REVISED Toxicological Assessment of ISS Air Quality: May 2012 – August 2012

A summary of the analytical results from 12 grab sample containers (GSCs) collected on ISS and returned aboard 30S is shown in Table 1. The average recoveries of the 3 surrogate standards from the GSCs were as follows: ^{13}C-acetone, 115 ± 11%; fluorobenzene, 108 ± 8%; and chlorobenzene, 102 ± 16%. Shaded rows indicate data that are limited due to low sample pressures. For completeness, previously reported data from the US Lab collected in May 2012 are included here as well.

This revised report provides results from one returned sample that was unlabeled and originally assumed to be unused. The sample was prepared and analyzed for the purpose of measuring the surrogate compounds. It was later determined, based on serial number, that this was the HTV3 first ingress sample. All standard analytical protocols were followed for this sample with the exception of measuring the initial pressure. The dilution factor was estimated by calculating the average difference between measured cabin pressure and measured GSC initial pressures for the samples collected in May, July, and August and subtracting this value from the measured ISS cabin pressure on the date the HTV3 first ingress sample was collected.

Table 1. Analytical Summary of ISS results

Sample Location	Sample Date	NMVOCs[a] (mg/m^3)	Freon 218 (mg/m^3)	CO_2 (mg/m^3)	Alcohols (mg/m^3)	T Value[b] (units)
Lab[c]	5/29/2012	16	31	5700	6.8	0.42
SM	5/29/2012	18	24	8000	7.3	0.56
JPM	5/29/2012	19	26	6800	6.8	0.61
Lab	6/29/2012	15	24	5500	9.8	0.69
SM	6/29/2012	13	26	5500	8.6	0.54
Columbus	6/29/2012	15	26	5700	7.2	0.97
Lab	7/17/2012	9.6	26	3800	5.2	0.53
SM	7/17/2012	9.4	28	3400	5.0	0.52
JPM	7/17/2012	9.8	29	3100	5.3	0.55
HTV3 first ingress[d]	7/28/2012	14	12	2800	3.9	1.47 (0.98)
Lab	8/21/2012	9.2	25	4900	4.7	0.57
SM	8/21/2012	8.2	24	5000	3.9	0.53
Columbus	8/21/2012	8.6	23	5300	4.1	0.57
Guideline		*<25*	---	*<9300*	*<5*	*<1*

[a] Non-methane volatile organic hydrocarbons, excluding Freon 218
[b] Based on 180-d SMACs and calculated excluding CO_2; parentheses indicate value based on 7-day SMACs
[c] previously reported – returned on 29S
[d] unlabeled sample – later identified as HTV3 first ingress sample; estimated dilution factor = 1.39

Toxicological Evaluation of ISS Air Quality: Routine monthly sampling provides a very limited set of samples on which to perform an air quality assessment. However, based on these samples, there is no concern for crew health. The primary contributor to the total T-value across all sampling locations throughout this time period was hexamethylcyclotrisiloxane. This compound was measured below levels of health concern; however, it may contribute to periodic accumulation of siloxanes in the water recovery system.

The CO_2 and Freon 218 levels measured in the HTV3 first ingress sample indicate that fairly substantial mixing occurred with the ISS atmosphere prior to sample collection. The slightly elevated T-value at

The CO_2 and Freon 218 levels measured in the HTV3 first ingress sample indicate that fairly substantial mixing occurred with the ISS atmosphere prior to sample collection. The slightly elevated T-value at HTV3 first ingress was primarily attributed to trimethylsilanol, hexamethylcyclotrisiloxane, and methane. This result is consistent with the pre-flight off-gas test performed by JAXA. The measured T-value of 0.98 based on 7-day SMACs is lower than the predicted T-value of 1.72 resulting from the off-gas test; however, it is likely that some dilution occurred due to mixing with the ISS atmosphere prior to sample collection.

GSCs provide only a snapshot of conditions and are not ideal for evaluating potential CO_2 exposures. However, reported levels were below 4 mmHg (9300 mg/m^3), as requested for this Increment in Chit 10385.

The alcohol guideline (<5 mg/m^3) is intended to protect the water recovery system from risk of overloading. Relatively high alcohol values were reported in May and June. Ethanol was the primary cause of the high alcohol levels; however, we are not aware of a new source of this compound, and levels show a downward trend in July and August.

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11/28/2012
Date

Enclosures
Table 1: Analytical concentrations of compounds found in the 30S GSCs
Table 2: T-values corresponding to analytical concentrations in Table 1.
Table 2A: HTV3 first ingress T-values based on 7-day and 180-day SMACs

TABLE 1
ANALYTICAL RESULTS OF
SOYUZ 30S RETURN GRAB SAMPLE CONTAINER AIR SAMPLES

CHEMICAL CONTAMINANT	CONCENTRATION (mg/m3)											
	AA05366 S/N 2098 JPM 5/29/12 @ 10:22 GMT	AA05367 S/N 2086 SM 5/29/12 @ 10:25 GMT	AA05368# S/N 2085 LAB 6/29/12 @ 09:15 GMT	AA05369# S/N 2114 COL 6/29/12 @ 09:20 GMT	AA05370# S/N 2110 SM 6/29/12 @ 09:25 GMT	AA05371 S/N 2009 LAB 7/17/12 @ 06:05 GMT	AA05372 S/N 2006 JPM 7/17/12 @ 06:05 GMT	AA05373 S/N 2111 SM 7/17/12 @ 06:10 GMT	AA05374 S/N 2018 COL 8/21/12 @ 13:05 GMT	AA05375 S/N 2015 LAB 8/21/12 @ 13:07 GMT	AA05376 S/N 2014 SM 8/21/12 @ 13:10 GMT	AA05377 S/N 2004 HTV3 INGRESS 7/28/12 @ 08:15 GMT
TARGET COMPOUNDS (TO-14/POLAR)												
FREON12	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
CHLOROMETHANE	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
FREON114	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
METHANOL	0.61	0.71	0.59	0.52	0.49	0.48	0.45	0.50	0.39	0.42	0.38	0.33
ACETALDEHYDE	0.24	0.24	0.30	0.21	0.23	0.15	0.15	0.14	0.12	0.14	0.11	0.16
VINYLCHLORIDE	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
BROMOMETHANE	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
ETHANOL *	**5.1**	**5.1**	**7.2**	**5.1**	**6.4**	**3.9**	**3.8**	**3.7**	**3.1**	**3.6**	**2.9**	**1.9**
CHLOROETHANE	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
ACETONITRILE	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
PROPENAL	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
ACETONE	0.39	0.43	0.66	0.41	0.50	0.37	0.43	0.33	0.34	0.35	0.33	0.37
PROPANAL	TRACE	TRACE	TRACE	TRACE	<0.150	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	0.080
ISOPROPANOL	0.49	0.77	1.3	0.97	0.97	0.25	0.48	0.32	0.15	0.17	0.16	1.1
FREON11	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
FURAN	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
ACRYLONITRILE	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
PENTANE	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
2-METHYL-2-PROPANOL	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
METHYLACETATE	0.15	0.17	<0.150	<0.150	<0.150	0.054	0.051	TRACE	TRACE	0.054	TRACE	TRACE
1,1-DICHLOROETHENE	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
DICHLOROMETHANE	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
3-CHLOROPROPENE	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
FREON113	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
N-PROPANOL	0.067	0.099	<0.150	TRACE	TRACE	0.060	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE
1,1-DICHLOROETHANE	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
BUTANAL	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
2-BUTANONE	TRACE	TRACE	<0.150	<0.150	<0.150	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	0.12
CIS-1,2-DICHLOROETHENE	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
2-METHYLFURAN	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
ETHYLACETATE	0.85	0.86	TRACE	TRACE	TRACE	0.082	0.085	0.080	0.080	0.092	0.083	0.066
HEXANE	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
CHLOROFORM	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
2-BUTENAL	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
1,2-DICHLOROETHANE	TRACE	0.051	<0.150	<0.150	<0.150	0.057	0.057	0.056	0.053	0.059	0.053	<0.050
1,1,1-TRICHLOROETHANE	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
N-BUTANOL	0.16	0.14	TRACE	TRACE	0.17	0.15	0.13	0.13	0.13	0.13	0.13	0.13
BENZENE	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
CARBONTETRACHLORIDE	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
2-PENTANONE	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
2-METHYLHEXANE	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
2,3-DIMETHYLPENTANE	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
PENTANAL	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
3-METHYLHEXANE	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
1,2-DICHLOROPROPANE	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
1,4-DIOXANE	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
TRICHLOROETHENE	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
2,5-DIMETHYLFURAN	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
N-HEPTANE	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
4-METHYL2-PENTANONE	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
CIS-1,3-DICHLOROPROPENE	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
2-PENTENAL	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
TRANS-1,3-DICHLOROPROPENE	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
1,1,2-TRICHLOROETHANE	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
TOLUENE	0.054	0.056	<0.150	<0.150	<0.150	TRACE	TRACE	TRACE	TRACE	TRACE	0.050	0.089
HEXANAL	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
MESITYLOXIDE	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
1,2-DIBROMOETHANE	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
BUTYLACETATE	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
OCTANE	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
TETRACHLOROETHENE	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
CHLOROBENZENE	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
ETHYLBENZENE	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
M/P-XYLENES	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	TRACE
2-HEPTANONE	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
CYCLOHEXANONE	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
HEPTANAL	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
STYRENE	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
1,1,2,2-TETRACHLOROETHANE	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
O-XYLENE	0.092	0.092	<0.150	<0.150	<0.150	0.062	0.061	0.061	0.10	0.10	0.10	TRACE
NONANE	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
1,3,5-TRIMETHYLBENZENE	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
1,2,4-TRIMETHYLBENZENE	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
1,3-DICHLOROBENZENE	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
1,4-DICHLOROBENZENE	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
1,2-DICHLOROBENZENE	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
1,2,4-TRICHLOROBENZENE	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
HEXACHLORO-1,3-BUTADIENE	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050

TABLE 1
ANALYTICAL RESULTS OF
SOYUZ 30S RETURN GRAB SAMPLE CONTAINER AIR SAMPLES

CHEMICAL CONTAMINANT	CONCENTRATION (mg/m3)											
	AA05366 S/N 2098 JPM 5/29/12 @ 10:22 GMT	AA05367 S/N 2086 SM 5/29/12 @ 10:25 GMT	AA05368# S/N 2085 LAB 6/29/12 @ 09:15 GMT	AA05369# S/N 2114 COL 6/29/12 @ 09:20 GMT	AA05370# S/N 2110 SM 6/29/12 @ 09:25 GMT	AA05371 S/N 2009 LAB 7/17/12 @ 06:05 GMT	AA05372 S/N 2006 JPM 7/17/12 @ 06:05 GMT	AA05373 S/N 2111 SM 7/17/12 @ 06:10 GMT	AA05374 S/N 2018 COL 8/21/12 @ 13:05 GMT	AA05375 S/N 2015 LAB 8/21/12 @ 13:07 GMT	AA05376 S/N 2014 SM 8/21/12 @ 13:10 GMT	AA05377 S/N 2004 HTV3 INGRESS 7/28/12 @ 08:15 GMT
SPECIAL INTEREST COMPOUNDS* **												
1,3-BUTADIENE	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
ETHYLENE OXIDE	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
CARBON DISULFIDE	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	TRACE
2-METHYL-2-PROPENAL	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	TRACE
3-BUTEN-2-ONE	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
2-ETHOXYETHANOL	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
DIMETHYL DISULFIDE	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
OCTAFLUOROPROPANE **	26	24	24	26	26	26	29	28	23	25	24	12
PERFLUORO-2-METHYLPENTANE **	4.9	4.8	<0.150	<0.150	<0.150	<0.050	<0.050	TRACE	<0.050	<0.050	<0.050	<0.050
TRIMETHYLSILANOL **	0.19	0.15	TRACE	0.30	TRACE	0.19	0.19	0.16	0.22	0.19	0.16	2.2
HEXAMETHYLCYCLOTRISILOXANE %	2.5	1.9	3.4	5.7	2.4	2.2	2.4	2.2	2.2	2.1	2.0	3.5
OCTAMETHYLCYCLOTETRASILOXANE **	0.13	0.11	TRACE	0.23	TRACE	0.13	0.14	0.13	0.13	0.13	0.14	0.17
DECAMETHYLCYCLOPENTASILOXANE **	0.86	0.78	0.70	0.76	0.73	0.88	0.72	0.94	0.93	1.1	1.0	1.6
NON-TARGET COMPOUNDS* **												
1,1,1,2-TETRAFLUOROETHANE	1.1	1.1	0.18	0.21	0.21	0.15	0.15	0.15	0.12	0.13	0.11	0.077
PROPENE	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
CHLORODIFLUOROMETHANE	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	TRACE
CARBONYL SULFIDE	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	TRACE
ISOBUTANE	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.068
1-BUTENE	TRACE	TRACE	<0.150	<0.150	<0.150	<0.050	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE
FLUOROTRIMETHYLSILANE	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.12
2-METHYL-1,3-BUTADIENE	0.080	0.094	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	0.070	0.072	0.075	TRACE
1,3-DIOXOLANE	TRACE	TRACE	<0.150	<0.150	<0.150	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	0.26
HEXAMETHYLDISILOXANE	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.71
2-ETHYL-1-HEXANOL	0.17	0.11	<0.150	<0.150	<0.150	0.16	0.15	0.14	0.09	0.16	0.12	0.093
C10-ALKENE	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
C4-SUBSTITUTEDBENZENE	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
C11-ALKANE	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.071
LIMONENE	0.10	0.11	<0.150	<0.150	TRACE	0.15	0.14	0.16	0.11	0.11	0.098	0.053
DODECAMETHYLPENTASILOXANE	<0.050	<0.050	<0.150	<0.150	<0.150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.38
TOTAL ALCOHOLS PLUS ACETONE	**6.8**	**7.3**	**9.8**	**7.2**	**8.6**	**5.2**	**5.3**	**5.0**	**4.1**	**4.7**	**3.9**	**3.9**
TARGET COMPOUNDS (GC)												
CARBON MONOXIDE	0.69	0.71	1.5	1.2	1.2	0.72	0.74	0.74	0.97	0.96	0.99	0.90
METHANE	8.7	8.5	8.4	8.5	8.9	7.2	7.3	7.5	10	9.8	9.8	4.0
HYDROGEN	5.1	5.4	4.8	4.9	4.8	3.2	3.2	3.3	4.8	4.8	4.7	1.4
CARBON DIOXIDE	6800	8000	5500	5700	5500	3800	3100	3400	5300	4900	5000	2800
TOTAL CONCENTRATION (NON-METHANE HYDROCARBONS)	**44**	**42**	**39**	**41**	**38**	**36**	**38**	**37**	**31**	**34**	**32**	**26**
TOTAL CONCENTRATION - OFP (NON-METHANE HYDROCARBONS)	**19**	**18**	**15**	**15**	**13**	**9.6**	**9.8**	**9.4**	**8.6**	**9.2**	**8.2**	**14**

Low sample pressure when received
* GC/FID data results are in bold
** Quantified using a 1-point calibration
*** Quantified using "B" response factor
%: Response factor generated from the internal Siloxanes Stability Study
< : Value is less than the laboratory report detection limit.
TRACE: Amount detected is sufficient for compound identification only.
OFP: Octafluoropropane

TABLE 2
ANALYTICAL RESULTS OF
SOYUZ 30S RETURN GRAB SAMPLE CONTAINER AIR SAMPLES

CHEMICAL CONTAMINANT	T-VALUE (180-d SMAC)										
	AA05366 S/N 2098 JPM 5/29/12 @ 10:22 GMT	AA05367 S/N 2086 SM 5/29/12 @ 10:25 GMT	AA05368# S/N 2085 LAB 6/29/12 @ 09:15 GMT	AA05369# S/N 2114 COL 6/29/12 @ 09:20 GMT	AA05370# S/N 2110 SM 6/29/12 @ 09:25 GMT	AA05371 S/N 2009 LAB 7/17/12 @ 06:05 GMT	AA05372 S/N 2006 JPM 7/17/12 @ 06:05 GMT	AA05373 S/N 2111 SM 7/17/12 @ 06:10 GMT	AA05374 S/N 2018 COL 8/21/12 @ 13:05 GMT	AA05375 S/N 2015 LAB 8/21/12 @ 13:07 GMT	AA05376 S/N 2014 SM 8/21/12 @ 13:10 GMT
TARGET COMPOUNDS (TO-14/POLAR)											
FREON12	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CHLOROMETHANE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
FREON114	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
METHANOL	0.00683	0.00788	0.00660	0.00573	0.00548	0.00531	0.00503	0.00560	0.00429	0.00472	0.00421
ACETALDEHYDE	0.06078	0.06003	0.07446	0.05362	0.05680	0.03751	0.03787	0.03482	0.03097	0.03577	0.02807
VINYLCHLORIDE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BROMOMETHANE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ETHANOL	0.00256	0.00257	0.00359	0.00256	0.00319	0.00196	0.00191	0.00183	0.00155	0.00180	0.00146
CHLOROETHANE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ACETONITRILE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PROPENAL	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ACETONE	0.00742	0.00823	0.01262	0.00795	0.00957	0.00703	0.00819	0.00640	0.00652	0.00683	0.00643
PROPANAL	0.00227	0.00227	0.00682	0.00682	ND	0.00227	0.00227	0.00227	0.00227	0.00227	0.00227
ISOPROPANOL	0.00326	0.00514	0.00834	0.00647	0.00647	0.00170	0.00322	0.00213	0.00101	0.00116	0.00107
FREON11	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
FURAN	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ACRYLONITRILE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PENTANE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-METHYL-2-PROPANOL	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
METHYLACETATE	0.00128	0.00139	ND	ND	ND	0.00045	0.00043	0.00021	0.00021	0.00045	0.00021
1,1-DICHLOROETHENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DICHLOROMETHANE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3-CHLOROPROPENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
FREON113	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
N-PROPANOL	0.00069	0.00101	ND	0.00077	0.00077	0.00061	0.00026	0.00026	0.00026	0.00026	0.00026
1,1-DICHLOROETHANE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BUTANAL	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-BUTANONE	0.00083	0.00083	ND	ND	ND	0.00083	0.00083	0.00083	0.00083	0.00083	0.00083
CIS-1,2-DICHLOROETHENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-METHYLFURAN	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ETHYLACETATE	0.00474	0.00479	0.00042	0.00042	0.00042	0.00046	0.00047	0.00045	0.00045	0.00051	0.00046
HEXANE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CHLOROFORM	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-BUTENAL	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-DICHLOROETHANE	0.01563	0.03179	ND	ND	ND	0.03576	0.03536	0.03510	0.03293	0.03675	0.03336
1,1,1-TRICHLOROETHANE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
N-BUTANOL	0.00389	0.00347	0.00188	0.00188	0.00413	0.00381	0.00328	0.00315	0.00336	0.00336	0.00325
BENZENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CARBONTETRACHLORIDE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-PENTANONE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-METHYLHEXANE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,3-DIMETHYLPENTANE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PENTANAL	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3-METHYLHEXANE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-DICHLOROPROPANE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-DIOXANE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TRICHLOROETHENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,5-DIMETHYLFURAN	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
N-HEPTANE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-METHYL2-PENTANONE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CIS-1,3-DICHLOROPROPENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-PENTENAL	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TRANS-1,3-DICHLOROPROPENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-TRICHLOROETHANE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TOLUENE	0.00359	0.00370	ND	ND	ND	0.00167	0.00167	0.00167	0.00167	0.00167	0.00337
HEXANAL	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MESITYLOXIDE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-DIBROMOETHANE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BUTYLACETATE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
OCTANE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TETRACHLOROETHENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CHLOROBENZENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ETHYLBENZENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
M/P-XYLENES	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-HEPTANONE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CYCLOHEXANONE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
HEPTANAL	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
STYRENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-TETRACHLOROETHANE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
O-XYLENE	0.00248	0.00249	ND	ND	ND	0.00168	0.00165	0.00164	0.00274	0.00282	0.00283
NONANE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3,5-TRIMETHYLBENZENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-TRIMETHYLBENZENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-DICHLOROBENZENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-DICHLOROBENZENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-DICHLOROBENZENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-TRICHLOROBENZENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
HEXACHLORO-1,3-BUTADIENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

TABLE 2
ANALYTICAL RESULTS OF
SOYUZ 30S RETURN GRAB SAMPLE CONTAINER AIR SAMPLES

CHEMICAL CONTAMINANT	T-VALUE (180-d SMAC)										
	AA05366 S/N 2098 JPM 5/29/12 @ 10:22 GMT	AA05367 S/N 2086 SM 5/29/12 @ 10:25 GMT	AA05368# S/N 2085 LAB 6/29/12 @ 09:15 GMT	AA05369# S/N 2114 COL 6/29/12 @ 09:20 GMT	AA05370# S/N 2110 SM 6/29/12 @ 09:25 GMT	AA05371 S/N 2009 LAB 7/17/12 @ 06:05 GMT	AA05372 S/N 2006 JPM 7/17/12 @ 06:05 GMT	AA05373 S/N 2111 SM 7/17/12 @ 06:10 GMT	AA05374 S/N 2018 COL 8/21/12 @ 13:05 GMT	AA05375 S/N 2015 LAB 8/21/12 @ 13:07 GMT	AA05376 S/N 2014 SM 8/21/12 @ 13:10 GMT
SPECIAL INTEREST COMPOUNDS											
1,3-BUTADIENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ETHYLENE OXIDE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CARBON DISULFIDE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-METHYL-2-PROPENAL	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3-BUTEN-2-ONE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-ETHOXYETHANOL	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DIMETHYL DISULFIDE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
OCTAFLUOROPROPANE **	0.00031	0.00028	0.00028	0.00031	0.00030	0.00031	0.00034	0.00032	0.00027	0.00029	0.00028
PERFLUORO-2-METHYLPENTANE **	0.00003	0.00003	ND	ND	ND	ND	ND	0.00000	ND	ND	ND
TRIMETHYLSILANOL **	0.04763	0.03796	0.01875	0.07421	0.01875	0.04729	0.04862	0.04002	0.05463	0.04728	0.04010
HEXAMETHYLCYCLOTRISILOXANE %	0.28048	0.21395	0.37313	0.62948	0.26311	0.24646	0.26751	0.24193	0.24941	0.23197	0.22025
OCTAMETHYLCYCLOTETRASILOXANE **	0.01049	0.00938	0.00625	0.01923	0.00625	0.01064	0.01173	0.01069	0.01108	0.01066	0.01162
DECAMETHYLCYCLOPENTASILOXANE **	0.05727	0.05220	0.04699	0.05040	0.04871	0.05857	0.04808	0.06286	0.06202	0.07233	0.06979
NON-TARGET COMPOUNDS											
1,1,1,2-TETRAFLUOROETHANE	0.01080	0.01078	0.00176	0.00202	0.00201	0.00142	0.00144	0.00146	0.00112	0.00123	0.00110
PROPENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CHLORODIFLUOROMETHANE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CARBONYL SULFIDE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ISOBUTANE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1-BUTENE	0.00005	0.00005	ND	ND	ND	ND	0.00005	0.00005	0.00005	0.00005	0.00005
FLUOROTRIMETHYLSILANE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-METHYL-1,3-BUTADIENE	0.02683	0.03119	0.02500	0.02500	0.02500	0.00833	0.00833	0.00833	0.02325	0.02408	0.02502
1,3-DIOXOLANE	0.00069	0.00069	ND	ND	ND	0.00069	0.00069	0.00069	0.00069	0.00069	0.00069
HEXAMETHYLDISILOXANE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-ETHYL-1-HEXANOL	0.00324	0.00205	ND	ND	ND	0.00297	0.00279	0.00265	0.00173	0.00296	0.00233
C10-ALKENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
C4-SUBSTITUTEDBENZENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
C11-ALKANE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
LIMONENE	0.00088	0.00099	ND	ND	0.00065	0.00129	0.00121	0.00141	0.00094	0.00096	0.00085
DODECAMETHYLPENTASILOXANE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TARGET COMPOUNDS (GC)											
CARBON MONOXIDE	0.04073	0.04189	0.08555	0.06900	0.06981	0.04229	0.04341	0.04353	0.05724	0.05644	0.05797
METHANE	0.00249	0.00243	0.00239	0.00241	0.00254	0.00204	0.00208	0.00213	0.00285	0.00279	0.00281
HYDROGEN	0.01486	0.01589	0.01396	0.01436	0.01423	0.00931	0.00942	0.00975	0.01412	0.01417	0.01371
CARBON DIOXIDE	0.52651	0.61262	0.42136	0.43570	0.42511	0.28990	0.23901	0.26338	0.40526	0.37313	0.38432
TOTAL T-VALUE	**1.13953**	**1.16800**	**1.11014**	**1.40834**	**0.96330**	**0.82256**	**0.78716**	**0.78557**	**0.97372**	**0.93821**	**0.91898**
TOTAL T-VALUE - CO2	**0.61302**	**0.55538**	**0.68878**	**0.97264**	**0.53819**	**0.53266**	**0.54815**	**0.52219**	**0.56846**	**0.56508**	**0.53466**

Low sample pressure when received

ND : Value is less than the laboratory report detection limit.

Note: Number of decimal places in T-Values do not represent significant figures of measurements.

TABLE 2A
ANALYTICAL RESULTS OF
HTV3 FIRST INGRESS GRAB SAMPLE CONTAINER AIR SAMPLE

CHEMICAL CONTAMINANT	T-VALUE (7-d SMAC)	T-VALUE (180-d SMAC)
	AA05377 S/N 2004 HTV3 INGRESS 7/28/12 @ 08:15 GMT	AA05377 S/N 2004 HTV3 INGRESS 7/28/12 @ 08:15 GMT
TARGET COMPOUNDS (TO-14/POLAR)		
FREON12	ND	ND
CHLOROMETHANE	ND	ND
FREON114	ND	ND
METHANOL	0.00365	0.00365
ACETALDEHYDE	0.03942	0.03942
VINYLCHLORIDE	ND	ND
BROMOMETHANE	ND	ND
ETHANOL	0.00096	0.00096
CHLOROETHANE	ND	ND
ACETONITRILE	ND	ND
PROPENAL	ND	ND
ACETONE	0.00706	0.00706
PROPANAL	0.00725	0.00725
ISOPROPANOL	0.00738	0.00738
FREON11	ND	ND
FURAN	ND	ND
ACRYLONITRILE	ND	ND
PENTANE	ND	ND
2-METHYL-2-PROPANOL	ND	ND
METHYLACETATE	0.00021	0.00010
1,1-DICHLOROETHENE	ND	ND
DICHLOROMETHANE	ND	ND
3-CHLOROPROPENE	ND	ND
FREON113	ND	ND
N-PROPANOL	0.00026	0.00013
1,1-DICHLOROETHANE	ND	ND
BUTANAL	ND	ND
2-BUTANONE	0.00404	0.00404
CIS-1,2-DICHLOROETHENE	ND	ND
2-METHYLFURAN	ND	ND
ETHYLACETATE	0.00037	0.00037
HEXANE	ND	ND
CHLOROFORM	ND	ND
2-BUTENAL	ND	ND
1,2-DICHLOROETHANE	ND	ND
1,1,1-TRICHLOROETHANE	ND	ND
N-BUTANOL	0.00163	0.00325
BENZENE	ND	ND
CARBONTETRACHLORIDE	ND	ND
2-PENTANONE	ND	ND
2-METHYLHEXANE	ND	ND
2,3-DIMETHYLPENTANE	ND	ND
PENTANAL	ND	ND
3-METHYLHEXANE	ND	ND
1,2-DICHLOROPROPANE	ND	ND
1,4-DIOXANE	ND	ND
TRICHLOROETHENE	ND	ND
2,5-DIMETHYLFURAN	ND	ND
N-HEPTANE	ND	ND
4-METHYL2-PENTANONE	ND	ND
CIS-1,3-DICHLOROPROPENE	ND	ND
2-PENTENAL	ND	ND
TRANS-1,3-DICHLOROPROPENE	ND	ND
1,1,2-TRICHLOROETHANE	ND	ND
TOLUENE	0.00592	0.00592
HEXANAL	ND	ND
MESITYLOXIDE	ND	ND
1,2-DIBROMOETHANE	ND	ND
BUTYLACETATE	ND	ND
OCTANE	ND	ND
TETRACHLOROETHENE	ND	ND
CHLOROBENZENE	ND	ND
ETHYLBENZENE	ND	ND
M/P-XYLENES	0.00034	0.00034
2-HEPTANONE	ND	ND
CYCLOHEXANONE	ND	ND
HEPTANAL	ND	ND
STYRENE	ND	ND
1,1,2,2-TETRACHLOROETHANE	ND	ND
O-XYLENE	0.00034	0.00034
NONANE	ND	ND
1,3,5-TRIMETHYLBENZENE	ND	ND
1,2,4-TRIMETHYLBENZENE	ND	ND
1,3-DICHLOROBENZENE	ND	ND
1,4-DICHLOROBENZENE	ND	ND
1,2-DICHLOROBENZENE	ND	ND
1,2,4-TRICHLOROBENZENE	ND	ND
HEXACHLORO-1,3-BUTADIENE	ND	ND

TABLE 2A
ANALYTICAL RESULTS OF
HTV3 FIRST INGRESS GRAB SAMPLE CONTAINER AIR SAMPLE

CHEMICAL CONTAMINANT	T-VALUE (7-d SMAC)	T-VALUE (180-d SMAC)
	AA05377 S/N 2004 HTV3 INGRESS 7/28/12 @ 08:15 GMT	AA05377 S/N 2004 HTV3 INGRESS 7/28/12 @ 08:15 GMT
SPECIAL INTEREST COMPOUNDS		
1,3-BUTADIENE	ND	ND
ETHYLENE OXIDE	ND	ND
CARBON DISULFIDE	0.00156	0.00078
2-METHYL-2-PROPENAL	0.01471	0.00735
3-BUTEN-2-ONE	ND	ND
2-ETHOXYETHANOL	ND	ND
DIMETHYL DISULFIDE	ND	ND
OCTAFLUOROPROPANE **	0.00014	0.00014
PERFLUORO-2-METHYLPENTANE **	ND	ND
TRIMETHYLSILANOL **	0.53988	0.53988
HEXAMETHYLCYCLOTRISILOXANE %	0.03926	0.39260
OCTAMETHYLCYCLOTETRASILOXANE **	0.00060	0.01390
DECAMETHYLCYCLOPENTASILOXANE **	0.01613	0.10753
NON-TARGET COMPOUNDS		
1,1,1,2-TETRAFLUOROETHANE	0.00074	0.00074
PROPENE	ND	ND
CHLORODIFLUOROMETHANE	0.00001	0.00000
CARBONYL SULFIDE	0.00208	0.00104
ISOBUTANE	0.00028	0.00028
1-BUTENE	0.00005	0.00003
FLUOROTRIMETHYLSILANE	0.24461	0.24461
2-METHYL-1,3-BUTADIENE	0.00417	0.00417
1,3-DIOXOLANE	0.00735	0.00735
HEXAMETHYLDISILOXANE	0.00713	0.00713
2-ETHYL-1-HEXANOL	0.00175	0.00175
C10-ALKENE	ND	ND
C4-SUBSTITUTEDBENZENE	ND	ND
C11-ALKANE	0.00149	0.00149
LIMONENE	0.00046	0.00046
DODECAMETHYLPENTASILOXANE	0.00190	0.00190
TARGET COMPOUNDS (GC)		
CARBON MONOXIDE	0.01417	0.05253
METHANE	0.00115	0.00115
HYDROGEN	0.00403	0.00403
CARBON DIOXIDE	0.21610	0.21610
TOTAL T-VALUE	**1.19858**	**1.68716**
TOTAL T-VALUE - CO2	**0.98248**	**1.47106**

ND : Value is less than the laboratory report detection limit.
Note: Number of decimal places in T-Values do not represent significant figures of measurements.