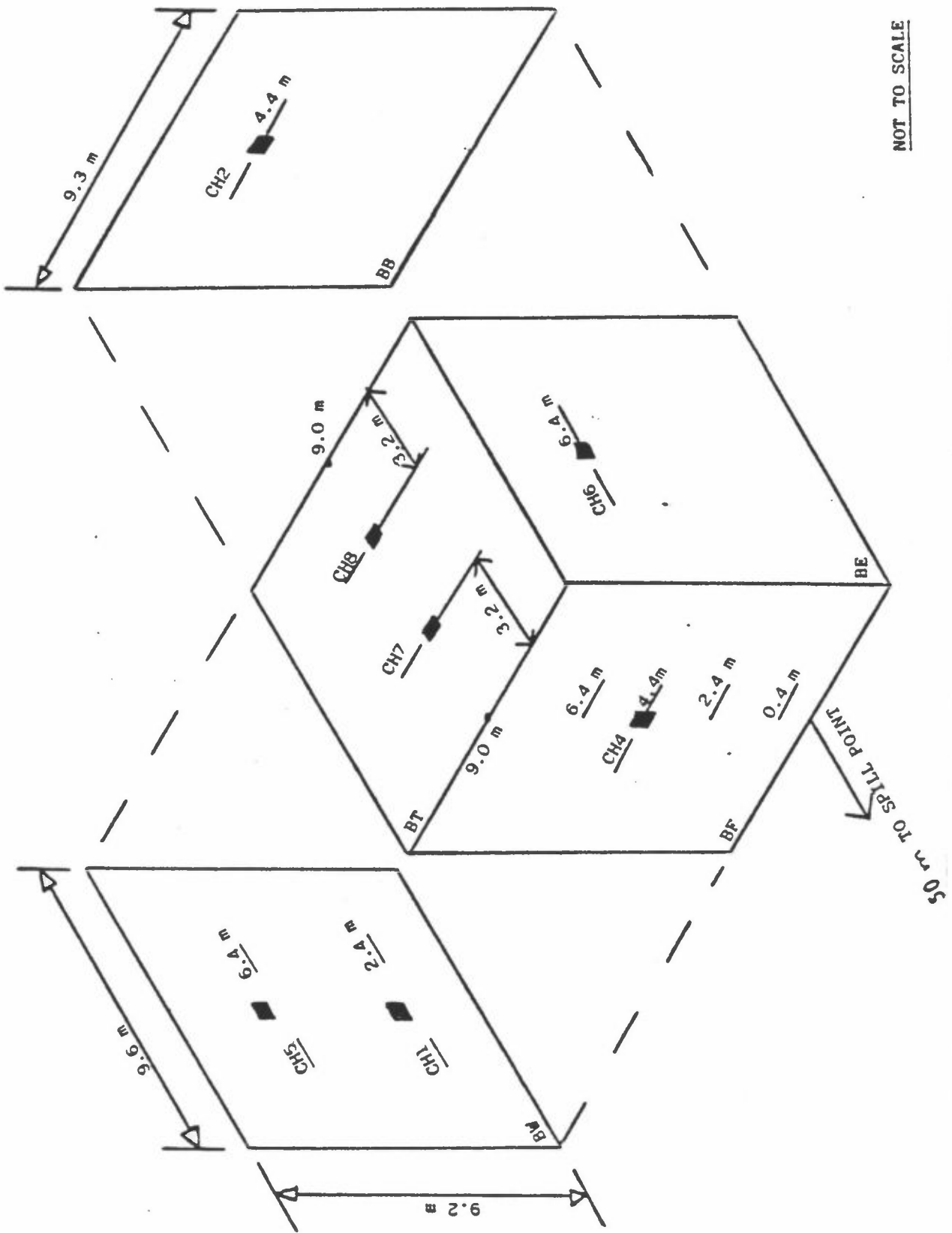
Fig. 1: Arrangement of gas sensors for Phase II : near field



NOT TO SCALE

Note:-
All gas sensor heights are measured from local ground level to plane of the membrane/sinter of the oxygen deficiency cell.

Fig. 2.: Location of gas sensors within the scaffolding frame



NOT TO SCALE

Fig. 3: Diagram showing positions of gas sensors connected to the HSE data logger during Trials 026, 027 and 028 on the mobile building

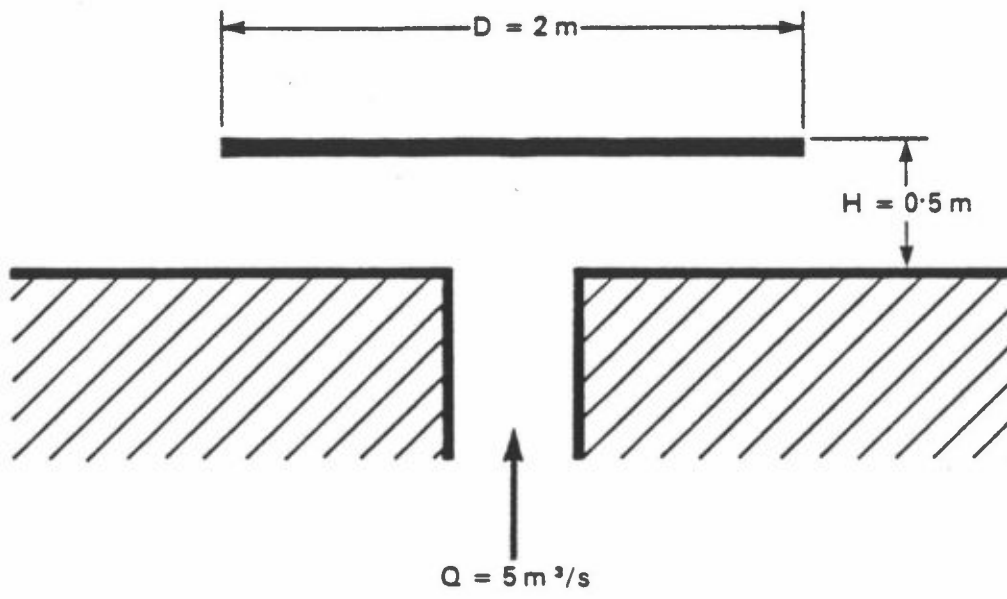


Fig. 4: Geometry of ground-level source for continuous release experiments

2 TRIALS PERFORMED WITH INSTANTANEOUS RELEASE CONDITIONS

EXECUTION OF THE TRIALS

The Phase II programme was conducted to a schedule that was necessarily tighter than that for Phase I. It was not possible to have more than one type of obstruction in position on the site at any one time and this laid down a rigid order for the trials. Nonetheless, planning was effective and the programme of 10 trials was completed in October 1983. The detailed arrangements for carrying out a trial were the same as described for the Phase I programme.

Some qualitative observations on each trial are given as follows:

Trial 020 - This trial corresponded to No 3 in the schedule, with the wind speed at the lower end of the specified range. The release was excellent in all respect. The front of the cloud surmounted the fence and the remainder of the cloud was subsequently held up in the fenced area. Dispersion of the cloud over the fence occurred slowly. These features were also very evident in the overhead video, where only the passage of the cloud front over the fence was visible. The ground-based video record suffers from distortion and the airborne video camera missed the first 3 seconds of the release. The airborne still camera missed the first 27 seconds of the release due to a fault in the radio link.

Trial 021 - This trial corresponds to No 2 in the schedule. Again the release was excellent and the comments for Trial 020 regarding the interaction with the fence apply more strongly, as would be expected in view of the lower windspeed.

All components of the photographic system operated successfully. The additional video camera on the 18 m mast was deployed but the record is in black-and-white only.

Trial 022 - This trial corresponded to No 9 in the schedule and was a pure Refrigerant-12 release. The container was only 2/3 full at release due to leakage through the ground at the base of the container, the same problem as had been experienced with the pure Refrigerant-12 release in the Phase I programme (trial 017). The folding of the gas container was also untidy, a quite large billow being left at one side as the container reached ground level. However, no obvious effect on the motion of the gas cloud was evident in the video records. The first 19 secs of the airborne video record was lost due to power failure and the complete record from the midrange high-speed still camera was also lost due to radio interference causing premature operation.

Trial 023 - This was the first trial with the permeable screens and corresponded to No 5 in the schedule. Two screens were deployed. Smoke marking of the gas cloud was not complete, the lower half being smoke-free. Apart from this, the release was excellent. There were no very evident visual effects of the screens in either the ground-based or airborne video records. The downrange still camera did not operate for the first 40 secs due to a radio fault and the elevated video camera record was not satisfactory due to poor light conditions. The HSE datalogger, monitoring gas concentrations within the screens as described in Section 18.6, was deployed for the first time in this trial.

Trial 024 - This trial, with 4 permeable screens, corresponded to No 4 in the schedule. Smoke marking of the gas cloud was again not complete, with no smoke in the lower half of the column. There is some evidence of a hold-up of gas by the screens, especially in the overhead view. The HSE datalogger and the elevated video camera were deployed. The midrange high-speed still camera did not operate.

Trial 025 - This was the low windspeed (1.4 m/s) trial with the impermeable fence, corresponding to No 1 in the schedule. The trial was conducted in poor light and there was no helicopter coverage. The release was excellent and the effects of the fence were very pronounced. Although the elevated video camera was deployed, the record obtained was of poor quality. The HSE datalogger was deployed, with the sensor disposition described in Section 18.6.

Trial 026 - This was the first trial with the building at 50 m downwind and corresponded to No 6 in the schedule. The wind heading was very close to the axis of the mast array; the building was positioned on this axis. There was a slight thinness of smoke at the bottom of the gas column but otherwise this was a good release. In the groundbased video record, the cloud appears to go around the building, with no obvious elevation of the cloud at the front of the building. However, the view from the elevated video camera does suggest that the cloud front splashes up the front of the building but with no effect thereafter. The overhead view is particularly impressive and displays a more symmetrical appearance and uniformity of smoke marking than any of the Phase I trials. There is no obvious effect of the building apparent in the overhead view. No records were obtained from the midrange high-speed still camera. The HSE datalogger was connected to some of the gas sensors deployed on the surface of the building, as described in Section 18.6.

Trial 027 - This was the release of pure Refrigerant-12 in the presence of the building and corresponded to No 10 in the schedule. The released volume was about 5/6 of the design figure and the folding of the container walls was untidy but not to the same extent as in the previous releases of pure Refrigerant-12. There was a late change in wind direction so that only the upwind front of the cloud encountered the building. The front extended beyond the building and the masts on the lee side (relative to the motion of the cloud front) were in the gas cloud. There was no helicopter coverage but the elevated camera was deployed. There was no evident splashing of the cloud front up the building. The HSE datalogger was connected to gas sensors at elevated heights on the building and thus no records were obtained.

Trial 028 - This trial was conducted at the highest windspeed (9 m/s) of both Phases in the programme and corresponded to No 7 in the schedule.1 The container lid suffered damage prior to release and the release itself was untidy, both factors due to the high windspeed. The elevated video camera showed the same effect as in previous trials in high windspeeds where the upper part of the cloud was carried away by the wind without slumping. There was no obvious effect of the building but the visibility of the cloud was much reduced by the time the cloud reached the building.

Trial 029 - This was the trial with the building upwind (at a separation of 20 m edge-to-edge from the gas container) and corresponded to No 8 in the schedule. The building and gas container orientation lined up very well with the wind heading. The trial was conducted in poor light. There was no helicopter coverage and the records from the photographic system are generally of too poor a quality to be usable.

2.1

THORNEY ISLAND TRIALS SPILL 020 15 JULY 1983

SUMMARY INFORMATION AT THE TIME OF THE SPILL

Gas released at:	15:10:52 hrs
Freon 12/Nitrogen mixture: relative density	1.92
Number of smoke canisters discharged:	4
Mean Wind Speed at 10 m height:	
During main data collection period:	5.7 m/s
From 5 minute cyclic data just before the release:	5.6 m/s
Mean Wind Heading ('A' station) - (relative to the centre line of the array)	-6.5°
NB Positive angles are to the right (clockwise) of the centre line when looking downwind of the gas bag. .	
Relative Humidity (at 10 m height)	70.0%
Insolation	686 W/m ²
Ambient Air Temperature (at 9 m height)	23.0°C
Treated Runway Surface Temperature	19.3°C
Grass Surface Temperature	21.5°C
Observed Cloud Cover	0/0 (Hazy)

STABILITY CONDITION

C	(From Observations)
F	(From DT/DZ)
C	(From Solarimeter)
C	(From Heat Flux)
F	(From Richardson No)
D	(From Bulk Richardson No)
E	(From Standard Deviation of Wind Heading)

Stability condition inferred from data during the release and just before the release: C/D.

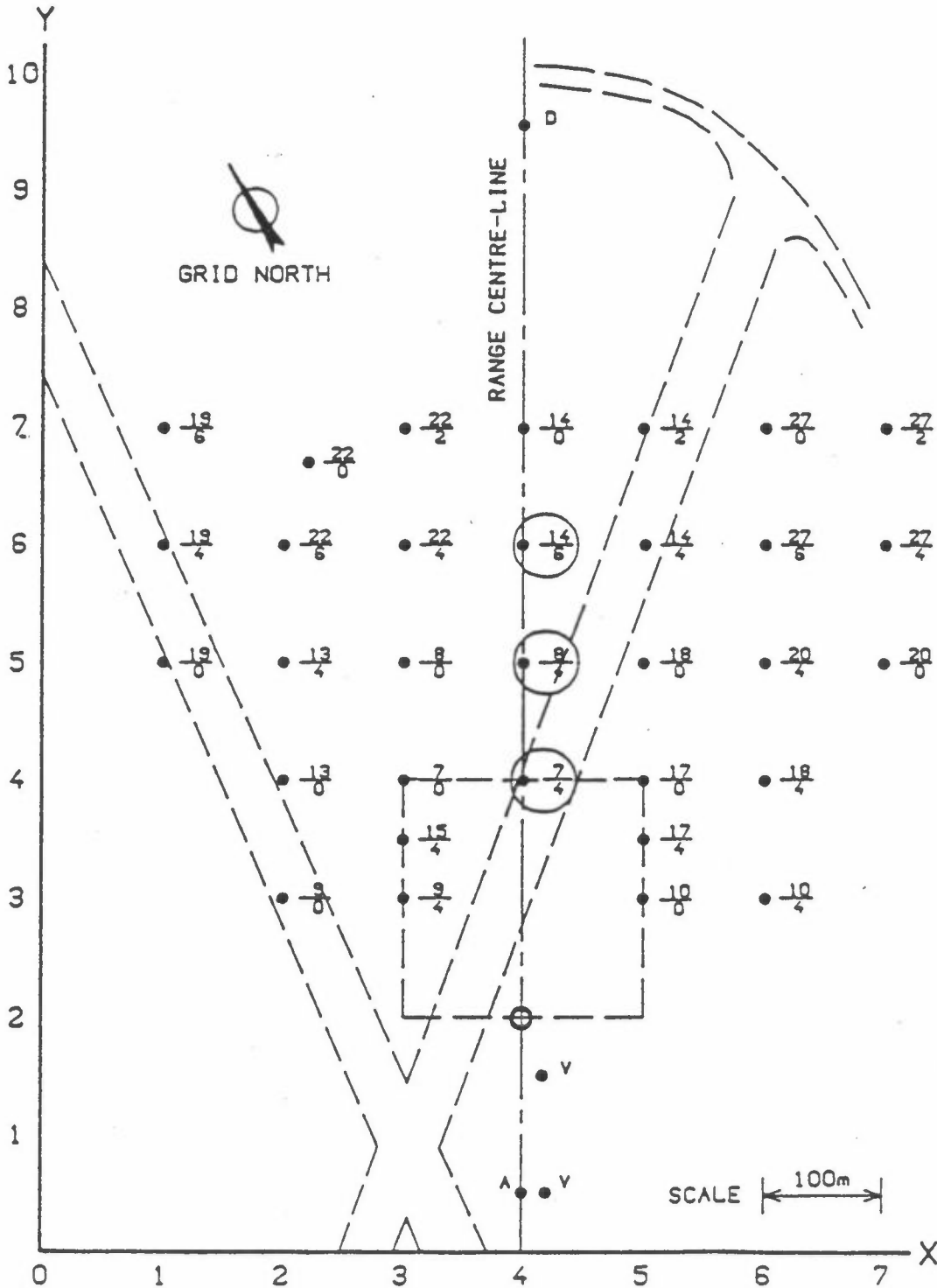
THORNEY ISLAND TRIALS SPILL 020 15 JULY 1983

HISTORY

About three hours before the spill (approximately midday) insolation was strong (740 W/m^2); the wind speed was then about 4 m/s and blowing about 20° to the left of the array centre line. During the following hour (between 12:00 and 13:00 hours) the wind speed gradually increased but the heading remained more or less the same. Within this time, the ambient temperature also increased by about 1°C but insolation was approximately the same. Between 13:00 and 14:00 hours however, the wind speed noticeably increased to about 6 m/s but with little change in heading. Insolation remained strong throughout this time except for a short period when it fell to about 350 W/m^2 . In the hour leading up to the spill (between 14:00 and 15:00 hours) the wind speed decreased slightly but the heading changed gradually making the wind blow just to the left of the centre line.

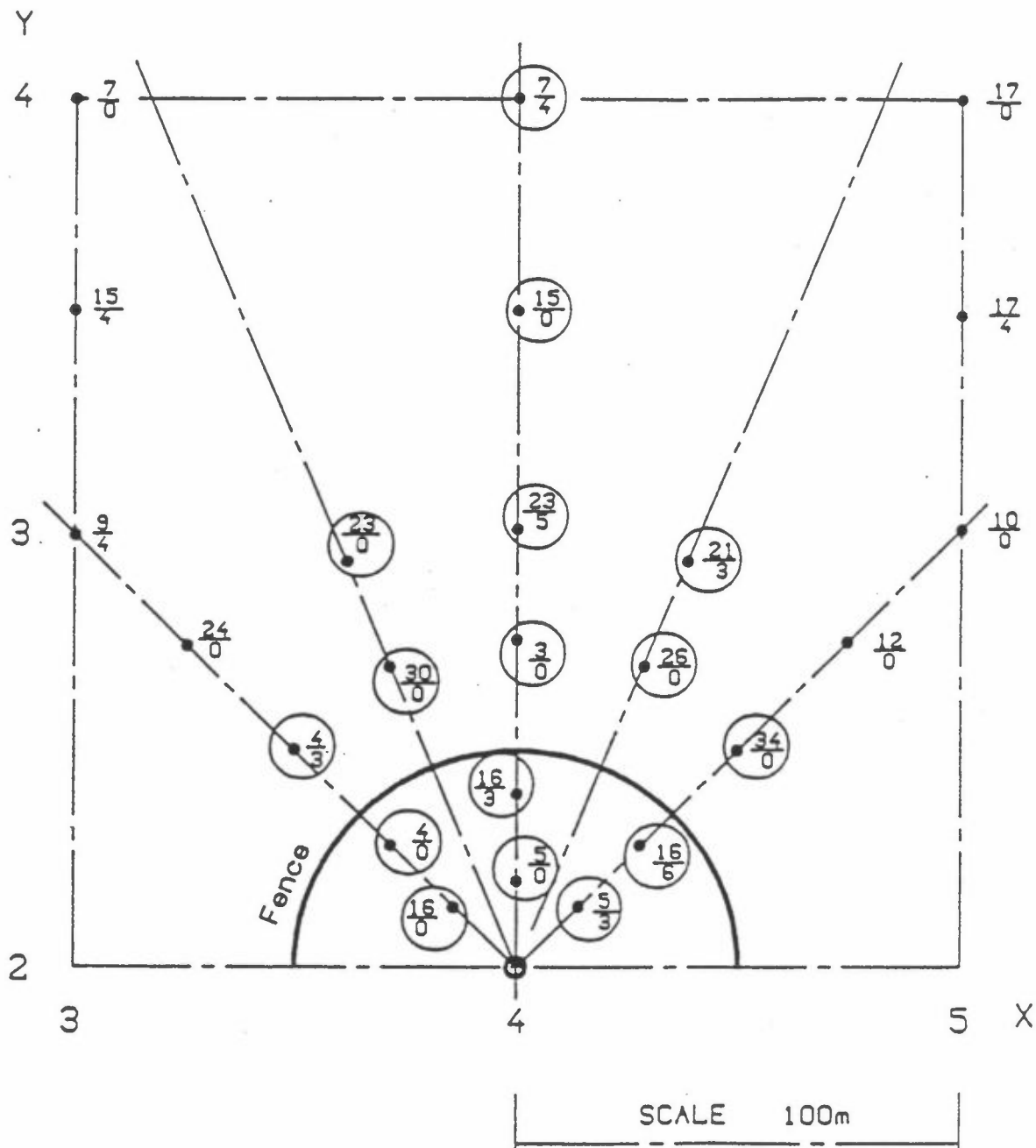
The atmospheric conditions had been judged unstable during the earlier part of the day, but by the time gas was released, the conditions were such that the atmosphere was judged to be only slightly unstable - possibly a 'C/D' Pasquill category.

TRIAL No. - 020 DATE - 15/7/83 72 SENSORS SAW GAS
 WIND SPEED (U_{10}) 5 m/sec PASQUILL CATEGORY C



$\frac{21}{4}$ = DATA TERMINAL CHANNEL NUMBER OF GAS SENSORS AT 0.4m HEIGHT
 ○ = SENSORS AT 0.4m HEIGHT VERIFIED TO HAVE SEEN GAS

TRIAL No. - 020 DATE - 15/7/83 72 SENSORS SAW GAS
 WIND SPEED (U_{10}) 5 m/sec PASQUILL CATEGORY C



$\frac{21}{4}$ = DATA TERMINAL CHANNEL NUMBER OF GAS SENSORS AT 0.4m HEIGHT
 ○ = SENSORS AT 0.4m HEIGHT VERIFIED TO HAVE SEEN GAS

Trial	20	X	Y	H	CM	C	T1	T2	T2-T1	REMARKS
1	Gas	386	214	0.4	49.0	4.0	10	210	200	
2	Gas	386	214	2.4	30.0	1.0	10	80	70	
3	Gas	386	214	4.4	3.4	0.2	0	80	80	
4	Gas	400	220	0.4	88.0	7.0	10	110	100	
5	Gas	400	220	2.4	27.0	3.0	10	60	50	
6	Gas	400	220	4.4	7.8	1.0	10	40	30	
7	Gas	414	214	0.4	51.5	7.0	10	80	70	
8	Gas	414	214	2.4	9.7	1.2	10	40	30	
9	Gas	414	214	4.4	1.3	0.1*	10	45	35	
10	Gas	372	228	0.4	14.5	5.0	15	225	210	
11	Gas	372	228	2.4	8.0	1.9	15	205	190	
12	Gas	372	228	4.4	12.0	1.0	15	105	90	
13	Gas	400	240	0.4	22.0	4.0	15	190	175	
14	Gas	400	240	2.4	13.0	2.0	15	115	100	
15	Gas	400	240	4.4	9.3	0.9	15	70	55	
16	Gas	428	228	0.4	21.0	5.0	15	200	185	
17	Gas	428	228	2.4	11.2	2.1	15	100	85	
18	Gas	428	228	4.4	8.2	0.9	15	70	55	
19	Gas	350	250	0.4	4.0	0.3	25	80	55	
20	Gas	350	250	2.4	2.6	0.2	25	80	55	
21	Gas	350	250	4.4	0.9	0.1*	25	90	65	
22	Gas	350	250	6.4	0.7	0.1*	40	70	30	
23	Gas	350	250	10.4	0.3	0.1*	40	45	5	
24	Gas	450	250	0.4	1.1	0.2	20	50	30	
25	Gas	450	250	2.4	1.7	0.4	20	55	35	
26	Gas	450	250	4.4	1.8	0.4	20	60	40	
27	Gas	450	250	6.4	2.2	0.2	20	60	40	
28	Gas	450	250	10.4	1.4	0.1	20	40	20	
29	Gas	371	269	0.4	2.6	0.7	20	75	55	
30	Gas	371	269	2.4	3.0	0.8	20	80	60	
31	Gas	371	269	4.4	3.2	0.8	20	115	95	
32	Gas	371	269	6.4	3.3	0.8	20	140	120	
33	Gas	371	269	10.4	2.2	0.3	20	120	100	
34	Gas	400	275	0.4	2.6	0.7	30	140	110	
35	Gas	400	275	2.0	3.2	0.9	20	100	80	
36	Gas	400	275	2.4	2.4	0.7	25	185	160	
37	Gas	400	275	4.4	2.4	0.6	25	240	215	
38	Gas	400	275	6.4	3.0	0.6	20	120	100	
39	Gas	400	275	10.4	2.8	0.6	20	160	140	
40	Gas	429	269	0.4	1.0	0.1	30	160	130	Heavy noise
41	Gas	429	269	2.4	1.2	0.2	25	150	125	
42	Gas	429	269	0.4	1.3	0.2	20	140	120	
43	Gas	429	269	10.4	1.8	0.3	20	180	160	
44	Gas	362	292	0.4	1.8	0.4	30	80	50	
45	Gas	362	292	2.4	1.6	0.3	30	100	70	
46	Gas	362	292	4.4	1.0	0.2	30	85	55	
47	Gas	362	292	6.4	0.8	0.1	30	95	65	
48	Gas	362	292	10.4	0.8	0.1	30	90	60	
49	Gas	400	300	0.4	2.4	0.5	30	130	100	
50	Gas	400	300	2.4	2.3	0.5	30	270	240	
51	Gas	400	300	4.4	2.2	0.5	30	220	190	
52	Gas	400	300	6.4	2.0	0.5	30	140	110	
53	Gas	400	300	10.4	1.7	0.5	30	220	190	
54	Gas	438	292	0.4	0.8	0.2	20	120	100	
55	Gas	438	292	2.4	0.4	0.1	20	90	70	Heavy noise
56	Gas	438	292	4.4	1.1	0.1	30	150	120	
57	Gas	438	292	6.4	1.2	0.1	20	180	160	
58	Gas	438	292	10.4	1.3	0.1	20	180	160	
59	Gas	400	350	0.4	1.1	0.2	40	180	140	
60	Gas	400	350	2.4	1.2	0.2	40	165	125	
61	Gas	400	350	4.4	1.1	0.2	40	160	120	
62	Gas	400	350	6.4	1.1	0.2	60	150	90	
63	Gas	400	400	0.4	0.8	0.2	50	190	140	
64	Gas	400	400	2.4	0.9	0.2	50	210	160	
65	Gas	400	400	4.4	0.8	0.2	50	190	140	
66	Gas	400	400	6.4	0.9	0.2	50	180	130	
67	Gas	400	500	0.4	0.5	0.1	75	190	115	
68	Gas	400	500	2.4	0.6	0.1	30	220	140	
69	Gas	400	500	4.4	0.6	0.1	70	180	110	
70	Gas	400	500	6.4	0.6	0.1	100	180	80	
71	Gas	500	600	0.4	0.3	0.1*	100	200	100	
72	Gas	500	600	2.4	0.4	0.1	90	230	140	

Trial 20			Seconds												
	X	Y	Peak Time	Cons	20	40	80	140	200	300	400	500	600	700	
H: 0.4 m	386	215	5	49.0	17.0	8.0									
	400	220	10	38.0	14.0	10.0	1.0								
	414	214	10	51.5	18.0	10.0									
	372	228	35	14.5	13.2	13.2	3.7								
	400	240	10	22.0	10.0	10.0	2.0								
	428	228	20	21.0	21.0	13.0	2.0								
	350	250	30	4.0		0.3									
	450	250	40	1.1	1.1										
	371	269	40	2.6	1.0	2.6									
	400	275	60	2.6		1.3	2.2								
	429	269	55	1.0		0.8	0.1	0.2							
	362	292	40	1.8		1.8									
	400	300	70	2.4		1.0	1.6								
	438	292	40	0.8		0.8	0.2								
	400	350	90	1.1		0.5	0.9	0.3							
	400	400	100	0.8			0.6	0.2							
	400	500	130	0.5			0.1	0.3							
500	600	170	0.3				0.2								
H: 2.4 m	386	214	5	30.0	5.0	2.0									
	400	220	10	27.0	5.0	1.0									
	414	214	10	9.7	2.0	1.0									
	372	228	10	8.0	6.0	5.7	2.0	0.2							
	400	240	10	13.0	4.0	5.0									
	428	228	10	11.2	7.0	8.0									
	350	250	30	2.6		0.3									
	450	250	30	1.7		1.5									
	371	269	40	3.0	1.2	3.0									
	400	275	50	2.4		1.6	1.7	0.1							
	429	269	50	1.2		0.9	0.2	0.2							
	362	292	40	1.6		1.6	0.6								
	400	300	70	2.3		1.0	1.8	0.1							
	438	292	40	0.4		0.4	0.1								
	400	350	90	1.2			1.1	0.2							
	400	400	100	0.9			0.4	0.2							
	400	500	130	0.6			0.1	0.3							
500	600	170	0.4				0.2	0.2							
H: 4.4 m	386	214	10	3.4	0.8	0.8									
	400	220	10	7.8	4.0										
	414	214	20	1.3	1.3	0.3									
	372	228	10	12.0	3.0	3.0	1.0								
	400	240	20	9.3	9.3	2.0									
	428	228	10	8.2	4.0	2.0									
	350	250	50	0.9		0.1									
	450	250	20	1.8	1.8	1.4									
	371	269	40	3.2	1.3	3.2	1.5								
	400	275	50	2.4		1.3	1.5	0.1							
	362	292	40	1.0		1.0	0.1								
	400	300	60	2.2		0.8	1.3	0.1							
	438	292	60	1.1		0.6	0.4	0.1							
	400	350	90	1.1			0.6	0.3							
	400	400	100	0.8			0.4	0.1							
	400	500	130	0.6			0.2	0.3							
	H: 6.4 m	350	250	50	0.7		0.2								
450		250	20	2.2	2.2	1.0									
371		269	40	3.3	0.7	3.3	2.3								
400		275	50	3.0		1.7	1.6								
429		269	50	1.3		1.1	0.4								
362		292	30	0.8		0.6	0.2								
400		300	60	2.0		0.7	1.0								
438		292	60	1.2		0.4	0.4	0.1							
400		350	90	1.1			0.8								
400		400	100	0.9			0.4	0.2							
400		500	130	0.6			0.2	0.4							
H: 10.4 m		350	250	40	0.3		0.3								
		450	250	30	1.4										
		371	269	30	2.2		1.2	2.2							
		400	275	50	2.8		1.5	1.2	0.1						
		429	269	55	1.9		0.8	0.4							
		362	292	80	0.8		0.5	0.8							
	400	300	70	1.7		0.6	0.9								
	438	292	60	1.3		0.3	0.3	0.2							

2.2

THORNEY ISLAND TRIALS SPILL 021 15 JULY 1983

SUMMARY INFORMATION AT THE TIME OF THE SPILL

Gas released at:	19:41:36 hrs
Freon 12/Nitrogen mixture: relative density	2.02
Number of smoke canisters discharged:	5
Mean Wind Speed at 10 m height:	
During main data collection period:	3.9 m/s
From 5 minute cyclic data just before the release:	3.8 m/s
Mean Wind Heading ('A' station) - (relative to the centre line of the array)	-6.1°
NB Positive angles are to the right (clockwise) of the centre line when looking downwind of the gas bag.	
Relative Humidity (at 10 m height)	82.2%
Insolation	96 W/m ²
Ambient Air Temperature (at 9 m height)	20.9°C
Treated Runway Surface Temperature	15.3°C
Grass Surface Temperature	13.9°C
Observed Cloud Cover	0/0 (Hazy)

STABILITY CONDITION

D	(From Observations)
G	(From DT/DZ)
D	(From Solarimeter)
D	(From Heat Flux)
F	(From Richardson No)
E	(From Bulk Richardson No)
E	(From Standard Deviation of Wind Heading)

Stability condition inferred from data during the release and just before the release: D/E.

THORNEY ISLAND TRIALS SPILL 021 15 JULY 1983

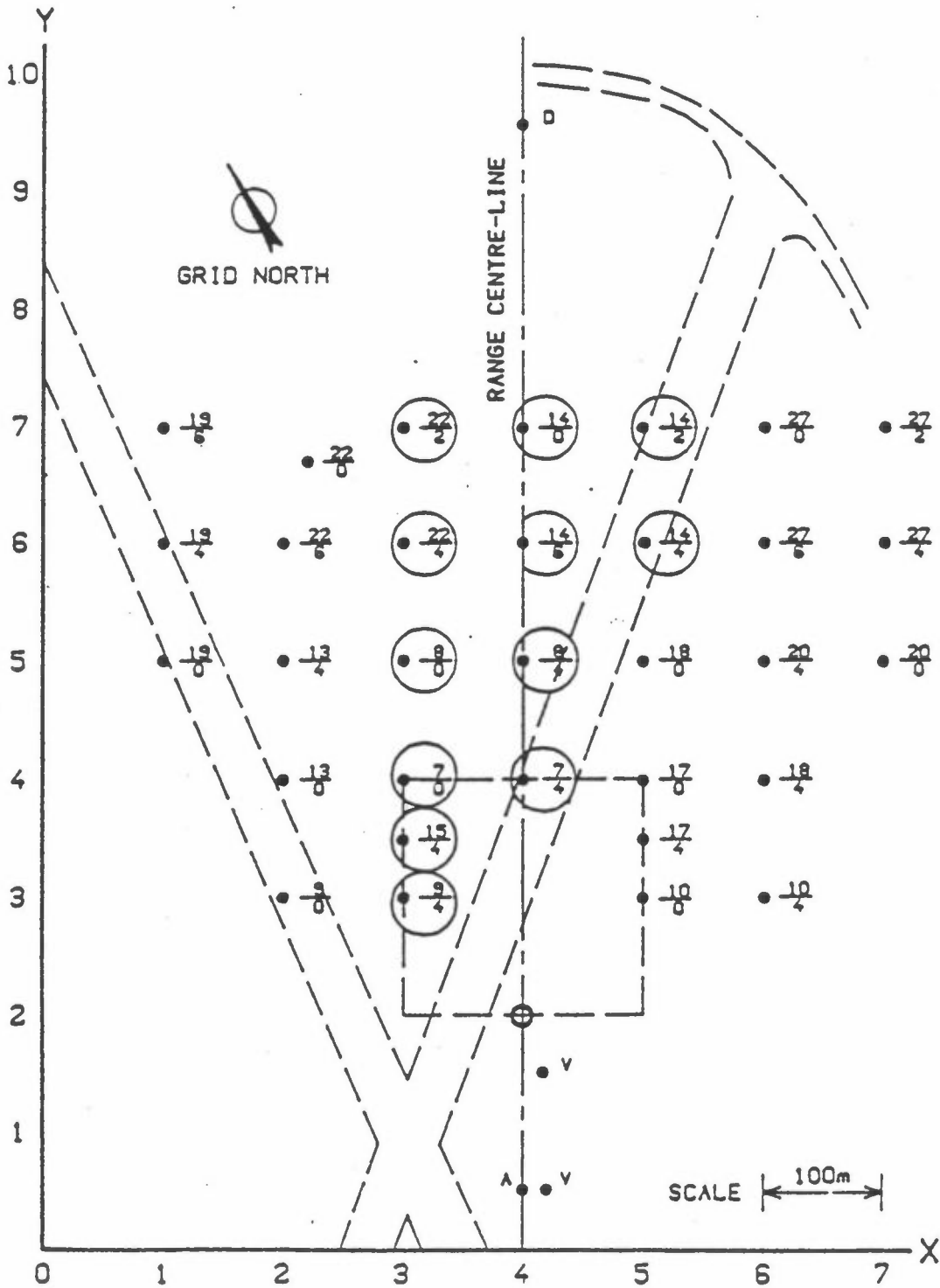
HISTORY

This spill was carried out late in the evening of a summers' day when insolation during the earlier part of the day had been strong. The wind was typically between 4 and 5 m/s and blew about 10-20° to the left of the array centre line for most of the day. This was the second spill of the day and took place about three and a half hours after spill 020, at approximately 19:40 hours.

Some three hours before the release, insolation was moderate (530 W/m²); the wind speed was then about 5 m/s and the heading was 10° to the left of the centre line. As the afternoon progressed the heading remained more or less constant and as expected, insolation steadily decreased. The wind speed decreased gradually and attained a value of about 3.5 m/s about half an hour before the release and remained more or less at this level until the spill without much change in wind direction.

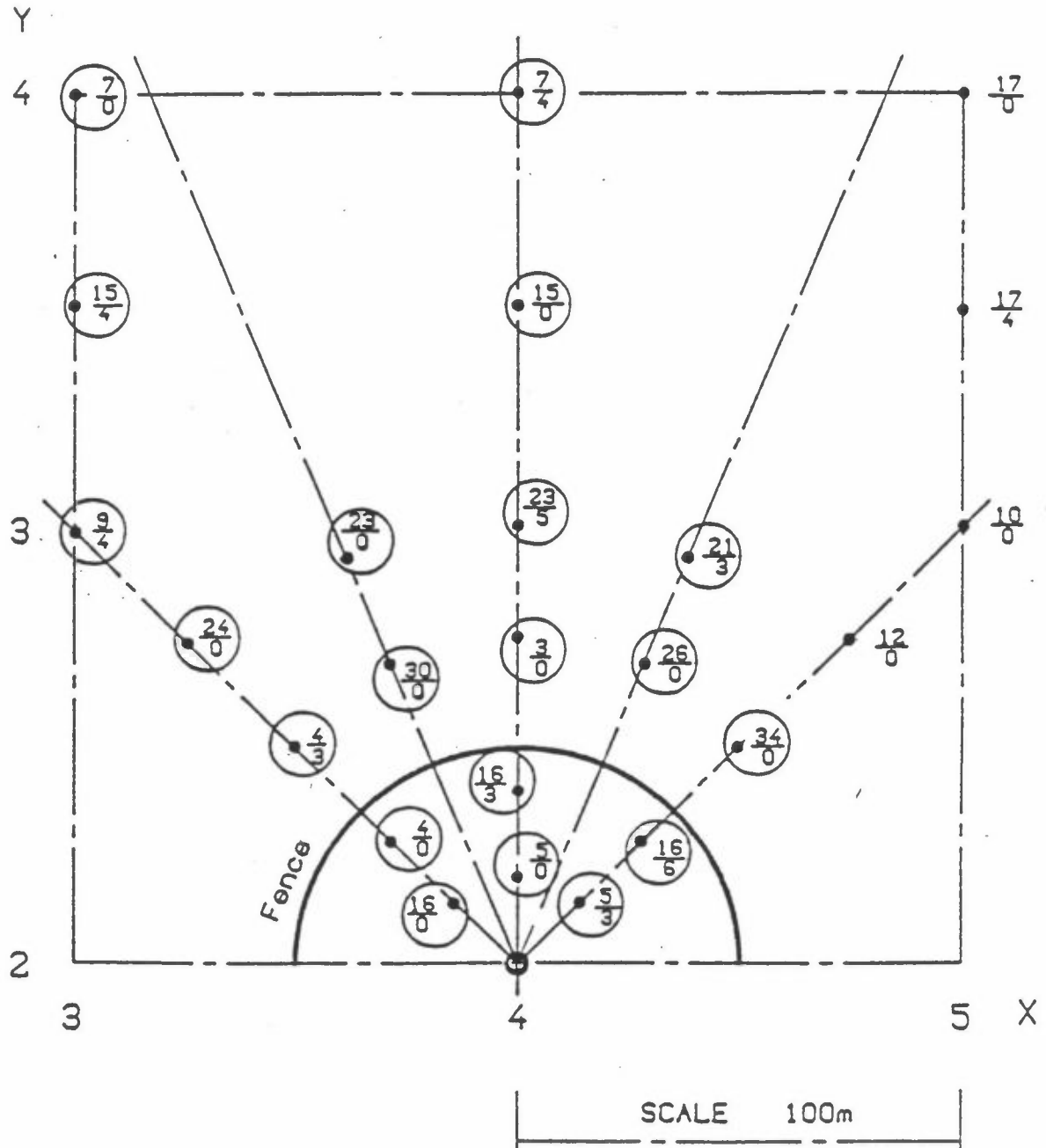
Earlier in the afternoon the atmospheric stability appeared to be on the unstable side of neutral. However, as the afternoon progressed it moved through neutral and by the time gas was released conditions were such that the atmospheric stability was judged to be on the stable side of neutral - possibly a 'D/E' category on the Pasquill scale.

TRIAL No. - 021 DATE - 15/7/83 99 SENSORS SAW GAS
 WIND SPEED (U_{10}) 3 m/sec PASQUILL CATEGORY C



$\frac{21}{4}$ = DATA TERMINAL CHANNEL NUMBER OF GAS SENSORS AT 0.4m HEIGHT
 ○ = SENSORS AT 0.4m HEIGHT VERIFIED TO HAVE SEEN GAS

TRIAL No. - 021 DATE - 15/7/83 99 SENSORS SAW GAS
 WIND SPEED (U_{10}) 3 m/sec PASQUILL CATEGORY C



$\frac{21}{4}$ = DATA TERMINAL CHANNEL NUMBER OF GAS SENSORS AT 0.4m HEIGHT
 ○ = SENSORS AT 0.4m HEIGHT VERIFIED TO HAVE SEEN GAS

	Trial	X	Y	H	CM	C	T1	T2	T2-T1	REMARKS
1	Gas	386	214	0.4	65.0	3.5	10	270	260	Narrow peak
2	Gas	386	214	2.4	4.7	0.8	5	300	295	
3	Gas	386	214	4.4	2.1	0.1	5	225	220	Well defined
4	Gas	400	220	0.4	84.0	4.0	10	270	260	Narrow peak
5	Gas	400	220	2.4	31.5	1.5	5	260	255	Narrow peak
6	Gas	400	220	4.4	2.2	0.2	0	180	180	Noise before t=0
7	Gas	414	214	0.4	54.0	4.0	5	190	185	Narrow peak
8	Gas	414	214	2.4	3.7	0.9	0	210	210	Well defined
9	Gas	414	214	4.4	2.4	0.2	10	150	140	Well defined
10	Gas	372	228	0.4	12.8	2.6	10	220	220	Well defined
11	Gas	372	228	2.4	13.3	3.5	10	210	200	Narrow peak
12	Gas	372	228	4.4	2.7	0.6	20	220	210	Well defined
13	Gas	400	240	0.4	14.0	2.5	10	340	330	Well defined
14	Gas	400	240	2.4	8.1	1.3	10	360	350	Well defined
15	Gas	400	240	4.4	3.4	0.6	10	300	290	Well defined
16	Gas	428	228	0.4	12.8	3.0	10	370	360	Well defined
17	Gas	428	228	2.4	12.0	1.6	10	180	170	Well defined
18	Gas	428	228	4.4	4.5	0.4	10	400	390	Well defined
19	Gas	350	250	0.4	1.8	0.4	10	150	140	
20	Gas	350	250	2.4	1.7	0.3	20	140	120	Noise
21	Gas	350	250	4.4	1.0	0.1	20	220	200	
22	Gas	350	250	6.4	1.4	0.1	20	210	210	
23	Gas	350	250	10.4	0.3	0.1+	20	180	160	Noise
24	Gas	450	250	0.4	1.4	0.3	30	190	160	Well defined
25	Gas	450	250	2.4	1.4	0.2	30	140	110	Noise
26	Gas	450	250	4.4	1.0	0.1	30	160	130	Well defined
27	Gas	450	250	6.4	1.5	0.1+	20	160	140	Narrow peak, well defined
28	Gas	450	250	10.4	0.3	0.1+	50	270	120	Noise
29	Gas	325	275	0.4	1.5	0.5	40	260	220	Noise
30	HGas	325	275	2.0	1.6	0.3	10	180	170	Noise
31	Gas	325	275	2.4	0.9	0.2	40	140	100	
32	Gas	325	275	4.4	0.5	0.1+	40	140	100	Heavy noise
33	Gas	371	269	0.4	1.4	0.5	30	230	200	Well defined
34	Gas	371	269	2.4	1.4	0.4	30	280	250	Noise
35	Gas	371	269	4.4	1.4	0.4	30	260	230	
36	Gas	371	269	6.4	1.7	0.3	10	260	250	Well defined
37	Gas	371	269	10.4	2.3	0.3	10	230	220	Well defined
38	Gas	400	275	0.4	1.6	0.6	30	400	370	
39	HGas	400	275	2.0	2.0	0.6	30	240	210	Noise
40	Smoke	400	275	2.0	0.1	0.1+	30	210	180	
41	Smoke	400	275	2.4	0.1	0.1+	30	190	160	
42	Gas	400	275	2.4	1.6	0.6	30	310	280	
43	Gas	400	275	4.4	1.4	0.5	30	370	340	Heavy noise
44	Gas	400	275	10.4	1.1	0.2	20	330	310	
45	Gas	429	269	0.4	1.6	0.4	30	330	300	Well defined
46	Gas	429	269	2.4	1.6	0.4	30	290	260	
47	Gas	429	269	4.4	1.2	0.3	30	370	340	Well defined
48	Gas	429	269	10.4	1.3	0.2	20	280	260	Noise
49	Gas	300	300	0.4	1.1	0.3	60	190	130	Well defined
50	Gas	300	300	4.4	0.7					Heavy noise
51	Gas	300	300	6.4	0.4	0.1+	30	240	210	
52	Gas	362	292	0.4	0.9	0.3	40	240	200	Noise
53	Gas	362	292	2.4	0.9	0.2	30	230	200	Noise
54	Gas	362	292	4.4	0.9	0.2	30	230	200	Noise
55	Gas	362	292	6.4	0.8	0.1	30	230	200	Noise
56	Gas	362	292	10.4	0.7	0.1+	30	230	200	Noise
57	Gas	400	300	0.4	1.3	0.4	40	440	400	Noise
58	Gas	400	300	2.4	1.2	0.4	40	380	340	
59	Gas	400	300	4.4	1.3	0.4	40	380	340	Noise
60	Gas	400	300	6.4	1.2	0.3	30	380	350	
61	Gas	400	300	10.4	1.1	0.3	30	400	370	
62	Gas	438	292	0.4	1.0	0.3	40	270	230	
63	Gas	438	292	2.4	0.4	0.1	30	200	170	Heavy noise
64	Gas	438	292	4.4	0.9	0.1	30	310	280	Noise
65	Gas	438	292	6.4	0.8	0.1	30	310	280	Noise
66	Gas	438	292	10.4	0.6	0.1+	30	280	250	Noise
67	Gas	300	350	0.4	0.6	0.2	60	220	160	Noise
68	Gas	300	350	2.4	0.5	0.1	60	200	140	Noise
69	Gas	300	350	4.4	0.4	0.1+	10			Noise
70	Gas	300	350	6.4	0.2	0.1+	40	160	120	Noise
71	Gas	400	350	0.4	0.9	0.2	60	410	350	Noise
72	Gas	400	350	2.4	0.8	0.2	60	430	370	Noise
73	Gas	400	350	4.4	0.7	0.2	60	400	340	Noise
74	Gas	400	350	6.4	0.6	0.2	60	360	300	Noise
75	Gas	300	400	0.4	0.4	0.1	80	200	120	
76	Gas	300	400	2.4	0.3	0.1	80	200	120	
77	Gas	300	400	4.4	0.2	0.1+	10	320	310	Noise
78	Gas	300	400	6.4	0.2	0.1+	60	180	120	
79	Gas	400	400	0.4	0.5	0.2	60	320	270	
80	Gas	400	400	2.4	0.6	0.2	60	330	270	Noise
81	Gas	400	400	4.4	0.5	0.1	70	330	260	Noise
82	Gas	400	400	6.4	0.4	0.1	80	270	190	Heavy noise
83	Gas	300	500	0.4	0.2	0.1+	100	300	200	
84	Gas	300	500	2.4	0.2	0.1+	100	280	180	Noise
85	Gas	300	500	4.4	0.2	0.1+	40	380	350	Noise
86	Gas	300	500	6.4	0.4					Heavy noise
87	Gas	400	500	0.4	0.4	0.1	100	320	220	Noise
88	Gas	400	500	2.4	0.4	0.1+	120	380	250	Noise
89	Gas	400	500	4.4	0.3	0.1+	70	360	270	Noise
90	Gas	400	500	6.4	0.3	0.1+	80	300	220	Noise
91	Gas	300	600	0.4	0.1	0.1+	70	270	100	
92	Gas	400	600	0.4	0.3	0.1+	90	470	380	Noise
93	Gas	400	600	2.4	0.3	0.1+	150	530	380	
94	Gas	600	600	0.4	0.1+	0.1+	200	220	20	Noise
95	Gas	600	600	2.4	0.1	0.1+	190	220	30	Noise
96	Gas	300	700	0.4	0.1	0.1+	160	320	170	
97	Gas	400	700	0.4	0.1	0.1+	240	460	220	Noise
98	Gas	500	700	0.4	0.1	0.1+	210	340	130	
99	Gas	500	700	2.4	0.1	0.1+	200	330	130	

2.3

THORNEY ISLAND TRIALS SPILL 022 24 JULY 1983

SUMMARY INFORMATION AT THE TIME OF THE SPILL

Gas released at:	19:00:15 hrs
Freon 12/Nitrogen mixture: relative density	4.2
Number of smoke canisters discharged:	4
Mean Wind Speed at 10 m height:	
During main data collection period:	5.9 m/s
From 5 minute cyclic data just before the release:	6.2 m/s
Mean Wind Heading ('A' station) - (relative to the centre line of the array)	-7.6°
NB Positive angles are to the right (clockwise) of the centre line when looking downwind of the gas bag.	
Relative Humidity (at 10 m height)	91.2%
Insolation	157 W/m ²
Ambient Air Temperature (at 9 m height)	18.0°C
Treated Runway Surface Temperature	18.1°C
Grass Surface Temperature	18.0°C
Observed Cloud Cover	2/8

STABILITY CONDITION

D	(From Observations)
E	(From DT/DZ)
D	(From Solarimeter)
D	(From Heat Flux)
F	(From Richardson No)
D	(From Bulk Richardson No)
E	(From Standard Deviation of Wind Heading)

Stability condition inferred from data during the release and just before the release: D/E.

THORNEY ISLAND TRIALS SPILL 022 24 JULY 1983

HISTORY

Three hours before gas was released (at about 16:00 hours) the wind speed was about 7 m/s and blowing approximately 20° to the left of the array centre line. At this time insolation was strong and a relatively large temperature gradient existed between 2 and 9 m (about 2°C over this height). Conditions remained more or less the same until about 17:00 hours when the wind speed dropped to about 6 m/s. Insolation had also fallen and was then slight (about 130 W/m^2); the air temperature was also noticeably lower and the temperature gradient between 2 and 9 m was markedly less than that observed earlier.

In the two hours leading up to the spill the wind speed remained more or less constant at about 6 m/s but the wind gradually swung round towards the array centre line. Insolation slightly increased between 17:00 and 18:00 hours but in the last hour before the spill decreased steadily. The air temperature increased at first but in the hour before the spill, remained more or less constant. These conditions then gave rise to an atmospheric stability judged to be on the stable side of neutral.

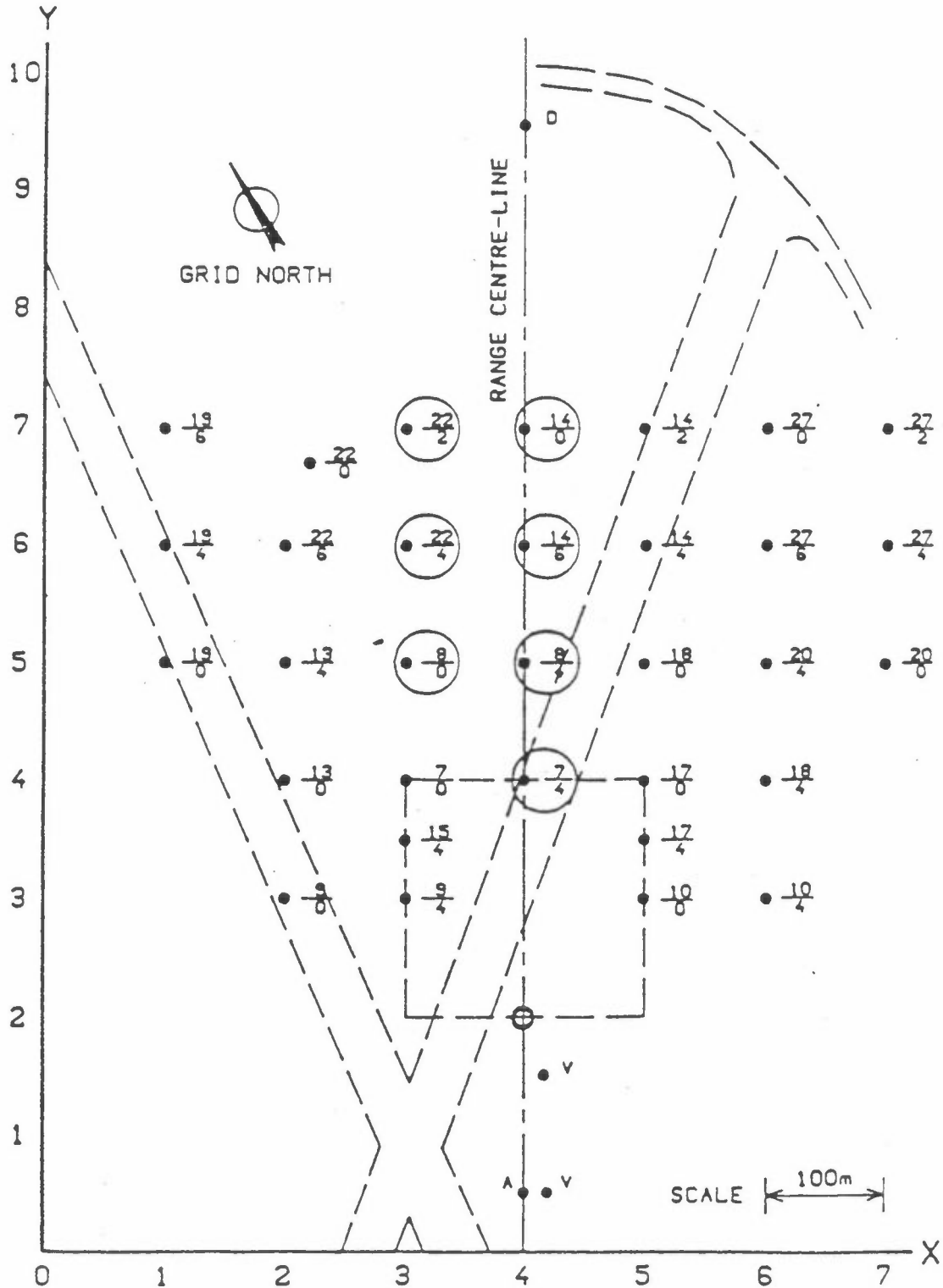
TRIAL No. - 022

DATE - 24/7/83

83 SENSORS SAW GAS

WIND SPEED (U_{10}) 5 m/sec

PASQUILL CATEGORY D



$\frac{21}{4}$ = DATA TERMINAL CHANNEL NUMBER OF GAS SENSORS AT 0.4m HEIGHT

○ = SENSORS AT 0.4m HEIGHT VERIFIED TO HAVE SEEN GAS

TRIAL No. - 022

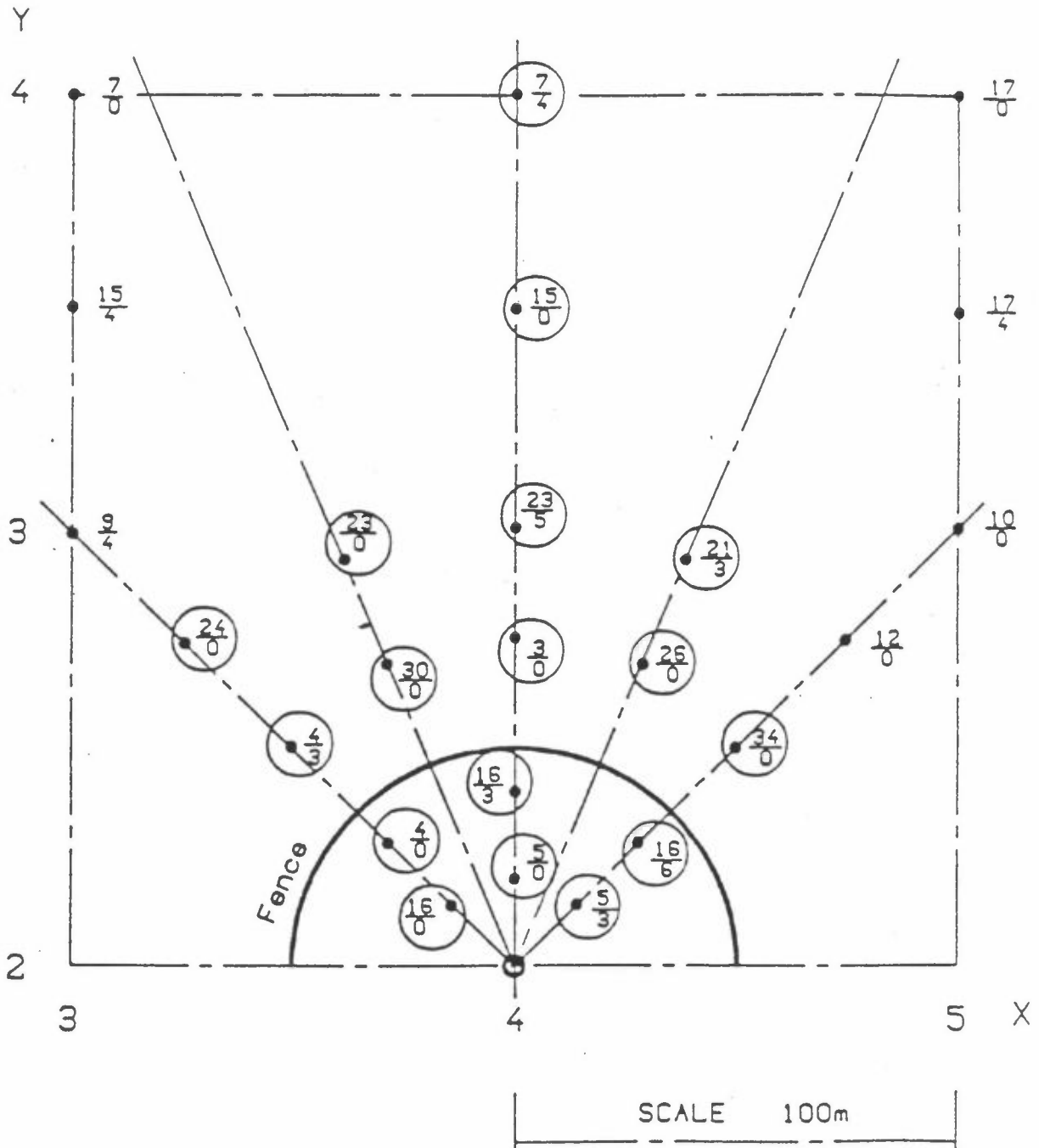
DATE - 24/7/83

83 SENSORS SAW GAS

WIND SPEED (U_{10})

5 m/sec

PASQUILL CATEGORY D



$\frac{21}{4}$ = DATA TERMINAL / CHANNEL NUMBER OF GAS SENSORS AT 0.4m HEIGHT
 ○ = SENSORS AT 0.4m HEIGHT VERIFIED TO HAVE SEEN GAS

		Trial 22				Seconds									
	X	Y	Peak Time Cons	20	40	80	140	200	300	400	500	600	700		
H: 0.4 m	386	214	10	29.0	3.5	5.5	7.0	5.5	2.0	1.5	1.0	0.7	0.5		
	400	220	10	42.0	15.0*	11.5*	6.0*	2.5	1.5	0.7	0.5	0.3			
	414	214	10	23.0	5.0	12.1	5.0	2.5	1.5	1.0	0.8	0.7	0.1		
	372	228	30	7.0	4.0	5.5	4.0	2.6	0.7	0.5	0.4	0.3	0.2		
	400	240	20	14.7	14.7	7.0	2.8	2.0	1.6	0.6	0.3	0.2	0.1		
	428	228	20	9.6	9.6	3.7	3.0	1.4	1.0	0.6	0.5	0.4	0.3		
	350	250	60	0.8		0.4	0.2	0.2							
	450	250	10	0.3	0.2	0.1	0.1								
	325	275	60	0.3			0.1								
	371	269	30	0.7		0.5	0.6	0.5	0.2	0.1	0.1				
	400	275	200	0.8		0.2	0.6	0.5	0.8						
	429	269	40	0.8		0.8	0.3	0.1							
	362	292	40	0.4		0.4	0.3	0.3	0.1						
	400	300	60	0.6		0.3	0.6	0.6	0.2	0.1	0.1	0.1			
	438	292	40	0.4		0.4	0.1		0.1						
	400	350	100	0.6		0.1	0.4	0.4	0.3	0.1	0.1	0.1			
	400	400	120	0.4		0.0	0.2	0.3	0.3	0.1					
	300	500	240	0.1*											
	400	500	150	0.2				0.2	0.1						
	300	600	240	0.1											
400	600	160	0.1					0.1							
300	700	250	0.1												
400	700	190	0.1					0.1	0.1						
H: 2.4 m	386	214	10	3.3	0.7	0.7	2.2	0.6	0.2	1.5	0.5				
	400	220	10	13.0	1.2	1.2	3.4	3.1	0.2						
	414	214	10	12.0	0.8	0.6	0.2	0.1							
	372	228	10	3.4	1.2	1.8	2.5	1.7	0.5	0.4	0.2				
	400	240	60	2.1	1.7	1.0	1.5	0.9	0.3	0.2	0.1	0.1	0.1		
	428	228	10	6.9	1.6	2.5	1.3	0.4	0.3	0.2	0.1				
	350	250	30	0.4		0.1	0.1	0.1							
	450	250	30	0.4		0.1									
	325	275	60	0.4			0.1								
	371	269	30	0.7		0.6	0.5	0.4	0.1	0.1					
	400	275	90	0.6		0.3	0.5	0.5	0.4	0.1	0.1				
	429	269	40	0.8		0.8	0.4	0.1	0.1						
	362	292	130	0.5		0.2	0.2	0.4	0.1						
	400	300	80	0.7		0.3	0.7	0.6	0.3	0.1	0.1	0.1			
	438	292	40	0.3		0.3	0.1								
	400	350	100	0.6			0.4	0.4	0.2	0.1	0.1	0.1			
	400	400	120	0.3			0.1	0.2	0.2						
	400	500	150	0.2				0.2	0.1						
	400	600	160	0.2				0.1	0.1						
	H: 4.4 m	386	214	30	0.7	0.1	0.2	0.3							
400		220	15	1.3	0.4	0.4	0.9	0.4	0.2	0.1	0.1	0.1	0.1		
414		214	20	0.2	0.2	0.2	0.1								
372		228	65	1.2	0.4	0.4	0.6	0.5	0.2	0.1					
400		240	20	1.5	1.5	0.5	0.6	0.6							
428		228	40	1.1	0.6	1.1	0.2	0.1	0.2	0.1					
350		250	170	0.2		0.2		0.1							
450		250	30	0.2											
325		275	60	0.1			0.1								
371		269	50	0.7		0.6	0.6	0.7	0.2	0.1	0.1	0.1			
400		275	80	0.6		0.1	0.6	0.5	0.4	0.1	0.1	0.1	0.1		
429		269	40	0.9		0.9	0.4	0.1							
362		292	140	0.5		0.1	0.2	0.5	0.1						
400		300	60	0.6		0.3	0.6	0.5	0.2	0.1	0.1				
438		292	40	0.2		0.2	0.1								
400		350	90	0.5			0.3	0.3	0.2	0.1					
400		400	120	0.3				0.1	0.2	0.2					
400		500	150	0.2					0.2	0.1					
H: 6.4 m		350	250	170	0.3				0.1						
		371	269	130	0.8		0.4	0.6	0.7	0.2	0.1				
	400	275	80	1.0			1.0	0.4	0.4	0.1					
	429	269	40	0.8		0.3	0.4	0.1	0.1						
	362	292	90	0.5		0.1	0.1	0.3							
	400	300	80	0.6		0.2	0.6	0.4	0.2						
	438	292	20	0.2	0.2		0.2								
	400	350	120	0.5				0.3	0.2						
	400	500	140	0.2					0.2	0.1					
	450	250	60	0.1											
	400	400	120	0.3			0.1	0.3	0.2						

Trial	22	X	Y	H	CM	C	T1	T2	T2-T1	REMARKS
1	Gas	386	214	0.4	29.0	4.0	5	500*		
2	Gas	386	214	2.4	3.3	0.3	5	500	495	
3	Gas	386	214	4.4	0.7	0.1*	20	150	130	
4	Gas	400	220	0.4	42.0	4.0	5	500*		
5	Gas	400	220	2.4	13.0	0.5	5	235	230	
6	Gas	400	220	4.4	1.3	0.2	5	500*		
7	Gas	414	214	0.4	23.0	3.0	5	500*		
8	Gas	414	214	2.4	12.0	0.4	5	185	180	
9	Gas	414	214	4.4	0.2	0.1*	10	100	90	
10	Gas	372	228	0.4	7.0	1.8	10	500*		
11	Gas	372	228	2.4	3.4	0.8	10	500*		
12	Gas	372	228	4.4	1.2	0.3	15	340	325	
13	Gas	400	240	0.4	14.7	3.0	15	500*		
14	Gas	400	240	2.4	2.1	0.6	10	500*		
15	Gas	400	240	4.4	1.5	0.3	15	190	185	
16	Gas	428	228	0.4	9.6	2.0	15	500*		
17	Gas	428	228	2.4	6.9	0.8	15	500*		
18	Gas	428	228	4.4	1.1	0.1	10	385	375	
19	Gas	350	250	0.4	0.8	0.1	20	200	180	
20	Gas	350	250	2.4	0.4	0.1*	20	220	200	Noise
21	Gas	350	250	4.4	0.2	0.1*	20	220	200	
22	Gas	350	250	6.4	0.3	0.1*	80	200	120	
23	Gas	350	250	10.4	0.2	0.1*	15	175	160	
24	Gas	450	250	0.4	0.3	0.1*	25	130	105	
25	Gas	450	250	2.4	0.4	0.1*	25	175	150	
26	Gas	450	250	4.4	0.2	0.1*				Noise
27	Gas	450	250	6.4	0.1	0.1*				Noise
28	Gas	325	275	0.4	0.3	0.1*	55	135	80	Noise
29	HGas	325	275	2.0	0.4	0.1*				Noise
30	Gas	325	275	2.4	0.3	0.1*				Noise
31	Gas	325	275	4.4	0.1	0.1*				Noise
32	Gas	371	269	0.4	0.7	0.2	20	500*		
33	Gas	371	269	2.4	0.7	0.2	25	365	340	
34	Gas	371	269	4.4	0.7	0.2	25	465	440	
35	Gas	371	269	6.4	0.8	0.2	25	305	280	
36	Gas	371	269	10.4	0.7	0.2	20	470	450	
37	Gas	400	275	0.4	0.8	0.3	30	320	290	
38	HGas	400	275	2.0	0.9	0.2	30	210	180	
39	Smoke	400	275	2.0	0.1*	0.1*				Diffuse, small amplitude
40	Smoke	400	275	2.4	0.1*	0.1*				Diffuse, small amplitude
41	Gas	400	275	2.4	0.6	0.2	30	500*		
42	Gas	400	275	4.4	0.6	0.2	30	500*		
43	Gas	400	275	6.4	1.0	0.2	30	410	380	Some noise
44	Gas	400	275	10.4	0.7	0.2	30	330	300	Some noise
45	Gas	429	269	0.4	0.8	0.2	30	215	185	Some noise
46	Gas	429	269	2.4	0.8	0.2	30	270	240	Some noise
47	Gas	429	269	4.4	0.9	0.2	30	250	220	Some noise
48	Gas	429	269	6.4	0.8	0.2	30	255	225	Some noise
49	Gas	429	269	10.4	0.5	0.1	30	245	215	Some noise
50	Gas	362	292	0.4	0.4	0.1	30	240	210	
51	Gas	362	292	2.4	0.5	0.1	30	240	210	
52	Gas	362	292	4.4	0.5	0.1	30	250	220	
53	Gas	362	292	6.4	0.5	0.1	10	235	225	
54	Gas	362	292	10.4	0.4	0.1*	25	360	335	
55	Gas	400	300	0.4	0.6	0.2	35	330	295	
56	Gas	400	300	2.4	0.7	0.3	30	585	555	
57	Gas	400	300	4.4	0.6	0.2	30	500*		
58	Gas	400	300	6.4	0.6	0.2	30	330	300	
59	Gas	400	300	10.4	0.5	0.1	30	370	310	
60	Gas	238	292	0.4	0.4	0.1	30	230	200*	
61	Gas	238	292	2.4	0.3	0.1*				Noise
62	Gas	238	292	4.4	0.2	0.1*				Noise
63	Gas	238	292	6.4	0.2	0.1*				Noise
64	Gas	238	292	10.4	0.1	0.1*				Noise
65	Gas	400	350	0.4	0.6	0.2	20	500*		
66	Gas	400	350	2.4	0.6	0.2	40	500*		
67	Gas	400	350	4.4	0.5	0.2	60	320	280	
68	Gas	400	350	6.4	0.5	0.1	40	320	280	
69	Gas	400	400	0.4	0.4	0.1	0	430	430	
70	Gas	400	400	2.4	0.3	0.1	60	260	200	
71	Gas	400	400	4.4	0.3	0.1	60	380	240	
72	Gas	400	400	6.4	0.3	0.1	60	250	190	
73	Gas	300	500	0.4	0.1*	0.1*				Noise
74	Gas	400	500	0.4	0.2	0.1	90	275	185	Noise
75	Gas	400	500	2.4	0.2	0.1	90	330	240	Noise
76	Gas	400	300	4.4	0.2	0.1	60	320	260	Noise
77	Gas	400	500	6.4	0.2	0.1				Noise
78	Gas	300	600	0.4	0.1	0.1*	160	330	170	
79	Gas	400	600	0.4	0.1	0.1*	115	285	170	
80	Gas	400	600	2.4	0.2	0.1*	115	315	200	
81	Gas	300	700	0.4	0.1	0.1*	160	270	90	
82	Gas	400	700	0.1*	0.1*	0.1*	180	255	75	Noise
83	Gas	400	700	0.4	0.1	0.1*	155	360	205	

2.4

THORNEY ISLAND TRIALS SPILL 023 15 AUGUST 1983

SUMMARY INFORMATION AT THE TIME OF THE SPILL

Gas released at:	20:24:03 hrs
Freon 12/Nitrogen mixture: relative density	1.80
Number of smoke canisters discharged:	4
Mean Wind Speed at 10 m height:	
During main data collection period:	5.8 m/s
From 5 minute cyclic data just before the release:	6.1 m/s
Mean Wind Heading ('A' station) - (relative to the centre line of the array)	28.6°
NB Positive angles are to the right (clockwise) of the centre line when looking downwind of the gas bag.	
Relative Humidity (at 10 m height)	86.6%
Insolation	3.3 W/m ²
Ambient Air Temperature (at 9 m height)	17.6°C
Treated Runway Surface Temperature	16.9°C
Grass Surface Temperature	15.5°C
Observed Cloud Cover	1/8

STABILITY CONDITION

D	(From Observations)
E	(From DT/DZ)
D	(From Solarimeter)
D/E	(From Heat Flux)
F	(From Richardson No)
D	(From Bulk Richardson No)
D	(From Standard Deviation of Wind Heading)

Stability condition inferred from data during the release and just before the release: D/E.

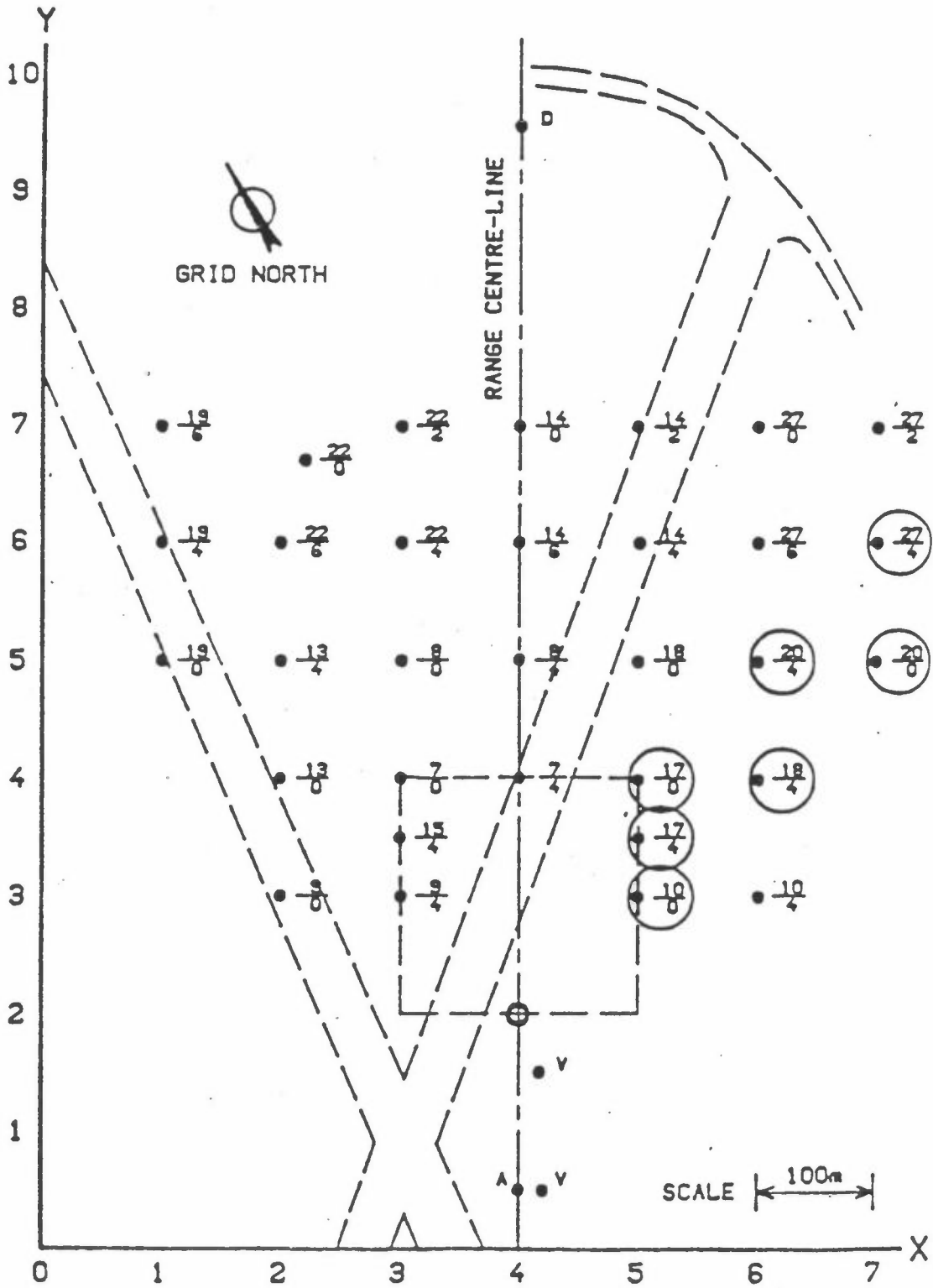
THORNEY ISLAND TRIALS SPILL 023 15 AUGUST 1983

HISTORY

This spill was conducted late in the evening on a day during which insolation had been strong to moderate with winds between 6 and 8 m/s blowing approximately 20° to the right of the array centre line.

Two hours before gas was released, the wind speed was about 7 m/s and insolation was about 300 W/m² but one hour later insolation had dropped to 60 W/m² without any noticeable change in wind speed. Throughout this time the wind heading varied between 20-30° to the right of the centre line. The ambient temperature was however steadily decreasing. By the time gas was released, insolation was virtually zero and the wind speed had decreased to about 6 m/s with a heading of about 30° to the right of the array centre line. These conditions then gave an atmospheric stability which was judged to be on the stable side of neutral - a 'D/E' category on the Pasquill scale.

TRIAL No. - 023 DATE - 15/8/83 77 SENSORS SAW GAS
 WIND SPEED (U_{10}) 5-6 m/sec PASQUILL CATEGORY D



$\frac{21}{4}$ = DATA TERMINAL CHANNEL NUMBER OF GAS SENSORS AT 0.4m HEIGHT
 ○ = SENSORS AT 0.4m HEIGHT VERIFIED TO HAVE SEEN GAS

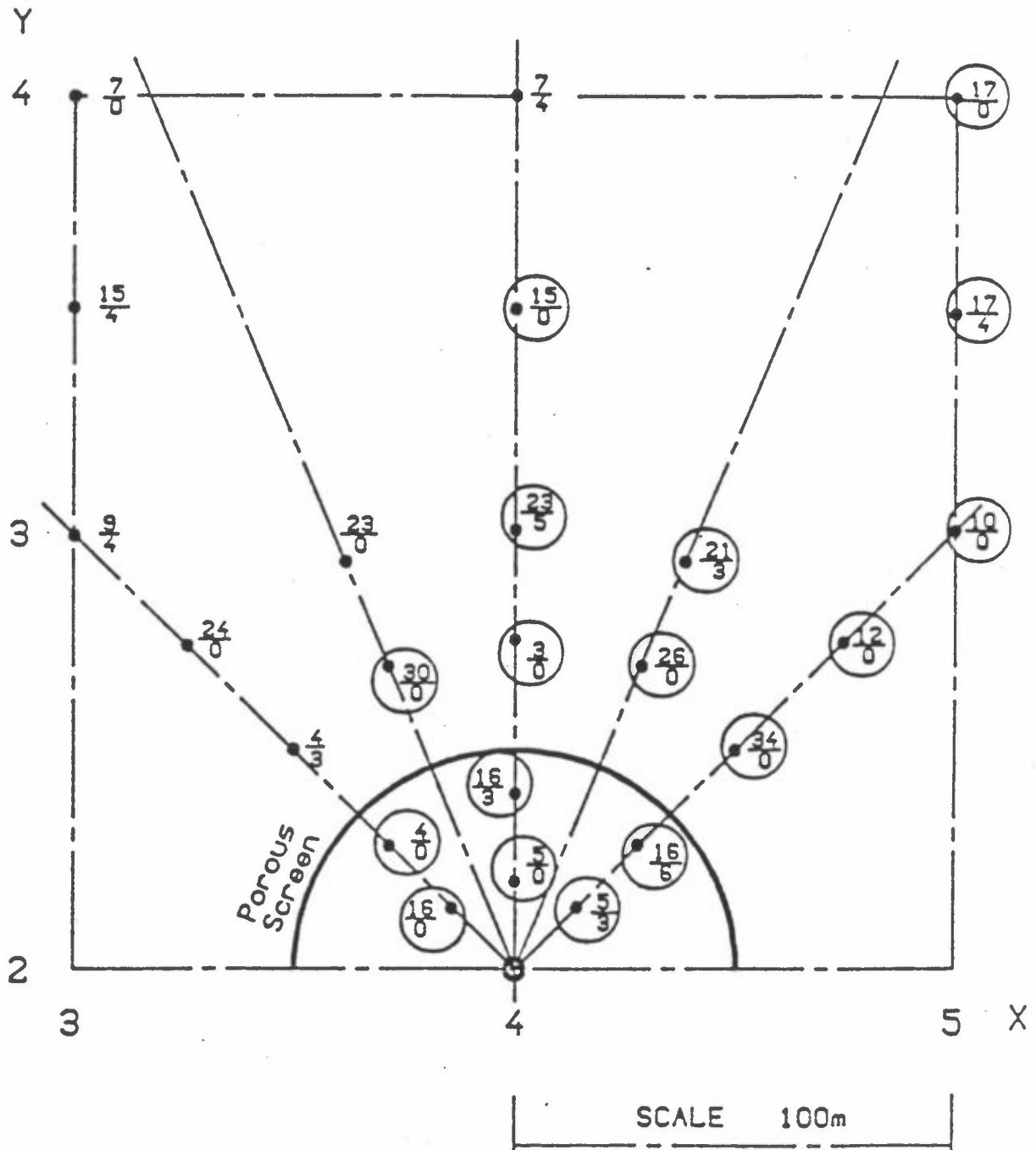
TRIAL No. - 023

DATE - 15/8/83

77 SENSORS SAW GAS

WIND SPEED (U_{10}) 5-6 m/sec

PASQUILL CATEGORY D



$\frac{21}{4}$ = DATA TERMINAL CHANNEL NUMBER OF GAS SENSORS AT 0.4m HEIGHT
 ○ = SENSORS AT 0.4m HEIGHT VERIFIED TO HAVE SEEN GAS

		Trial 23		Seconds										
	X	Y	Peak Time Cons	20	40	80	140	200	300	400	500	600	700	
H: 0.4 m	386	214	10	78.0	20.0	2.5	1.0	0.7						
	400	220	10	64.0	20.0	10.0	1.0							
	414	214	10	64.0	20.0	6.0	1.0							
	372	228	20	18.7	18.7	0.2								
	400	240	20	14.5	14.5	8.7	0.4							
	428	228	20	42.0	42.0	8.0	0.7							
	450	250	30	14.5	6.0	14.3	6.0	4.0	0.3					
	371	269	30	9.8		6.6								
	400	275	60	6.1		5.2	6.1	4.8	0.2					
	429	269	30	10.3		6.4	3.5	0.6						
	475	275	95	4.8		4.4	4.0	4.4	2.6	0.5				
	400	300	55	5.1		3.2	0.2							
	438	292	60	6.2		3.0	5.6	0.7	0.4					
	500	300	100	2.8			1.0	1.7	0.3					
	400	350	60	2.0										
	500	400	140	0.3			0.1	0.3						
	600	400	160	0.3				0.1	0.2					
	700	500	230	0.1					0.1					
	700	600	190	0.2				0.1	0.1					
	H: 2.4 m	386	214	10	46.5	18.0								
400		220	10	64.0	9.0	0.5								
414		214	10	41.0	1.5									
372		228	20	9.9	9.9	0.3	0.2							
400		240	20	6.6	6.6	5.0								
428		228	20	12.5	12.5	0.4	0.4							
450		250	20	6.5	6.5	2.8	4.6	0.4						
371		269	30	4.4		2.3								
400		275	40	4.6		4.6	0.4							
429		269	30	5.8		4.2	1.4	0.8						
475		275	100	3.6		2.8	3.5	2.2	1.0					
400		300	60	2.3		1.3	0.3							
438		292	60	4.7		1.2	3.8	0.5						
500		300	100	1.7			1.3	1.3	0.2	0.1				
400		350	60	1.8										
500		350	100	1.0			0.5	0.3	0.4					
500		400	120	0.4			0.1	0.2						
600		400	160	0.4			0.1	0.2	0.2					
600		500	110	0.2				0.1						
700		500	190	0.2				0.1	0.1					
700	600	190	0.2					0.1						
H: 4.4 m	386	214	10	11.0	6.0									
	400	220	10	12.5	0.4									
	414	214	10	39.9	0.1									
	400	240	20	8.0	8.0									
	428	228	20	7.6	7.6									
	450	250	30	2.6		0.6	0.1	0.1						
	371	269	30	1.5		0.1*								
	400	275	40	3.2		3.2	0.1							
	475	275	70	3.2		0.5	2.3	1.5	0.7					
	400	300	60	2.0			0.2							
	438	292	55	4.4		1.3	2.4							
	400	350	60	0.9										
	500	350	100	1.0			0.5	0.1						
	500	400	110	0.3			0.1	0.1						
	600	400	160	0.4				0.1	0.2					
	600	500	110	0.2					0.1					
	H: 6.4 m	450	250	20	1.2	1.2	0.2	0.2	0.1					
		371	269	40	0.4		0.4							
		400	275	40	3.1	2.5	3.1							
		429	269	40	2.1		2.1	1.0						
475		275	60	2.4		0.5	1.4	0.7	0.6					
400		300	60	0.9		0.6	0.1							
438		292	50	3.9		0.7	2.2							
500		300	80	1.1			1.1	0.9	0.3					
500		350	100	0.9			0.4	0.2	0.3					
600		400	160	0.4				0.1	0.2					
600		500	120	0.2					0.1					
H: 10.4 m		450	250	20	0.7	0.7								
	400	275	30	0.9	0.3	0.3								
	429	269	30	0.9		0.3	3.1							
	475	275	30	1.2		0.5	0.4	0.2	0.2					
	400	300	60	0.2										
	438	292	60	1.5		1.0								

Trial	23	X	Y	H	CM	C	T1	T2	T2-T1	REMARKS
1	Gas	386	214	0.4	78.0	12.0	30	195	165	
2	Gas	386	214	2.4	46.5	10.0	10	70	60	
3	Gas	386	214	4.4	11.0	4.0	15	30	15	
4	Gas	400	220	0.4	64.0	14.0	10	100	150	
5	Gas	400	220	2.4	14.5	4.0	5	85	80	
6	Gas	400	220	4.4	12.5	3.0	5	60	55	
7	Gas	414	214	0.4	64.0	12.0	10	105	155	
8	Gas	414	214	2.4	41.0	8.0	10	35	25	
9	Gas	414	214	4.4	9.9	3.4	0	25	25	
10	Gas	372	228	0.4	18.7	7.0	15	120	105	
11	Gas	372	228	2.4	9.9	2.5	0	120	120	
12	Gas	400	240	0.4	14.5	4.0	15	100	145	
13	Gas	400	240	2.4	6.6	2.0	10	80	70	
14	Gas	400	240	4.4	8.0	2.0	10	50	40	
15	Gas	428	228	0.4	42.0	6.0	15	200	185	
16	Gas	428	228	2.4	12.5	3.0	10	140	130	
17	Gas	428	228	4.4	7.6	1.2	5	25	20	
18	Gas	450	250	0.4	14.5	2.5	20	280	260	
19	Gas	450	250	2.4	6.5	1.3	20	230	210	
20	Gas	450	250	4.4	2.6	0.4	20	155	135	
21	Gas	450	250	6.4	1.2	0.1	20	160	140	
22	Gas	450	250	10.4	0.7	0.1	15	35	20	
23	Gas	371	269	0.4	9.3	3.0	25	105	80	
24	Gas	371	269	2.4	4.4	0.9	25	80	55	
25	Gas	371	269	4.4	1.5	0.2	30	90	60	
26	Gas	371	269	6.4	0.4	0.1	30	45	15	Heavy noise
27	Gas	400	275	0.4	6.1	2.0	25	25	330	
28	HGas	400	275	2.0	6.5	2.1	25	105	140	
29	Gas	400	275	2.4	4.6	1.5	20	260	240	
30	Gas	400	275	4.4	3.2	0.9	20	190	170	
31	Gas	400	275	6.4	3.1	1.0	20	110	90	
32	Gas	400	275	10.4	0.9	0.3	20	60	40	Noise
33	Gas	429	269	0.4	10.3	3.6	20	170	150	
34	Gas	429	269	2.4	5.8	1.4	20	160	140	
35	Gas	429	269	6.4	2.1	0.6	20	130	110	
36	Gas	429	269	10.4	0.9	0.2	20	0	70	
37	Gas	475	275	0.4	4.3	1.9	40	430	390	
38	HGas	475	275	2.0	4.2	1.3	40	440	400	
39	Smoke	475	275	2.0	0.1	0.1*				Small fluctuations
40	Gas	475	275	2.4	3.6	1.3	40	410	370	
41	Gas	475	275	4.4	3.2	0.7	40	310	270	
42	Smoke	475	275	5.0	0.1*	0.1*				Small fluctuations
43	Gas	475	275	6.4	2.4	0.5	20	300	280	
44	Gas	475	275	10.4	1.2	0.3	20	250	230	
45	Gas	400	300	0.4	5.1	1.4	30	100	70	
46	Gas	400	300	2.4	2.3	0.5	30	90	60	
47	Gas	400	300	4.4	2.0	0.6	40	90	50	
48	Gas	400	300	6.4	0.9	0.2	40	90	50	
49	Gas	400	300	10.4	0.2	0.1*	40	75	35	
50	Gas	438	292	0.4	6.2	2.7	30	225	195	
51	Gas	438	292	2.4	4.7	1.6	35	215	180	
52	Gas	438	292	4.4	4.4	1.5	35	170	135	
53	Gas	438	292	6.4	3.9	1.0	25	135	110	
54	Gas	438	292	10.4	1.5	0.4	40	105	65	
55	Gas	500	300	0.4	2.3	0.9	40	300	260	
56	Gas	500	300	2.4	1.7	0.5	40	320	280	
57	Gas	500	300	6.4	1.1	0.3	35	300	265	
58	Gas	400	350	0.4	2.0	0.6	55	130	75	
59	Gas	400	350	2.4	1.3	0.6	55	75	20	
60	Gas	400	350	4.4	0.9	0.3	55	100	45	
61	Gas	500	350	2.4	1.0	0.3	55	230	175	
62	Gas	500	350	4.4	1.0	0.3	40	260	220	
63	Gas	500	350	6.4	0.9	0.2	50	250	200	
64	Gas	500	400	0.4	0.3	0.1	40	180	140	
65	Gas	500	400	2.4	0.4	0.1	50	150	100	
66	Gas	500	400	4.4	0.3	0.1*	50	130	80	
67	Gas	500	400	6.4	0.2	0.1*	50	110	60	
68	Gas	500	400	2.4	0.4	0.1	50	200	180	
69	Gas	500	400	4.4	0.4	0.1	60	230	170	
70	Gas	500	400	6.4	0.4	0.1	80	210	130	
71	Gas	500	500	2.4	0.2	0.1*	90	170	80	
72	Gas	500	500	4.4	0.2	0.1*	90	165	75	
73	Gas	500	500	6.4	0.2	0.1*	100	165	65	
74	Gas	700	500	0.4	0.1	0.1*				Noise
75	Gas	700	500	2.4	0.2	0.1*				Noise
76	Gas	700	500	0.4	0.2	0.1*				Noise
77	Gas	700	500	2.4	0.2	0.1*				Noise

2.5

THORNEY ISLAND TRIALS SPILL 024 16 AUGUST 1983

SUMMARY INFORMATION AT THE TIME OF THE SPILL

Gas released at:	20:05:17 hrs
Freon 12/Nitrogen mixture: relative density	2.03
Number of smoke canisters discharged:	4
Mean Wind Speed at 10 m height:	
During main data collection period:	6.8 m/s
From 5 minute cyclic data just before the release:	7.2 m/s
Mean Wind Heading ('A' station) - (relative to the centre line of the array)	28.8°
NB Positive angles are to the right (clockwise) of the centre line when looking downwind of the gas bag.	
Relative Humidity (at 10 m height)	86.4%
Insolation	9.4 W/m ²
Ambient Air Temperature (at 9 m height)	18.2°C
Treated Runway Surface Temperature	17.4°C
Grass Surface Temperature	16.3°C
Observed Cloud Cover	4/8

STABILITY CONDITION

D (From Observations)
 E (From DT/DZ)
 D (From Solarimeter)
 D (From Heat Flux)
 F (From Richardson No)
 D (From Bulk Richardson No)
 D (From Standard Deviation of Wind Heading)

Stability condition inferred from data during the release and just before the release: D.

THORNEY ISLAND TRIALS SPILL 024 16 AUGUST 1983

HISTORY

This spill was conducted late in the evening of a day during which insolation had been generally strong but with wind speed high and blowing between 20 and 30° to the right of the array centre line. During the afternoon hours the wind speed varied from 7 to 9 m/s, but in the two hours leading up to the spill it remained nearer to 7 m/s. Throughout this time the wind heading stayed more or less constant at about 30° to the right of the array centre line. Insolation generally decreased as dusk approached so that by the time gas was released it was virtually zero. These conditions then resulted in a neutrally stable atmosphere.

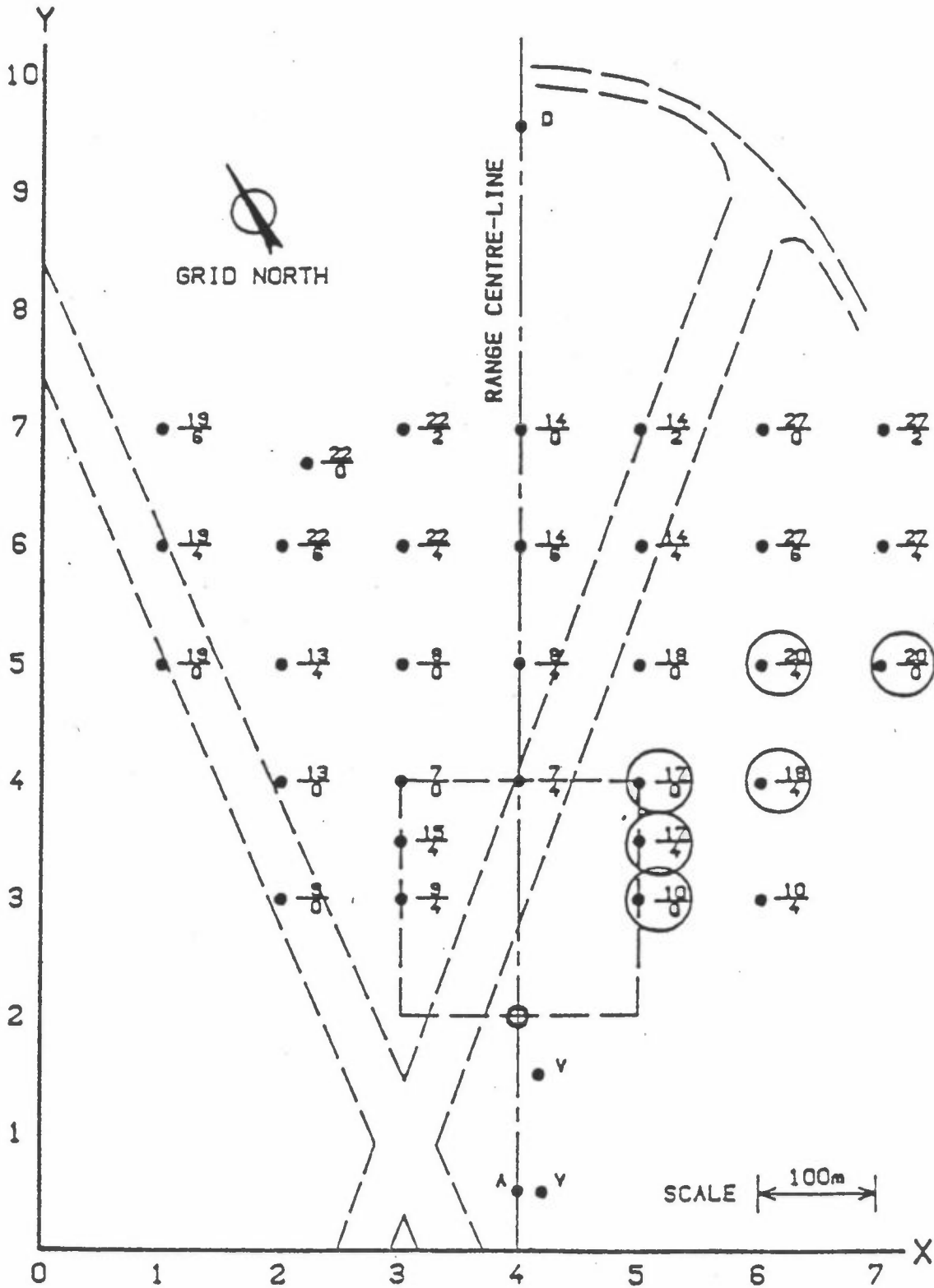
TRIAL No. - 024

DATE - 16/8/83

65 SENSORS SAW GAS

WIND SPEED (U_{10}) 7 m/sec

PASQUILL CATEGORY D



$\frac{21}{4}$ = DATA TERMINAL CHANNEL NUMBER OF GAS SENSORS AT 0.4m HEIGHT
 ○ = SENSORS AT 0.4m HEIGHT VERIFIED TO HAVE SEEN GAS

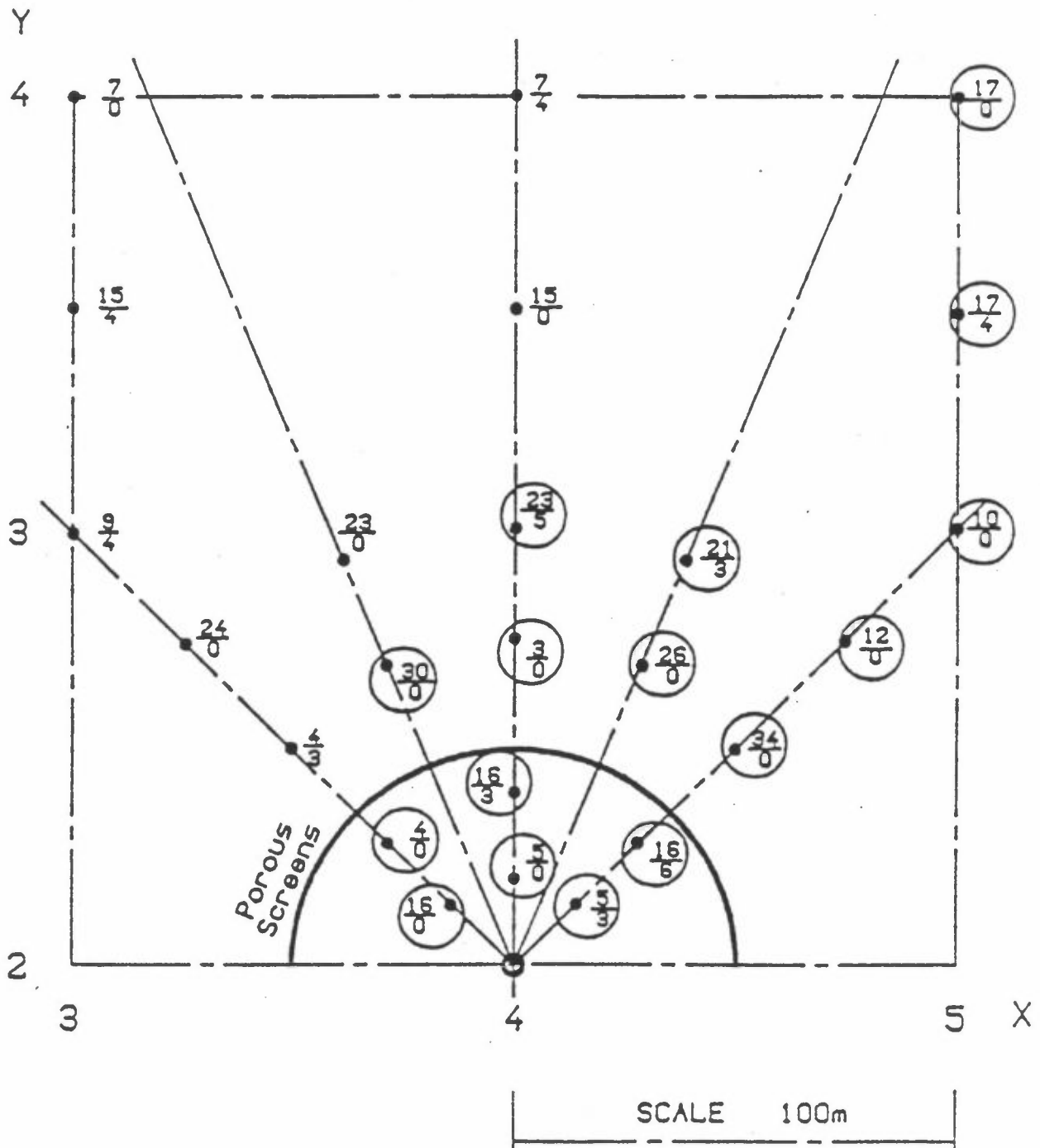
TRIAL No. - 024

DATE - 16/8/83

65 SENSORS SAW GAS

WIND SPEED (U_{10}) 7 m/sec

PASQUILL CATEGORY D



$\frac{21}{4}$ = DATA TERMINAL CHANNEL NUMBER OF GAS SENSORS AT 0.4m HEIGHT
 ○ = SENSORS AT 0.4m HEIGHT VERIFIED TO HAVE SEEN GAS

Trial	24	X	Y	H	CM	C	T1	T2	T2-T1	REMARKS
1	Gas	386	214	2.4	34.0	10.0	5	115	110	
2	Gas	386	214	4.4	8.0	2.9	5	45	40	
3	Gas	400	220	0.4	67.0	10.0	5	215	210	
4	Gas	400	220	2.4	21.0	5.0	5	80	75	
5	Gas	400	220	4.4	10.5	3.0	5	30	25	
6	Gas	414	214	0.4	59.0	10.0	5	200	195	
7	Gas	414	214	2.4	33.0	7.5	5	50	45	
8	Gas	414	214	4.4	1.9	0.4	0	50	50	Noise
9	Gas	372	228	0.4	19.5	6.0	15	75	60	
10	Gas	400	240	0.4	16.0	5.0	10	230	220	
11	Gas	400	240	2.4	9.5	1.6	10	130	120	
12	Gas	400	240	4.4	9.2	2.0	10	60	50	
13	Gas	428	228	0.4	24.0	5.0	10	200	190	
14	Gas	428	228	2.4	12.0	2.0	10	120	110	
15	Gas	428	228	4.4	4.2	0.7	10	120	110	
16	Gas	450	250	0.4	8.4	2.0	25	370	345	
17	Gas	450	250	2.4	4.0	1.2	25	250	225	
18	Gas	450	250	4.4	3.2	0.7	25	220	195	Heavy noise
19	Gas	450	250	6.4	2.7	0.6	25	240	215	
20	Gas	450	250	10.4	0.7	0.2	20	90	70	Heavy noise
21	Gas	371	269	0.4	8.1	2.0	30	230	200	
22	Gas	371	269	2.4	2.6	0.8	30	65	35	
23	Gas	400	275	0.4	7.0	2.1	30	350	320	
24	HGas	400	275	2.0	4.8	1.5	30	185	155	
25	Gas	400	275	2.4	3.4	1.2	30	250	220	
26	Gas	400	275	4.4	1.5	0.5	30	265	235	
27	Gas	400	275	6.4	1.1	0.3	30	120	90	
28	Gas	429	269	0.4	9.0	2.5	30	370	340	
29	Gas	429	269	2.4	4.3	1.3	30	315	185	
30	Gas	429	269	4.4	3.5	0.9	30	245	215	
31	Gas	429	269	6.4	2.0	0.6	30	160	130	Heavy noise
32	Gas	429	269	10.4	1.0	0.3	30	120	90	
33	Gas	475	275	0.4	4.0	1.3	50	340	290	
34	HGas	475	275	2.0	3.2	0.9	40	290	250	
35	Smoke	475	275	2.0	0.2	0.1*	60	140	80	Heavy noise
36	Gas	475	275	2.4	2.9	0.7	50	310	260	
37	Gas	475	275	4.4	2.4	0.4	50	300	250	
38	Smoke	475	275	5.0	0.1	0.1*	55	205	150	
39	Gas	475	275	6.4	1.6	0.3	40	300	260	
40	Gas	475	275	10.4	1.2	0.2	25	300	275	
41	Gas	400	300	0.4	4.5	1.4	35	300	265	
42	Gas	400	300	2.4	1.7	0.5	30	115	85	
43	Gas	400	300	4.4	0.7	0.2	30	190	160	
44	Gas	438	292	0.4	6.2	2.0	40	335	295	
45	Gas	438	292	2.4	3.8	1.0	40	220	180	
46	Gas	438	292	4.4	2.2	0.7	40	230	190	
47	Gas	438	292	6.4	2.2	0.6	30	330	300	
48	Gas	438	292	10.4	1.2	0.2	25	320	295	
49	Gas	500	300	0.4	1.2	0.2	40	340	300	
50	Gas	500	300	2.4	1.1	0.2	40	320	280	
51	Gas	500	300	6.4	0.7	0.2	40	345	305	
52	Gas	500	350	2.4	0.5	0.1	40	315	375	
53	Gas	500	350	4.4	0.5	0.1	5	225	220	
54	Gas	500	400	0.4	0.3	0.1*	70	135	65	Noise
55	Gas	500	400	2.4	0.3	0.1*	70	155	85	
56	Gas	500	400	4.4	0.2	0.1*	70	150	80	Noise
57	Gas	600	400	0.4	0.4	0.1	70	225	155	Noise
58	Gas	600	400	2.4	0.4	0.1	70	235	165	Noise
59	Gas	600	400	4.4	0.4	0.1*	70	310	240	Noise
60	Gas	600	400	6.4	0.5	0.1*	70	240	170	Noise
61	Gas	600	500	2.4	0.1	0.1*	75	180	105	Noise
62	Gas	600	500	4.4	0.1	0.1*	90	175	85	Noise
63	Gas	600	500	6.4	0.1	0.1*	75	175	100	Noise
64	Gas	700	500	0.4	0.2	0.1*	100	170	70	Noise
65	Gas	700	500	2.4	0.3	0.1*	100	170	70	

2.6

THORNEY ISLAND TRIALS SPILL 025 31 AUGUST 1983

SUMMARY INFORMATION AT THE TIME OF THE SPILL

Gas released at:	20:12:01 hrs
Freon 12/Nitrogen mixture: relative density	1.95
Number of smoke canisters discharged:	5
Mean Wind Speed at 10 m height:	
During main data collection period:	1.4 m/s
From 5 minute cyclic data just before the release:	1.4 m/s
Mean Wind Heading ('A' station) - (relative to the centre line of the array)	-124.5°
NB Positive angles are to the right (clockwise) of the centre line when looking downwind of the gas bag.	
Relative Humidity (at 10 m height)	72.1%
Insolation	0 W/m ²
Ambient Air Temperature (at 9 m height)	19.5°C
Treated Runway Surface Temperature	17.6°C
Grass Surface Temperature	15.1°C
Observed Cloud Cover	3/8

STABILITY CONDITION

D (From Observations)
 F (From DT/DZ)
 G (From Solarimeter)
 G (From Heat Flux)
 F (From Richardson No)
 D (From Bulk Richardson No)
 E (From Standard Deviation of Wind Heading)

Stability condition inferred from data during the release and just before the release: F.

THORNEY ISLAND TRIALS SPILL 025 31 AUGUST 1983

HISTORY

This spill was conducted late in the evening on a day during which the wind speed had been generally low and insolation slight. However, the predominant wind heading was well outside the acceptable operational envelope, except for the two hour period prior to the release. During this time indications were that the wind was gradually improving in direction and on this basis the decision was taken to proceed with the usual 'start-up' operations, prior to each spill. One hour before release, the wind heading was 58° to the left of the centre line at 1.4 m/s. However, the wind subsequently changed its direction so that by the time the gas was released, the wind dispersed the gas largely away from the sensor field.

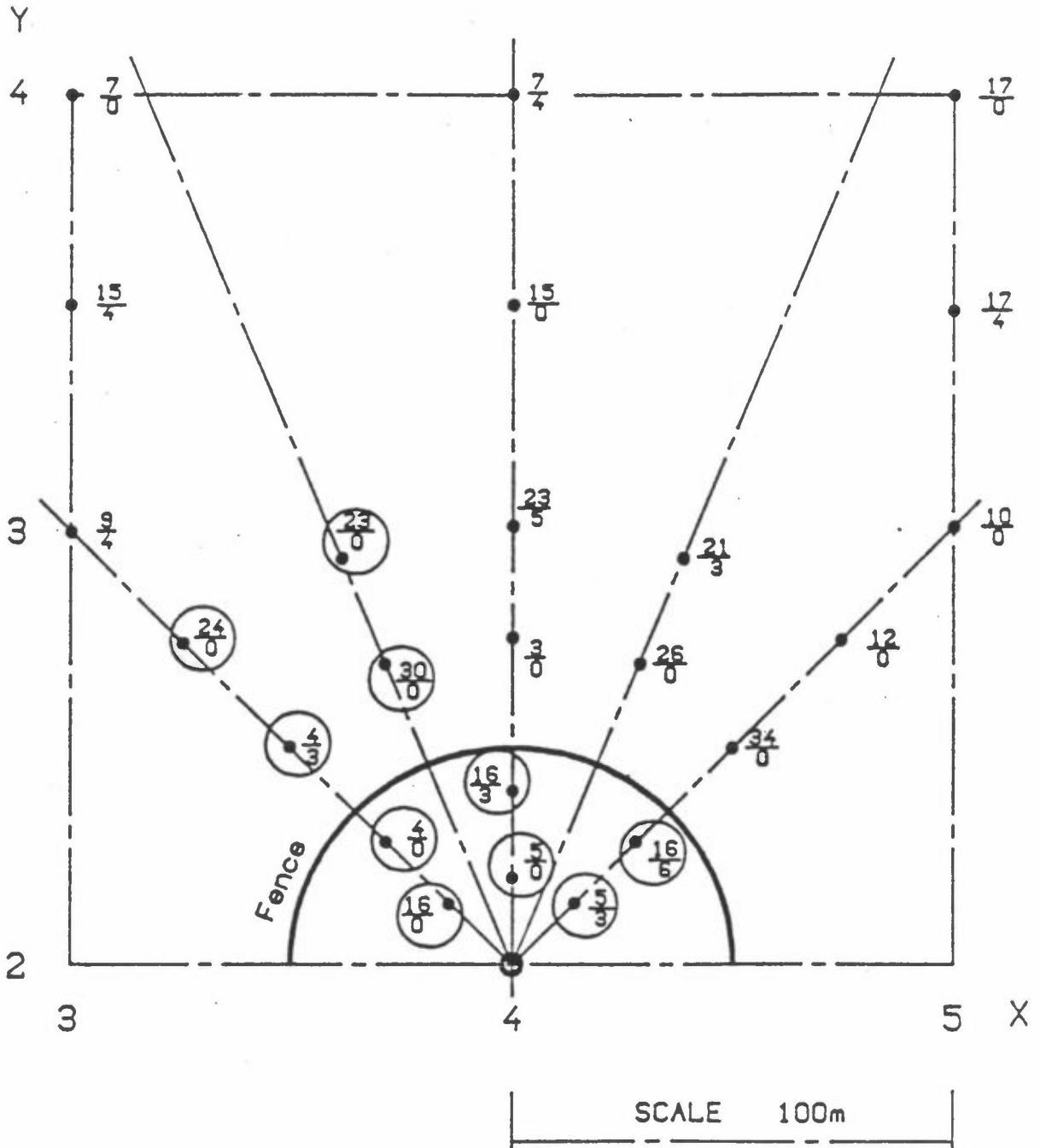
TRIAL No. - 025

DATE - 31/8/83

26 SENSORS SAW GAS

WIND SPEED (U_{10}) 1.5 m/sec

PASQUILL CATEGORY D



$\frac{21}{4}$ = DATA TERMINAL CHANNEL NUMBER OF GAS SENSORS AT 0.4m HEIGHT
 ○ = SENSORS AT 0.4m HEIGHT VERIFIED TO HAVE SEEN GAS

Trial	25	X	Y	H	CM	C	T1	T2	T2-T1	REMARKS
1	Gas	386	214	0.4	45.0	4.0	5	215	215	
2	Gas	386	214	2.4	30.0	10.0	5	15	10	
3	Gas	400	220	0.4	53.0	7.0	10	215	205	
4	Gas	400	220	2.4	27.0	10.0	5	110	105	
5	Gas	400	220	4.4	12.0	2.7	5	90	85	
6	Gas	414	214	0.4	42.0	5.0	10	260	250	
7	Gas	414	214	2.4	23.0	4.0	5	75	70	
8	Gas	414	214	4.4	0.5	0.1	30	300	270	
9	Gas	372	228	0.4	21.0	3.0	15	180	165	
10	Gas	372	228	1.4	14.5	0.1*	10	170	160	
11	Gas	372	228	2.4	0.4	0.1*	15	215	200	Heavy noise
12	Gas	400	240	0.4	19.5	4.0	20	370	350	
13	Gas	400	240	2.4	10.0	1.7	20	260	240	
14	Gas	400	240	4.4	0.8	0.1	15	355	340	Noise
15	Gas	428	228	0.4	25.0	4.0	20	450	430	
16	Gas	428	228	2.4	23.0	4.0	20	80	60	
17	Gas	428	228	4.4	0.7	0.1*	30	160	130	Heavy noise
18	Gas	350	250	0.4	1.2	0.2	40	380	340	
19	Gas	350	250	2.4	0.6	0.2	40	120	80	Noise
20	Gas	350	250	4.4	0.5	0.1	30	100	70	Noise
21	Gas	350	250	6.4	0.5	0.1*				Heavy noise
22	Gas	325	275	0.4	0.3	0.1*				Heavy noise
23	Gas	325	275	2.4	0.3	0.1*				Heavy noise
24	Gas	371	269	0.4	0.6	0.1	65	255	180	Noise
25	Gas	371	269	2.4	0.2	0.1*				Heavy noise
26	Gas	362	292	0.4	0.3	0.1	100	170	70*	Noise

Trial 25

	X	Y	Peak						Seconds				
			Time	Cons	20	40	80	140	200	300	400	500	600
H: 0.4 m	386	214	10	45.0	6.0	17.0	7.0	9.0	7.0				
	400	220	10	53.0	12.0	16.0	10.0	4.0					
	414	214	10	42.0	12.0	17.0	5.0	4.0	2.5				
	372	228	15	21.0	9.0	12.0	5.0	7.5					
	400	240	20	19.5	19.5	13.0	12.0	5.0	7.0				
	428	228	20	25.0	25.0	11.0	10.0	5.0	4.0	2.5	0.5		
	350	250	50	1.2		0.4	0.3	0.4	0.3	0.1			
	325	275	170	0.3				0.1	0.2	0.1			
H: 2.4 m	371	269	80	0.6			0.6	0.3	0.1				
	362	292	100	0.3					0.2				
	386	214	10	30.0									
	400	220	10	27.0									
	414	214	10	23.0									
	372	228	60	0.4	0.1		0.2	0.1					
	400	240	20	10.0	10.0	4.6	0.6	0.3					
	428	228	20	23.0	23.0	2.5							
H: 4.4 m	350	250	50	0.5		0.4							
	325	275	80	0.3			0.3	0.2	0.1	0.1			
	371	269	90	0.2			0.1	0.1					
	400	220	10	12.0									
	414	214	50	0.5		0.2		0.1	0.1				
	400	240	40	0.9		0.9	0.3	0.2	0.1				
428	228	40	0.7		0.7	0.2	0.1						
350	250	40	0.5		0.5								

2.7

THORNEY ISLAND TRIALS SPILL 026 24 SEPTEMBER 1983

SUMMARY INFORMATION AT THE TIME OF THE SPILL

Gas released at:	11:35:43 hrs
Freon 12/Nitrogen mixture: relative density	2.00
Number of smoke canisters discharged:	4
Mean Wind Speed at 10 m height:	
During main data collection period:	1.9 m/s
From 5 minute cyclic data just before the release:	2.4 m/s
Mean Wind Heading ('A' station) - (relative to the centre line of the array)	5.0°
NB Positive angles are to the right (clockwise) of the centre line when looking downwind of the gas bag.	
Relative Humidity (at 10 m height)	91.7%
Insolation	271.4 W/m ²
Ambient Air Temperature (at 9 m height)	18.4°C
Treated Runway Surface Temperature	21.3°C
Grass Surface Temperature	18.5°C
Observed Cloud Cover	7/8

STABILITY CONDITION

B (From Observations)
 F (From DT/DZ)
 C (From Solarimeter)
 C (From Heat Flux)
 F (From Richardson No)
 F (From Bulk Richardson No)
 B/C (From Standard Deviation of Wind Heading)

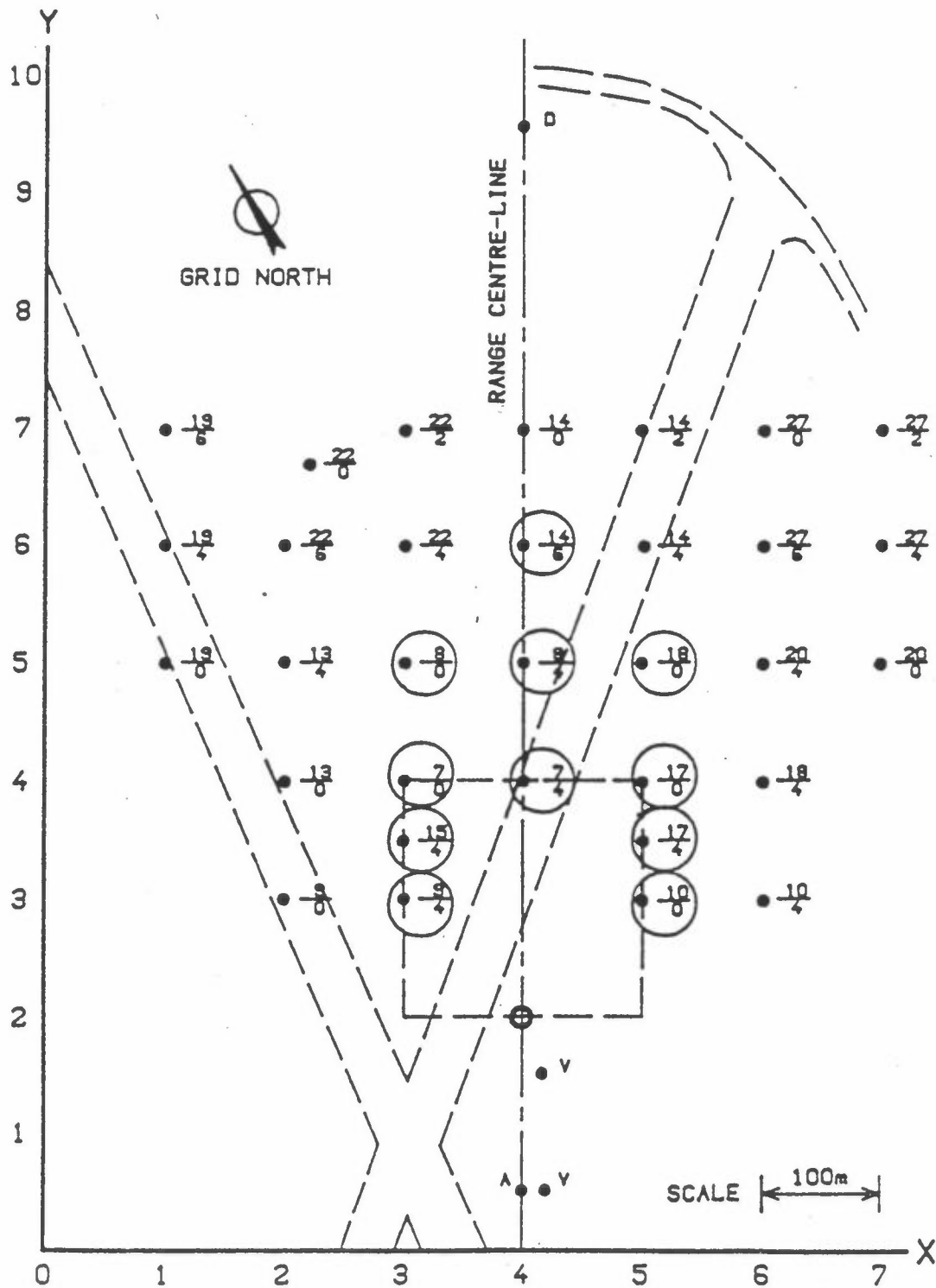
Stability condition inferred from data during the release and just before the release: B.

THORNEY ISLAND TRIALS SPILL 026 24 SEPTEMBER 1983

HISTORY

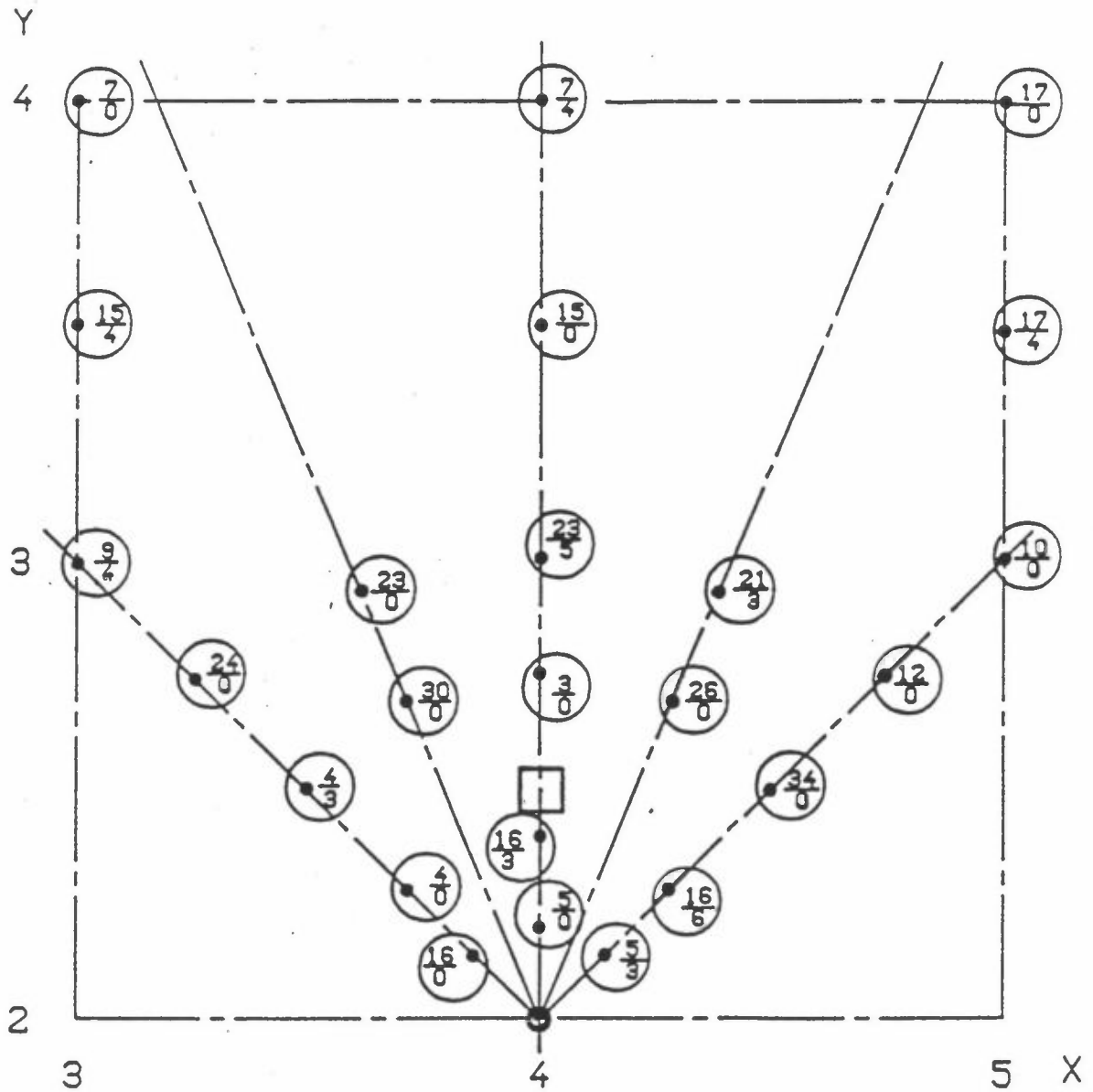
This spill was conducted in the morning of a day during which the wind speed remained more or less constant at about 2 to 3 m/s; the wind heading however was very variable during the morning. Earlier in the morning, about three hours before the spill, the ground was sufficiently cooler than the air aloft to give rise to strong stabilising temperature gradients. As the morning progressed however, the ground quickly warmed, such that by the time gas was released, unstable conditions were clearly present. Throughout the morning insolation also steadily, though not rapidly, increased.

TRIAL No. - 026 DATE - 24/9/83 101 SENSORS SAW GAS
 WIND SPEED (U_{10}) 1 m/sec PASQUILL CATEGORY B



$\frac{21}{4}$ = DATA TERMINAL OF GAS SENSORS AT 0.4m HEIGHT
 CHANNEL NUMBER
 ○ = SENSORS AT 0.4m HEIGHT VERIFIED TO HAVE SEEN GAS

TRIAL No. - 026 DATE - 24/9/83 101 SENSORS SAW GAS
 WIND SPEED (U_{10}) 1 m/sec PASQUILL CATEGORY B



SCALE 100m

□ BUILDING

$\frac{21}{4}$ = DATA TERMINAL OF GAS SENSORS AT 0.4m HEIGHT
CHANNEL NUMBER
 ○ = SENSORS AT 0.4m HEIGHT VERIFIED TO HAVE SEEN GAS

	Total	DS	X	Y	H	OM	C	TI	TD	TD-TI	REMARKS
1	Gas	386	214	0.4	50.0	4.0	0	100	100		Narrow peak
2	Gas	400	220	0.4	47.0	3.0	0	400	420		Narrow peak
3	Gas	414	214	0.4	23.0	2.0	0	310	310		Narrow peak
4	Gas	372	223	0.4	22.0	2.0	0	310	310		Narrow peak
5	Gas	372	223	0.4	17.5	0.4	0	220	220		Narrow peak
6	Gas	400	240	0.4	16.7	2.0	0	360	360		
7	Gas	400	240	0.4	12.3	0.2	0	40	40		Narrow peak
8	Gas	428	228	0.4	3.9	0.2	0	30	30		Narrow peak
9	Gas	350	250	0.4	17.3	1.3	0	310	310		
10	Gas	350	250	0.4	5.7	0.1	10	140	130		Narrow peak
11	Gas	350	250	0.4	2.3	0.1	10	100	90		Narrow peak
12	Gas	350	250	0.4	1.1	0.1*	10				Narrow peak
13	Gas	450	250	0.4	9.0	1.0	10	280	270		
14	Gas	450	250	0.4	9.3	0.2	10	320	310		
15	Gas	450	250	0.4	3.0						Useless
16	Gas	450	250	0.4	0.4	0.1*	30	270	240		Heavy noise
17	Gas	450	250	10.4	0.2	0.1*	100	240	240		Heavy noise
18	Gas	325	275	0.4	5.5	1.5	20	400	380		Well defined
19	HGas	325	275	0.0	3.0	0.2	20	120	100		Noise
20	Gas	325	275	0.4	3.0	0.2	20	200	180		
21	Gas	325	275	0.4	0.9	0.1*	20	180	100		Heavy noise
22	Gas	325	275	0.4	0.4	0.1*					Heavy noise
23	Gas	371	269	0.4	16.0	1.0	10	370	360		Well defined
24	Gas	371	269	0.4	3.5	0.3	10	360	350		Well defined
25	Gas	371	269	0.4	0.5						Heavy noise
26	Gas	371	269	0.4	0.3						Heavy noise
27	Gas	400	275	0.4	3.4	0.3	20	560	540		Well defined
28	HGas	400	275	2.0	2.5						Noise
29	Gas	400	275	0.4	1.4	0.1	10	220	210		
30	Gas	400	275	0.4	0.5	0.1*	10	340	330		Noise
31	Gas	400	275	0.4	0.3						Heavy noise
32	Gas	400	275	10.4	0.3	0.1*					Heavy noise
33	Gas	429	269	0.4	3.0	1.5	10	360	350		Well defined
34	Gas	429	269	0.4	5.0	0.1	10	410	400		
35	Gas	429	269	0.4	2.7	0.1*					Small fluctuations
36	Gas	475	275	0.4	3.9	0.4	20	340	320		
37	HGas	475	275	2.0	3.4	0.2					Noise
38	Gas	475	275	0.4	2.7	0.3	20	360	340		
39	Gas	475	275	0.4	0.4	0.1*	20	310	290		Noise
40	Gas	300	300	0.4	3.0	0.7	40	370	330		
41	Gas	300	300	0.4	1.2	0.2	40	300	260		
42	Gas	300	300	0.4	0.5	0.1*	50	400	350		
43	Gas	300	300	10.4	0.2	0.1*					Noise
44	Gas	362	292	0.4	3.0	1.2	20	380	360		Well defined
45	Gas	362	292	0.4	3.7	0.1	20	330	310		Well defined
46	Gas	362	292	0.4	0.7	0.2	0	380	380		Well defined
47	Gas	400	300	0.4	3.2	0.5	20	430	390		
48	Gas	400	300	0.4	1.0	0.1	20	520	500		
49	Gas	400	300	0.4	0.8	0.1	20	430	410		
50	Gas	400	300	0.4	0.5	0.1*					Noise
51	Gas	438	292	0.4	3.1	0.3	20	560	540		
52	Gas	438	292	0.4	1.0	0.1	20	440	420		
53	Gas	438	292	0.4	0.5	0.1*	40	360	320		
54	Gas	438	292	0.4	0.4	0.1*	120	380	260		Noise
55	Gas	438	292	10.4	0.3	0.1*	20	250	230		Noise
56	Gas	500	300	0.4	1.3	0.2	80	390	310		Noise
57	Gas	500	300	0.4	0.9	0.1	80	400	320		
58	Gas	500	300	0.4	0.4	0.1*	80	440	360		Noise
59	Gas	400	350	0.4	1.4	0.3	40	380	340		Noise
60	Gas	400	350	0.4	0.4	0.1*					
61	Gas	400	350	0.4	0.3	0.1*					Heavy noise
62	Gas	300	350	0.4	1.3	0.3	50	160	110		Heavy noise
63	Gas	300	350	0.4	1.0	0.2	50	400	350		
64	Gas	300	350	0.4	0.7	0.2	50	150	100		
65	Gas	300	350	0.4	0.5	0.1*	60	290	230		Noise
66	Gas	500	350	0.4	0.7	0.1	30	330	300		Noise
67	Gas	500	350	0.4	0.7	0.1	50	140	110		Noise
68	Gas	500	350	0.4	0.7	0.1	80	410	330		Noise
69	Gas	300	400	0.4	0.3	0.2	40	340	300		
70	Gas	300	400	0.4	0.5	0.1	60	400	400		
71	Gas	300	400	0.4	0.4	0.1	60	400	400		
72	Gas	300	400	0.4	0.5	0.1*	70	490	420		
73	Gas	400	400	0.4	1.3	0.2	60	260	200		
74	Gas	400	400	0.4	0.4	0.1	60	310	230		Noise
75	Gas	400	400	0.4	0.3	0.1*	60	400	340		Noise
76	Gas	400	400	0.4	0.2	0.1*	60	320	320		Noise
77	Gas	500	400	0.4	0.4	0.1*	60	360	300		Noise
78	Gas	500	400	0.4	0.4	0.1*	60	260	200		Noise
79	Gas	300	500	0.4	0.4	0.1*	0	200	200		Noise
80	Gas	300	500	0.4	0.4	0.1*	60	530	470		Noise
81	Gas	300	500	0.4	0.5	0.1*	60	510	450		Noise
82	Gas	300	500	0.4	0.3	0.1*	140	320	180		Noise
83	Gas	400	500	0.4	0.1	0.1	0	420	420		Noise
84	Gas	400	500	0.4	0.5	0.1	40	380	340		Noise
85	Gas	400	500	0.4	0.5	0.1	90	520	420		Noise
86	Gas	400	300	0.4	0.3	0.1*	100	340	240		Noise
87	Gas	300	500	0.4	0.3	0.1*	80	280	200		Noise
88	Gas	300	300	0.4	0.2	0.1*	100	210	110		Noise
89	Gas	400	600	0.4	0.2	0.1*	100	540	440		Noise
90	Gas	400	250	0.4	9.3	2.3	0	20	20		Narrow peak
91	Gas	400	250	0.4	4.0	1.5	0	480	480		Narrow peak
92	Gas	400	250	0.4	4.7	1.5	0	380	330		Narrow peak
93	Gas	400	250	0.0	0.2	1.0	0	480	480		Narrow peak
94	Gas	400	250	0.4	2.2	0.5	10	240	200		Narrow peak
95	Gas	400	250	0.4	1.5	0.2	0	40	40		Noise
96	Gas	400	250	0.4	0.3	0.2	20	200	280		
97	Gas	400	250	0.4	1.1	0	0	240	240		
98	Gas	400	250	0.4	0.3	0.2	0	240	240		
99	Gas	400	250	0.4	1.5	0.2	10	490	480		Narrow peak
100	Gas	400	250	0.4	0.3	0.2	0	200	200		Narrow peak
101	Gas	400	250	0.4	1.2	0.2	0	60	20		Narrow peak

2.8

THORNEY ISLAND TRIALS SPILL 027 24 SEPTEMBER 1983

SUMMARY INFORMATION AT THE TIME OF THE SPILL

Gas released at:	17:06:01 hrs
Freon 12/Nitrogen mixture: relative density	4.2
Number of smoke canisters discharged:	4
Mean Wind Speed at 10 m height:	
During main data collection period:	2.2 m/s
From 5 minute cyclic data just before the release:	1.6 m/s
Mean Wind Heading ('A' station) - (relative to the centre line of the array)	137.3°
NB Positive angles are to the right (clockwise) of the centre line when looking downwind of the gas bag.	
Relative Humidity (at 10 m height)	67.2%
Insolation	114.8 W/m ²
Ambient Air Temperature (at 9 m height)	23.8°C
Treated Runway Surface Temperature	23.3°C
Grass Surface Temperature	20.2°C
Observed Cloud Cover	6/8

STABILITY CONDITION

B	(From Observations)
F	(From DT/DZ)
D	(From Solarimeter)
D	(From Heat Flux)
F	(From Richardson No)
F	(From Bulk Richardson No)
D	(From Standard Deviation of Wind Heading)

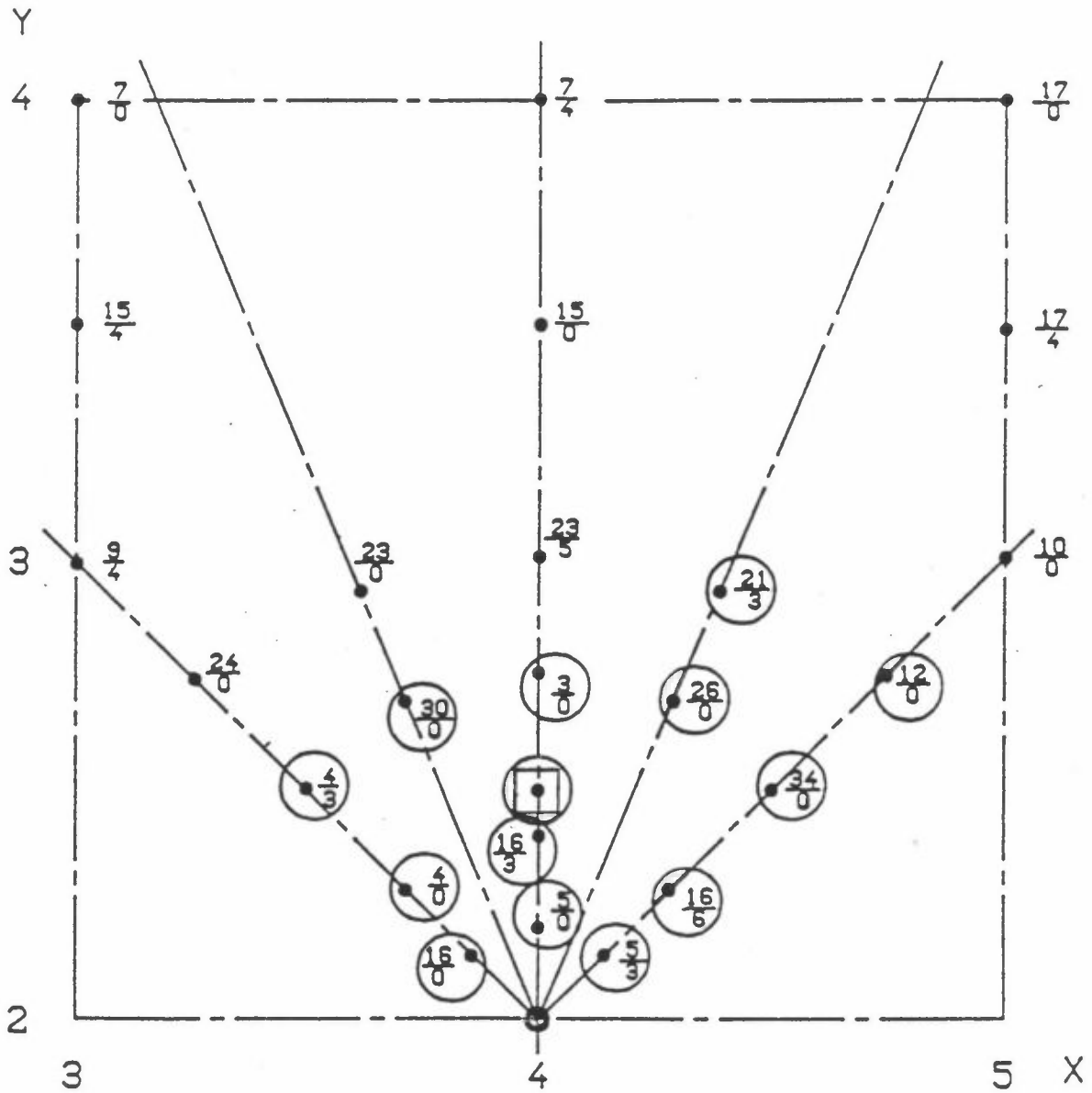
Stability condition inferred from data during the release and just before the release: D/E.

THORNEY ISLAND TRIALS SPILL 027 24 SEPTEMBER 1983

HISTORY

This spill was conducted about five hours after spill 026, during which time the wind speed remained constant at 2 to 3 m/s except for about two hours just before the spill when the speed dropped to values between 1 and 2 m/s. Throughout the day the wind heading was variable with periods when the direction was suitable for trials. Unfortunately although the direction was such when bag filling commenced, by the time the bag was full and for a while afterwards the wind direction had changed. The gas cloud was therefore directed away from the sensors during this trial. Although insolation was not strong during the earlier part of the day, unstable conditions existed from about mid-morning but as the afternoon approached more neutral conditions were observed and by the time gas was released the stability was judged to be on the stable side of neutral.

TRIAL No. - 027 DATE - 24/9/83 29 SENSORS SAW GAS
 WIND SPEED (U_{10}) 1.5 m/sec PASQUILL CATEGORY D



□ BUILDING

$\frac{21}{4}$ = $\frac{\text{DATA TERMINAL}}{\text{CHANNEL NUMBER}}$ OF GAS SENSORS AT 0.4m HEIGHT
 ○ = SENSORS AT 0.4m HEIGHT VERIFIED TO HAVE SEEN GAS

Trial	27	X	Y	H	CM	C	T1	T2	T2-T1	REMARKS
1	Gas	386	214	0.4	56.0	10.0	0	180	180	
2	Gas	400	220	0.4	70.0	10.0	0	170	170	
3	Gas	414	214	0.4	35.0	5.0	0	205	205	
4	Gas	372	228	0.4	11.0	2.0	10	200	190	
5	Gas	372	228	2.4	0.2	0.1*	0	50	50	Heavy noise
6	Gas	400	240	0.4	13.0	3.0	1	240	230	
7	Gas	400	240	2.4	5.2	0.6	10	130	120	
8	Gas	428	228	2.4	5.6	0.2	10	180	170	
9	Gas	350	250	0.4	3.7	0.7	15	135	120	
10	Gas	450	250	0.4	4.7	0.8	15	230	215	
11	Gas	450	250	2.4	1.9	0.1	15	90	75	
12	Gas	450	250	4.4	0.4					Heavy noise
13	Gas	371	269	0.4	2.2	0.8	30	120	90	
14	Gas	400	275	0.4	4.7	1.5	20	360	340	
15	Gas	400	275	2.4	0.2	0.1*	30	115	85	
16	Gas	429	269	0.4	5.6	1.8	20	190	170	
17	Gas	429	269	2.4	1.4	0.2	20	75	55	
18	Gas	475	275	0.2	2.0	0.6	40	140	100	
19	HGas	475	275	2.0	1.2	0.2	16	70	60	Heavy noise
20	Gas	475	275	2.4	0.7	0.1	20	70	50	Noise
21	Gas	438	292	0.4	1.9	0.4	40	170	130	
22	Gas	400	250	0.4	12.0	3.0	10	350	340	
23	Gas	400	250	2.4	4.5	0.5	10	300	290	
24	Gas	400	250	6.4	0.3	0.1*	20	260	240	Heavy noise
25	Gas	400	250	3.4	0.4	0.1*				Heavy noise
26	Gas	400	250	0.4	9.0	2.0	10	310	300	
27	Gas	400	250	2.4	1.0	0.2	20	300	280	
28	Gas	400	250	4.4	0.4	0.1	20	300	280	
29	Gas	400	250	0.4	2.4	0.2	10	55	45	

Trial 27		X	Y	Peak					Seconds				
				Time	Cons	20	40	80	140	200	300	400	500
H: 0.4 m		386	214	10	56.0	8.0	6.0	2.0	1.0				
		400	220	10	70.0	8.0	6.0	2.0	1.0				
		414	214	10	35.0	7.0	3.0	2.0	2.0	1.0			
		372	228	10	11.0	5.0	2.0	1.0					
		400	240	15	13.0	11.0	4.0	4.0	1.0				
		350	250	25	3.7		1.8	0.6					
		450	250	20	4.7	4.7	4.0	1.8	0.6	0.2			
		371	269	30	2.2		1.5	0.1					
		400	275	55	4.7		4.0	3.5	0.6	0.3	0.1		
		429	269	20	5.6	5.6	2.6	1.4	0.3				
		475	275	40	2.0		2.0	1.2					
		438	292	40	1.9		1.9	0.9	0.1				
		400	250	20	12.0	12.0	7.6	4.1	1.8	1.9	0.4		
		400	250	20	9.0	9.0	4.0	3.4	1.8	1.0			
		400	250	20	2.4	2.4							
H: 2.4 m		372	228	30	2.4								
		400	240	10	5.2	1.6	0.4	0.1					
		428	228	10	5.6	0.2	0.1	0.1	0.1				
		450	250	20	1.9	1.9	0.2						
		400	275	50	0.2		0.2						
		429	269	20	1.4	1.4	0.2						
		475	275	40	0.7	0.2	0.7						
		400	250	10	4.5	2.7	4.5	0.5	0.7	0.3			
		400	250	20	0.4	0.4							
		400	250	20	1.0	1.0	0.5	0.6	0.4	0.3			

2.9

THORNEY ISLAND TRIALS SPILL 028 5 OCTOBER 1983

SUMMARY INFORMATION AT THE TIME OF THE SPILL

Gas released at:	11:15:51 hrs
Freon 12/Nitrogen mixture: relative density	2.0
Number of smoke canisters discharged:	4
Mean Wind Speed at 10 m height:	
During main data collection period:	9.0 m/s
From 5 minute cyclic data just before the release:	8.9 m/s
Mean Wind Heading ('A' station) - (relative to the centre line of the array)	41.9°
NB Positive angles are to the right (clockwise) of the centre line when looking downwind of the gas bag.	
Relative Humidity (at 10 m height)	76.0%
Insolation	229.6 W/m ²
Ambient Air Temperature (at 9 m height)	15.8°C
Treated Runway Surface Temperature	16.4°C
Grass Surface Temperature	14.5°C
Observed Cloud Cover	5/8

STABILITY CONDITION

D (From Observations)
E (From DT/DZ)
D (From Solarimeter)
D (From Heat Flux)
D (From Richardson No)
D (From Bulk Richardson No)
D (From Standard Deviation of Wind Heading)

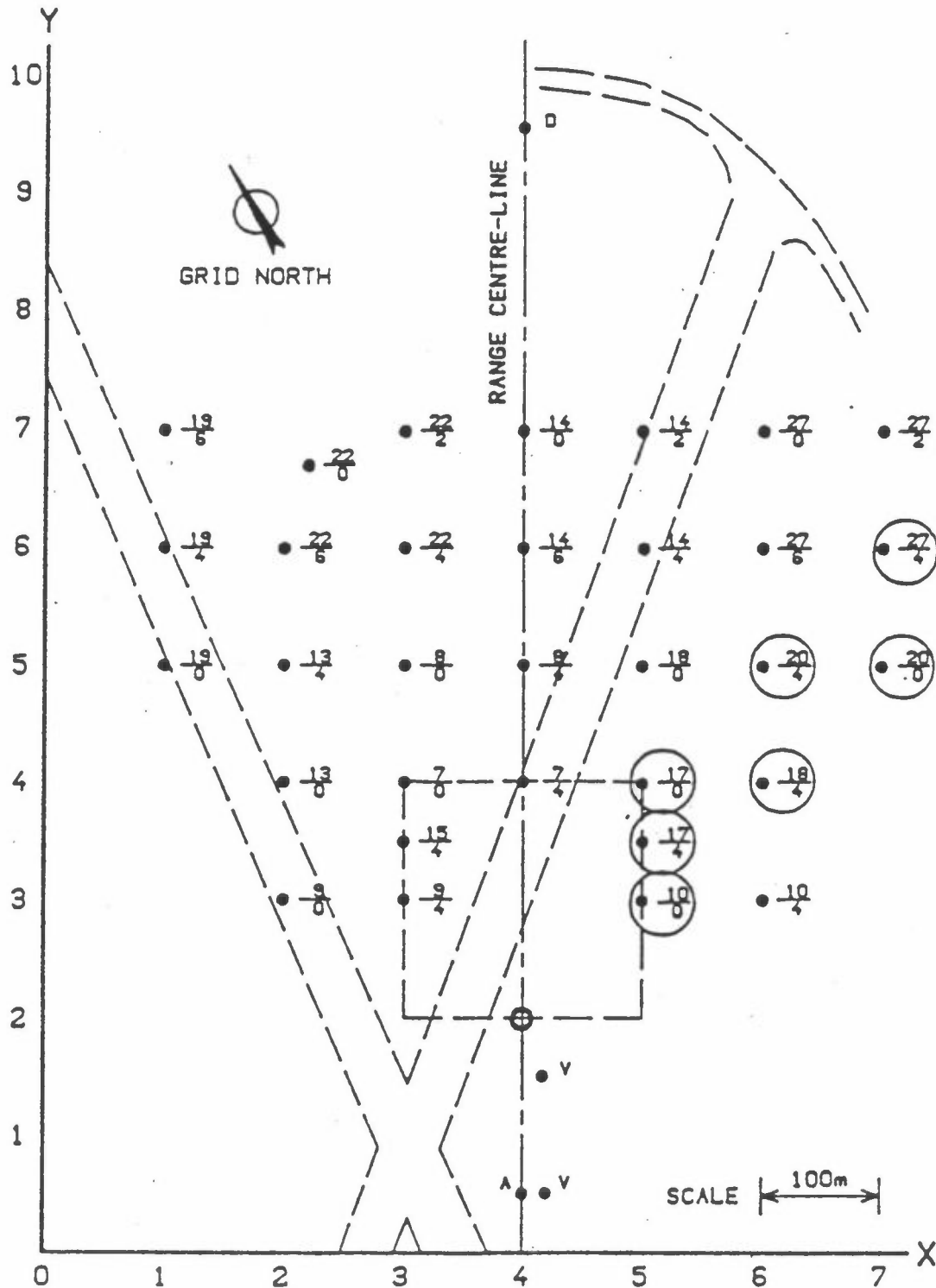
Stability condition inferred from data during the release and just before the release: D.

THORNEY ISLAND TRIALS SPILL 028 5 OCTOBER 1983

HISTORY

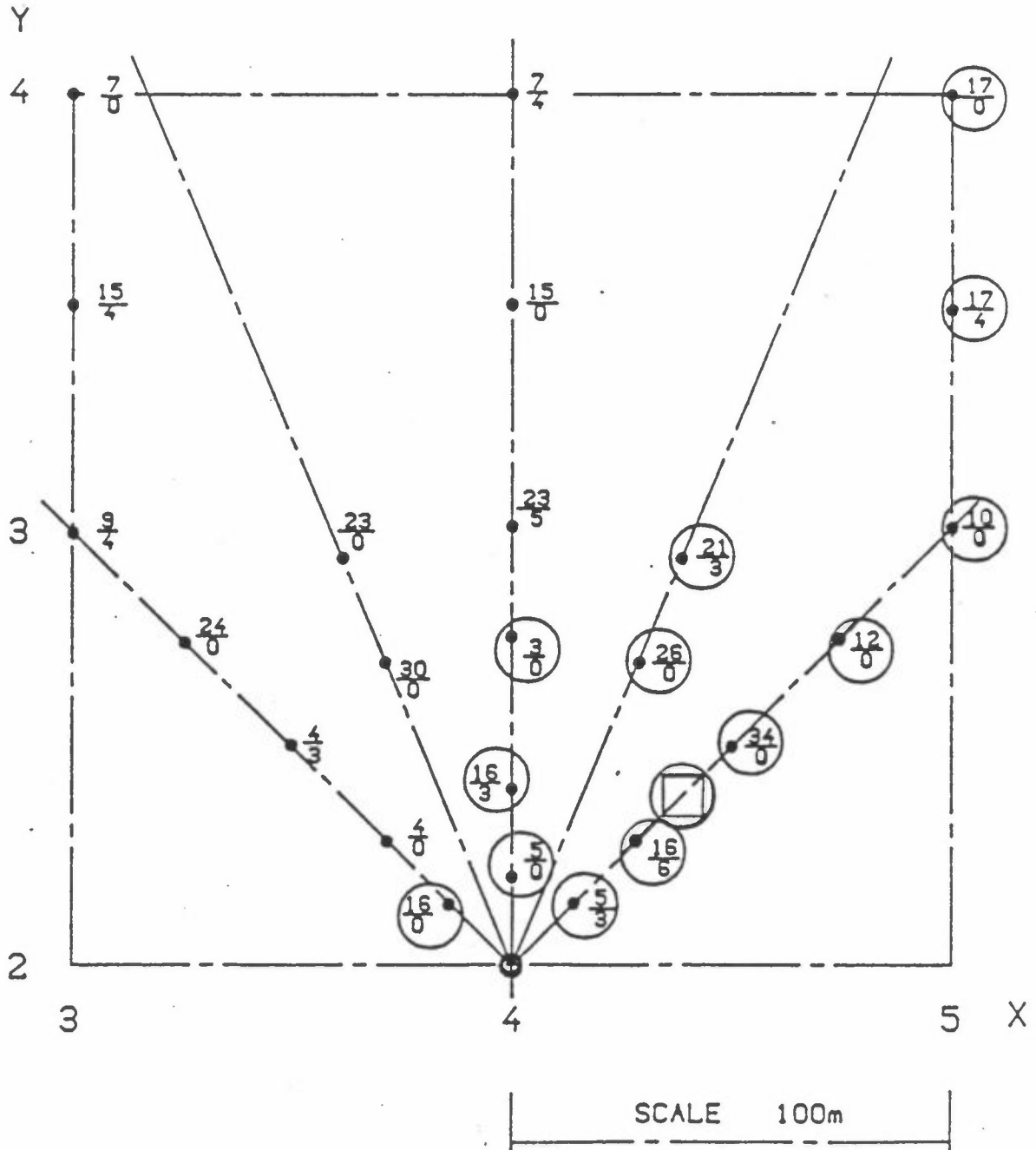
This spill was conducted on the morning of a day during which the wind speed was relatively high at between 7 and 9 m/s. There was little change in wind characteristics (speed & direction) throughout the morning and the wind consistently blew about 30-40 degrees to the left of the array. Early in the morning the high wind speed suggested that neutrally stable conditions existed and by the time gas was released there was little change in conditions, except for insolation which though steadily increasing did not affect the stability. Neutral conditions were therefore judged to be present during this spill.

TRIAL No. - 028 DATE - 5.10.83 59 SENSORS SAW GAS
 WIND SPEED (U₁₀) 9 m/sec PASQUILL CATEGORY D



$\frac{21}{4}$ = $\frac{\text{DATA TERMINAL}}{\text{CHANNEL NUMBER}}$ OF GAS SENSORS AT 0.4m HEIGHT
 ○ = SENSORS AT 0.4m HEIGHT VERIFIED TO HAVE SEEN GAS

TRIAL No. - 028 DATE - 5/10/83 59 SENSORS SAW GAS
 WIND SPEED (U_{10}) 9 m/sec PASQUILL CATEGORY D



□ BUILDING

$\frac{21}{4}$ = DATA TERMINAL CHANNEL NUMBER OF GAS SENSORS AT 0.4m HEIGHT
 ○ = SENSORS AT 0.4m HEIGHT VERIFIED TO HAVE SEEN GAS

Trial	28	X	Y	H	CM	C	T1	T2	T2-T1	REMARKS
1	Gas	386	214	0.4	69.0	20.0	5	100	95	
2	Gas	400	220	0.4	48.0	10.0	0	110	110	
3	Gas	414	214	0.4	47.0	10.0	0	120	120	
4	Gas	400	240	0.4	10.5	4.0	10	100	90	
5	Gas	400	240	2.4	9.9	2.9	10	50	40	
6	Gas	428	228	2.4	11.2	2.0	5	50	45	
7	Gas	450	250	0.4	4.7	0.9	15	60	45	
8	Gas	450	250	2.4	4.4	0.9	15	60	45	
9	Gas	450	250	6.4	1.4	0.3	15	40	25	
10	Gas	450	250	10.4	1.1	0.3	10	35	20	Noise
11	Gas	400	275	0.4	2.9	0.5	20	35	15	
12	HGas	400	275	2.0	0.8	0.2	30	40	10	Heavy noise
13	Gas	400	275	2.4	0.2	0.1*	20	25	5	Noise
14	Gas	429	269	0.4	10.5	2.4	15	60	45	
15	Gas	429	269	2.4	4.7	1.7	15	70	55	
16	Gas	429	269	4.4	2.7	0.8	15	40	25	
17	Gas	429	269	6.4	1.6	0.4	15	45	30	Noise
18	Gas	429	269	10.4	0.9	0.2	15	35	20	Noise
19	Gas	475	275	0.4	3.4	0.8	20	55	35	
20	HGas	475	275	2.0	3.4	0.9	15	50	35	Heavy noise
21	Gas	475	275	2.4	3.0	0.9	20	50	30	
22	Gas	475	275	4.4	1.6	0.4	15	60	45	
23	Gas	475	275	6.4	1.1	0.3	15	60	45	
24	Gas	438	292	0.4	7.0	2.8	20	120	100	
25	Gas	438	292	2.4	2.7	1.0	20	140	120	
26	Gas	438	292	4.4	2.5	0.7	20	40	20	
27	Gas	438	292	6.4	1.4	0.4	20	40	20	
28	Gas	438	292	10.4	0.4	0.1*	20	30	10	Noise
29	Gas	500	300	0.4	1.5	0.5	20	60	40	
30	Gas	500	300	2.4	1.4	0.4	20	60	40	
31	Gas	500	300	4.4	1.8	0.5	20	45	25	Heavy noise
32	Gas	500	300	6.4	0.8	0.2	20	55	35	
33	Gas	500	350	2.4	1.9	0.6	30	70	40	
34	Gas	500	350	4.4	2.0	0.6	30	70	40	Noise
35	Gas	500	350	6.4	1.0	0.3	30	60	30	Heavy noise
36	Gas	500	400	0.4	1.0	0.4	45	75	30	
37	Gas	500	400	2.4	0.8	0.2	30	60	30	Heavy noise
38	Gas	600	400	0.4	0.5	0.1	40	80	40	Heavy noise
39	Gas	600	400	2.4	0.6	0.2	40	75	35	Heavy noise
40	Gas	600	400	4.4	0.5	0.1	40	80	40	Heavy noise
41	Gas	600	400	6.4	0.4	0.1	55	80	25	Noise
42	Gas	600	500	0.4	0.8	0.2	60	90	30	Noise
43	Gas	600	500	2.4	0.8	0.2	60	90	30	
44	Gas	600	500	4.4	0.8	0.2	55	90	35	Heavy noise
45	Gas	600	500	6.4	0.9	0.2	50	90	40	Noise
46	Gas	700	500	0.4	0.2	0.1*	60	100	40	Noise
47	Gas	700	500	2.4	0.2	0.1*	55	95	40	Noise
48	Gas	700	600	2.4	0.4	0.1	70	120	60	Noise
49	Gas	400	250	0.4	0.8	0.1	20	300	280	
50	Gas	400	250	2.4	0.6	0.2	15	95	80	
51	Gas	400	250	0.4	0.5	0.1	20	70	50	
52	Gas	400	250	2.4	2.9	0.7	15	40	25	
53	Gas	400	250	6.4	3.0	0.7	20	60	40	
54	Gas	400	250	9.0	2.7	1.0	15	60	45	
55	Gas	400	250	0.4	5.2	1.4	10	60	50	Noise
56	Gas	400	250	2.4	7.6	2.4	10	40	30	Heavy noise
57	Gas	400	250	4.4	3.6	1.0	10	50	40	Heavy noise
58	Gas	400	250	0.4	3.7	0.5	15	100	85	

2.10

THORNEY ISLAND TRIALS SPILL 029 6 OCTOBER 1983

SUMMARY INFORMATION AT THE TIME OF THE SPILL

Gas released at:	19:02:40 hrs
Freon 12/Nitrogen mixture: relative density	2.0
Number of smoke canisters discharged:	5
Mean Wind Speed at 10 m height:	
During main data collection period:	5.6 m/s
From 5 minute cyclic data just before the release:	4.9 m/s
Mean Wind Heading ('A' station) - (relative to the centre line of the array)	27.0°
NB Positive angles are to the right (clockwise) of the centre line when looking downwind of the gas bag.	
Relative Humidity (at 10 m height)	81.7%
Insolation	2.5 W/m ²
Ambient Air Temperature (at 9 m height)	14.3°C
Treated Runway Surface Temperature	13.2°C
Grass Surface Temperature	12.8°C
Observed Cloud Cover	6/8

STABILITY CONDITION

D (From Observations)
 E (From DT/DZ)
 E (From Solarimeter)
 D/E (From Heat Flux)
 F (From Richardson No)
 D (From Bulk Richardson No)
 D (From Standard Deviation of Wind Heading)

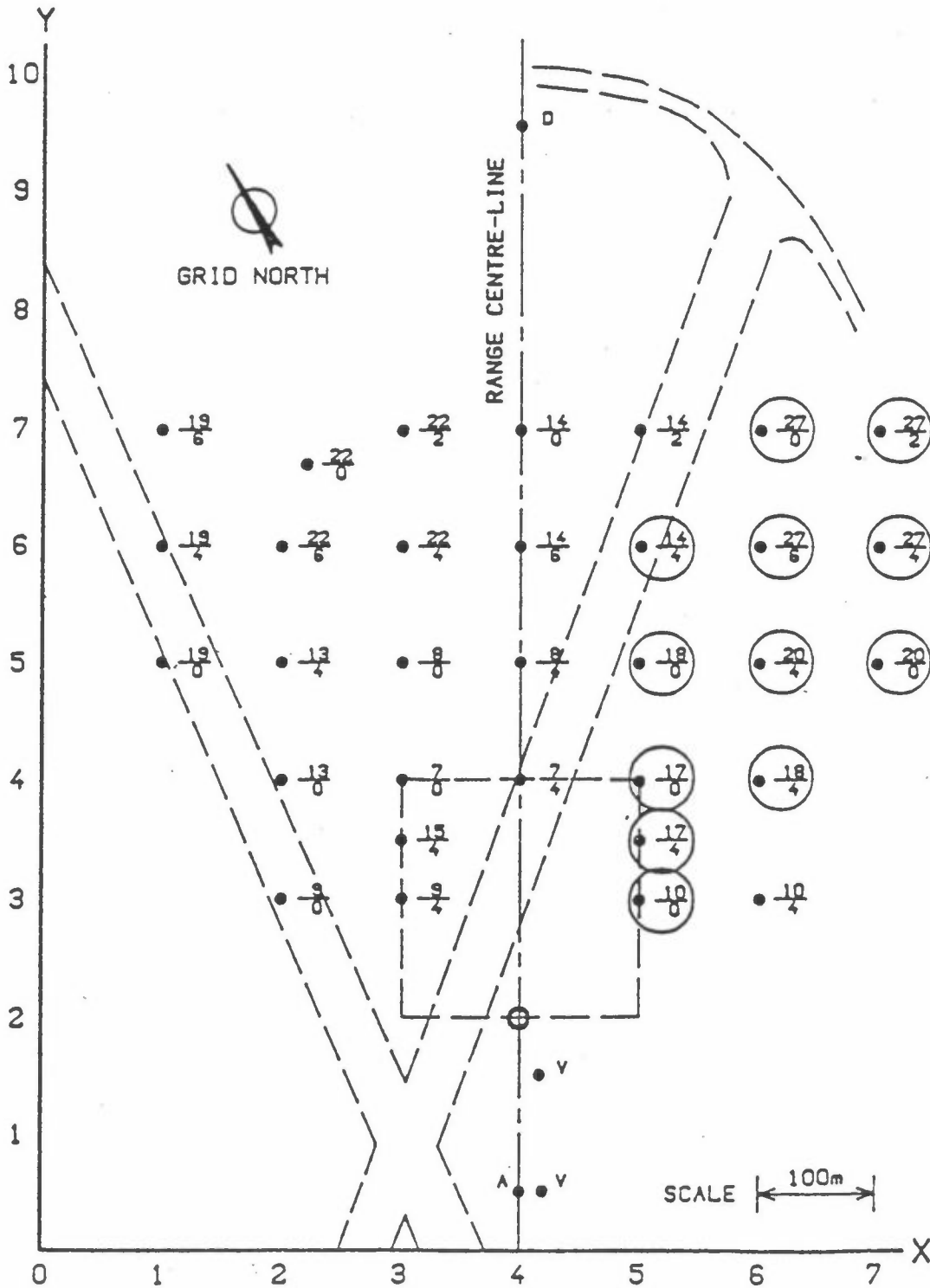
Stability condition inferred from data during the release and just before the release: D.

THORNEY ISLAND TRIALS SPILL 029 6 OCTOBER 1983

HISTORY

This trial was conducted in the early evening of the day after spill 028, by which time visibility was poor. The high wind speed that featured during the earlier part of the day had decreased slightly but the direction remained at about 30 degrees to the right of the array. As this was an evening spill in October, insolation was very low and with the still relatively high wind speed of about 6 m/s neutrally stable conditions were judged to be present at the spill time and several hours before.

TRIAL No. - 029 DATE - 6.10.83 72 SENSORS SAW GAS
 WIND SPEED (U₁₀) 5 m/sec PASQUILL CATEGORY D



$\frac{2i}{4}$ = DATA TERMINAL CHANNEL NUMBER OF GAS SENSORS AT 0.4m HEIGHT
 ○ = SENSORS AT 0.4m HEIGHT VERIFIED TO HAVE SEEN GAS

TRIAL No. - 029

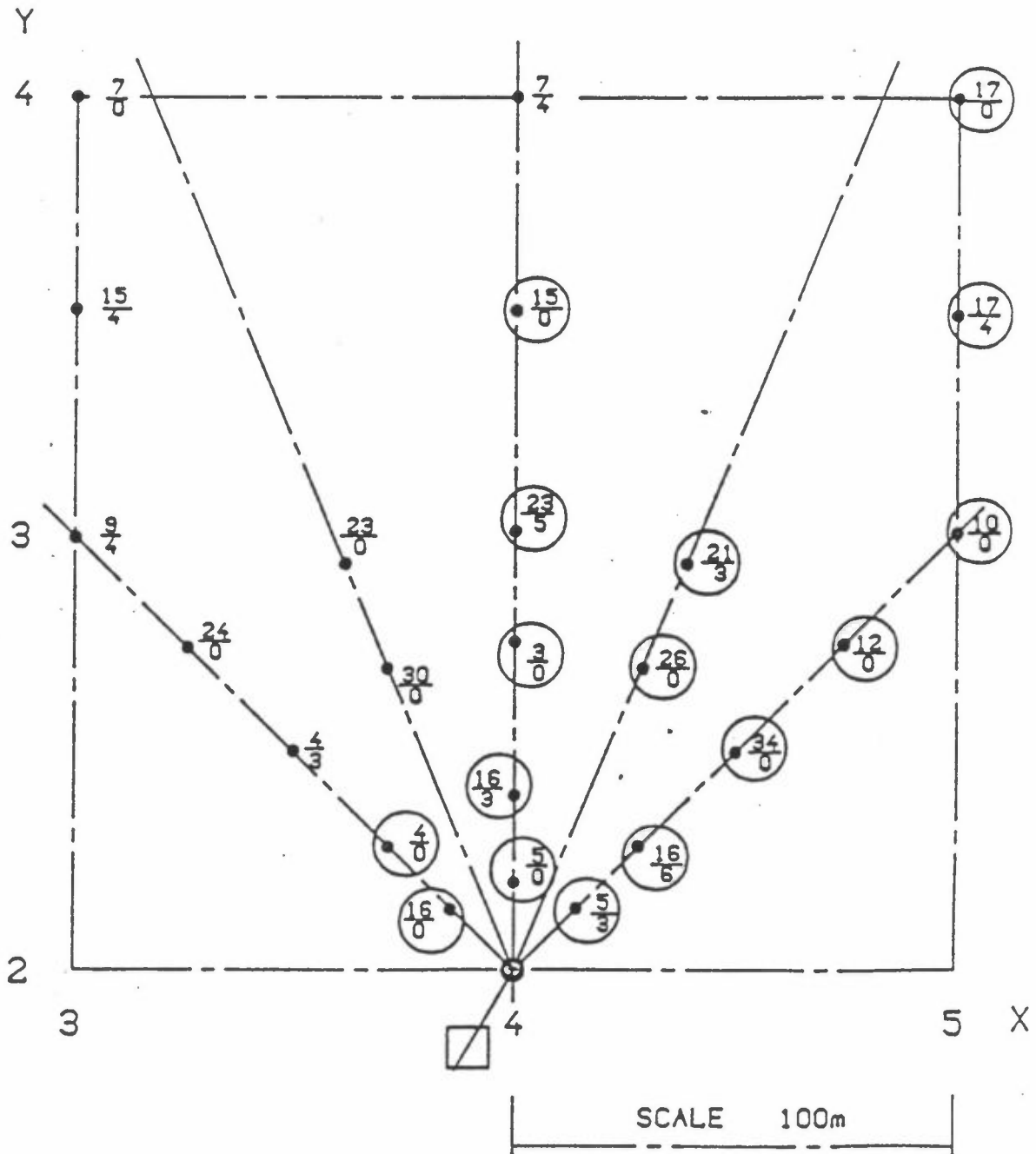
DATE - 6/10/83

72 SENSORS SAW GAS

WIND SPEED (U_{10})


5 m/sec

PASQUILL CATEGORY D



 BUILDING

$\frac{21}{4}$ = DATA TERMINAL CHANNEL NUMBER OF GAS SENSORS AT 0.4m HEIGHT

 = SENSORS AT 0.4m HEIGHT VERIFIED TO HAVE SEEN GAS

Trial	29	X	Y	H	CM	C	T1	T2	T2-T1	REMARKS
1	Gas	386	214	0.4	54.0	10.0	5	190	185	
2	Gas	400	220	0.4	53.0	10.0	5	140	135	
3	Gas	414	214	0.4	24.0	5.0	5	105	100	
4	Gas	372	228	0.4	21.5	5.0	15	70	55	
5	Gas	400	240	0.4	16.0	5.0	15	170	155	
6	Gas	400	240	2.4	7.9	2.5	10	95	85	
7	Gas	428	228	2.4	14.0	0.7	10	75	65	
8	Gas	450	250	0.4	8.2	1.7	15	375	360	
9	Gas	450	250	2.4	4.6	1.0	15	90	75	
10	Gas	450	250	4.4	1.2					Heavy noise
11	Gas	450	250	6.4	1.9	0.2	15	60	45	
12	Gas	450	250	10.4	0.4	0.1	10	35	25	Noise
13	Gas	400	275	0.4	8.6	3.0	20	180	160	
14	HGas	400	275	2.0	5.4	1.9	20	130	110	Noise
15	Smoke	400	275	2.4	0.3	0.1*	20	50	30	
16	Gas	400	275	2.4	4.0	1.0	20	200	180	
17	Gas	400	275	4.4	1.0	0.3	20	70	50	
18	Gas	400	275	6.4	1.8	0.4	15	40	25	
19	Gas	429	269	0.4	6.4	2.0	20	150	130	
20	Gas	429	269	2.4	3.8	0.9	20	115	95	
21	Gas	429	269	4.4	2.5	0.5	20	70	50	
22	Gas	429	269	6.4	1.4	0.3	20	70	50	
23	Gas	429	269	10.4	0.6	0.1	20	50	30	
24	Gas	475	275	0.4	3.4	0.8	25	300	275	
25	HGas	475	275	2.0	3.8	0.9	25	160	135	
26	Smoke	475	275	2.0	0.2	0.1*	30	55	25	Noise
27	Gas	475	275	2.4	3.4	0.9	25	180	155	
28	Gas	475	275	4.4	0.9	0.2	25	125	100	
29	Gas	475	275	6.4	0.9	0.2	25	95	75	
30	Gas	400	300	0.4	8.1	2.4	25	80	55	
31	Gas	400	300	2.4	2.8	0.7	25	85	60	
32	Gas	400	300	4.4	1.7	0.4	25	60	35	
33	Gas	400	300	6.4	1.5	0.2	25	40	15	
34	Gas	438	292	0.4	4.8	1.4	25	240	215	
35	Gas	438	292	2.4	2.3	0.6	25	270	245	
36	Gas	438	292	4.4	1.8	0.4	25	80	55	
37	Gas	438	292	6.4	1.1	0.3	25	90	65	
38	Gas	438	292	10.4	0.9	0.1	20	60	40	
39	Gas	500	300	0.4	2.4	0.8	35	210	175	
40	Gas	500	300	2.4	1.5	0.4	35	170	135	
41	Gas	500	300	4.4	1.5	0.4	35	110	75	
42	Gas	500	300	6.4	0.6	0.1	25	115	90	
43	Gas	400	350	0.4	4.9	1.4	40	130	90	
44	Gas	400	350	2.4	1.4	0.4	40	80	40	
45	Gas	400	350	4.4	0.5	0.1	40	50	40	
46	Gas	500	350	2.4	1.0	0.2	35	120	85	
47	Gas	500	350	4.4	1.0	0.2	35	110	75	
48	Gas	500	350	6.4	1.0	0.2	35	100	65	
49	Gas	500	400	0.4	1.6	0.5	40	190	150	
50	Gas	500	400	2.4	1.4	0.4	40	210	170	
51	Gas	500	400	4.4	0.9	0.3	40	40	140	
52	Gas	600	400	0.4	0.9	0.3	70	70	140	
53	Gas	600	400	2.4	0.8	0.3	70	70	240	
54	Gas	600	400	4.4	0.6	0.3	60	60	90	
55	Gas	600	400	6.4	0.6	0.2	65	65	85	
56	Gas	500	500	2.4	1.3	0.4	65	65	105	
57	Gas	500	500	4.4	0.8	0.2	65	65	75	
58	Gas	500	500	6.4	0.3	0.1*	65	65	55	
59	Gas	600	500	0.4	0.3	0.1*	60	60	140	
60	Gas	600	500	2.4	0.4	0.1	25	25	275	
61	Gas	600	500	6.4	0.3	0.1*	50	50	115	
62	Gas	700	500	0.4	0.4	0.1	105	105	210	
63	Gas	700	500	2.4	0.4	0.1	110	110	65	
64	Gas	500	600	0.4	0.4	0.1	115	115	20	
65	Gas	500	600	2.4	0.2	0.1*	110	110	40	
66	Gas	600	600	0.4	0.7	0.2	75	75	140	
67	Gas	600	600	2.4	0.7	0.2	80	80	175	
68	Gas	700	600	2.4	0.4	0.1	110	110	105	
69	Gas	600	700	0.4	0.4	0.1	120	120	100	
70	Gas	600	700	2.4	0.3	0.1	105	105	105	
71	Gas	700	700	0.4	0.3	0.1	80	80	270	
72	Gas	700	700	2.4	0.3	0.1	100	100	170	

3 TRIALS PERFORMED WITH CONTINUOUS RELEASE CONDITIONS

EXECUTING OF THE TRIALS

Following completion of the Phase II programme in October 1983, the trials' site was used for the separate programme funded by the US Department of Transportation. Preparation for the continuous release trials, including the revision of the instrument layout, were completed in May 1983. The required low windspeed conditions proved elusive and the trials were not performed until mid-June, following two abortive attempts. The first trial was successful but the second was marred by a wind direction rather far from the axis of the instrument array. A third trial was therefore added to the plan and this was successfully performed. The trials are numbered 045- to 047.

3.1 THORNEY ISLAND TRIALS --- SPILL 045 ---- 09/6/84

SUMMARY INFORMATION AT THE TIME OF THE SPILL

Gas released (approx. 5 secs after fan start)	19:58:41
Freon 12 / Nitrogen mixture: relative density	= 2.0
Spill rate	260 m ³ /min
Spill duration	7 min 35 sec
Number of smoke cannisters discharged:	5
Mean Wind Speed at 10m height:	
During main data collection period:-	2.3 m/s
From 5 minute cyclic data just before the release:-	2.4 m/s
Mean Wind Heading ('A' station)	-34.5°
(relative to the centre line of the array)	

N.B: Positive angles are to the right (clockwise) of the centre line when looking downwind of the gas bag.

Relative Humidity (at 10m height)	102.4%
Insolation	65.0 W/m ²
Ambient Air Temperature (at 10m height)	13.1°C
Treated Runway Surface Temperature	14.6°C
Grass Surface Temperature	12.8°C
Observed Cloud Cover	1/8

STABILITY CONDITION

- C (From Observations)
- F (From DT/DZ)
- D/E (From Solarimeter)
- E (From Heat Flux)
- F (From Richardson No.)
- F (From Bulk Richardson No.)
- D (From Standard Deviation of Wind Heading)

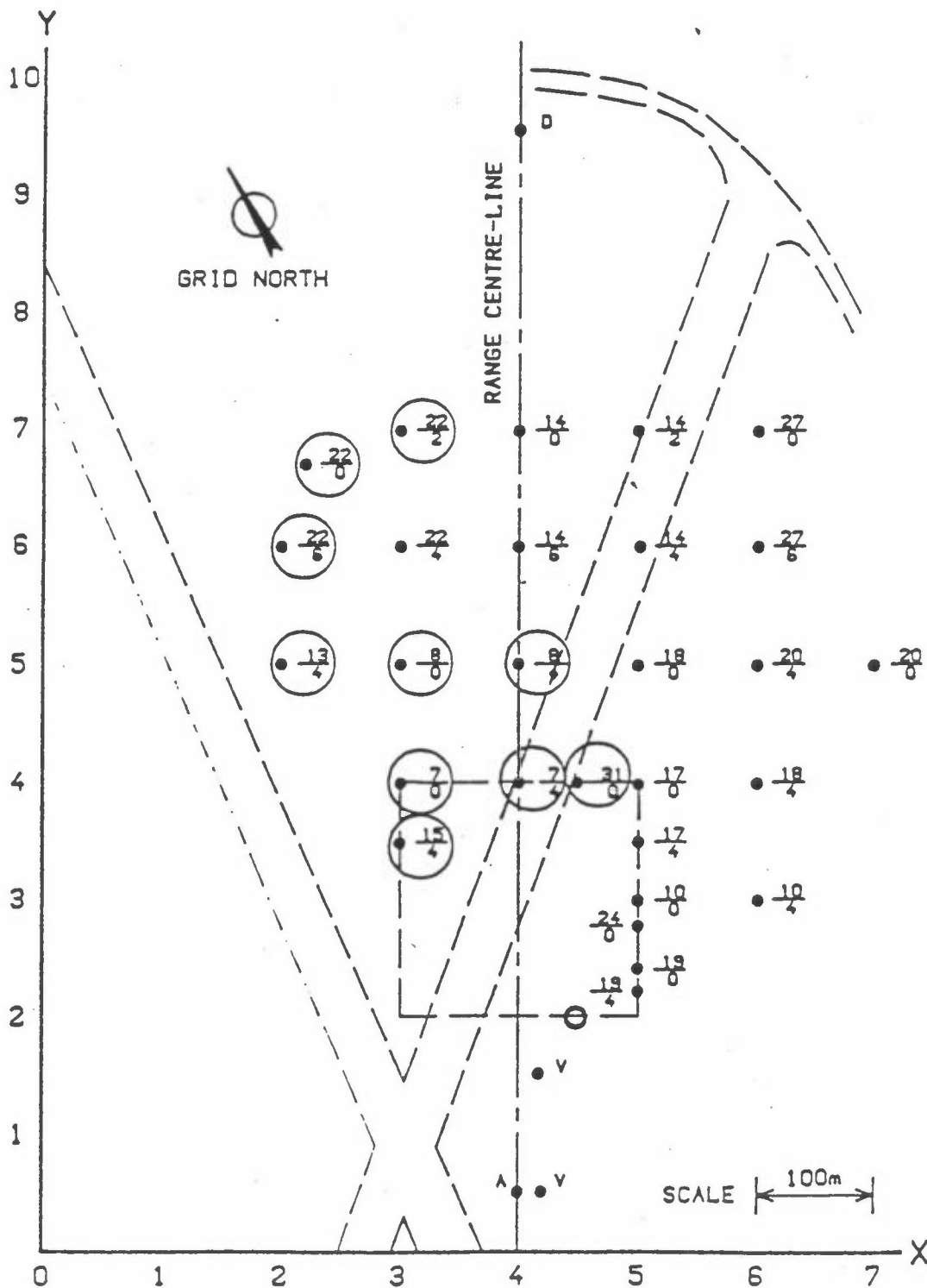
Stability condition inferred from data during the release and just before the release : E/F

THORNEY ISLAND TRIALS --- SPILL 045 ---- 24/9/83

HISTORY

This spill was conducted towards the late evening of a day during which insolation was generally strong to moderate. About three or four hours before gas was released, for example, insolation was about 56 W/m^2 ; the wind speed was then about 4 to 5 m/s and the heading was about 20 degrees to the left of the array centre line. Conditions at this time were judged to be on the unstable side of neutral. As the evening progressed and the sun set, insolation steadily dropped, as expected; the wind speed was also observed to decrease steadily but the heading remained at about 20 to 30 degrees to the left of the array centre line. Thus, by the time gas was released, insolation was very slight, the wind speed was relatively low and the heading was 30 degrees left of the centre line. Atmospheric conditions were then judged to be stable.

TRIAL No. - 045 DATE - 9/6/84 86 SENSORS SAW GAS
 WIND SPEED (U_{10}) 2.3 m/sec PASQUILL CATEGORY E/F



$\frac{21}{4}$ = DATA TERMINAL CHANNEL NUMBER OF GAS SENSORS AT 0.4m HEIGHT
 ○ = SENSORS AT 0.4m HEIGHT VERIFIED TO HAVE SEEN GAS

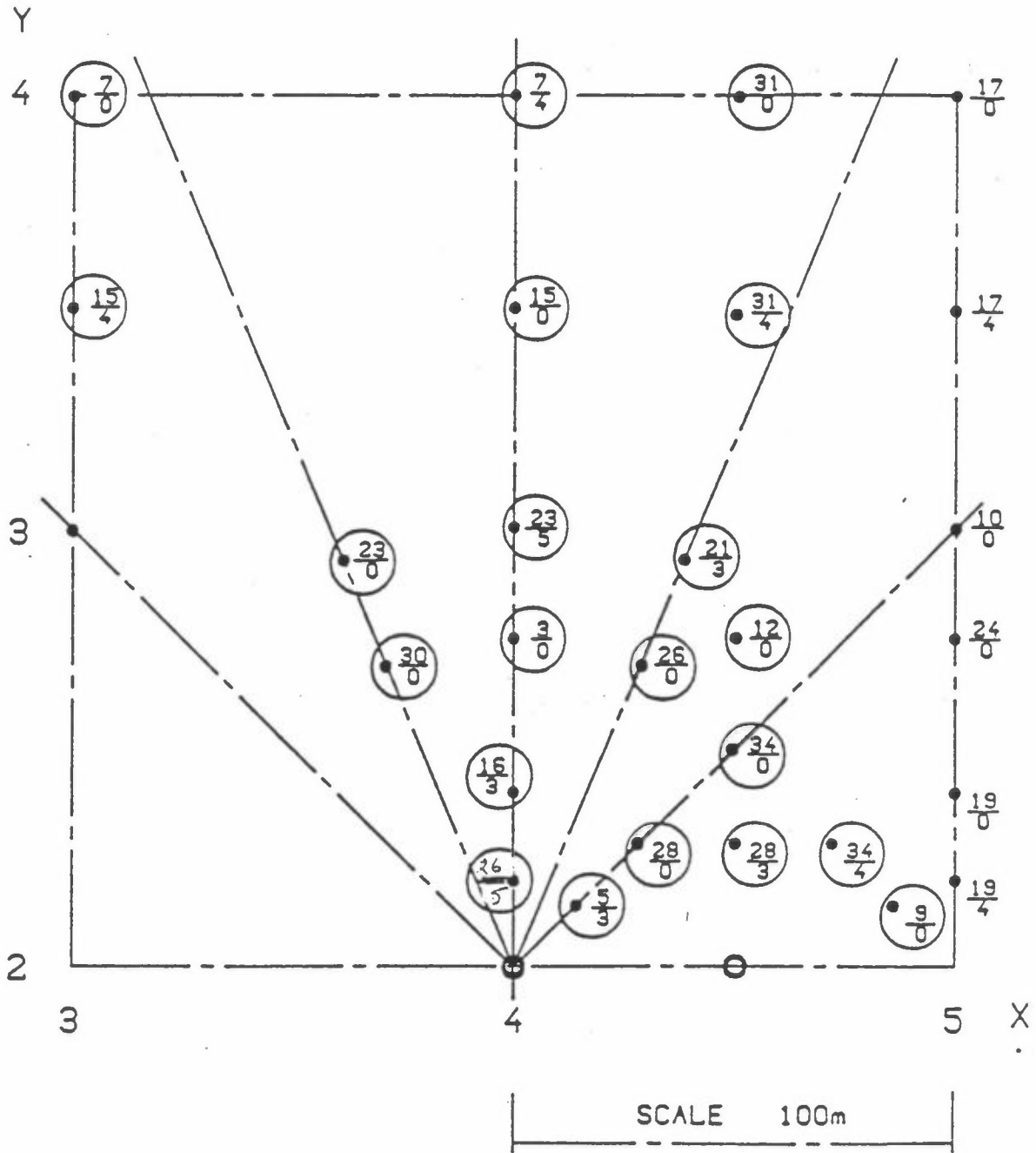
TRIAL No. - 045

DATE - 9/6/84

86 SENSORS SAW GAS

WIND SPEED (U_{10}) 2.3 m/sec

PASQUILL CATEGORY E/F



$\frac{21}{4}$ = DATA TERMINAL / CHANNEL NUMBER OF GAS SENSORS AT 0.4m HEIGHT
 ○ = SENSORS AT 0.4m HEIGHT VERIFIED TO HAVE SEEN GAS

TRIAL	45	X	Y	H	CM	C	T1	T2	REMARKS
1	450	202	0.4	66.0	60.0		0	520	
2	450	210	0.4	13.0	9.0		10	520	
3	414	214	0.4	13.0	9.0		60	540	
4	486	214	0.4	9.0	3.5		240	680	
5	486	214	1.4	0.4	0.1		320	600	
6	486	214	2.4						
7	400	220	0.4	11.0	8.5		130	760	
8	400	220	2.4	3.5	1.0		90	760	
9	450	220	0.4	18.5	15.5		20	510	
10	428	228	0.4	13.0	9.0		40	530	
11	428	228	1.4	0.9	0.2		40	750	
12	428	228	2.4	0.3	0.1		340	480	
13	450	228	0.4	16.0	13.5		20	510	
14	450	228	1.4	12.0	9.5		60	520	
15	450	228	2.4	0.4	0.1		200	300	
16	472	228	0.4	11.5	5.5		80	550	
17	472	228	1.4	0.7	0.3		80	660	
18	472	228	2.4	0.3	0.1		210	450	
19	450	230	0.4	9.0	6.2		150	750	
20	400	240	0.4	8.5	5.5		130	720	
21	400	240	1.4	2.5	1.0		100	800	
22	400	240	2.4	1.0	0.5		100	750	
23	450	240	0.4	22.0	17.5		60	600	
24	428	248	0.4	14.0	11.5		60	680	
25	472	248	0.4	13.0	5.5		80	520	
26	450	250	0.4	15.5	9.0		80	620	
27	450	250	1.4	1.1	0.2		40	900	
28	450	250	2.4	0.3					
29	371	269	1.4	1.4	0.4		220	940	
30	371	269	2.4	0.6	0.1		200	900	
31	371	269	4.4	0.4	0.1				Noise
32	429	269	0.4	9.6	6.0		80	700	
33	429	269	1.4	1.0	0.2		60	920	
34	429	269	2.4	0.2	0.1				Noise
35	429	269	4.4	0.1					Noise
36	400	275	0.4	6.8	3.0		80	1000	
37	400	270	1.0	3.3	1.4		80	810	
38	400	275	1.4	2.5	0.8		60	900	
39	400	275	2.4	0.9	0.3		60	610	
40	400	275	4.4	0.3	0.1				Noise
41	450	275	0.4	7.4	2.5		80	900	
42	450	275	1.0	2.2	0.5				Noise
43	450	270	1.0	0.3					Noise
44	450	275	1.0	1.0	0.4		70	900	
45	450	275	4.4	0.1					Noise
46	362	292	0.4	2.5	1.0		280	1040	
47	362	292	2.4	0.5	0.1		240	1020	
48	438	292	0.4	4.5	2.0		80	880	
49	438	292	2.4	0.5	0.2		80	700	
50	438	292	4.4	0.1					Noise
51	400	300	0.4	4.5	2.5		80	1100	
52	400	300	1.4	1.8	0.6		100	940	
53	400	300	2.4	0.9	0.2		100	600	
54	300	350	0.4	0.6	0.4		55	1020	
55	300	350	2.4	0.6	0.3		290	1020	
56	300	350	4.4	0.4	0.1		370	870	
57	400	350	0.4	3.0	2.0		120	940	
58	400	350	1.4	1.6	0.6		120	910	
59	400	350	2.4	0.7	0.2		120	900	
60	400	350	4.4	0.2					Noise
61	450	350	0.4	0.5	0.3		340	720	
62	450	350	1.4	0.5	0.2		340	690	
63	450	350	2.4	0.3	0.1		400	780	
64	450	350	4.4	0.2					Noise
65	300	400	0.4	0.6	0.4		320	1110	
66	300	400	2.4	0.7	0.4		320	1010	
67	300	400	4.4	0.2	0.1		450	600	
68	300	400	6.4	0.2					Noise
69	400	400	0.4	0.9	0.5		160	1000	
70	400	400	2.4	0.7	0.2		160	800	
71	400	400	4.4	0.2	0.1		160	660	
72	450	400	0.4	0.1					Noise
73	450	400	4.4	0.1					Noise
74	200	500	0.4	0.4	0.2		740	1120	
75	200	500	2.4	0.4	0.2		740	1090	
76	200	500	4.4	0.3	0.1		740	900	Noise
77	200	500	6.4	0.2					Noise
78	300	500	0.4	0.6	0.3		320	1200	
79	300	500	2.4	0.5	0.2		340	1020	
80	300	500	4.4	0.5	0.1				Noise
81	300	500	6.4	0.2					Noise
82	400	500	2.4	0.2					Noise
83	400	500	4.4	0.2					Noise
84	200	600	0.4	0.5	0.3		420	1220	
85	200	600	2.4	0.3	0.1		470	1000	
86	300	700	0.4	0.2	0.1		460	920	

3.2 THORNEY ISLAND TRIALS --- SPILL 046 ----- 10/06/84

SUMMARY INFORMATION AT THE TIME OF THE SPILL

Gas released (approx. 5 secs after fan start)	20:43:47
Freon 12 / Nitrogen mixture: relative density	= 2.0
spill rate	260 m ³ /min
spill duration	6 min 30 sec
Number of smoke cannisters discharged:	5
Mean Wind Speed at 10m height:	
During main data collection period:-	3.4 m/s
From 5 minute cyclic data just before the release:-	3.1 m/s

Mean Wind Heading ('A' station)	76.6°
(relative to the centre line of the array)	

N.B: Positive angles are to the right (clockwise) of the centre line when looking downwind of the gas bag.

Relative Humidity (at 10m height)	97.9%
Insolation	18.3 W/m ²
Ambient Air Temperature (at 10m height)	18.2°C
Treated Runway Surface Temperature	17.6°C
Grass Surface Temperature	14.2°C
Observed Cloud Cover	5/8

STABILITY CONDITION

- D (From Observations)
- E (From DT/DZ)
- F (From Solarimeter)
- D (From Heat Flux)
- D (From Richardson No.)
- D (From Bulk Richardson No.)
- D (From Standard Deviation of Wind Heading)

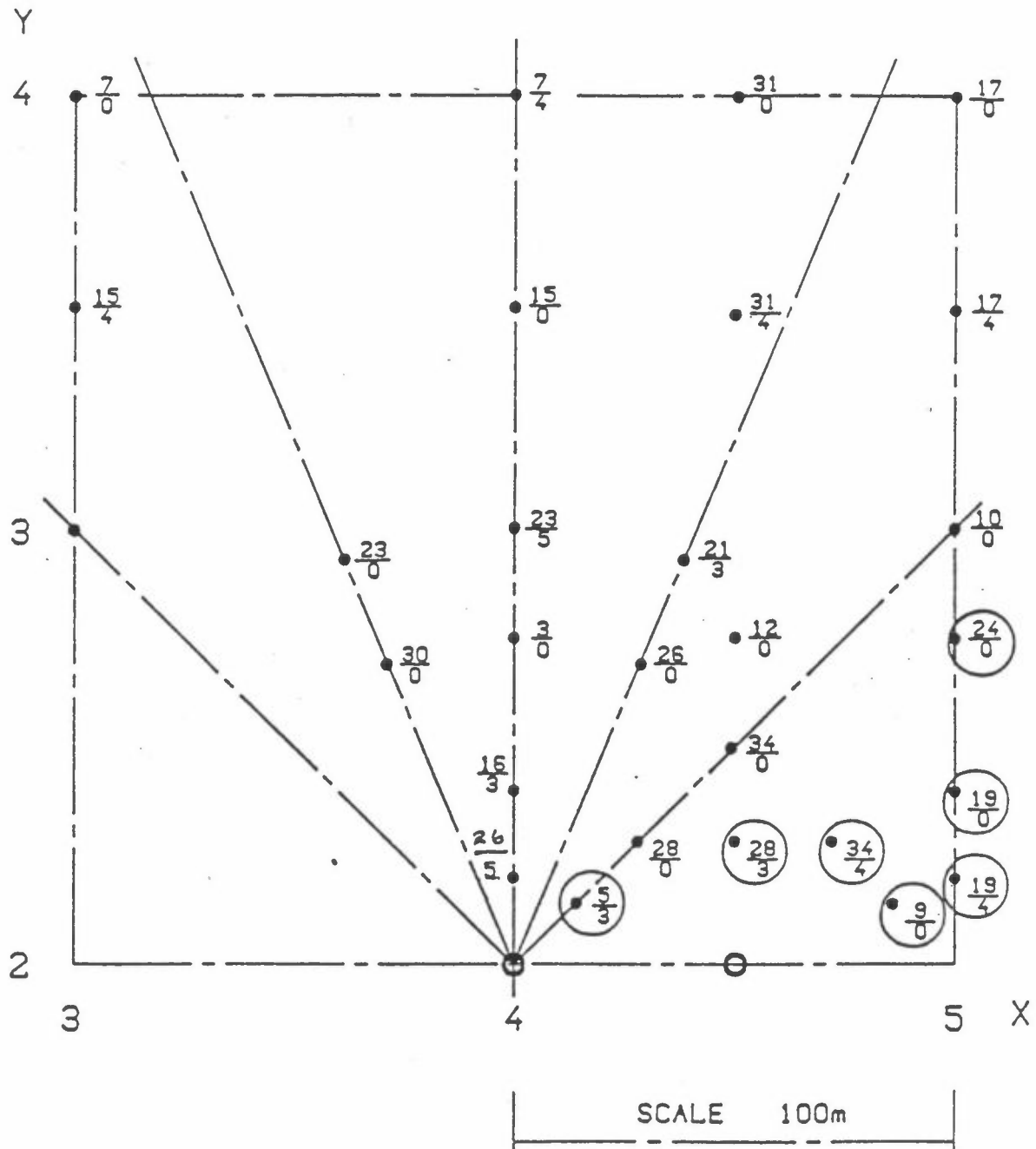
Stability condition inferred from data during the release and just before the release : D

THORNEY ISLAND TRIALS --- SPILL 046 ---- 10/06/84

HISTORY

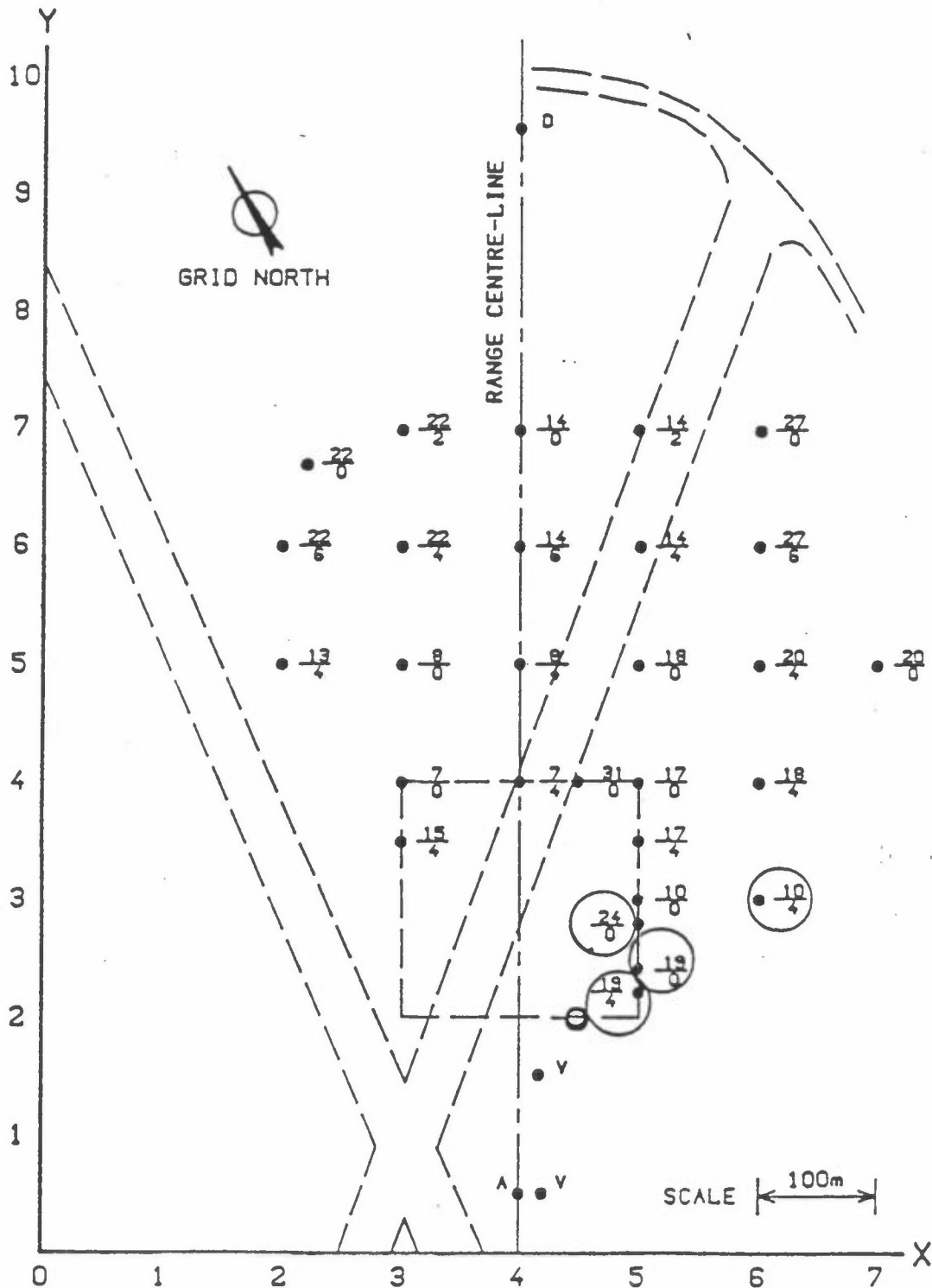
This spill was conducted late in the evening (20:43 hrs) of a summers day during which strong insolation was present. About four hours before the spill the wind speed was approximately 6 m/s, blowing just to the right of the array centre line. As the evening progressed however, the wind speed steadily decreased and the wind oscillated about the array centre line . However in the hour leading up to the spill the wind speed remained mostly constant at around 3 m/s , and the wind direction swung far to the right of the centre line and remained in that direction. Throughout this time insolation steadily decreased. Whilst it was clearly an unstable day earlier on, by the time gas was released stable conditions undoubtedly existed.

TRIAL No. - 046 DATE - 10/6/84 24 SENSORS SAW GAS
 WIND SPEED (U_{10}) 3.4 m/sec PASQUILL CATEGORY D



$\frac{21}{4}$ = DATA TERMINAL CHANNEL NUMBER OF GAS SENSORS AT 0.4m HEIGHT
 ○ = SENSORS AT 0.4m HEIGHT VERIFIED TO HAVE SEEN GAS

TRIAL No. - 046 DATE - 10/6/84 24 SENSORS SAW GAS
 WIND SPEED (U_{10}) 3.4 m/sec PASQUILL CATEGORY D



$\frac{21}{4}$ = DATA TERMINAL CHANNEL NUMBER OF GAS SENSORS AT 0.4m HEIGHT
 ○ = SENSORS AT 0.4m HEIGHT VERIFIED TO HAVE SEEN GAS

Trial	46	X	Y	H	CM	C	T1	T2	REMARKS
1		450	202	0.4	70.0	62.0	0	460	
2		450	210	0.4	21.0	7.5	20	420	
3		414	214	0.4	0.2	0.1			Noise
4		486	214	0.4	5.6	3.0	40	470	
5		486	214	1.4	2.4	0.8	30	470	
6		486	214	2.4	1.1	0.2	30	470	
7		450	220	0.4	16.5	6.0	40	440	
8		500	220	0.4	4.0	2.5	40	500	
9		450	228	0.4	4.9	3.0	120	300	
10		450	228	1.4	0.5	0.2			Noise
11		450	228	2.4	0.5	0.1			Noise
12		472	228	0.4	6.2	4.0	60	500	
13		472	228	1.4	2.0	0.8	50	500	
14		472	228	2.4	0.8	0.3	60	480	
15		450	240	0.4	0.1				Noise
16		500	240	0.4	2.1	1.7	70	510	
17		500	240	1.4	6.2	3.0			Noise
18		500	240	2.4	0.9	0.3	80	480	
19		472	248	0.4	4.7	3.5	130	360	
20		500	275	1.0	0.5	0.2	250	420	Noise
21		600	300	0.4	0.4	0.3	270	450	Noise
22		600	300	1.4	0.3	0.2	270	460	Noise
23		600	300	2.4	0.3	0.2	270	440	Noise
24		600	300	4.4	0.2	0.1	260	480	Noise

THORNEY ISLAND TRIALS --- SPILL 047 ---- 15/06/84

SUMMARY INFORMATION AT THE TIME OF THE SPILL

Gas released (approx. 5 secs after fan start)	20:08:04
Freon 12: relative density	= 2.0
Spill rate	250 m ³ /min
spill duration	7 min 45 sec
Number of smoke cannisters discharged:	10
Mean Wind Speed at 10m height:	
During main data collection period:-	1.5 m/s
From 5 minute cyclic data just before the release:-	1.4 m/s
Mean Wind Heading ('A' station)	-32.6°
(relative to the centre line of the array)	

N.B: Positive angles are to the right (clockwise) of the centre line when looking downwind of the gas bag.

Relative Humidity (at 10m height)	97.4%
Insolation	55 W/m ²
Ambient Air Temperature (at 10m height)	14.3°C
Treated Runway Surface Temperature	16.2°C
Grass Surface Temperature	14.5°C
Observed Cloud Cover	0/8

STABILITY CONDITION

C (From Observations)
 F (From DT/DZ)
 E (From Solarimeter)
 G (From Heat Flux)
 F (From Richardson No.)
 F (From Bulk Richardson No.)
 D (From Standard Deviation of Wind Heading)

Stability condition inferred from data during the release and just before the release : F

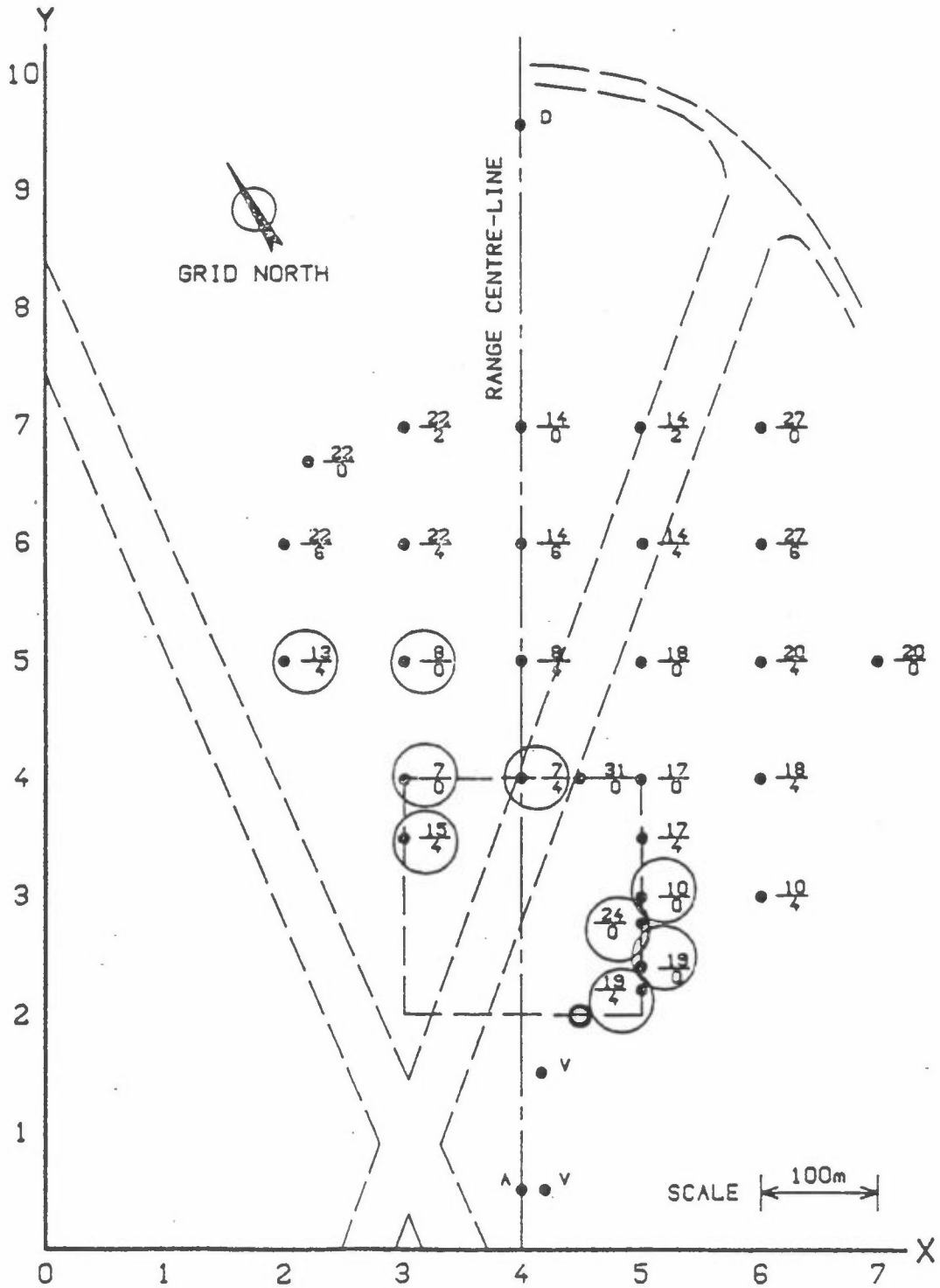
THORNEY ISLAND TRIALS --- SPILL 047 ---- 15/06/84

HISTORY

This spill was also conducted late in the evening of a summers day. Conditions earlier in the day were unfavourable because the wind was blowing too far to the left of the array. In the two hours before the spill however the wind direction started to change as the wind gradually swung towards the array centre line. In this time the wind speed also steadily decreased as did insolation. Therefore, by the time the gas was released, the wind was relatively low at about 1.5 m/s, and the wind direction was about 30 degrees to the left of the array centre line.

As with most summer days the atmosphere earlier in the day was unstable but as evening approached firstly neutral and then stable conditions were observed. As evident from conditions listed previously the atmosphere was clearly stable during this spill.

TRIAL No. - 047 DATE - 15/6/84 79 SENSORS SAW GAS
 WIND SPEED (U_{10}) 1.5 m/sec PASQUILL CATEGORY F



$\frac{21}{4}$ = DATA TERMINAL CHANNEL NUMBER OF GAS SENSORS AT 0.4m HEIGHT
 ○ = SENSORS AT 0.4m HEIGHT VERIFIED TO HAVE SEEN GAS

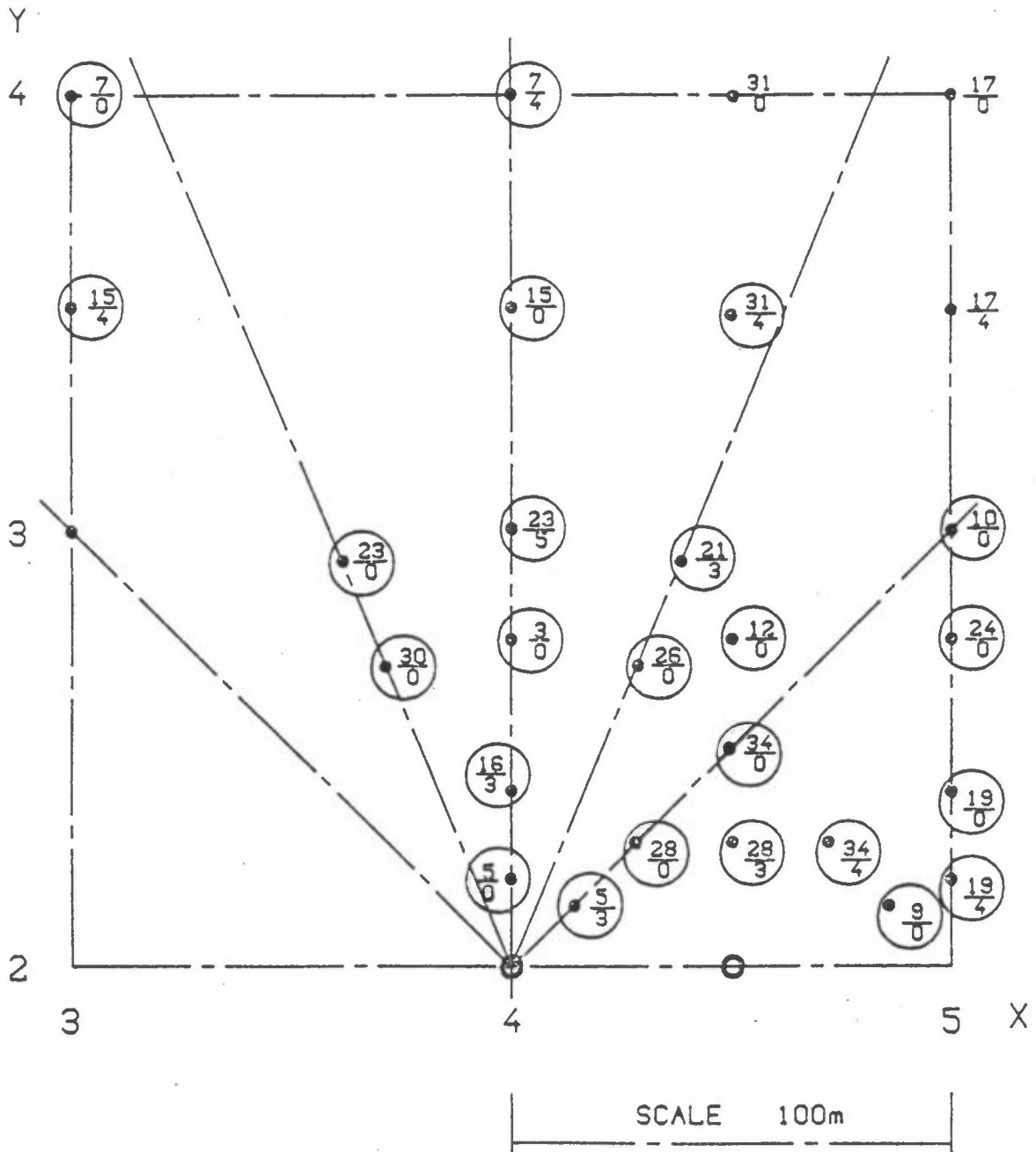
TRIAL No. - 047

DATE - 15/6/84

79 SENSORS SAW GAS

WIND SPEED (U_{10}) 1.5 m/sec

PASQUILL CATEGORY F



Trial	47	X	Y	H	CM	C	T1	T2	REMARKS
1	450	202	0.4	72.0	70.0		0	600	
2	450	210	0.4	17.5	14.0		10	530	
3	414	214	0.4	16.5	14.0		50	540	
4	486	214	0.4	18.2	12.0		50	600	
5	486	214	1.4	0.4	0.1				Noise
6	486	214	2.4	0.2					Noise
7	400	220	0.4	15.9	11.5		100	760	
8	400	220	2.4	1.5	0.4				Noise
9	450	220	0.4	20.0	18.0		20	680	
10	500	220	0.4	1.8	0.3		380	1000	
11	428	228	0.4	16.0	12.0		40	600	
12	428	228	1.4	0.7	0.4				Noise
13	428	228	2.4	0.5	0.3		310	600	
14	450	228	0.4	19.2	16.3		30	650	
15	450	228	1.4	14.6	11.0		40	600	
16	450	228	2.4	0.2	0.1				Noise
17	472	228	0.4	19.6	16.0		60	600	
18	472	228	1.4	0.3	0.1				Noise
19	450	230	0.4	14.0	11.7		70	650	
20	400	240	0.4	14.0	10.0		80	700	
21	400	240	1.4	1.0	0.3		80	1200	Noise
22	400	240	2.4	0.5	0.2				Noise
23	450	240	0.4	17.0	14.0		80	630	
24	500	240	0.4	1.0	0.5		410	980	
25	500	240	1.4	0.2	0.1				Noise
26	428	248	0.4	13.0	9.0		100	640	
27	472	248	0.4	18.0	11.0		60	540	
28	450	250	0.4	17.8	14.0		70	660	
29	450	250	1.4	0.4	0.1				Noise
30	371	269	1.4	1.2	0.2				Noise
31	371	269	4.4	0.2	0.1				Noise
32	429	269	0.4	12.5	11.3		110	700	
33	429	269	1.4	0.5	0.2				Noise
34	429	269	2.4	0.2	0.1				Noise
35	429	269	4.4	0.2	0.1				Noise
36	400	275	0.4	8.2	4.5		140	940	
37	400	270	1.0	4.7	2.0		140	800	
38	400	275	1.4	0.9	0.3		100	610	
39	400	275	2.4	0.5	0.2				Noise
40	400	275	4.4	0.2	0.1				Noise
41	450	275	0.4	11.3	8.0		330	600	
42	450	275	1.0	2.5	1.5		230	1020	
43	450	275	1.4	0.4	0.2		110		Noise
44	450	275	2.4	0.4	0.2		200		Noise
45	500	275	0.4	0.5	0.4		540	1340	
46	500	275	1.0	0.9	0.6		490	1360	
47	362	292	0.4	2.7	1.4		310	910	
48	362	292	1.4	0.6	0.2				Noise
49	362	292	2.4	0.4	0.1				Noise
50	438	292	0.4	3.0	1.5		140	1240	
51	438	292	1.4	0.5	0.2				Noise
52	438	292	2.4	0.3	0.1				Noise
53	400	300	0.4	3.0	1.4		140	1070	
54	400	300	1.4	0.6	0.3		160	900	
55	400	300	2.4	0.3	0.1				Noise
56	500	300	0.4	0.3	0.2		560	1340	
57	500	300	2.4	0.1					Noise
58	300	350	0.4	1.6	0.3		420	1340	
59	300	350	2.4	0.5	0.2				Noise
60	400	350	0.4	0.3	0.4		560	1340	
61	400	350	1.4	0.7	0.3		180	1340	
62	400	350	2.4	0.3	0.1				Noise
63	400	350	4.4	0.2	0.1				Noise
64	450	350	0.4	0.4	0.2		540	1340	
65	450	350	1.4	0.3	0.2		540	1250	
66	450	350	2.4	0.2	0.1			1050	
67	300	400	0.4	0.7	0.4		500	1340	
68	300	400	2.4	0.4	0.2		410	1030	
69	300	400	4.4	0.2	0.1		300	700	
70	400	400	0.4	0.3	0.2		600	1310	
71	400	400	2.4	0.3	0.1				Noise
72	400	400	4.4	0.2	0.1				Noise
73	450	400	0.4	0.5	0.3		740	1340	
74	450	400	2.4	0.2	0.1		700	1340	
75	500	500	2.4	0.2	0.1		500	1140	
76	300	500	0.4	0.5	0.3		400	1340	
77	300	500	2.4	0.2	0.1		620	1280	
78	300	500	4.4	0.3	0.2				Noise
79	400	500	2.4	0.1	0.1				Noise
80	200	500	0.4	0.3	0.2		700	1340	

4 REFERANSER

Gotaas, Y., Bøhler, T. og Haugsbakk, I. (1984) Spredning av tung gass.
Utdrag av måledata fra Thorney Island-forsøkene, fase 1. Lillestrøm (NILU
TR 7/84).

**NORSK INSTITUTT FOR LUFTFORSKNING (NILU)
NORWEGIAN INSTITUTE FOR AIR RESEARCH**

(NORGES TEKNISK-NATURVITENSKAPELIGE FORSKNINGSRÅD)

POSTBOKS 130, 2001 LILLESTRØM (ELVEGT. 52), NORGE

RAPPORRTYPE Teknisk rapport	RAPPORTRNR. TR 1/86	ISBN-82-7247-663-0	
DATO Januar 1986	ANSV. SIGN. <i>Storland</i>	ANT. SIDER 88	PRIS kr. 80,00
TITTEL Spredning av tung gass. Utdrag fra måledata fra Thorney Island-forsøkene. Fase 2.		PROSJEKTLEDER Y. Gotaas	
		NILU PROSJEKT NR. 0-8415	
FORFATTER(E) I. Haugsbakk Y. Gotaas		TILGJENGELIGHET* A	
		OPPDRAKSGIVERS REF.	
OPPDRAKSGIVER (NAVN OG ADRESSE) Statoil Norsk Hydro A/S Borregaard Fabrikker A/S			
3 STIKKORD (å maks. 20 anslag) Utslipp Tunge gasser Spredningsfors.			
REFERAT (maks. 300 anslag, 7 linjer) Denne rapport gir en enkel oversikt og et sammendrag av forsøkene som ble gjennomført ved spredning av tung gass, Thorney Island, Fase 2.			

TITLE Heavy gas dispersion trials. Summary from Thorney Island tests, phase 2.
ABSTRACT (max. 300 characters, 7 lines) This report is a simple survey and summary from the heavy gas tests at Thorney Island, phase 2.

*Kategorier: Apen - kan bestilles fra NILU A
 Må bestilles gjennom oppdragsgiver B
 Kan ikke utleveres C