RESULTS OF THE BLOOD MONITORING PROGRAM AT THE GARFIELD AVENUE CHROMIUM(VI) REMEDIATION SITES

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I. Background

Jersey City has a long history of chromium processing and the use of chromate chemical production waste (CCPW), a by-product generated from the production of sodium dichromate, as construction fill material. Also known as chromium ore processing residue (COPR), CCPW contains hexavalent chromium (referred to herein as "chromium(VI)" or "CR (VI)"), which can cause lung cancer in humans and has been linked to other health effects, such as respiratory and skin conditions. PPG Industries, Inc. (PPG) operated a chromium production facility located at Garfield Avenue in Jersey City.

On June 26, 2009, a Partial Consent Judgment Concerning the PPG Sites (JCO) was entered with the Superior Court of New Jersey, binding PPG, the New Jersey Department of Environmental Protection (NJDEP), and the City of Jersey City (City) to work together to remediate certain chromium sites in Hudson County. One of those sites was formerly used as a chrome production facility located at and/or near 880 Garfield Avenue, Jersey City, Hudson County, New Jersey and that is identified in the JCO as the "Garfield Avenue Site."

Pursuant to the JCO, the Court appointed an independent Site Administrator, W. Michael McCabe, to oversee the remediation, including developing a judicially enforceable 5-year master schedule, facilitating parties' progress in meeting master schedule milestones, hiring an independent technical consultant, maintaining regular communications with community representatives, and communicating community concerns to the parties.

A specific provision of the JCO required the Site Administrator to

> *"Review previous and ongoing health studies concerning the health impacts of chromium in Hudson County and consult with experts in the field and, if necessary, to recommend a protocol for a medical study (health exposure study), that would monitor the people living within the vicinity of the Garfield Avenue Site to ascertain chromium exposure risks…"* (Partial Consent Judgment Concerning The PPG Sites (Civil Action No.: HUD-C-77-05), June 26, 2009, p. 18, XVI. 49 (g))

In May of 2010, the Site Administrator produced a document titled "Health Exposure Study Recommendation." In this report, Site Administrator McCabe reviewed studies of exposure to chromium (VI) and possible health effects in Jersey City, Hudson County, other exposed communities in the U.S. and abroad, and occupational settings, as well as studies of the sources and toxicology of chromium (VI). The Site Administrator reviewed relevant scientific literature and consulted with close to 20 experts, including scientists at Robert Wood Johnson Medical School, New York University, and NJDEP, among others. Based on evidence from this review, the Site Administrator recommended a "Community Exposure Prevention and Testing Program" consisting of the following three components:

> *The recommended program will be three-tiered: 1) a comprehensive Air Monitoring Program to ensure the protection of the surrounding community during the remediation of the Garfield Avenue Site; 2) an accompanying health exposure program to determine whether the community is being exposed to Cr(VI) related to the site cleanup; and 3) a mapping project using results from the Residential Inspection Program established by the settlement to outline areas of soil contamination, if detected. (pg. 9)*

Here, we summarize results of the second tier of the Program, i.e., the "health exposure program to determine whether the community is being exposed to Cr(VI) related to the site cleanup."

The second tier of the Program was a voluntary program open to all residents living in the area from the Garfield Avenue Site west to Ocean Avenue; south to Bayview Avenue and north to Bramhall Avenue (Study Area). As planned, the blood of residents living in the Study Area was to be sampled and analyzed for chromium(VI) before, during and after cleanup activities to determine whether increases of chromium(VI) above levels of concern were observed.

The blood monitoring program was to consist of:

- *An initial screening for chromium level in red blood cells (blood screening) to be completed before any remedial excavation activities are initiated at the Garfield Avenue Site in order to establish a baseline for comparison purposes;*
- *Semi-annual blood screenings throughout the period of land-disturbing remedial activities;*
- *Physical examinations for evidence of medical conditions that indicate a recent exposure to Cr(VI), if red blood cell sampling results are elevated above a level of concern;*
- *Data management and integration of participant blood data with environmental exposure studies data; and*
- *Protections for participant privacy. (pgs. 10-11)*

The blood monitoring program was implemented as planned, but with one modification after consultation between the then Site Administrator and environmental health scientists at the Environmental and Occupational Health Sciences Institute (EOHSI), who conducted the blood monitoring program, i.e., that blood sampling would be performed annually, instead of semi-annually. Sampling periods were selected to coincide with active remediation (soil removal).

On January 4, 2016, Ronald Riccio succeeded Michael McCabe as the court-appointed Site Administrator for the PPG chromium sites. Site Administrator Riccio continued the blood monitoring program. At the present time, much of the CCWP at the Garfield Avenue Site and the adjacent sites that surround it has been removed, although further remediation activities are required and remain to be completed.

II. The Rationale for the Blood Monitoring Program

As noted above, the blood monitoring program was part of a multi-tiered approach to prevent exposure to chromium(VI) among residents in the Study Area during remediation at the Garfield Avenue Site. The primary means of preventing exposure was the institution of work practices and dust suppression to prevent migration of dust and soil contaminated with chromium(VI) from leaving the site. An Air Sampling Program was also instituted to provide continuous verification by air sampling both within the controlled area of the site and at the perimeter of the site. The purpose of the blood monitoringprogram was to confirm that individuals in the Study Area were not being exposed to elevated chromium(VI)levels as a result of the remediation activity. If biological testing showed that individuals in the Study Area were being exposed to chromium(VI), further steps could be taken to identify the route of exposure and eliminate the source or control the exposure.

Chromium is a naturally occurring element found in rocks, animals, plants, soil, and in volcanic dust and gases. Chromium is present in the environment in several different forms (oxidation states). The most common forms are chromium(0), chromium(III), and chromium(VI). Chromium compoundshave no distinctive taste or odor.Chromium(III) occurs naturally in the environment and is an essential nutrient. Chromium(VI) and chromium(0) are generally produced by industrial processes. Chromium(0) is metallic chromium, which is used in steel production. Chromium(VI) and chromium(III) are used for industrial processes such as chrome plating, production of dyes and pigments, leather tanning, and wood preserving. It should be noted that chromium is normally present in blood, urine, and body tissues, because chromium(III) is normally present in foods and it is an essential human dietary element that is often found in vitamin and mineral supplements.Because CCWP is very rich in chromium(VI), and because chromium(VI) is a known human carcinogen, it was agreed to focus attention on identifying exposure to chromium(VI).

Chromium(VI) can enter the body by ingestion, inhalation, and to some extent by skin absorption. After absorption into the body, chromium(VI) is transported in the blood and distributes throughout the body. In the body, chromium(VI) is reduced to chromium(III). Chromium(VI) can cross cell membranes and enter cells much more readily than chromium(III). Therefore,chromium(VI) in blood is taken up into red blood cells, while chromium(III) in blood does not enter the red cells. This provides the blood monitoring program rationale for analyzing red blood cell chromium as a measure of exposure to chromium(VI). In the red cells, chromium (III)is reduced and, in the process, reacts with hemoglobin and other proteins inside the red blood cells.These compounds are stable and remain largely inside the red blood cell for its lifetime of up to 120 days. Due to the differential uptake and retention of chromium(VI) in red blood cells, the measurement of totalchromium in red blood cells is a useful biomarker for cumulative exposure to chromium(VI) over a period of up to several months prior to the time of blood sampling. Since chromium occurs in various food items, virtually all persons have chromium in their blood, including very low levels of chromium(VI) in their red blood cells, although these levels may be so low as to be undetectable by conventional analysis methods.

III. Summary of Blood Sample Collection Procedures, including Quality Assurance and Quality Control

a. Participants

Participants in the blood monitoring program were adult residents who were recruited at public meetings in Jersey City by the former Site Administrator, Michael McCabe. Participants were required to live within the Study Area. Participation was voluntary and the purpose of the sampling and its limitations were explained to the participants.

The initial baseline round of sampling was conducted in June/July of 2010, before the cleanup activities commenced. In the initial round of sampling, blood samples were collected from 42 individuals. The program was designed to provide for six subsequent annual rounds of sampling. In the rounds of sampling following the initial round, the participants were contacted by mail and email with follow-up by phone calls. To give individuals every opportunity to participate, repeated attempts were made to contact individuals, including direct contact at home addresses, when necessary, although participation was strictly voluntary. Participation in the rounds subsequent to the initial baseline round of sampling was as follows:

Round	Dates	Number of Participants
2	February/March 2011	36
3	June/July 2012	30
4	May/June 2013	30
5	May/June 2014	26
6	June 2015	29
7	June/July 2016	28

During the period from the initial baseline sampling round until the seventh and final annual round of sampling in 2016, eight participants could not continue participation due to relocation of their residences outside of the monitoring program area, and one participant died at the age of 90. A total of 21 residents participated in all seven rounds of sampling.

b. Sample collection and storage

Most blood draws were performed at the Mary McLeod Bethune Community Center located at 140 Martin Luther King Jr. Drive, Jersey City, New Jersey. Due to scheduling conflicts at the Community Center, one sampling session in Round 2 was held at St. Patrick's Church located at 492 Bramhall Avenue.

The same protocol was followed during each of the blood sampling rounds. Blood samples were collected by appointment only. After enrollment, the names and contact information of participants living in the eligible area were given to EOHSI by the Site Administrator. At the initial appointment, each participant was asked to provide a form of identification (such as driver's license

or utility bill). Project personnel then reviewed a consent form and answered participant questions and discussed any participant concerns. Participants then signed and dated the consent form. A unique subject identification number was then assigned to the participant to be maintained for the duration of the project. The confidentiality of subject identification and personal information was protected throughout the blood monitoring program.

At each subsequent round, investigators confirmed the name, residence address, and mailing address with the participant. For each round, four to six sampling dates were offered to provide convenient opportunities to maximize participation.

Prior to sample collection in each round, study personnel interviewed the participant in order to complete the Exposure Assessment Questionnaire. The purpose of the Questionnaire was to obtain exposure information that would be helpful in interpreting the chromium(VI) blood levels. Questions included occupation and changes in occupation, time spent at Jersey City residence, hobbies that might involve exposure to chromium, outdoor activities such as gardening, exposure to cigarette smoke, alcohol consumption, home renovation, and use of vitamins or dietary supplements.

Blood collection was performed by a licensed phlebotomist and followed a standard phlebotomy protocol observing universal precautions. During sample collection, three separate work areas of the clinic were used for participant intake/questionnaire completion, blood collection, and sample preparation. Additionally, a recovery area (mat and pillow placed on a table) was set up to provide a place for participants to recline if needed after the blood draw. Refreshments were provided to the subjects. Collected blood samples were in the direct custody of primary technician and/or the project manager, who initiated the chain of custody form for the chromium analysis by NMS laboratories. A separate duplicate blood sample was collected for possible later confirmatory analysis at the EOHSI laboratory. After late-afternoon or evening collections the samples were secured in a dedicated refrigerator in EOHSI Room 128, which is a locked laboratory with limited access.

c. Sample Analysis

NMS was chosen as the laboratory based on its extensive experience as a clinical medicine and forensic toxicology laboratory. The participating EOHSI scientists had prior experience with heavy metal analysis in biological materials, using NMS and other laboratories, and NMS was chosen based on this experience. NMS is a fully accredited laboratory with a well-developed and well-documented quality assurance program.

Complete Blood Count (CBC) analysis was performed by Quest Diagnostics to measure the hematocrit (percent of red blood cells). The CBC analysis was needed in order to properly interpret the levels of Chromium that might be found in participants' red blood cells. The primary chromium analysis on all samples was performed by NMS Labs (Willow Grove, PA). Two test requisition forms were initiated and completed by the phlebotomist, one for Quest Diagnostics and one for

NMS Labs. The requisition forms contained only the age, gender and subject ID number as identifiers. Participant names did not appear on the requisition forms.

NMS Labs measured total chromium in the red blood cell samples. As noted above (pg. 4), total chromium in red blood cells is a sensitive biomarker (indicator) of potential exposure to chromium(VI), because red blood cells take up and retain chromium(VI) much more avidly than other forms of chromium.

The primary technician collected the sample tubes and test requisition forms directly from the phlebotomist. The technician confirmed that the subject number on the tube corresponded to the subject number on the test requisition form.

The technician appropriately packaged the CBC tube in a cooler with cold packs, and secured the client copy of the test requisition form in the Chromium Exposure Assessment Project Binder.

The technician centrifuged (10 to 15 min at 1000-1200 RCF) the NMS trace metal tube to separate the red blood cells. After centrifugation and removal of the plasma, the technician transferred the red blood cells into a labeled, pre-cleaned plastic screw cap vial provided by NMS. The technician then appropriately packaged and placed the sample in the cooler with cold packs. The NMS Sample Submission form accompanied the samples. Duplicate samples for possible confirmatory analysis at EOHSI were labeled and similarly packaged and stored for transport to the EOHSI laboratory.

During transport to EOHSI or Quest Diagnostics, the cooler holding the blood samples was in the direct custody of either the project manager or primary technician. For evening sessions, the CBC samples were brought directly to the Quest Diagnostics in Teterboro, NJ. Otherwise they were transported to EOHSI. Samples and forms were stored in a secure refrigerator in Room 128. The CBC samples were placed in a locked Quest pick-up box at EOHSI. Appropriate pick up times were confirmed with Quest prior to each blood collection session.

For the purpose of maintaining confidentiality for participants, signed consents were stored in a locked cabinet in a private office at EOHSI. Questionnaires and the Chromium Exposure Assessment Project Binder were locked in a separate private office at EOHSI.

d. Sample Shipment

Within one week of the blood draw, the red blood cell samples collected for chromium analysis were packed with cold packs in approved shipping containers according to University regulations under the direction of either the primary technician or project manager. The chain of custody section on each Forensic Sample Submission Form was completed to reflect relinquishment of custody to the carrier. The lab copy of the sample submission form was packed with the samples. The client copy was secured in the Chromium Exposure Assessment Project Binder. Once the package was secured and labeled, it remained under the control of a staff assistant until picked up by the carrier. Upon

receipt at NMS, the chain-of-custody procedure resumed from sample receipt through analysis. Copies of the NMS internal chain of custody were available to EOHSI upon request.

IV. PPG Independent Review

Ronald Teichman MD, a board-certified occupational physician, was contracted by PPG as an "Independent Expert Overseer." He reviewed the standard operating procedures, and EOHSI staff training programs. He was present at the Bethune Center during each annual round of blood sampling to verify compliance with procedures.

V. Results of the Blood Monitoring Program

Results were generally received from NMS within 2-3 weeks of receipt of samples. Results were reviewed by the EOHSI Co-Principal Investigators (Michael Gochfeld MD, PhD in years 1-6, and Robert Laumbach MD, MPH in year 6-7). Letters containing the laboratory results for both Chromium and the Complete Blood Count were sent to each participant. A summary of sample results without personal identifiers was provided to the Site Administrator within several weeks of receipt of sample results after each round of sampling.

Interpretation of low levels of chemicals in the body requires paying attention to what the laboratory calls the "method detection limit (MDL)," which is the lowest level of chromium that can be identified with confidence using the laboratory's method.

The results for chromium levels in red blood cells for all samples collected during the seven rounds of sampling are summarized in Table 1 annexed to this report. As noted above, the initial baseline round of sampling was conducted in June/July of 2010, before the start of remediation activities at the Garfield Avenue Site. Blood samples were collected from 42 individuals. All of the sample results were below the 2.0 micrograms per liter (μg/L) limit of detection of the analytical method being used by the laboratory at that time. (2.0 micrograms per liter is equivalent to 2 parts per billion).

The second round was conducted in February/March of 2011 with 36 of the original 42 individuals participating. One sample was reported by NMS to be 3.6 μg/L, but on re-analysis of the duplicate sample at EOHSI, the result was less than 2.0 μg/L. To reconcile the difference between the two laboratories, the remaining duplicate sample was sent to NMS for analysis. The result, which was less than 2.0 μg/L, confirmed EOHSI's finding. Based on the analyses of the duplicate sample by two laboratories, the initial result of 3.6 μg/L was considered to be a laboratory error.

During the third round, 30 samples were collected in June/July of 2012. A single sample was above the limit of detection which was lowered to 1.0 μg/L for this round. The level of 1.5 μg/L was below the 2.0 μg/L reporting limit and was interpreted as not indicating exposure to chromium(VI) from site remediation activities.

The fourth round with 30 participants was conducted in May/June of 2013. All of the fourth round samples were below the detectable level of 1.0 μg/L chromium.

For the fifth round, conducted in May/June of 2014, 26 samples were collected. All were below the limit of detection at <1.0 μg/L.

In round 6, 28 samples were collected and all were below the limit of detection, which was set by the NMS laboratory at 2.2 μg/L in this round.

During the 7th and final round of sampling, 28 samples were collected and all were less than the 2.2 μg/L limit of detection.

VI. Conclusions

In summary, all of the sample results, beginning with the initial baseline sampling round through the subsequent six annual sampling rounds, were below the initial detection limit of 2.0 μg/L for chromium, indicating that there was no evidence of elevation of exposure to chromium during the 6 rounds of tests conducted after the baseline sampling. (See Table 1 annexed). In total, 191 of 192 samples did not have levels of chromium above the initial detection levels of 2.0 μg/L. In Round 3, one sample was reported with detectable chromium at 1.5μg/L, but this did not exceed the previous detection limit of 2.0 μg/L. This sample result was below the previous limit of detection of 2.0 μg/L during the baseline and second rounds of sampling, and therefore did not represent an elevation from the baseline level for this participant. During Round 3, the results for the remaining 29 participants' samples were all less than the new detection limit of 1.0 μg/L. If migration of chromium(VI) from the site was leading to exposure to individuals in the Study Area, we would expect to see a pattern of increase in chromium in the blood cells relative to the baseline levels. Taken together, the results show no evidence of elevation during any of the six sampling rounds that were completed after the remediation at the Garfield Avenue Site was initiated. The results support the conclusion that the work practices, dust suppression activities and the Air Monitoring Program for controlling potential exposures to chromium(VI) during the site remediation activities at the Garfield Avenue Site provided effective protection for residents in the Study Area.

VII. Acknowledgments

We would like to acknowledge the dedication and the community service of the program participants, who acted out of concern for the community to voluntarily give blood samples to the monitoring program annually for up to seven blood samples over 6 years.

[TABLE 1 ON FOLLOWING PAGE]

TABLE 1
Rounds 1 to 7 RBC Chromium Blood Monitoring Results (2010 - 2016)

ID	Baseline Date	Cr (ug/L) Base	Round 2 Date	Cr (ug/L) 2	Round 3 Date	Cr (ug/L) 3	Round4 Date	Cr (ug/L) 4	Round5 Date	Cr (ug/L) 5	Round6 Date	Cr (ug/L) 6	Round6 Date	Cr (ug/L) 7
CEAP-001	06/23/10	<2.0	02/26/11	<2.0			05/22/13	<1.0						
CEAP-002	06/28/10	<2.0	03/04/11	<2.0			05/22/13	<1.0						
CEAP-003	06/23/10	<2.0	03/19/11	<2.0	06/23/12	<1.0	06/01/13	<1.0	06/07/14	<1.0	06/22/15	<2.2	07/01/16	<2.2
CEAP-004	06/23/10	<2.0	03/19/11	<2.0	06/23/12	<1.0	06/01/13	<1.0	06/07/14	<1.0	06/22/15	<2.2	06/25/16	<2.2
CEAP-005	06/25/10	<2.0	03/04/11	<2.0										
CEAP-006	06/25/10	<2.0	02/26/11	<2.0	06/15/12	<1.0	05/09/13	<1.0	05/28/14	<1.0	06/12/15	<2.2	06/25/16	<2.2
CEAP-007	06/25/10	<2.0	02/16/11	<2.0	06/15/12	<1.0	05/22/13	<1.0	06/05/14	<1.0	06/18/15	<2.2	07/01/16	<2.2
CEAP-008	06/25/10	<2.0	03/04/11	<2.0	06/15/12	<1.0	05/09/13	<1.0	05/28/14	<1.0	06/12/15	<2.2	06/23/16	<2.2
CEAP-009	06/25/10	<2.0	03/04/11	<2.0	06/15/12	<1.0	05/17/13	<1.0	06/05/14	<1.0	06/20/15	<2.2	06/23/16	<2.2
CEAP-010	06/25/10	<2.0	03/04/11	<2.0	06/15/12	<1.0	05/22/13	<1.0	05/28/14	<1.0	06/12/15	<2.2	07/01/16	<2.2
CEAP-011	06/26/10	<2.0	02/16/11	<2.0										
CEAP-012	06/26/10	<2.0	03/01/11	<2.0	06/23/12	<1.0	05/22/13	<1.0	05/28/14	<1.0	06/10/15	<2.2	07/20/16	<2.2
CEAP-013	06/26/10	<2.0	03/01/11	<2.0	06/23/12	<1.0	05/22/13	<1.0	05/28/14	<1.0	06/10/15	<2.2	07/20/16	<2.2
CEAP-014	06/26/10	<2.0	03/04/11	<2.0										
CEAP-015	06/26/10	<2.0	03/04/11	3.6(1)										
CEAP-017	06/26/10	<2.0	03/19/11	<2.0	06/15/12	<1.0	06/01/13	<1.0	06/07/14	<1.0	06/10/15	<2.2	06/23/16	<2.2
CEAP-018	06/26/10	<2.0	03/04/11	<2.0	06/20/12	<1.0	05/09/13	<1.0	06/05/14	<1.0	06/12/15	<2.2	06/23/16	<2.2
CEAP-019	06/26/10	<2.0	02/26/11	<2.0	06/23/12	<1.0	06/01/13	<1.0	06/07/14	<1.0	06/20/15	<2.2	06/25/16	<2.2
CEAP-020	06/26/10	<2.0			06/23/12	<1.0	06/21/13	<1.0						
CEAP-021	06/26/10	<2.0	03/01/11	<2.0	06/20/12	<1.0	06/01/13	<1.0			06/18/15	<2.2	07/01/16	<2.2
CEAP-022	06/26/10	<2.0			06/20/12	<1.0								
CEAP-023	06/26/10	<2.0			06/23/12	<1.0	05/09/13	<1.0	06/21/14	<1.0	06/20/15	<2.2	06/25/16	<2.2
CEAP-024	06/26/10	<2.0	02/26/11	<2.0										
CEAP-025	06/28/10	<2.0	03/04/11	<2.0	07/10/12	<1.0	05/09/13	<1.0	06/21/14	<1.0	06/18/15	<2.2	06/29/16	<2.2
CEAP-026	06/28/10	<2.0	02/16/11	<2.0	06/20/12	<1.0	06/01/13	<1.0	06/05/14	<1.0	06/10/15	<2.2	06/29/16	<2.2
CEAP-027	06/28/10	<2.0	02/16/11	<2.0	06/20/12	<1.0	05/09/13	<1.0	06/05/14	<1.0	06/10/15	<2.2	06/29/16	<2.2
CEAP-028	06/28/10	<2.0			07/10/12	<1.0	06/21/13	<1.0			06/12/15	<2.2	06/29/16	<2.2
CEAP-029	06/28/10	<2.0					06/21/13	<1.0			06/18/15	<2.2	06/29/16	<2.2
CEAP-030	06/28/10	<2.0	03/04/11	<2.0	06/15/12	<1.0	05/22/13	<1.0	06/07/14	<1.0	06/10/15	<2.2		<2.2
CEAP-031	06/28/10	<2.0	03/04/11	<2.0	06/15/12	<1.0			06/21/14	<1.0	06/18/15	<2.2	07/01/16	<2.2
CEAP-032	06/28/10	<2.0	02/26/11	<2.0	06/23/12	<1.0	06/01/13	<1.0	06/07/14	<1.0	06/20/15	<2.2	06/25/16	<2.2
CEAP-033	06/28/10	<2.0	02/26/11	<2.0	06/23/12	<1.0	05/09/13	<1.0	05/28/14	<1.0	06/18/15	<2.2	06/23/16	<2.2
CEAP-034	06/28/10	<2.0	02/26/11	<2.0	06/20/12	1.5(2)	05/09/13	<1.0	05/28/14	<1.0	06/18/15	<2.2	06/23/16	<2.2
CEAP-035	07/01/10	<2.0	02/26/11	<2.0										
CEAP-036	07/01/10	<2.0	03/01/11	<2.0	06/15/12	<1.0	05/17/13	<1.0	05/28/14	<1.0	06/10/15	<2.2	06/23/16	<2.2
CEAP-037	07/01/10	<2.0	03/01/11	<2.0			05/09/13	<1.0	06/05/14	<1.0	06/22/15	<2.2	06/29/16	<2.2
CEAP-038	07/01/10	<2.0	03/01/11	<2.0	06/15/12	<1.0	05/17/13	<1.0	05/28/14	<1.0	06/10/15	<2.2	06/23/16	<2.2
CEAP-039	07/01/10	<2.0	03/01/11	<2.0	06/15/12	<1.0	05/17/13	<1.0	05/28/14	<1.0	06/10/15	<2.2	06/23/16	<2.2
CEAP-040	07/01/10	<2.0	03/04/11	<2.0	06/23/12	<1.0								
CEAP-041	07/01/10	<2.0												
CEAP-042	07/01/10	<2.0	03/04/11	<2.0	06/20/12	<1.0			05/28/14	<1.0	06/20/15	<2.2		
CEAP-043	07/01/10	<2.0	03/04/11	<2.0										

(1) Analysis of this sample was repeated at NMS and at the EOHSI laboratory and both of the repeated analyses were < 2.0 ug/L.

(2) The level of 1.5 ug/L was detectable with a lowered detection limit during this round (1.0 ug/L), but remained below the initial detectable limit of 2.0 ug/L.