Camp Stanley Storage Activity
Environmental Program Update

FACT SHEET

No. 35 – Annual Fact Sheet
May 2015

The purpose of this Fact Sheet is to provide an update on the status of Camp Stanley Storage Activity's (CSSA) environmental program, as well as an overview of quarterly groundwater sampling conducted in 2014. CSSA's Administrative Record and results for all groundwater sampling events are available in the CSSA Environmental Encyclopedia located on the internet at www.stanley.army.mil.

Overview of CSSA's Environmental Program

In 1991, routine water well testing by the Texas Department of Health detected the presence of dissolved cleaning solvent tetrachloroethene (PCE) and related degradation products above maximum contaminant levels (MCLs) in a CSSA water supply well (Well 16 [CS-16]). Subsequent sampling showed volatile organic compound (VOC) contaminant concentrations greater than MCLs in other wells. VOCs make up substances such as paint thinners, dry cleaning solvents, and some constituents of petroleum fuels (e.g. gasoline and natural gas). Decades-old industrial practices sometimes accidentally released VOCs into the environment, where they can contaminate the soil and groundwater. CSSA ceased using VOC solvents in the mid-1990s, and monitors for VOCs and metals associated with its past industrial processes.

Sources of CSSA's groundwater contamination were initially determined to be Solid Waste Management Unit (SWMU) O-1 and SWMU B-3; this area is referred to as Plume 1. Later, Area of Concern 65 (AOC-65) was identified as the source of groundwater contamination at Plume 2. Both plumes are shown on Figure 1.

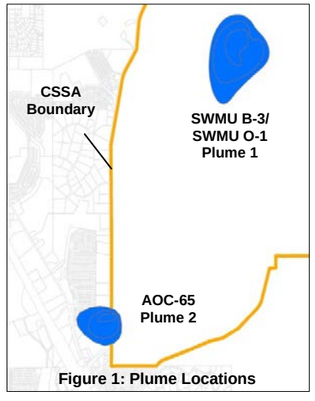


Figure 1: Plume Locations

In May 1999, the U.S. Environmental Protection Agency (USEPA) issued a Resource Conservation and Recovery Act (RCRA) 3008(h) Administrative Order on Consent (Order) requiring CSSA to identify, investigate, and prevent further spread of releases of hazardous wastes and/or hazardous constituents to the environment, and to ensure that corrective action activities are implemented to protect human health and the environment. These requirements were met by following the RCRA process as shown in Figure 2.

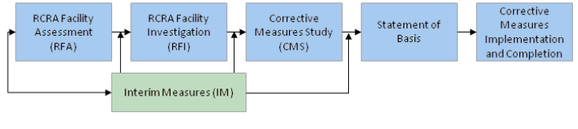


Figure 2: RCRA Corrective Action Process

Significant Milestone Reached

After 15 years of investigations and cleanups, CSSA reached a significant milestone in its environmental program with USEPA's issuance of a Statement of Basis in April 2015.

Between 1999 and 2014, investigations and removal of soil (if warranted) were conducted at 83 identified waste sites. A total of 77 sites were closed to Texas Commission on Environmental Quality (TCEQ) residential land use standards. Four additional SWMUs were combined with RMU-1 as they are part of the active firing range. A total of approximately 212,000 tons of contaminated soil were excavated and either disposed of off-site or beneficially reused at CSSA. Nearly 160,000 cubic yards of soil has been reused at the East Pasture firing range which greatly enhanced the operational safety of the range. Additionally, more than 560 tons of scrap metal removed from waste sites were also recycled. One investigation site was converted into a solar array station after the site was cleaned. These resulted not only in significant cost savings, they supported CSSA's goal of using sustainable "green" remediation practices. Two sites with groundwater contamination remain open (discussed below), and are the subject of the Statement of Basis.

The RFI and CMS reports were approved by USEPA in December 2014 and January 2015, respectively. A public meeting was held in April 2015 to present the Statement of Basis and proposed remedy for groundwater contamination at CSSA. USEPA solicited feedback from the community and addressed public comments on the proposed remedy. The Statement of Basis document can be viewed at http://www.epa.gov/earth1r6/6pd/rcra_c/ca/camp-stanley-sob.pdf. Additional documents pertaining to CSSA's environmental program are available on the CSSA Environmental Encyclopedia at http://www.stanley.army.mil/.

The corrective measure preferred by USEPA to address remaining groundwater contamination at CSSA includes a combination of source area treatment, point-of-use treatment (granular activated carbon [GAC]), land use controls, and long-term monitoring. The measure is protective of human health and the environment, complies with applicable waste management standards, provides both short- and long-term effectiveness for the protection of human health, and attains media cleanup standards. The remedial methods employed (bioremediation and in-situ chemical oxidation [ISCO]) are already reducing contamination at SWMU B-3 and AOC-65, and would continue to do so effectively in the future. This corrective measure is easily implementable since all of the elements for these alternatives are already in place at CSSA. It also supports CSSA's goal for using environmentally sustainable remedial alternatives.

The next step is to implement the corrective measures to continue to address the source areas for groundwater contamination at CSSA. These remediation efforts have already proven effective, and are described in further detail below.

Source Area Cleanup

Plume 1 originates from SWMUs B-3 and O-1 in the central portion of CSSA (Figure 1). Approximately 1,515 cubic yards of soil were removed from SWMU O-1 in 2002, and 17,000 cubic yards of waste and contaminated soil have been removed from SWMU B-3 since 2003. A bioreactor designed to eliminate VOCs by accelerating biological activity of microorganisms capable of degrading PCE and TCE was installed in 2007. Wells installed around SWMU B-3 and the bioreactor are closely monitored to confirm that the system is running efficiently and effectively, and that degradation of the contamination is continuing.

AOC-65, located in the southwest corner of CSSA, is the source area for Plume 2. An SVE system in operation from 2002-2011 resulted in a reduction in soil gas concentrations, and in 2012, the testing of an ISCO method to treat underlying contamination remaining in the near-surface rock in a former drainage ditch was performed.

The ISCO process is an advanced oxidation technology that chemically destroys contaminants such as PCE and TCE. ISCO material is injected within a trench along the former drainage ditch. The material follows preferential contaminant migration pathways from the former drainage area. This effort is expected to reduce VOC source material at AOC-65. Three injections of ISCO material have taken place at AOC-65: August 2012 (approximately 15,000 gallons, May 2013 (approximately 34,000 gallons), and September 2014 (approximately 102,000 gallons). Laboratory results indicate that the treatment process is capable of dislodging and reducing the amount of contaminants present in the surrounding bedrock.

On-post Groundwater Monitoring

On-post groundwater has been monitored since 1991. Sampled wells include drinking water, monitoring, and agriculture/livestock wells. Sampling frequencies for on-post wells are determined by the Long-Term Monitoring Optimization (LTMO) Plan as approved by USEPA and TCEQ. The CSSA Groundwater Monitoring Program Data Quality Objectives (DQOs), which provide a description of the ongoing groundwater monitoring program and sampling frequencies, are available in the Environmental Encyclopedia. Both the LTMO and DQO Plans are currently undergoing revisions for both on- and off-post monitoring, and the community will be provided with the updates to those plans upon approval by USEPA and TCEQ.

Off-post Groundwater Monitoring

The goals of CSSA's off-post monitoring program are to confirm that off-post drinking water meets USEPA and TCEQ safe drinking water standards, determine where VOC contamination has migrated, and define the appropriate response. As part of the program, 55 off-post wells were sampled in 2014 (see Table 1).

Factors considered in deciding if a well is sampled include where the well is located, how close it is to areas where VOCs have been detected, whether the well owner grants access for sampling, and results of previous sampling at the well. A well is initially sampled for four consecutive quarters (i.e., every three months for one year). Depending on the analytical results for the well, future sampling occurs as illustrated on Figure 3. CSSA takes action if VOCs are detected in off-post wells at concentrations that begin approaching greater than 4.5 ppb).

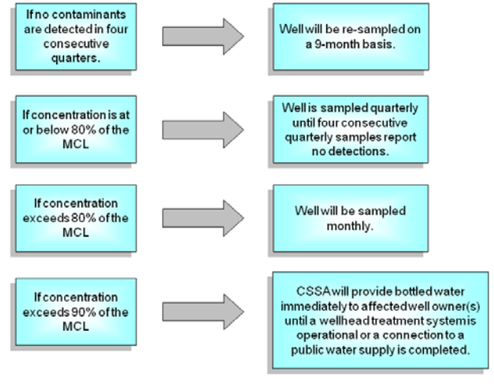


Figure 3: Off-Post Well Sampling Decision Chart

If a VOC exceedance occurs, CSSA will supply bottled water to affected residents within 24 hours of the detection and the well will be resampled to confirm the results. If additional sampling confirms previous test results, CSSA will either install a GAC filtration system to remove contaminants from the water, or provide the well owner with an alternate water supply for as long as contaminant levels in the well exceed standards. Over the history of off-post sampling, eight off-post water wells have been fitted with GAC filtration systems: LS-7 (August 2001), LS-6 (August 2001), RFR-10 (two units, October 2001), RFR-11 (October 2001), LS-2 and LS-3 (installed April 2002, discontinued August 2007 when use of wells ceased), OFR-3 (April 2002), and LS-5 (October 2011).

2014 Groundwater On- and Off-Post Sampling Results

The locations of all on- and off-post wells sampled in 2014 are shown on Figure 4 (back side). Table 1 presents off-post groundwater data for PCE and TCE from all 2014 sampling events. One well (RFR-10) exceeded the MCL for PCE and TCE in samples collected prior to the well's GAC filter. In all other wells tested, any VOCs that were detected had concentrations below the drinking water MCLs for PCE and TCE.

In March and September 2014 analyses of the GAC-filtered water samples confirmed that no VOCs were present above the laboratory detection levels and that GAC units were functioning properly (Table 2). Carbon filter maintenance for the GAC filtration systems was performed in January and July 2014, and in February 2015. Well I10-4 is not currently being used and therefore is not equipped with a GAC filtration system. The next carbon-canister replacement is scheduled for August 2015. GAC-filtered samples are collected every six months and will be collected again in September 2015.

CSSA will continue to sample both on- and off-post groundwater wells at frequencies approved by USEPA and TCEQ; and to coordinate the groundwater monitoring program with the regulatory agencies and other potentially affected parties in the community.

Activities Planned for 2015

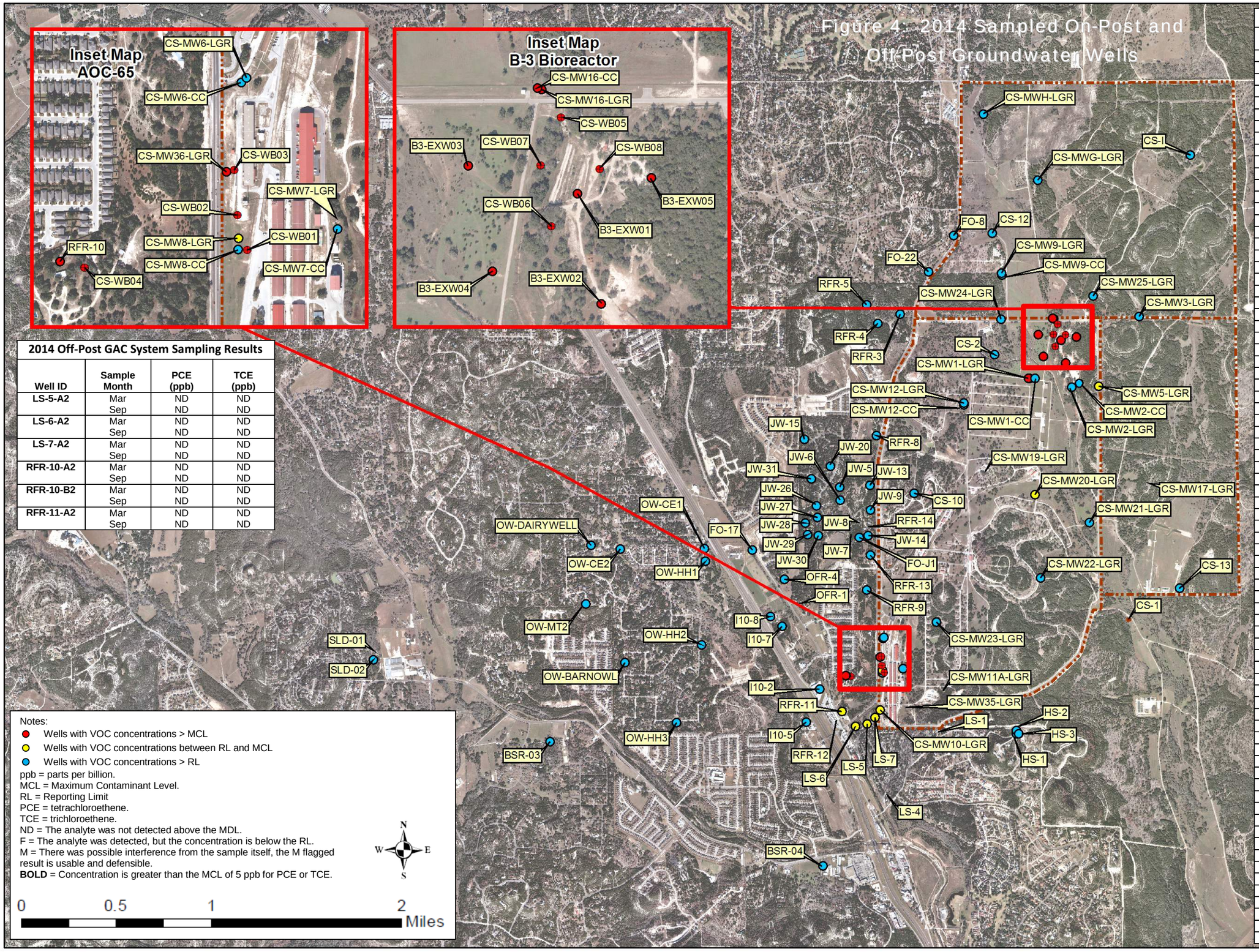
- Excavation of additional soils at AOC-65 to create new/expanded infiltration galleries for the injection of additional ISCO at AOC-65.
- Continued monitoring of the SWMU B-3 bioreactor system.
- Continued groundwater monitoring at on- and off-post wells.
- CSSA drinking water system operation & maintenance.

Public Outreach and Future Fact Sheets

CSSA has been issuing Fact Sheets similar to this one since 2000. We will continue to mail Fact Sheets annually to provide information on sampling results, ongoing investigations, and cleanup activities. Each well owner involved in the groundwater monitoring program will continue to receive a separate letter concerning laboratory results for their wells after sampling by CSSA. The public is welcome to comment on this Fact Sheet and the environmental activities at CSSA by writing or calling:

- CSSA Installation Manager, Mr. Jason D. Shirley, Camp Stanley Storage Activity, 25800 Ralph Fair Road, Boerne, TX 78015-4800 at (210) 295-7416;
- USEPA Regional Program Manager, Mr. Greg Lyssy, at (214) 665-8317;
- TCEQ Regional Program Manager, Ms. Amanda Pirani, at (512) 239-6526; or
- Fort Sam Houston, Public Affairs Office, Mr. Phillip Reidinger, at (210) 221-1151 or (210) 336-0449 (mobile).

Figure 4 2014 Sampled On-Post and Off-Post Groundwater Wells



2014 Off-Post GAC System Sampling Results

Well ID	Sample Month	PCE (ppb)	TCE (ppb)
LS-5-A2	Mar	ND	ND
	Sep	ND	ND
LS-6-A2	Mar	ND	ND
	Sep	ND	ND
LS-7-A2	Mar	ND	ND
	Sep	ND	ND
RFR-10-A2	Mar	ND	ND
	Sep	ND	ND
RFR-10-B2	Mar	ND	ND
	Sep	ND	ND
RFR-11-A2	Mar	ND	ND
	Sep	ND	ND

Notes:
- Wells with VOC concentrations > MCL
- Wells with VOC concentrations between RL and MCL
- Wells with VOC concentrations > RL

ppb = parts per billion.
MCL = Maximum Contaminant Level.
RL = Reporting Limit
PCE = tetrachloroethene.
TCE = trichloroethene.
ND = The analyte was not detected above the MDL.
F = The analyte was detected, but the concentration is below the RL.
M = There was possible interference from the sample itself, the M flagged result is usable and defensible.
BOLD = Concentration is greater than the MCL of 5 ppb for PCE or TCE.

2014 Off-Post Groundwater Results

Well ID	Sample Month	PCE (ppb)	TCE (ppb)
BSR-03	Jun	ND	ND
BSR-04	Jun	ND	ND
FO-8	Jun	ND	ND
FO-17	Jun	ND	ND
FO-22	Jun	ND	ND
FO-J1	Jun	ND	ND
HS-1	Jun	ND	ND
HS-2	Jun	ND	ND
HS-3	Jun	ND	ND
I10-2	Jun	ND	ND
I10-5	Jun	ND	ND
I10-7	Jun	ND	ND
I10-8	Jun	ND	ND
JW-5	Jun	ND	ND
JW-6	Jun	ND	ND
JW-7	Jun	0.34F	ND
JW-8	Jun	0.20F	ND
JW-9	Jun	ND	ND
JW-13	Jun	ND	ND
JW-14	Jun	ND	ND
JW-15	Jun	ND	ND
JW-20	Jan	ND	ND
	Mar	ND	ND
	Jun	ND	ND
	Sep	ND	ND
JW-26	Jun	ND	ND
JW-27	Jun	ND	ND
JW-28	Jun	ND	ND
JW-29	Jun	ND	ND
JW-30	Jun	ND	ND
JW-31	Jun	ND	ND
LS-1	Jun	0.39F	ND
LS-4	Jun	0.08F	ND
LS-5	Mar	1.01F	2.99
	Jun	1.17F	3.29
	Sep	0.88F	3.14
	Dec	0.91F	2.86
LS-6	Mar	0.76F	3.19
	Jun	0.91F	3.16
	Sep	0.80F	3.13
	Dec	0.93F	3.68
LS-7	Mar	1.62	0.44F
	Jun	2.1	0.46F
	Sep	2.14	0.54F
	Dec	2	0.38F
OFR-1	Jun	0.22F	ND
OFR-4	Jun	ND	ND
OW-BARNOWL	Jun	ND	ND
OW-CE1	Jun	ND	ND
OW-CE2	Jun	ND	ND
OW-DAIRYWELL	Jun	ND	ND
OW-HH1	Jun	ND	ND
OW-HH2	Jun	ND	ND
OW-HH3	Jun	ND	ND
OW-MT2	Jun	ND	ND
RFR-3	Jun	ND	ND
RFR-4	Jun	ND	ND
RFR-5	Jun	ND	ND
RFR-8	Jun	ND	ND
RFR-9	Jun	ND	ND
RFR-10	Mar	**8.36**	3.43
	Jun	**9.39**	4.88
	Sep	**6.78**	2.41
	Dec	**12.1**	**7.1**
RFR-11	Mar	0.54F	2.29
	Jun	0.69F	2.38
	Sep	0.73F	2.58
	Dec	0.81F	3.06
RFR-12	Jun	ND	0.67F
RFR-13	Jun	ND	ND
RFR-14	Jun	0.14F	ND
SLD-01	Mar	ND	ND
	Jun	ND	ND
	Sep	0.09F	ND
	Dec	ND	ND
SLD-02	Jun	ND	ND