JSC TOXICOLOGY AND ENVIRONMENTAL CHEMISTRY GROUP

Valerie Ryder, Ph.D., DABT
Technical Monitor - Toxicology
NASA JSC/SK4
Houston, TX 77058

Memorandum Number

TOX-VR-2016-04

Voice: (281) 483-4989
Fax: (281) 483-3058
valerie.e.ryder@nasa.gov

DATE: April 6, 2016

SUBJECT: Toxicological Assessment of ISS Air and Water Quality: March 13, 2015 – June 11, 2015 (Increment 43), Including SpX-6 First Ingress, a Contingency Sample, and Special Ethanol Investigation

SUMMARY: Based on these data, air quality was acceptable on ISS for this period, and potable water remains acceptable for crew consumption.

AIR QUALITY

Ten mini grab sample containers (mGSCs) were collected on ISS during Increment 43 and were returned on SpX-6 and 43S. Three mGSCs were collected as routine monthly samples in the US Laboratory (Lab) and the remaining three were rotated between the Russian Service Module (SM), the Japanese Pressurized Module (JPM), or the Columbus (Col) module. A contingency mGSC sample was collected on 4/22/2015 in Node 1 following a crew report of medical symptoms. Two additional mGSCs were collected in the SM and Node 3 to support the investigation of rising ethanol levels in atmospheric condensate samples. Two pairs of passive-diffusion formaldehyde badges were deployed in the Lab and SM in April and May. June formaldehyde sampling was reduced to one pair of formaldehyde badges in the Lab due to the loss of a resupply kit on 59P. A summary of the analytical results is provided in Table 1.

Table 1. Analytical Summary of ISS air analyses

Sample Location	Sample Date	NMVOCs[a] (mg/m^3)	Freon 218 (mg/m^3)	Alcohols[b] (mg/m^3)	T-Value[c] (units)	CO_2 (mg/m^3)	Formaldehyde ($\mu g/m^3$)
Lab	4/1/2015	21	146	9	**1.4**	7000	32
SM	4/1/2015	11	145	9	0.3	7200	19
SpX-6 First Ingress	4/18/2015	8.2	44	7	(0.1) 0.3	2800	--
Node 1 Contingency	4/22/2015	14	130	12	0.3	7100	--
Lab	5/8/2015	13	123	10	0.3	5100	30
JPM	5/8/2015	13	122	10	0.4	5400	--
SM	5/8/2015	--	--	--	--	--	21
SM (ethanol)	5/19/2015	8.8	91	8	0.2	6300	--
Node 3 (ethanol)	5/19/2015	9.7	91	9	0.2	5200	--
Lab	6/2/2015	10	107	9	0.2	6000	36
Col	6/2/2015	10	83	9	0.2	6700	--
Guideline		*<25*	---	*<5*	*<1*[d]	*<9500*[e]	*<120*

[a]Non-methane volatile organic hydrocarbons, excluding Freon 218, [b]Includes acetone, [c]Sum of the ratios of the measured concentration and the corresponding 180-day SMAC for each compound, excluding CO_2 and formaldehyde; parentheses indicate value based on 7-day SMACs, [d]T-value <1 used to evaluate routine monthly sampling; <3 used to evaluate first ingress, [e]CO^2 to be controlled to 4 mmHg (9500 mg/m^3) or below

Data tables containing concentrations and corresponding T-values based on appropriate SMACs for compounds present at levels above the detection limit are enclosed. Complete data tables including compounds assessed but not detected are available upon request. The average relative recoveries of the 3 surrogate standards from the mGSCs were as follows: 13C-acetone, 94 ± 6%; fluorobenzene-d5, 88 ± 6%; and chlorobenzene-d5, 86 ± 19% for samples returned on SpX-6 and 13C-acetone, 95 ± 5%; fluorobenzene-d5, 100 ± 5%; and chlorobenzene-d5, 98 ± 7% for samples returned on 43S. For the passive-diffusion formaldehyde badges, positive control recoveries (3 lab controls) were 104, 112, and 91%, respectively.

During Increment 43, Air Quality Monitor (AQM) unit 1 (S/N 1003) remained inoperable, so data reported were obtained from AQM unit 2 (S/N 1004), which was located in the US Lab for the entire duration of the Increment. Automated AQM sampling sessions are scheduled every 73 hours, which results in 2-3 sampling sessions per unit per week and ensures that samples are taken on different days of the week and at different time of day over the course of an Increment. Nominally, data are received weekly. Monthly average concentrations as well as the Increment average concentrations are presented in Table 2.

Table 2. Average monthly concentrations (mg/m^3) of AQM target compounds.

	Mar	Apr	May	Jun	Average
2-Propanol	--	--	--	--	--
Acetone	--	--	--	--	--
Acrolein	--	--	--	--	--
Benzene	--	--	--	--	--
1,2-Dichloroethane	--	--	--	--	--
Decamethylcyclopentasiloxane	2.7#	2.5#	2.1#	1.5#	2.2#
Hexanal	--	--	--	--	--
Hexane	--	--	--	--	--
m,p-Xylenes	ND#	ND#	ND#	ND#	ND#
Methanol	--	--	--	--	--
o-Xylene	0.1#	0.1#	TRACE#	TRACE#	TRACE#
Octamethylcylcotetrasiloxane	TRACE#	TRACE#	TRACE#	ND#	TRACE#
Toluene	ND#	ND#	ND#	ND#	ND#
2-Butanone	ND	ND	ND	ND	ND
Acetaldehyde	0.2	0.3	0.3	0.3	0.3
Dichloromethane	0.1	0.1	0.1	0.1	0.1
Ethanol*	7.3	11.8	7.7	3.7	7.6
Ethyl Acetate	0.1	0.1	TRACE	ND	TRACE
Hexamethycyclotrisiloxane	1.8	1.6	1	0.8	1.3
n-Butanol	0.1	0.1	0.1	TRACE	0.1
Trimethylsilanol	0.3	0.3	0.2	TRACE	0.2

#Data reported are from the non-prime Unit 2 as available

*AQM calibration range for ethanol = 0.2 – 7.1 mg/m^3; Values exceeding the calibration range are estimates

Toxicological Evaluation of ISS Air Quality

Routine monthly mGSC sampling provides a limited set of samples which are complementary to in-flight air monitoring data collected by the AQM (see enclosed data tables). **Measured values (mGSC and AQM) were below 1 T unit, with the exception of the April Lab sample.** The elevated T value in April (1.4 units) was due almost exclusively to hexamethylcyclotrisiloxane (HMCTS), which was measured at 11 mg/m^3 in the mGSC. This concentration is approximately 1 order of magnitude higher than standard background levels. Data from the AQM run the same day indicated normal background levels (2 mg/m^3). The spurious spike did not exceed the 7-day SMAC value of 90 mg/m^3 and did not persist, as levels returned to baseline in the next monthly Lab mGSC sample.

The average T-value for Increment 43 calculated from the mGSC data was ~0.5 (Figure 1). The average T-value calculated from the AQM data was slightly lower, but this is expected since one of the two units was inoperable during this period (Figure 2). The primary contributors to the total T-value across all routine sampling locations throughout this time period were HMCTS, acetaldehyde, trimethylsilanol (TMS), and decamethylcyclopentasiloxane (DMCPS). Due to concerns that HMCTS, TMS, and DMCPS may contribute to the periodic breakthrough of siloxane compounds in the water recovery system, specially designed charcoal filters were installed in Node 1 on May 12, 2015. Air concentrations of these compounds, especially HMCTS, were notably reduced following installation of the charcoal filters.

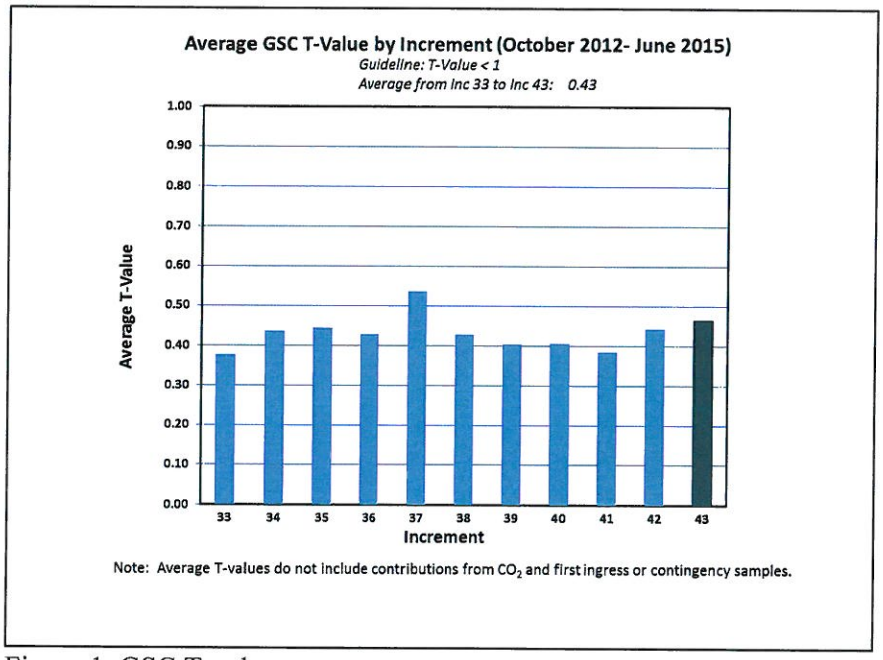

Figure 1. GSC T-values

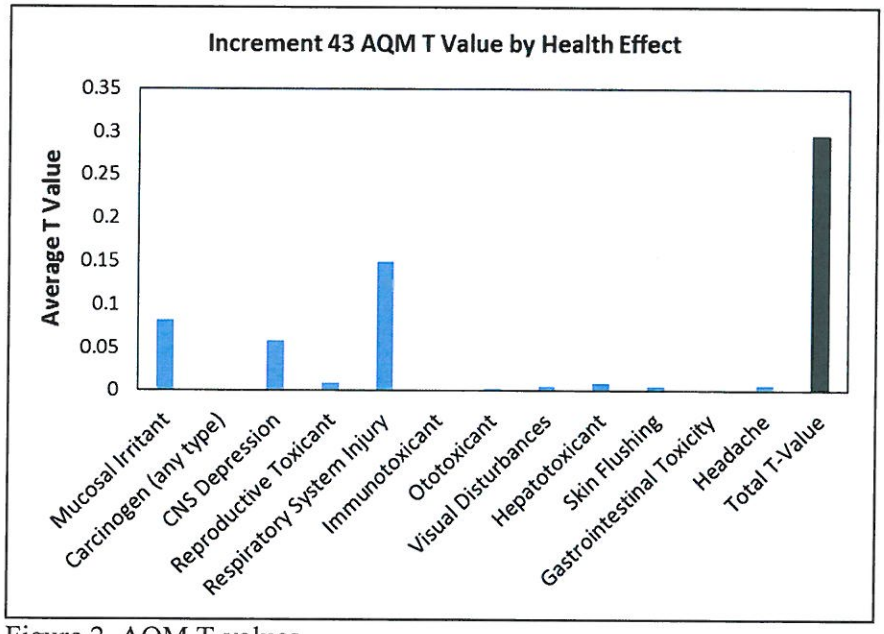

Figure 2. AQM T-values

The mGSCs provide only a snapshot of conditions and are not ideal for evaluating potential CO_2 exposures; however, reported levels were below 4 mmHg (9500 mg/m^3), as requested for this Increment in Chit 013186. **Notably, alcohol values in all routine monthly samples continue to exceed the Environmental Control and Life Support (ECLS) alcohol guideline of <5 mg/m^3, which is intended to protect the water recovery system from risk of overloading.** These levels are primarily due to a sustained increase in ethanol levels on ISS. This includes samples that were collected in the SM and Node 3 at the request of US ECLS personnel. Elevated ethanol levels were also detected in US water samples during this Increment (see Water Quality discussion below). Formaldehyde levels in the Lab and SM (shown in Table 1 and Figure 3) are generally consistent with historic levels and remain below the SMAC of 120 μg/m^3.

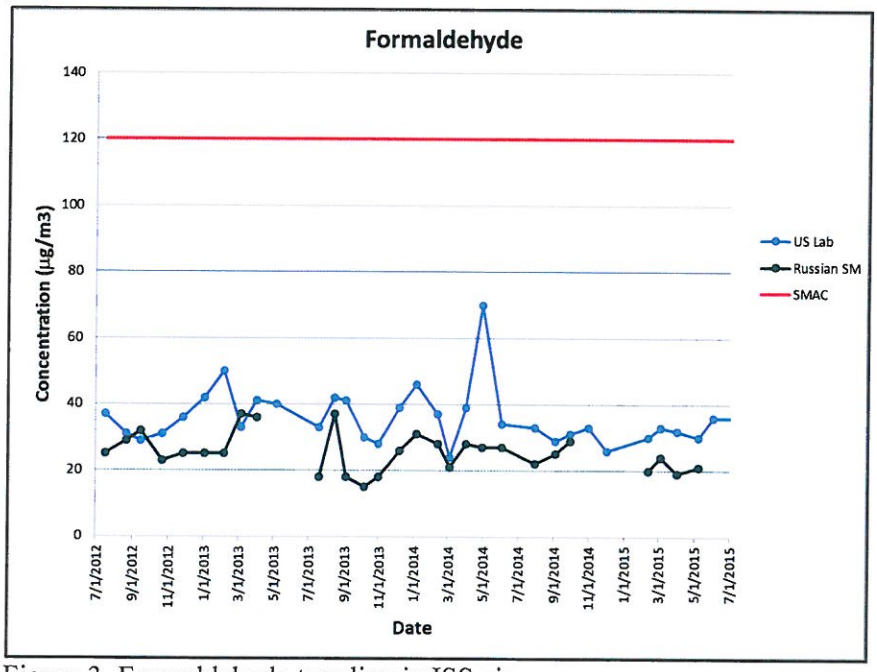

Figure 3. Formaldehyde trending in ISS air.

SpX-6 First Ingress

Reported CO_2 and Freon 218 levels measured in the SpX-6 first ingress sample indicate limited mixing with the ISS atmosphere prior to sample collection. Overall, contaminant levels at first ingress were notably lower than SpX-5. Levels of perfluoro-2-methylpentane, which originates from the Dragon vehicle's heat-exchange fluid, were elevated for SpX-5 (previously reported), but returned to low levels (0.5 mg/m^3) in this sample. The primary contributors to the T-value were acetaldehyde and carbon monoxide. In contrast to SpX-5, TMS concentration were at trace levels in this vehicle and the only non-target compounds detected were trace levels of 1,1,1,2-tetrafluoroethane (R-134a) and low levels of 1,1-difluoroethane.

Node 1 Contingency Sample

Concentrations of target compounds in the Node 1 contingency sample did not differ substantially from background ISS levels with the exception of acetaldehyde and ethanol, which were only slightly elevated, and Freon 218, which was notably elevated. The likely source of the Freon 218 is an estimated leak of 100 g of the coolant from the CKB on 11/19/2014. All target compounds detected were well below SMAC levels and would not be expected to contribute to the effects noted. A few non-target compounds were also detected, including trace levels of sulfur hexafluoride and limonene and low levels of R-134a (a refrigerant detected a few days prior during SpX-6 ingress) and 2-ethylhexanol (a precursor for coatings and plasticizers); however, the low levels of these compounds also do not explain the crew symptoms. It is possible that the symptoms may have been influenced by CO_2 levels rather than any particular trace

contaminant. Shortly following the conclusion of this increment, the CO_2 limit was reduced from 4 mmHg (9500 mg/m^3) to 3 mmHg (7100 mg/m^3) to protect against such symptoms.

WATER QUALITY

Archive samples were collected from the potable water dispenser (PWD) in the US segment and the SVO-ZV and SRV-K systems in the RS during Increment 43 and were returned on SpX-6 and 41S. Samples of wastewater and condensate were also collected from the US segment during this Increment and returned on SpX-6. Comprehensive organic and inorganic analyses were performed on all returned samples. Complete data tables with results from these analyses can be found in report #2015-WFL-ISSWQ-004.1. A summary of select analytical results is provided in Table 3 below. Expanded summary tables containing organic carbon recoveries and results for analytes detected in the samples at concentrations above reporting limits are included as attachments to this report.

Table 3. Analytical Summary of ISS Water Analyses

Sample Location	Sample Date	TOC (mg/L)	DMSD (mg/L)	Conductivity (µS/cm)	Total Iodine (mg/L)	Total Silver (µg/L)
PWD (ambient)	3/31/2015	<0.1	<0.5	1	<0.05	<1
US Wastewater	4/2/2015	11.6	10	88[b]	N/A	35
US Condensate	4/5/2015	110	34	237[b]	N/A	20
PWD (hot)	5/4/2015	0.2	<0.5	1	<0.05	<1
SVO-ZV	5/4/2015	0.9	<0.5	345[a]	<0.05	108
SRV-K (warm)	5/4/2015	9.7	<0.5	296[a]	<0.05	61
PWD Aux Port	6/10/2015	2.4	0.85	N/A[c]	N/A[c]	<2

[a]Russian water system is intentionally mineralized.
[b]TOC levels are high in wastewater and humidity condensate, but the water recovery system successfully scrubs these compounds prior to consumption.
[c]These analyses were not performed due to insufficient sample volume.

Toxicological Evaluation of ISS Water Quality: Routine water quality monitoring is performed in-flight using the total organic carbon analyzer (TOCA). Results from these analyses provide a general indication of overall water quality. Archive water samples are collected during each Increment and returned for analysis in ground laboratories. Data from the ground analyses complement the in-flight data and provide a more complete understanding of water quality on the ISS.

Potable Water

Total organic carbon (TOC) data from in-flight and archival sampling of the US potable water system conducted between June 2014 and June 2015 are shown in Figure 4. Data display excellent agreement between in-flight levels measured using the TOCA and archival samples. **TOC levels in US and Russian potable water systems were below the Spacecraft Water Exposure Guideline (SWEG) of 3.0 mg/L throughout the Increment; however, levels began to rise steeply immediately prior to 41S return.** Dimethylsilanediol (DMSD) was present in the wastewater, humidity condensate, and product water samples but was not detected in any of the potable water samples. TOC levels in the SRV-K warm sample were substantially higher than the historical average. Ethanol (11.2 mg/L) and acetate (4.8 mg/L) were the primary contributors. Methanol, acetone, acetaldehyde, and bis-2-ethylhexylphthalate were also detected. TOC levels in the SVO-ZV were below historic averages. None of the organic compounds detected in either of the Russian potable water samples exceeded SWEGs or MORD requirements.

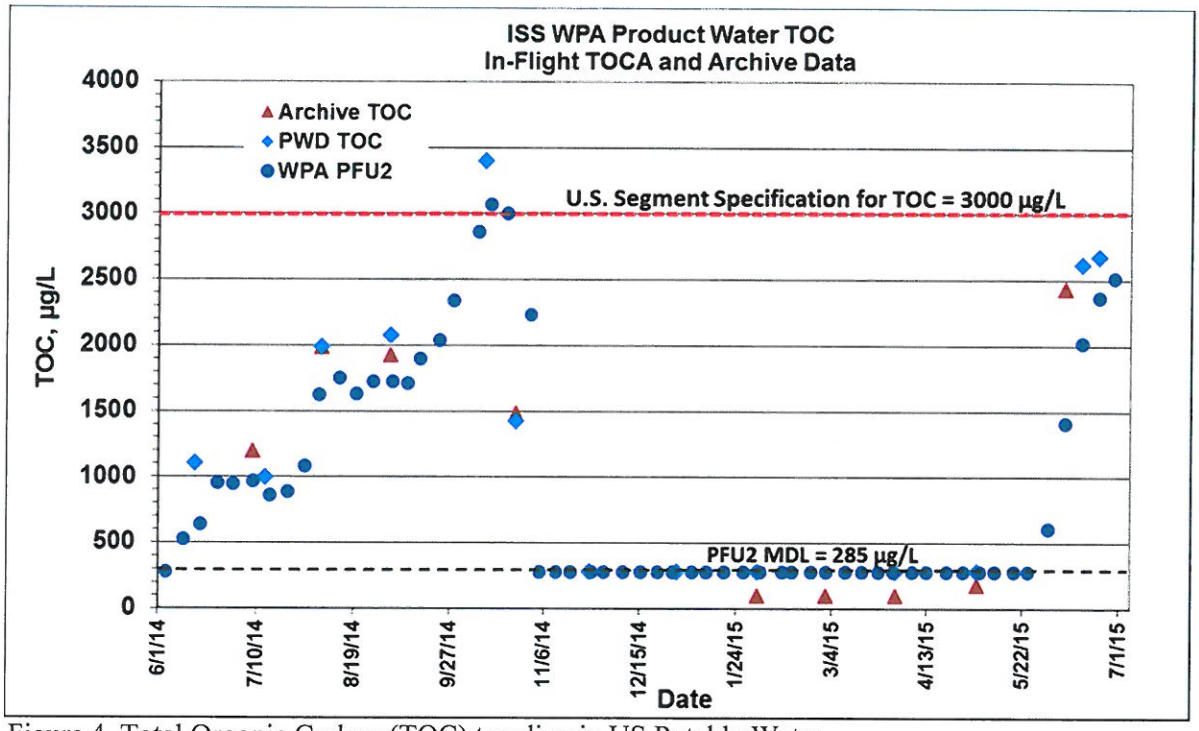

Figure 4. Total Organic Carbon (TOC) trending in US Potable Water

Conductivity provides an indication of the total amount of inorganic contaminants present in water. The conductivity in the samples from the PWD was very low, as expected. Detectable levels of calcium, nickel, zinc, and silicon were present in the US potable water. Inorganic levels are higher in Russian water, which is mineralized to improve palatability. The only inorganic compound detected above the MORD limit was manganese in both Russian potable water samples. Manganese has consistently exceeded the MORD limit of 50 µg/L in samples from the SVO-ZV but remains well below the US SWEG of 300 µg/L. All other inorganic compounds measured in archive samples were below MORD limits, indicating no concern for crew consumption.

Iodine and silver are biocides used on the US and Russian segments, respectively. Iodine is added to the water produced by the Water Processor Assembly (WPA), but it is removed prior to crew consumption to avoid potential thyroid dysfunction. Total iodine levels in the samples collected from the PWD were below detection limits, indicating successful removal of iodine. Conversely, silver levels in Russian water samples are expected to remain above the minimal effective biocidal level of 0.1 mg/L or 100 µg/L. Levels in the SVO-ZV met this minimum, but levels in the SRV-K warm (61 µg/L) remain below the minimal effective biocide level, which increases the risk of microbial growth. For additional information regarding microbial analyses, please contact the Environmental Microbiology Laboratory for post-flight reports for Increment 43.

Product Water

As depicted in Figure 4, TOC levels began to rise dramatically just prior to the end of Increment 43. In response to this increase, a sample of product water was collected from the PWD auxiliary port just prior to 43S return. Data from ground analysis of that sample indicated a much higher TOC concentration than what was measured inflight with TOCA (2.4 mg/L versus 1.4 mg/L). Initially, this raised concerns about TOCA performance, but further investigation revealed that the flush tank in the Waste and Hygiene Compartment (WHC) was filled between the TOCA analysis and sample collection. Filling the flush tank effectively purged the WPA product water tank of the water that was analyzed by TOCA. The product

tank was then refilled with freshly processed water that had a higher TOC concentration, so the returned sample was not representative of the water in the product tank at the time of the TOCA analysis. The TOC concentration measured in the subsequent TOCA analysis (2.6 mg/L) showed much better agreement with the archive sample.

During all previous TOC increases, dimethylsilanediol (DMSD) was the primary source of organic carbon in the water produced by the WPA. However, DMSD only accounted for 9% of the measured TOC in the product water sample. No other target organics were detected, although the semi-volatile organic analysis could not be run due to limited sample volume. The total silicon concentration in the sample (4.3 mg/L) was much higher than what is typically found in WPA product water (< 100 µg/L when no DMSD is present) and results from a reactive silica analysis (performed by the Advanced Water Recovery Lab at JSC) ruled out inorganic silicon as a major contributor. Together, these results indicated that the majority of the silicon must be present as organosilicon compound(s) other than DMSD. This was eventually confirmed when the source of the both the TOC and the silicon was determined to be either monomethylsilanetriol (MMST) or the sodium salt of MMST. An interim SWEG for MMST was developed based on a review of existing toxicological data. The 100 day interim SWEG was set at 110 mg/L, which is much higher than the estimated concentrations found in the product water sample. As such, the presence of MMST or its sodium salt at the current levels is not expected to pose a significant risk to crew health.

Conductivity and total iodine were not analyzed in the product water due to insufficient sample volume. Therefore, we were unable to determine whether or not an adequate levels of biocidal iodine was present in the product water sample, which is collected before iodine is removed for consumption.

Wastewater

US Wastewater is a composite of humidity condensate and urine distillate that is stored in the waste tank of the WPA prior to being processed into potable water. Overall, the U.S. wastewater sample was very clean. The TOC concentration in the sample was 11.6 mg/L, which is below the previous minimum concentration (21.1 mg/L) measured in U.S. wastewater. The silicon concentration in the sample (3.9 mg/L) was the lowest measured in U.S. wastewater. Only ethanol (47.7 mg/L) and methanol (7.4 mg/L) were detected at elevated levels. This result is consistent with the elevated levels noted in the air. The observed levels do not pose a concern for crew health, but may negatively impact the performance of the water recovery system.

Condensate

The TOC concentration in the Lab condensate tank, collected on April 6, 2015, was 110 mg/L, which is below the historical average of 174 mg/L. The most notable organic compound detected was ethanol (180 mg/L). The high ethanol level in the condensate is consistent with archival and in-flight air data that showed elevated concentrations of ethanol in the ISS atmosphere during part of Increment 43. DMSD was reported at 34.0 mg/L, and silicon was 12.6 mg/L.

Valerie Ryder

Valerie Ryder, Ph.D., DABT
NASA Toxicologist

4/6/16
Date

Enclosures
Table 1/1A: Analytical concentrations of compounds quantified in the mGSCs returned on SpX-6/43S.
Table 2/2A: T-values corresponding to concentrations in Table 1, based on 180-day SMACs

Table 3: T-values corresponding to concentrations in Table 1, based on 7-day and 180-day SMACs for evaluation of first ingress
Table 4: Analytical concentrations of compounds quantified in US potable water samples returned on SpX-6 and US product water sample returned on 43S
Table 5: Analytical concentrations of compounds quantified in Russian potable water samples returned on SpX-6
Table 6: Analytical concentrations of compounds quantified in US wastewater and condensate samples returned on SpX-6

TABLE 1
ANALYTICAL RESULTS OF
SPACEX-6 RETURN GSC AIR SAMPLES

CHEMICAL CONTAMINANT	CONCENTRATION (mg/M3)							
	AA05920 SN 2091 LAB 04/01/15 @ 08:30 GMT	AA05921 SN 2092 SM 04/01/15 @ 08:30 GMT	AA05925 SN 2103 SpaceX-6 Ingress 04/18/15 @ 08:45 GMT	AA05922 SN 2096 NODE 1 Contingency 04/22/15 @ 16:20 GMT	AA05918 SN 2008 JPM 05/08/15 @ 15:20 GMT	AA05919 SN 2009 LAB 05/08/15 @ 15:20 GMT	AA05923 SN 2095 NODE 3 EtOH Invest.[1] 05/19/15 @ 12:04 GMT	AA05924 SN 2099 SM EtOH Invest. 05/19/15 @ 12:06 GMT
TARGET COMPOUNDS (TO-15)								
Methanol	0.30	0.30	0.39	0.36	0.32	0.34	0.27	0.25
Acetaldehyde	0.18	0.19	0.095	0.26	0.19	0.20	0.12	0.13
Ethanol	**8.0**	**8.1**	**5.5**	**11**	**9.3**	**9.4**	**8.6**	**7.6**
Acetone	0.30	0.27	0.18	0.26	0.32	0.33	0.15	0.15
Propanal (Propionaldehyde)	<0.025	TRACE	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
2-Propanol (Isopropanol)	0.28	0.17	0.56	0.26	0.27	0.24	0.099	0.091
Acrylonitrile	<0.025	<0.025	<0.025	<0.025	<0.025	TRACE	<0.025	<0.025
Methyl acetate	TRACE	<0.025	<0.025	<0.025	TRACE	TRACE	<0.025	<0.025
Methylene chloride (Dichloromethane)	TRACE	TRACE	<0.025	<0.025	TRACE	TRACE	<0.025	<0.025
1-Propanol	TRACE	0.027	TRACE	0.026	0.033	0.030	TRACE	TRACE
2-Butanone (Methyl ethyl ketone)	TRACE	<0.025	TRACE	TRACE	TRACE	TRACE	<0.025	<0.025
Ethyl acetate	0.035	0.038	TRACE	0.028	TRACE	0.026	<0.025	<0.025
1,2-Dichloroethane	TRACE	TRACE	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
1-Butanol	0.052	0.044	0.041	0.045	0.044	0.041	<0.025	<0.025
Toluene	TRACE	TRACE	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
o-Xylene	0.037	0.034	<0.025	TRACE	TRACE	TRACE	<0.025	<0.025
Octafluoropropane (Perfluoropropane)	**146**	**145**	**44**	**130**	**122**	**123**	**91**	**91**
Perfluoro(2-methylpentane)	<0.050	<0.050	0.45	0.14	0.21	0.15	<0.050	<0.050
Carbonyl sulfide (Carbon oxide sulfide)	<0.025	TRACE	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
Isobutane	<0.025	<0.025	TRACE	<0.025	<0.025	<0.025	<0.025	<0.025
2-Methyl-1-propene	TRACE	TRACE	<0.025	<0.025	TRACE	TRACE	<0.025	<0.025
Carbon disulfide	<0.025	TRACE	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
Trimethylsilanol	0.12	0.035	TRACE	0.096	0.12	0.090	<0.025	<0.025
Octamethylcyclotetrasiloxane	TRACE	<0.075	<0.075	<0.075	<0.075	<0.075	<0.075	<0.075
Decamethylcyclopentasiloxane	0.34	<0.15	<0.15	0.25	0.35	0.31	<0.15	<0.15
Propane	<0.050	<0.050	TRACE	<0.050	<0.050	<0.050	<0.050	<0.050
Isoprene (2-Methyl-1,3-butadiene)	0.05	TRACE	<0.050	TRACE	TRACE	TRACE	<0.050	<0.050
SPECIAL INTEREST COMPOUNDS **								
Hexamethylcyclotrisiloxane %	11	1.0	0.79	1.0	1.4	1.1	0.36	0.52
NON-TARGET COMPOUNDS **								
Sulfur hexafluoride	TRACE	<0.050	<0.050	TRACE	<0.050	<0.050	<0.050	<0.050
1,1,1,2-Tetrafluoroethane	0.14	0.13	TRACE	0.094	0.066	0.074	0.054	0.055
1,1-Difluoroethane	<0.050	<0.050	0.13	<0.050	<0.050	<0.050	<0.050	<0.050
2-Ethyl-1-hexanol	0.064	<0.050	<0.050	0.061	0.074	0.058	<0.050	<0.050
Limonene	TRACE	TRACE	<0.050	TRACE	<0.050	<0.050	<0.050	<0.050
TOTAL ALCOHOLS PLUS ACETONE	**8.9**	**8.9**	**6.6**	**12**	**10**	**10**	**9.2**	**8.1**
TARGET COMPOUNDS (GC)								
Carbon Monoxide	0.90	1.6	3.1	0.93	0.93	0.92	0.93	1.3
Methane	1.7	1.5	3.0	6.3	7.3	7.3	7.1	7.1
Hydrogen	4.1	4.1	2.5	4.9	5.3	5.3	5.8	6.0
Carbon Dioxide	6950	7210	2770	7070	5400	5090	5200	6340
TOTAL CONCENTRATION (NON-METHANE HYDROCARBONS)	**167**	**156**	**52**	**144**	**135**	**135**	**101**	**100**
TOTAL CONCENTRATION - OFP (NON-METHANE HYDROCARBONS)	**21**	**11**	**8.2**	**14**	**13**	**13**	**9.7**	**8.8**

[1] Ethanol investigation
* GC/FID data results are in bold
** Quantified using "B" response factor except where noted
% Response factor generated from an internal study
<: Value is less than the laboratory report detection limit.
TRACE: Amount detected is sufficient for compound identification only.
OFP - Octafluoropropane

TABLE 1A
ANALYTICAL RESULTS OF
SOYUZ 43 RETURN GSC AIR SAMPLES

CHEMICAL CONTAMINANT	CONCENTRATION (mg/M^3)			
	AQ160012 SN 2104 LAB 6/2/15 @ 10:30 GMT	AQ160013 SN 2105 COL 6/2/15 @ 10:30 GMT	AQ160014 SN 2101 LAB 6/29/15 @ 12:30 GMT	AQ160015 SN 2102 SM 6/29/15 @ 12:40 GMT
TARGET COMPOUNDS (TO-15) **				
Octafluoropropane (Perfluoropropane) *	**107**	**83**	**97**	**99**
Perfluoro(2-methylpentane)	<0.050	<0.050	<0.050	<0.050
Carbonyl sulfide (Carbon oxide sulfide)	<0.025	<0.025	<0.025	<0.025
Chloromethane	<0.025	<0.025	<0.025	<0.025
Isobutane	<0.025	<0.025	<0.025	<0.025
Methanol	0.36	0.39	0.34	0.33
Acetaldehyde	0.18	0.24	0.22	0.20
2-Methyl-1-propene	<0.025	<0.025	<0.025	<0.025
Ethanol *	**8.2**	**8.5**	**5.9**	**5.5**
Acetone	0.25	0.27	0.27	0.28
Propanal (Propionaldehyde)	<0.025	<0.025	<0.025	<0.025
2-Propanol (Isopropanol) *	0.25	0.12	0.33	0.42
Isoprene (2-Methyl-1,3-butadiene)	<0.050	<0.050	<0.050	<0.050
2-Methyl-2-propanol	<0.025	<0.025	<0.025	<0.025
Methyl acetate	<0.025	<0.025	<0.025	<0.025
Methylene chloride (Dichloromethane)	<0.025	<0.025	<0.025	<0.025
Carbon disulfide	<0.025	<0.025	<0.025	<0.025
1-Propanol	TRACE	TRACE	TRACE	TRACE
Trimethylsilanol	0.044	0.059	0.043	0.026
Butanal (Butyraldehyde)	<0.025	<0.025	<0.025	<0.025
2-Butanone (Methyl ethyl ketone)	<0.025	<0.025	<0.025	<0.025
Ethyl acetate	TRACE	<0.025	<0.025	<0.025
1,2-Dichloroethane	<0.025	<0.025	<0.025	<0.025
1-Butanol	TRACE	TRACE	TRACE	0.025
2-Methylhexane	<0.025	<0.025	<0.025	<0.025
2,3-Dimethylpentane	<0.025	<0.025	<0.025	<0.025
3-Methylhexane	TRACE	TRACE	TRACE	TRACE
2-Pentanone	<0.025	<0.025	<0.025	<0.025
Pentanal	<0.025	<0.025	<0.025	<0.025
n-Heptane	<0.025	<0.025	<0.025	<0.025
4-Methyl-2-pentanone (MIBK)	<0.025	<0.025	<0.025	<0.025
Toluene	<0.025	<0.025	<0.025	TRACE
Hexanal	<0.025	<0.025	<0.025	<0.025
Butyl acetate	<0.025	<0.025	<0.025	<0.025
Ethylbenzene	<0.025	<0.025	<0.025	<0.025
m & p-Xylene	<0.050	<0.050	<0.050	<0.050
o-Xylene	<0.025	<0.025	<0.025	<0.025
Octamethylcyclotetrasiloxane	<0.075	<0.075	<0.075	<0.075
Decamethylcyclopentasiloxane	0.65	0.38	<0.15	<0.15
SPECIAL INTEREST COMPOUNDS ***				
Hexamethylcyclotrisiloxane #	0.11	0.14	0.11	<0.10
NON-TARGET COMPOUNDS ***				
1,1-Difluoroethane	<0.050	<0.050	<0.050	<0.050
Fluorotrimethylsilane	<0.050	<0.050	<0.050	<0.050
Carbonic acid, dimethyl ester	<0.050	<0.050	<0.050	<0.050
Pentamethyldisiloxane-1-ol	<0.050	<0.050	<0.050	<0.050
C12-Alkane	<0.050	<0.050	<0.050	<0.050
C12-Alkane	<0.050	<0.050	<0.050	<0.050
C12-Alkane	<0.050	<0.050	<0.050	<0.050
C12-Alkane	<0.050	<0.050	<0.050	<0.050
C12-Alkane	<0.050	<0.050	<0.050	<0.050
C12-Alkane	<0.050	<0.050	<0.050	<0.050
Dodecamethylpentasiloxane	<0.050	<0.050	<0.050	<0.050
TOTAL ALCOHOLS PLUS ACETONE	**9.1**	**9.3**	**6.9**	**6.5**
TARGET COMPOUNDS (GC)				
Carbon Monoxide	1.0	1.1	0.83	0.78
Methane	8.5	8.5	8.7	9.1
Hydrogen	5.8	6.0	3.0	2.9
Carbon Dioxide	6000	6700	3300	4300
TOTAL CONCENTRATION (NON-METHANE HYDROCARBONS)	**118**	**94**	**105**	**106**
TOTAL CONCENTRATION - OFP (NON-METHANE HYDROCARBONS)	**10**	**10**	**7.3**	**6.8**

* GC/FID data results are in bold

** Quantified using a multi-point calibration

*** Quantified using "B" response factor except where noted; concentrations are estimates only.

Response factor generated from an internal study

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

TRACE: Amount detected is sufficient for compound identification only.

OFP - Octafluoropropane

TABLE 2
T-VALUES FOR SPACEX-6 RETURN GSC AIR SAMPLES

CHEMICAL CONTAMINANT	T-VALUE (180-d SMAC)						
	AA05920 SN 2091 LAB 04/01/15 @ 08:30 GMT	AA05921 SN 2092 SM 04/01/15 @ 08:30 GMT	AA05922 SN 2096 NODE 1 Contingency 04/22/15 @ 17:21 GMT	AA05918 SN 2008 JPM 05/08/15 @ 15:20 GMT	AA05919 SN 2009 LAB 05/08/15 @ 15:20 GMT	AA05923 SN 2095 NODE 3 EtOH Invest. [1] 05/19/15 @ 12:04 GMT	AA05924 SN 2099 SM EtOH Invest. 05/19/15 @ 12:06 GMT
TARGET COMPOUNDS (TO-15)							
Methanol	0.00329	0.00335	0.00401	0.00356	0.00383	0.00303	0.00282
Acetaldehyde	0.04472	0.04791	0.06587	0.04821	0.04977	0.02958	0.03292
Ethanol	0.00399	0.00407	0.00552	0.00463	0.00471	0.00432	0.00381
Acetone	0.00581	0.00516	0.00493	0.00620	0.00642	0.00282	0.00297
Propanal (Propionaldehyde)	ND	0.00114	ND	ND	ND	ND	ND
2-Propanol (Isopropanol)	0.00185	0.00112	0.00172	0.00182	0.00158	0.00066	0.00061
Acrylonitrile	ND	ND	ND	ND	0.00446	ND	ND
Methyl acetate	0.00010	ND	ND	0.00010	0.00010	ND	ND
Methylene chloride (Dichloromethane)	0.00125	0.00125	ND	0.00125	0.00125	ND	ND
1-Propanol	0.00013	0.00027	0.00027	0.00034	0.00031	0.00013	0.00013
2-Butanone (Methyl ethyl ketone)	0.00042	ND	0.00042	0.00042	0.00042	ND	ND
Ethyl acetate	0.00019	0.00021	0.00015	0.00007	0.00015	ND	ND
1,2-Dichloroethane	0.00781	0.00781	ND	ND	ND	ND	ND
1-Butanol	0.00129	0.00109	0.00112	0.00111	0.00103	ND	ND
Toluene	0.00083	0.00083	ND	ND	ND	ND	ND
o-Xylene	0.00100	0.00091	0.00034	0.00034	0.00034	ND	ND
Octafluoropropane (Perfluoropropane)	0.00172	0.00171	0.00153	0.00144	0.00144	0.00107	0.00107
Perfluoro(2-methylpentane)	ND	ND	0.00000	0.00000	0.00000	ND	ND
Carbonyl sulfide (Carbon oxide sulfide)	ND	ND	ND	ND	ND	ND	ND
2-Methyl-1-propene	0.00001	0.00001	ND	0.00001	0.00001	ND	ND
Carbon disulfide	ND	0.00078	ND	ND	ND	ND	ND
Trimethylsilanol	0.03010	0.00873	0.02403	0.02985	0.02248	ND	ND
Octamethylcyclotetrasiloxane	0.00313	ND	ND	ND	ND	ND	ND
Decamethylcyclopentasiloxane	0.02245	ND	0.01658	0.02318	0.02054	ND	ND
Isoprene (2-Methyl-1,3-butadiene)	0.01684	0.00833	0.00833	0.00833	0.00833	ND	ND
SPECIAL INTEREST COMPOUNDS							
Hexamethylcyclotrisiloxane %	1.17975	0.11063	0.11341	0.15497	0.12236	0.03952	0.05763
NON-TARGET COMPOUNDS							
Sulfur hexafluoride	0.00002	ND	0.00002	ND	ND	ND	ND
1,1,1,2-Tetrafluoroethane	0.00136	0.00122	0.00091	0.00063	0.00071	0.00052	0.00053
2-Ethyl-1-hexanol	0.00121	ND	0.00114	0.00140	0.00110	ND	ND
Limonene	0.00022	0.00022	0.00022	ND	ND	ND	ND
TARGET COMPOUNDS (GC)							
Carbon Monoxide	0.05269	0.09117	0.05444	0.05484	0.05430	0.05484	0.07447
Methane	0.00049	0.00042	0.00179	0.00208	0.00208	0.00203	0.00203
Hydrogen	0.01208	0.01210	0.01434	0.01555	0.01546	0.01697	0.01758
Carbon Dioxide	0.53462	0.55462	0.54385	0.41538	0.39154	0.40000	0.48769
TOTAL T-VALUE	**1.92938**	**0.86610**	**0.86494**	**0.77572**	**0.71472**	**0.55549**	**0.68426**
TOTAL T-VALUE - CO2	**1.39476**	**0.31148**	**0.32109**	**0.36034**	**0.32318**	**0.15549**	**0.19657**

[1] Ethanol investigation
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
T-VALUES FOR 43S RETURN GSC AIR SAMPLES

CHEMICAL CONTAMINANT	T-VALUE (180-d SMAC)			
	AQ160012 SN 2104 LAB 6/2/15 @ 10:30 GMT	AQ160013 SN 2105 COL 6/2/15 @ 10:30 GMT	AQ160014 SN 2101 LAB 6/29/15 @ 12:30 GMT	AQ160015 SN 2102 SM 6/29/15 @ 12:40 GMT
TARGET COMPOUNDS (TO-15)				
Octafluoropropane (Perfluoropropane)	0.00126	0.00098	0.00114	0.00117
Perfluoro(2-methylpentane) &	ND	ND	ND	ND
Isobutane	ND	ND	ND	ND
Methanol	0.00404	0.00432	0.00383	0.00370
Acetaldehyde	0.04557	0.06122	0.05616	0.05012
2-Methyl-1-propene	ND	ND	ND	ND
Ethanol	0.00410	0.00423	0.00296	0.00273
Acetone	0.00476	0.00517	0.00514	0.00534
2-Propanol (Isopropanol)	0.00168	0.00083	0.00220	0.00280
Isoprene (2-Methyl-1,3-butadiene)	ND	ND	ND	ND
2-Methyl-2-propanol	ND	ND	ND	ND
Methyl acetate	ND	ND	ND	ND
Carbon disulfide	ND	ND	ND	ND
1-Propanol	0.00013	0.00013	0.00013	0.00013
Trimethylsilanol	0.01100	0.01480	0.01064	0.00641
Butanal (Butyraldehyde)	ND	ND	ND	ND
2-Butanone (Methyl ethyl ketone)	ND	ND	ND	ND
Ethyl acetate	0.00007	ND	ND	ND
1,2-Dichloroethane	ND	ND	ND	ND
1-Butanol	0.00031	0.00031	0.00031	0.00063
3-Methylhexane	0.00104	0.00104	0.00104	0.00104
Pentanal	ND	ND	ND	ND
4-Methyl-2-pentanone (MIBK)	ND	ND	ND	ND
Toluene	ND	ND	ND	0.00083
Butyl acetate	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND
m & p-Xylene	ND	ND	ND	ND
o-Xylene	ND	ND	ND	ND
Decamethylcyclopentasiloxane	0.04321	0.02521	ND	ND
SPECIAL INTEREST COMPOUNDS				
Hexamethylcyclotrisiloxane	0.01249	0.01511	0.01261	ND
NON-TARGET COMPOUNDS				
1,1-Difluoroethane	ND	ND	ND	ND
Carbonic acid, dimethyl ester	ND	ND	ND	ND
C12-Alkane	ND	ND	ND	ND
C12-Alkane	ND	ND	ND	ND
C12-Alkane	ND	ND	ND	ND
C12-Alkane	ND	ND	ND	ND
C12-Alkane	ND	ND	ND	ND
C12-Alkane	ND	ND	ND	ND
TARGET COMPOUNDS (GC)				
CARBON MONOXIDE	0.06042	0.06177	0.04861	0.04592
METHANE	0.00242	0.00244	0.00248	0.00261
HYDROGEN	0.01698	0.01777	0.00878	0.00856
CARBON DIOXIDE	0.46079	0.51534	0.25500	0.32994
TOTAL T-VALUE	**0.67028**	**0.73066**	**0.41104**	**0.46194**
TOTAL T-VALUE - CO2	**0.20950**	**0.21532**	**0.15604**	**0.13199**

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 3
T-VALUES FOR SPACEX-6 GSC INGRESS SAMPLE

CHEMICAL CONTAMINANT	T-VALUE (7-d SMAC) AA05925 SN 2103 SpaceX-6 Ingress 04/18/15 @ 08:45 GMT	T-VALUE (180-d SMAC) AA05925 SN 2103 SpaceX-6 Ingress 04/18/15 @ 08:45 GMT
TARGET COMPOUNDS (TO-15)		
Methanol	0.00434	0.00434
Acetaldehyde	0.02383	0.02383
Ethanol	0.00273	0.00273
Acetone	0.00337	0.00337
2-Propanol (Isopropanol)	0.00375	0.00375
1-Propanol	0.00013	0.00013
2-Butanone (Methyl ethyl ketone)	0.00042	0.00042
Ethyl acetate	0.00007	0.00007
1-Butanol	0.00052	0.00103
Octafluoropropane (Perfluoropropane)	0.00052	0.00052
Perfluoro(2-methylpentane)	0.00003	0.00000
Isobutane	0.00005	0.00005
Trimethylsilanol	0.00313	0.00313
Propane	0.00023	0.00455
SPECIAL INTEREST COMPOUNDS		
Hexamethylcyclotrisiloxane %	0.00883	0.08831
NON-TARGET COMPOUNDS		
1,1,1,2-Tetrafluoroethane	0.00024	0.00024
1,1-Difluoroethane	0.00199	0.00199
TARGET COMPOUNDS (GC)		
Carbon Monoxide	0.04970	0.18420
Methane	0.00086	0.00086
Hydrogen	0.00731	0.00731
Carbon Dioxide	0.21308	0.21308
TOTAL T-VALUE	**0.32509**	**0.54390**
TOTAL T-VALUE - CO2	**0.11201**	**0.33082**

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 4
Expedition 43 Water Sample Summary Report
US Potable and Product Water Samples

Mission					SpaceX-6/Exp. 43		Soyuz 41/Exp. 43
Sample Location					WPA PWD Ambient	WPA PWD Hot	PWD Aux Port
Sample Description					Potable Water	Potable Water	Product Water
Sample Date					3/31/2015	5/4/2015	6/10/2015
Analysis/Sample ID	Units	Test Conducted by	Potable Water Maximum Contaminant Level (MCL)	Maximum Contaminant Level Source	20150526007	20150526008	20150612003
Physical Characteristics							
pH	pH units	U.S.	4.5-8.5	41000	6.17	6.58	NA
Conductivity	µS/cm	U.S.			1	1	NA
Trace Metals (ICP/MS)							
Calcium	mg/L	U.S.	30	41000	<0.01	0.01	0.04
Potassium	mg/L	U.S.	340	41000	<0.01	<0.01	0.02
Nickel	µg/L	U.S.	300	SWEG&41000	7	6	96
Zinc	µg/L	U.S.	2,000	SWEG&41000	2	2	<2
Silicon (ICP/MS)							
Silicon (ICP/MS)	µg/L	U.S.			44	248	4260
Total Organic Carbon (Sievers)							
Inorganic Carbon	mg/L	U.S.			0.79	0.80	0.81
Organic Carbon	mg/L	U.S.	3	41000	<0.10	0.18	2.44
Semi-volatiles (GC/MS) - Target List							
Methyl sulfone	µg/L	U.S.			86	71	NA
Diethylphthalate	µg/L	U.S.			<8	14	NA
Silanols (LC/RI) (R & D Method -NIST traceable standard not available)							
Dimethylsilanediol (DMSD)	µg/L	U.S.	35,000	SWEG	<500	<500	850
Organic Carbon Recovery	percent	U.S.			N/A	15.11	9.07
Unaccounted Organic Carbon	mg/L	U.S.			N/A	0.15	2.22

NA=Not analyzed
MI=Matrix Interference
N/A=Not applicable

Table 5
Expedition 43 Water Sample Summary Report
Russian Potable Water Samples

Mission					SpaceX-6/Exp. 43	
Sample Location			Potable Water Maximum Contaminant Level (MCL)	Maximum Contaminant Level Source	SVO-ZV	SRV-K Warm
Sample Description		Test Conducted by			Potable Water	Potable Water
Sample Date					5/4/2015	5/4/2015
Analysis/Sample ID	Units				20150526009	20150526010
Physical Characteristics						
pH	pH units	U.S.	5.5-9.0	MORD	7.88	7.80
Conductivity	µS/cm	U.S.			345	296
Turbidity	NTU	U.S.	1.5*	MORD	1.3	1.6
Anions (IC/ISE)						
Chloride	mg/L	U.S.	250	MORD	10.9	9.8
Fluoride	mg/L	U.S.	1.5/4	MORD/EPA	0.1	0.1
Sulfate	mg/L	U.S.	250	MORD	28.0	27.2
Metals (ICP/MS)						
Calcium	mg/L	U.S.	100	MORD	45.5	38.6
Magnesium	mg/L	U.S.	50	MORD	11.6	9.15
Potassium	mg/L	U.S.			2.26	2.00
Sodium	mg/L	U.S.			9.67	8.77
Aluminum	µg/L	U.S.			83	47
Barium	µg/L	U.S.	1,000/10,000	MORD/SWEG	30	27
Copper	µg/L	U.S.	1,000/1,300	MORD/EPA	2	2
Manganese	µg/L	U.S.	50/300	MORD/SWEG	98	95
Nickel	µg/L	U.S.	100/300	MORD/SWEG	1	3
Silver	µg/L	U.S.	500/400	MORD/SWEG	108	61
Silver, Dissolved	µg/L	U.S.			25	5
Zinc	µg/L	U.S.	5,000/2,000	MORD/SWEG	86	63
Silicon (ICP/MS)						
Silicon (ICP/MS)	µg/L	U.S.			1990	1340
Total Organic Carbon (OI)						
Inorganic Carbon	mg/L	U.S.			30.1	24.3
Organic Carbon	mg/L	U.S.	20	MORD	0.89	9.70
Volatile Organics						
Acetone	µg/L	U.S.	15,000	SWEG	<5	52
Volatiles (GC/MS) - Special Interest Compounds						
Acetaldehyde	µg/L	U.S.			<5	99
Semi-volatiles (GC/MS) - Target List						
bis-(2-Ethylhexyl)adipate	µg/L	U.S.	400	EPA	90	<20
bis-(2-Ethylhexyl)phthalate	µg/L	U.S.	20,000/6	SWEG/EPA	161	60
Semi-volatiles (GC/MS) - Special Interest Compounds (Semi-quantitative - 2 pt curve) - None found						
Monomethyl phthalate	µg/L	U.S.			40	not found
Alcohols (DAI/GC/MS)						
Ethanol	µg/L	U.S.			<400	11,200
Methanol	µg/L	U.S.	40000	SWEG	<400	886
Carboxylates (CE)						
Acetate	µg/L	U.S.			<625	4770
Organic Carbon Recovery	percent	U.S.			23.14	84.98
Unaccounted Organic Carbon	mg/L	U.S.			0.69	1.46

NA=Not analyzed; MI=Matrix interference
*MORD limit 1.5 mg/L (Russian method)
#allowable limit after mineralization

Table 6
Expedition 43 Water Sample Summary Report
US Wastewater Sample

Mission			SpaceX-6/Exp. 43	
Sample Location			WPA Wastewater ORU	US Lab Condensate Tank
Sample Description		Test	WPA Wastewater Water	Condensate sample
Sample Date		Conducted	4/2/2015	4/6/2015
Analysis/Sample ID	Units	by	20150526011	20150526012
Physical Characteristics				
pH	pH units	U.S.	7.36	7.60
Conductivity	µS/cm	U.S.	88	237
Anions (IC/ISE/ICP/MS)				
Chloride	mg/L	U.S.	0.6	<0.5
Fluoride	mg/L	U.S.	0.2	0.4
Sulfate	mg/L	U.S.	0.9	<0.5
Cations (IC)				
Ammonia as Nitrogen (NH3-N)	mg/L	U.S.	8.93	28.0
Trace Metals (ICP/MS)				
Calcium	mg/L	U.S.	0.11	0.15
Magnesium	mg/L	U.S.	0.01	<0.01
Potassium	mg/L	U.S.	0.29	0.05
Sodium	mg/L	U.S.	0.35	0.09
Aluminum	µg/L	U.S.	5	6
Chromium	µg/L	U.S.	48	7
Copper	µg/L	U.S.	4	11
Iron	µg/L	U.S.	6	11
Manganese	µg/L	U.S.	8	18
Molybdenum	µg/L	U.S.	4	1
Nickel	µg/L	U.S.	229	306
Silver	µg/L	U.S.	35	20
Zinc	µg/L	U.S.	5230	3260
Silicon (ICP/MS)				
Silicon (ICP/MS)	µg/L	U.S.	3880	12,600
Total Organic Carbon (OI)				
Inorganic Carbon	mg/L	U.S.	9.5	27.2
Organic Carbon	mg/L	U.S.	11.6	110
Volatile Organics				
Acetone	µg/L	U.S.	<50	264
Volatile Organics -Special Interest Compounds (Semi-quantitative)				
Acetaldehyde	µg/L	U.S.	not found	87
Trimethylsilanol	µg/L	U.S.	73	210
Semi-volatiles (GC/MS) - Target List				
Benzothiazole	µg/L	U.S.	65	120
N-n-Butylbenzenesulfonamide	µg/L	U.S.	40	78
Tris(2-Chloroethyl)phosphate	µg/L	U.S.	56	67
Decamethylcyclopentasiloxane	µg/L	U.S.	95	105
Dodecamethylcyclohexasiloxane	µg/L	U.S.	80	88
Methyl sulfone	µg/L	U.S.	206	150
Base/Neutral Extractables - EPA 625 List				
bis-(2-Ethylhexyl)phthalate	µg/L	U.S.	64	90
Dibutylphthalate	µg/L	U.S.	<20	60
Diethylphthalate	µg/L	U.S.	<20	1290
Isophorone	µg/L	U.S.	<20	41
Semi-volatiles (GC/MS) - Special Interest Compounds (Semi-quantitative - 2 pt curve)				
2-(2-Butoxyethoxy)ethanol	µg/L	U.S.	not found	710
Butylated hydroxyanisole (BHA)	µg/L	U.S.	not found	460
3-tert-Butylphenol	µg/L	U.S.	<100	120
Diethylene glycol monoethyl ether	µg/L	U.S.	560	not found
N,N-Dimethyl acetamide	µg/L	U.S.	320	840
N,N-Dimethylformamide	µg/L	U.S.	230	500
Dipropylene glycol methyl ether	µg/L	U.S.	not found	1600
2-Ethoxyethanol	µg/L	U.S.	not found	790

NA=Not analyzed
MI=Matrix Interference
N/A=Not applicable

Table 6
Expedition 43 Water Sample Summary Report
US Wastewater Sample

Mission			SpaceX-6/Exp. 43	
Sample Location			WPA Wastewater ORU	US Lab Condensate Tank
Sample Description		Test	WPA Wastewater Water	Condensate sample
Sample Date		Conducted	4/2/2015	4/6/2015
Analysis/Sample ID	Units	by	20150526011	20150526012
p-Menth-1-en-8-ol (alpha-Terpineol)	µg/L	U.S.	<50	110
1-Methyl-2-pyrrolidinone	µg/L	U.S.	200	590
Monomethyl phthalate	µg/L	U.S.	110	290
(+)-Neomenthol	µg/L	U.S.	not found	160
2-Phenoxyethanol	µg/L	U.S.	not found	50
2-Phenyl-2-propanol	µg/L	U.S.	not found	170
1,3,5-Triallyl-1,3,5-triazine-2,4,6(1H,3H,5H)-	µg/L	U.S.	<50	120
Tributyl phosphate	µg/L	U.S.	not found	48
Alcohols (DAI/GC/MS)				
Ethanol	µg/L	U.S.	<400	180,000
Methanol	µg/L	U.S.	<400	5470
Glycols (DAI/GC/MS)				
1,2-Ethanediol (Ethylene glycol)	µg/L	U.S.	<1000	1680
1,2-Propanediol (Propylene glycol)	µg/L	U.S.	<1000	6480
Silanols (LC/RI) (R & D Method -NIST traceable standard not available)				
Dimethylsilanediol (DMSD)	µg/L	U.S.	10,000	34,000
Carboxylates (CE)				
Acetate	µg/L	U.S.	<625	634
Aldehydes				
Formaldehyde	µg/L	U.S.	<20	90
Organic Carbon Recovery	percent	U.S.	31.42	103.79
Unaccounted Organic Carbon	mg/L	U.S.	7.96	0.00

NA=Not analyzed
MI=Matrix Interference
N/A=Not applicable