City Water, Light & Power
Springfield, Illinois

Groundwater Sampling and Analysis Procedures

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ATTACHMENTS

1. INTRODUCTION

This Groundwater Sampling and Analysis Procedures (SAP) describes the methods and procedures to be used for conducting groundwater monitoring at the City Water, Light and Power (CWLP) CCR Units. This SAP is subject to periodic revision as circumstances and/or new regulations dictate. Revisions to the SAP must be approved by a qualified professional engineer before placed in effect. The most up-to-date version of the SAP shall be kept in the Operating Records for use by CWLP and subcontractor personnel.

1.1 OBJECTIVE AND PURPOSE

The objective of the groundwater monitoring program is to provide analytical data for groundwater collected from monitoring wells as required by the CCR Rule (40 CFR §257.90-257.98). The SAP describes the procedures and techniques associated with the following:

- Pre-field activities,
- Record keeping and chain-of-custody,
- Well assessment prior to purging,
- Groundwater sampling procedures,
- Decontamination and waste management,
- Sample packing and shipping,
- Analytical procedures, and
- Quality assurance.

The purpose of the sampling protocol described herein is to provide the basis for sampling consistency and scientific credibility in obtaining the desired analyses. Groundwater sampling will be conducted in general accordance with applicable procedures established in the RCRA Groundwater Monitoring: Technical Enforcement Guidance Document (TEGD) (EPA 530-R-93 001, November 1992 and subsequent updates).

2. PRE-FIELD ACTIVITIES

At the beginning of each groundwater monitoring event, the necessary field equipment will be obtained. Sampling equipment that may be needed for collecting representative sample of groundwater are:

- Temperature, pH, specific conductivity, dissolved oxygen, oxidation-reduction potential, and turbidity meters or multi-meter (2)
- Low flow or Micropurge bladder pumps
- Peristaltic pumps (2)
- Submersible pump (1), with flow controller
- Disposable bailers with spool of clean rope

- 100-foot Water level indicator probe (2)
- 3/16” (I.D.) silicon tubing (initial installation) for use with peristaltic pump.
  - Note – Have 5 feet on hand in case tubing replacement needed.
- 0.17” (I.D.) LDPE tubing (initial installation) for use with peristaltic pump.
  - Note – Have 200 – 300 feet on hand for in case tubing replacement needed.
- 3/8” (I.D.) LDPE tubing (initial installation) for use with peristaltic pump.
  - Note – Have 200 – 300 feet on hand for in case tubing replacement needed.
- Field logbooks (2), clipboards (2), black ink pens/pencils
- Powder-free nitrile gloves
- Graduated 5-gallon bucket (2)
- One sampling bottle kit per well, plus QA/QC samples, and extras in case of breakage
- Sample bottle labels, custody seals, and chain-of-custodies
- Waterproof marking pen for labeling sample bottles (pre-labeling of bottles is preferred)
- Sample coolers
- Ice for each cooler
- Distilled or de-ionized water – five gallons (quantity may vary)Scrub brush (or sponge) and spray wash bottles
- Phosphate–free cleaner (e.g., Liquinox)
- Box of large plastic garbage bags and paper towel rolls
- 5-gallon buckets with lids (8), for temporarily containerizing purge water and submersible pump decontamination, if necessary

Sampling personnel (CWLP personnel and/or subcontractors) must comply with all safety and health guidelines for the facility.

The levels of personal protective equipment (PPE) to be used for work tasks will be selected based on known or anticipated physical hazards, as well as the types, concentrations and exposure routes of contaminants that may be encountered on site. Currently, it is anticipated that work will be initially conducted in Level D PPE.

3. RECORD KEEPING AND CHAIN OF CUSTODY

This section of the SAP provides information on field recording, field instrument calibration and chain of custody procedures.

3.1 FIELD RECORDING

Documentation of activities associated with groundwater monitoring events will be recorded each day in a bound field logbook with hard cover, water resistant paper, and sequentially numbered pages. Documentation will be completed in waterproof, black or blue ink and written errors will be crossed out with a single line, initialed, and dated. The logbooks will remain on-site during use

and then will be stored off-site. Entries in the logbook will be chronological and will include, where applicable and appropriate, such information as the following:

- Date and times,
- Locations of particular events,
- Instrument calibrations,
- Weather (temperature and wind direction) and significant changes in climatic conditions that may affect monitoring activities or results, and
- Other information/observations pertinent to the well inspection, well gauging, and sampling event.

Each page of the field logbook will be signed by the person(s) making entries in the logbook.

Three separate field report forms have been developed as an extension to the field logbook. These include the following:

- Monitoring Well Inspection Record (Form 1),
- Monitoring Well Gauging Record (Form 2), and
- Monitoring Well Sampling Record (Form 3).

These forms (or equivalent) may be used for recording water level data, well purging volumes, and sampling data. The field report forms or logbook may include, but not be limited to the following:

- Names of members of the gauging or sampling team,
- Date and time,
- Specific activity being performed,
- Well identification,
- Sample identification number,
- Sample volume,
- Sampling method,
- Preservative type,
- Analyses to be performed, and
- Measured field water quality parameters and readings (when applicable).

3.2 FIELD INSTRUMENT CALIBRATION

The following meters/probes may be used to analyze groundwater samples in the field:

- Temperature and pH,
- Specific conductance (SC),
- Oxidation-reduction potential (ORP),

- Dissolved oxygen (DO), and
- Turbidity

The quality of data generated by these measurements will be verified through qualitative means, such as regular calibrations, compliance with operating instructions, and decontamination between uses. A calibration procedure establishes the relationship between a known calibration standard and the accuracy of a measurement made by an instrument according to that standard. Calibration indicates absolute physical or electronic calibration and is not to be confused with chemical standardization.

The calibration for field monitoring equipment will be checked in accordance with manufacturer's specifications, but at least daily. Instrument calibration may be checked prior to entering the site or in the field prior to use. The time, date and location of instrument calibration and verification will be recorded in the field data sheet or logbook. If an instrument is out of calibration, then the calibration will be performed as needed.

3.3 CHAIN-OF-CUSTODY

Possession of samples will be traceable from the time of sample collection through check-in at the laboratory. Documentation begins immediately following sample collection and proper labeling and is accomplished using a standard chain-of-custody form. This document traces possession of each sample from the time of collection through time of analysis. For the purpose of these procedures, a sample is considered in custody if it is:

- In sampler's physical possession;
- In view, after being in physical possession;
- Locked to prevent tampering, after having been in physical possession; or
- In a secured area, restricted to authorized personnel.

The chain-of-custody form contains the following information:

- Project number, site name, and company address;
- Number of samples;
- Preservatives used for sample collection;
- Sample description (e.g., water, etc.);
- Sample ID number;
- Date and time of sample collection;
- Number of containers for the sample;
- Name of sampler responsible for sample transmittal;
- Signatures of all persons involved in the chain-of-custody;
- Type of analysis requested;
- Requested turnaround time and level of quality control documentation; and
- Pertinent comments about sample or sample conditions.

This information is entered onto the chain-of-custody form. Upon receipt of samples, the analytical laboratory will initiate its own chain-of-custody procedures. The sampler shall be responsible for properly packaging and dispatching samples to the analytical laboratory. When transferring samples, the sampler shall sign and record the date and time on the first Relinquished By line on the chain-of-custody form. The person to whom custody is being transferred shall sign on the first Accepted By line of the chain-of-custody form, indicating that custody is being accepted by that person for all the samples listed on the sheet. When samples are shipped via courier, the chain-of-custody form is attached to the inside of the shipping container and the shipping container is sealed using tape. For subsequent transfers of custody, the succeeding Relinquish and Receipt lines are used. To reduce custody records, the number of custodians in the chain-of-custody is minimized.

The following record keeping items will supplement the chain-of-custody form:

- Field Logbook,
- Monitoring Well Sampling Record, and
- Sample Receipt Checklist (typically provided by the laboratory).

4. WELL ASSESSMENT PRIOR TO PURGING

This section of the SAP provides information about inspecting monitoring wells, gauging fluid levels, and weather conditions. To reduce potential cross contamination during fluid level measurements, one of the following two options are recommended:

1. Activities begin at the upgradient wells and then proceed to downgradient wells, with water that is potentially affected; or
2. Each well sampling team carries dedicated well gauging equipment (one set for potentially affected wells and one set for non-affected wells). The determination as to which equipment is used at a particular well should be based on historical data.

As required, PPE will be worn at all times during the performance of the described procedures.

4.1 MONITORING WELL INSPECTION

The sampling team shall perform a visual inspection of each monitoring well and record the results in the field logbook or on a Monitoring Well Inspection Record (Form 1). The inspection of each well will include the following:

- Inspecting the casing and cap for cracks, signs of deterioration, or tampering;
- Verifying the identification information on the well is correct and clearly visible;
- Determining whether the cap and monitoring well are secure (via locks, bolted vault covers, in addition to general facility security);

- Inspecting the well pad for cracks, signs of deterioration, erosion, settling, and/or animal and insect burrowing; and
- Where appropriate, inspecting any dedicated equipment for signs of cleanliness, structural integrity, and deterioration.

4.2 WATER LEVEL AND TOTAL DEPTH INFORMATION

The depth to groundwater (DTW) in each well will be measured at the beginning of each sampling event before undertaking any purging or sampling activities and will be recorded in the field log book or on a Monitoring Well Gauging Record (Form 2). The distance from the designated measuring point at the top-of-casing (TOC) to the water surface will be measured to the nearest 0.01-foot with an electric water level indicator. The DTW measurements will be taken from the TOC on the true north side of the well.

Total well depth measurements will be periodically obtained to determine the occurrence of siltation. The total well depth will be measured after the samples are taken to avoid unnecessary disturbance of the water column prior to sampling. Total well depths will be obtained for each sampling event for wells that are sampled by bailers or non-dedicated pumps. Total depth measurements will be obtained on an annual basis for wells that contain dedicated pumps. Total well depth measurements will be required in the event a well is damaged or modified (casing lowered or extended).

Total well depth will be measured by allowing the probe to drop to the bottom of the well and determining the depth where the tape becomes slack. The reading will be recorded to the nearest 0.01-foot. These measurements will be compared with previous measurements and the original well depth to determine if sediment has accumulated within the screened interval, (i.e., "silted in"). Wells which have sediment in the screened interval will be redeveloped.

In addition to the collection of groundwater elevation measurements at each of the groundwater monitoring wells and piezometers, surface water elevations in the adjacent surface water bodies will be collected each time groundwater elevations are measured. These surface water bodies include the following – Lake Springfield, Sugar Creek and the Clarification Pond. Historically, the Lakeside Ash Pond and the Dallman Ash Pond have exhibited the presence of surface water. However, as of October 13, 2023, all CCR and non-CCR waste streams ceased flowing into the Lakeside Ash Pond and Dallman Ash Pond and the surface water levels have significantly declined. At present, rainwater is the only water entering the CCR surface impoundments.

See Section 9.0 for equipment decontamination procedures, investigation-derived waste (IDW) management, and IDW sampling.

4.3 WEATHER CONDITIONS

Weather conditions at the time of gauging/sampling activities (e.g., precipitation, temperature, wind speed and direction) will be recorded in the field logbook or the Monitoring Well Sampling Record (Form 3).

5. GROUNDWATER SAMPLING PROCEDURES

This section of the SAP provides information about purging and sampling groundwater collected from monitoring wells. Micropurging will be the preferred method of sampling for all the monitoring wells at CWLP CCR unit groundwater monitoring wells.

As required, PPE will be worn at all times during the performance of the described procedures.

5.1 MICROPURGING OF WELLS

To establish a common point of reference, low-flow refers to the flow rate at which water enters the pump intake and is the rate that is imparted to the formation pore water in the immediate vicinity of the well screen. The pump intake should be set:

1. Just above the mid-point of the screened interval if the transmissive zone is thicker than the screened section and the water column is at or above the top of the screen; or
2. Mid-point of the transmissive interval when the screened section is greater than the thickness of transmissive zone.

Water level drawdown provides the best indication of the stress (drawdown) imparted by a given flow rate for a given hydrogeological situation. Flow rates during low-flow purging will be used to regulate drawdown to less than 0.1 meter (0.3 feet). While these flow rates will typically range between 0.1 to 0.5 liter/minute (L/min), the flow rate for an individual well may vary due to site-specific hydrogeology. For example, sand channel lenses may support flow rates of up to 1 L/min without causing drawdown greater than 0.3 feet. Alternatively, wells that screen clayey, silty layers may not produce groundwater at 0.1 L/min without having drawdown greater than 0.3 feet.

For monitoring wells with low water productivity that have drawdown greater than 0.3 feet, there are two possible situations:

- Drawdown is greater than 0.3 feet, but stabilizes at a level above the pump intake; or
- Drawdown continues to occur even at the slowest possible pumping rate.

For these situations, the following purging and sampling procedures will be followed and documented on the sampling record.

- If drawdown is greater than 0.3 feet, but stabilizes at a level above the pump intake; record water levels in well and continue to monitoring water quality indicator parameters until

those stabilize. Collect groundwater sample upon stabilization of water quality indicator parameters.

- If at the slowest possible pumping rate drawdown is greater than 0.3 feet and continues to drop pumping shall be halted when the water level reaches the middle of the screened interval at which time the water level shall be allowed recover to a minimum of 80% of the original water level before collecting a groundwater sample using the slowest possible pumping rate. If the water level drops to the bottom of the screened section before all sample bottles have been filled, allow the well to recovery to a minimum of 80% of the original water level before continuing to fill the remaining sample bottles. If possible, the well should be sampled no more than 24 hours after the completion of purging, regardless of the recovery.

Groundwater samples will be collected from the monitoring wells using the following low-flow (micropurge) procedures.

- Non-submersible peristaltic pump – Where DTW is less than 29 ft the well may be purged and sampled using a non-submersible a peristaltic pump. To purge and sample the well, insert clean disposable polyethylene tubing into the well casing with the intake placed at the appropriate depth discussed above. Remember to include enough slack in tubing to allow for drawdown of the water level to the bottom of screen. Silicon tubing will be connected to the polyethylene tubing and threaded through the pumping apparatus on the peristaltic pump.
- Submersible pump – Where DTW is greater than 29 ft the well may be purged and sampled using a submersible pump. To purge and sample the well, the submersible pump should be fitted with clean disposable polyethylene tubing and the tubing inserted into the well with the intake placed at the appropriate depth discussed above.
- If dedicated polyethylene and silicon tubing were utilized and left in the monitoring well from a previous groundwater sampling event, skip the first two bullets above. Before sampling, check tubing for any damage and replace as necessary using the above mentioned methodology.
- The selected pump will be used to purge groundwater at a low-flow rate, generally less than approximately 0.5 L/min (100-500 milliliter/min).
- The well should be pumped at a sustainable flow rate to allow the lowest drawdown of water level (see above) until water quality parameters stabilize or the water level drops below the bottom of the screened interval.
- Groundwater quality indicator parameters will be monitored during low-flow purging to determine stabilization. The water quality indicator parameters to be monitored and their stability criteria are identified on the Monitoring Well Sampling Record (Form 3).

Measurements of water quality indicator parameters will be recorded every 3 to 5 minutes until stabilization is achieved. These measurements, along with flow rate and depth to water, will be

recorded be recorded in the field log book or on a Monitoring Well Sampling Record (Form 3). Stabilization is achieved when at least 3 of the 5 parameters have stabilized for three successive readings. If the minimum three water quality indicator parameters do not stabilize within 45 minutes of low-flow purging, a groundwater analytical sample will be collected from the well. For the purposes of sample turbidity, if a turbidity less than 10 nephelometric (NTUs) cannot be achieved, then a secondary backup criteria be set at less than 10% change between the final three is acceptable.

See Section 9.0 for equipment decontamination procedures, IDW management, and IDW sampling.

5.2 SAMPLE COLLECTION

Groundwater will be collected from the well and transferred to the appropriate sampling containers in a manner that reduces the amount of exposure to the ambient environment. The sequence of sample collection will be as follows:

- Metals,
- Water Chemistry (cations, anions, TDS, pH, etc.), and
- Radioactive elements (if required).

All samples will be collected in clean, laboratory-supplied sample containers with the appropriate preservative for the analytical method.

Metals analysis will measure total recoverable metals, which captures both particulate and dissolved fractions. Groundwater samples will not be field filtered prior to analysis. Samples will be collected and analyzed for constituents identified in a given groundwater monitoring program's list of analytes. Any required preservatives will be added to the bottles by the laboratory prior to delivery to the sampling personnel.

A sample label will be affixed to each sample container. Complete the label on each sample container with the typical information:

- Project name,
- Sample identification (well ID),
- Date and time of collection,
- Sample type, requested analysis,
- Type of preservative (if any), and
- Sampler's initials.

Sampler shall record the sample ID, sampling procedure, date, and time of sample collection on the Monitoring Well Sampling Record (Form 3) or field log book. Sampler shall record the sample ID (well ID), time and date of collection, sample media, and specified analyses to be conducted

by the laboratory, if not already provided, on the chain-of-custody record. See Section 3.3 for details on sample custody information.

Sampler shall check that the sample container caps are tight; then place the filled sample containers into a sample cooler containing bagged ice in a manner to prevent breakage. The cooler will be packed with sufficient ice to maintain the proper preservation temperature. See Section 6.0 for details on sample packing and shipment.

After sampling is completed at a particular well, the tubing will be removed from the well and placed in an appropriate disposal container (See Section 9.0). The well will be secured before proceeding to the next well.

See Section 9.0 for equipment decontamination procedures, IDW management, and IDW sampling.

5.3 QUALITY CONTROL SAMPLING

Quality control (QC) and quality assurance (QA) samples will be collected and analyzed along with monitoring well samples to assess the variability introduced in sampling, handling, shipping, and analysis. The analytical program for the QC samples will follow the analytical program for the associated investigative samples. The following sample types will be collected.

- Blind Duplicate - One duplicate sample will be collected at each CCR Unit for each sampling event; a total of three blind duplicates will be collected per event. The blind duplicate will be analyzed for identical parameters as the monitoring well samples. The duplicate sample(s) will be collected from randomly selected wells; and will be labeled with an appropriate identification number other than the well number. The sample bottles for regular and duplicate analysis will be filled in alternate succession for each required analysis (e.g. fill the metals sample container, then the metals duplicate container). The identification number will be recorded in the field log book, or in a separate Monitoring Well Sampling Record (Form 3).
- Matrix Spike/Matrix Spike Duplicates (MS/MSDs) – One MS/MSD will be collected during each sampling event to test the potential effects of matrix interference on the laboratory results. To reduce the possible adverse impact to the laboratory equipment, wells selected for the MS/MSD samples will be those that historically have shown low or non-detect constituent concentrations (to the extent practical). The sample is collected as a triplicate (the original sample plus two additional sets). The matrix spike sample will be labeled with the well number followed by an “MS”. Similarly, the matrix spike duplicate will be labeled with the well number followed by “MSD”.
- Field Blank - One field blank sample will be collected for each sampling event. Field blank samples provide information about potential contamination of the samples during exposure to ambient conditions at the site during sample collection. Field blanks will be

prepared at a specified well site by pouring commercially-available distilled water into sample bottles and vials in the same quantities as the groundwater samples. The samples should be labeled appropriately and stored in the same manner as the groundwater samples.

- Equipment Blank – An equipment blank sample will be collected during the groundwater sampling event only if non-dedicated sampling equipment is used. After the non-dedicated equipment has been cleaned and rinsed (see Section 9.0 for decontamination procedures), distilled water will be passed over (e.g., poured over) the decontaminated equipment and the water will be collected in appropriate sample containers. The equipment blanks will be analyzed for the same suite of parameters as the monitoring well samples. Equipment blanks will not be collected if dedicated equipment is used for sample collection.

6. SAMPLE PACKING AND SHIPPING

Samples for chemical analyses will be placed into the correct laboratory-supplied sample containers, labeled appropriately, and immediately placed in a cooler with ice. The field sampler will document the appropriate information on the chain-of-custody form (see Section 3.3 for details). Prior to packing coolers and shipping to the laboratory, the outside surfaces of the sample containers will be cleaned if necessary (by wiping carefully with a paper towel) and repacked in the cooler. Sample containers will not be opened after they have been sealed. The containers will be placed inside a sealed plastic Ziploc-style bag and will then be placed in coolers containing sufficient ice (or packs of frozen gel) to maintain a sample temperature of approximately 4° C. Sample coolers should be lined with a new, large plastic trash bag to reduce the potential of melt water leaks. Care must be taken to avoid leakage of water from melted ice because overnight delivery service (e.g., FedEx) will not accept leaking coolers.

The sampler will be responsible for properly packaging and dispatching samples to the analytical laboratory. This responsibility includes using the proper shipping container, shipping labels, shipping papers, and filling out, dating, and signing the appropriate portion of the chain-of-custody form. Samples will be packed with cushioning material sufficient to reduce the potential for breakage of glass sample containers during transport. The chain-of-custody form will be placed inside a sealed plastic Ziploc-style bag and the bag placed inside the cooler on top of the cushioning material.

If a laboratory with a local or nearby field-service center is contracted to perform analytical services, samples and coolers will be transported directly to the laboratory service-center or to a secure drop-off location by field personnel on the same day as sampling. The insulated coolers containing groundwater samples will be delivered to or picked-up by the laboratory and signed over to the laboratory personnel in accordance with chain of custody procedures for storage and analysis.

If a distant laboratory is contracted to perform analytical services, then samples and coolers will be shipped via overnight delivery service (e.g., FedEx). Shipments will be accompanied by the chain-of-custody form and it will be sealed in an airtight, resealable plastic bag inside the cooler. The cooler will be taped shut with clear packaging tape and a tamper-evident custody seal will be attached across the lid. This seal will only be broken by the recipient at the laboratory.

7. ANALYTICAL PROCEDURES

Groundwater samples collected under the Detection Monitoring Program will be analyzed for the constituents in Appendix III to Part 257, including boron, calcium, chloride, fluoride, pH, sulfate, and total dissolved solids (TDS). Groundwater samples collected under the Assessment Monitoring Program will be analyzed for the constituents listed in Appendix III to Part 257, including boron, calcium, chloride, fluoride, pH, sulfate, and total dissolved solids (TDS) and for the constituents listed in Appendix IV to Part 257 including antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, fluoride, lead, lithium, mercury, molybdenum, selenium, thallium and radium 226 & 228 combined. IDW samples (further described in Section 9.0) will be analyzed for the constituents specified in Table. A NELAC-accredited laboratory will perform the groundwater analyses.

Groundwater analyses will be performed in accordance with the most recent edition of Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (EPA SW 846), ASTM Standard Test Methods, or other EPA-approved methods. Detection limits will be those recommended for the procedure and analytical instrument specified.

8. QUALITY ASSURANCE

This section briefly summarizes the quality assurance measures during field and laboratory activities associated with groundwater monitoring.

8.1 FIELD QUALITY ASSURANCE

Sample collection will be conducted according to the procedures outlined in Section 5.2. These procedures are designed to minimize potential sources of contamination and include the following key elements:

- Using dedicated or disposable tubing for each well to reduce the potential for cross-contamination between wells.
- Completing purging using low-flow (micropurge) sampling techniques. If the screened water-bearing unit has low hydraulic conductivity that results in drawdown greater than the guidelines for low-flow sampling, the well should be allowed to recover to at least 80 percent of the static water level prior to sampling.

- Using duplicates, matrix spikes, matrix spike duplicates, field blanks, and equipment blank samples to assess potential cross-contamination during sample collection, transport, and analysis as well as providing a check on the data quality from the laboratory (see Section 5.3).
- Handling samples, preservatives, and sample containers carefully to minimize exposure time and potential for evaporative loss and/or airborne contamination.
- Using containerized ice whenever possible to maintain 4°C sample temperatures during transit and cushioning materials to minimize breakage.

8.2 LABORATORY QUALITY ASSURANCE

The laboratory documentation system will comply with the requirements of the USEPA analytical protocols, as appropriate. The laboratory will perform internal QC checks for the analytical method. Depending on the analytical method, the QC checks may include analyzing sample spikes, surrogate spikes, reference samples, laboratory control samples, storage blanks, and/or method blanks.

The laboratory will document internally that instrument and analytical QC criteria have been met. The data package will contain all of the information required to evaluate compliance with the analytical methods' required and recommended QC checks, instrument tuning, calibration, and sample analysis. If errors or deficiencies are identified in an analytical system, corrective actions are implemented to return the system to normal operation.

8.3 DATA REVIEW AND EVALUATION

A data validation will be performed to assess whether the dataset meet the project requirements in terms of following the appropriate analytical methods, sample locations, and sampling procedures. All sample collection procedures and laboratory reports will be reviewed to verify that the field and laboratory QA/QC requirements have been met.

The final reportable data, laboratory checklist, associated exception report(s), laboratory quality control data, and chain-of-custody will be reviewed in accordance with applicable EPA guidance, including, but not limited to the National Functional Guidelines for Inorganic Superfund Data Review (EPA 540-R-013-001), August 2014. Data precision and accuracy will be assessed based on control limits of 70-130% for laboratory control samples (except for antimony which will be assessed based on control limits of 50-150%) and 75-125% for spike sample analysis. A control limit of 20% for the relative percent difference (RPD) shall be used for original and duplicate sample values.

9. DECONTAMINATION AND WASTE MANAGEMENT

This section of the SAP provides information about equipment cleaning procedures and management of IDW during monitoring events.

9.1 EQUIPMENT DECONTAMINATION PROCEDURES

The decontamination of sampling equipment is necessary to reduce the potential for the spread of constituents to clean areas, to reduce exposure of personnel to constituents of concern, and to reduce the potential cross-contamination when equipment is used more than once. The water level indicator will be rinsed with deionized water between wells, or cleaned with Alconox® or other equivalent solution and rinsed with deionized water as necessary.

To reduce the potential for cross-contamination between monitoring wells during purging and sampling, well-dedicated or disposable equipment will be used to the extent practical. If non-dedicated pumps, discharge, and safety lines are used at a well, such equipment will be washed with non-phosphate detergent and distilled water solution, then rinsed with distilled water.

9.2 MANAGEMENT OF INVESTIGATION-DERIVED WASTE

Common IDW from the groundwater sampling events are purge water, decontamination water, and trash (i.e., non-reusable plastic tubing, nitrile gloves, paper towels, etc.).

Well purge water will be discarded on the ground away from the well. Collection of purge water is not necessary. Collection of decontamination water is not necessary either and should be discarded in the same manner as the purge water.

Disposable equipment and supplies (i.e., domestic trash) will be placed in heavy duty plastic bags and the full bags placed in facility-designated receptacles. If it becomes necessary to place affected materials in a 55-gallon DOT-approved drum(s), then the drums will be labeled and secured. Further management of the drums and containerized waste will be handled by CWLP. Disposal may also occur at other receptacles managed by CWLP.

ATTACHMENT 1:
MONITORING WELL FORMS

FORM 1:
MONITORING WELL GAUGING RECORD

FORM 1

MONITORING WELL GAUGING RECORD
Groundwater Monitoring Program
City Water, Light, and Power
Springfield, Illinois

PROJECT INFORMATION
City Water, Light and Power
Springfield, Illinois
CCR Unit Groundwater Monitoring
Sampler(s):
Date:
Weather Conditions:

GAUGING RECORD
Measuring Pont: Top of Casing
Instrument ID:

Well ID	Depth To Water (ft)	Total Depth (ft)	Notes

FORM 2:
MONITORING WELL INSPECTION RECORD

FORM 2

MONITORING WELL INSPECTION RECORD
Groundwater Monitoring Program
City Water, Light, and Power
Springfield, Illinois

PROJECT INFORMATION	
City Water, Light and Power	
Springfield, Illinois	
CCR Unit Groundwater Monitoring	
Sampler:	Signature:
Company:	Date/Time:
WELL ID	
Stick-Up: ☐	
Flush-Mounted ☐	
Is the well site clear of weeds and debris? Comment:	Yes No
Has the grass been mowed? Comment:	Yes No
Are there bollards or protective barriers around the well? Comment:	Yes No
Is the well identification clearly visible and in good condition? Comment:	Yes No
Is the protective casing or vault in good condition? Comment:	Yes No
Is the protective casing (or vault) equipped with a protective cap? Comment:	Yes No
Does the well have a concrete pad? Comment:	Yes No
If yes, what is the condition of the pad? Comment:	Good Cracked Broken
What is the condition of the inner casing? Comment:	Good Cracked Broken
Does the inner casing have a cap? Comment:	Yes No
Is the well locked? Comment:	Yes No
If yes, what is the condition of the lock? Comment:	Yes No
Is the annulus between the inner and outer casing free of standing water? Comment:	Yes No
Is the survey measuring point marked on the TOC? Comment:	Yes No
Expected Depth of Well:	
Measured Depth of Well:	
General Observations:	

FORM 3:
MONITORING WELL SAMPLING RECORD

FORM 3

MONITORING WELL SAMPLING RECORD
Groundwater Monitoring Program
City Water, Light, and Power
Springfield, Illinois

PROJECT INFORMATION
City Water, Light and Power
Springfield, Illinois
CCR Unit Groundwater Monitoring
Well ID:
Well Diameter:
Sampler(s):
Date:
Weather Conditions:

INITIAL MEASUREMENT	
Measuring Pont: Top of Casing	Water Column Ht. (H1=D2-D1):
Measuring Point Elevation:	Max. Drawdown (D1+0.33 ft):
Depth to Water (D1):	DTW at 80% Rec. (D2-(0.8xH1):
Total Well Depth (D2):	Tubing Intake Depth:

PURGING RECORD								
Purge Method:				Instrument ID:				
Time (Hr:Mn)	**Pump Rate (mL/min)**	**DTW (ft below TOC)**	**Temp (°C)**	**pH (Std Units)**	**ORP (mV)**	**SC (mS/cm2)**	**DO (mg/L)**	**Turbidity (NTU)**
Stabilization Criteria		± 0.3 ft	-	± 0.1 Units	± 10 mV	± 3%	± 10%	± 10%
				Total groundwater purged (gallons):				

SAMPLING RECORD		
Analysis Requested	Container/Preservative	Sample Date/Time:
		Sampling Remarks:

NOTE: For the purposes of sample turbidity, if a turbidity less than 10 nephelometric turbidity units (NTUs) cannot be achieved, then a secondary, backup criteria be set at less than 10% change between the final three is acceptable.