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WP 02-EM1010

Revision 6

Field Parameter Measurements and Final Sample Collection

Technical Procedure

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CHANGE HISTORY SUMMARY

REVISION NUMBER	DATE ISSUED	DESCRIPTION OF CHANGES
5	01/12/23	• Editorial Changes. • Updated directory location ..\..\WQSP Data & Reports - Rounds (1 thru 44)\Master Files for EM1010 for Excel files in Section 1.0. • Deleted TROLL 9500 Operators Manual in Reference Section 2.0. • Added Section 2.1, Abbreviations and Acronyms list. • Deleted note in Section 5.3.3. • Moved Section 5.8.9 to Section 5.10
6	03/26/24	• Changes made were identified during the blue sheeting process during the SIMCO transition; therefore, only an editorial correction is needed.

1.0 INTRODUCTION

This procedure describes processes for field parameter measurement and final sample collection for the Detection Monitoring Wells (DMWs) of the Detection Monitoring Program (DMP). Groundwater (GW) parameters are measured in the field laboratory until indicator-parameters are stable. In accordance with WP 02-1, WIPP Groundwater Monitoring Program Plan, final samples are collected and submitted for hazardous constituents, general parameters, and radionuclide analyses.

Tasks listed under the Performance section are independent and can be performed as stand-alone processes. Samplers determine the order of final sample collection. Several tasks may be performed simultaneously during field operations by one or more qualified samplers.

Measurements described herein follow established field procedures per industry standards. Results of field parameters determine when purged GW is representative of the undisturbed native-GW of the Culebra Member of the Rustler Formation.

Field measurements and their corresponding performance sections are as follows:

- Section 5.1 Specific Conductance Calibration
- Section 5.2 pH Calibration
- Section 5.3 Continuous Measurements and Post-Testing QC
- Section 5.4 Printing Multimeter Reports
- Section 5.5 Specific Gravity Measurement
- Section 5.6 Stabilization Calculations
- Section 5.7 Sample Number Development
- Section 5.8 Collecting and Preserving Unfiltered Final Samples
- Section 5.9 Collecting and Preserving Filtered Final Samples
- Section 5.10 Shipping Final Samples and Storing Retains
- Section 5.11 Field Data Management
- Section 5.12 Quality Assurance/Quality Control Implementation
- Section 5.13 Field Data Package Completion and Finalization

Field data is entered into electronic worksheets represented by Attachments 2 through 4 and are automatically summarized on Attachment 1. Formulas (mathematical and logical) required for comparisons, whether calculated and/or transferred, are included in the attachments. Attachments 1 through 5 will be maintained as Excel files located in the following directory: ..\..\WQSP Data & Reports - Rounds (1 thru 44)\Master Files for EM1010. Qualified field-personnel interpret measurement results to determine when parameters are stable (representative of undisturbed native GW) and when to collect final samples. Final samples are shipped or hand-delivered to analytical laboratories for analyses.

Any records generated are handled in accordance with departmental Records Inventory and Disposition Schedule (RIDS). Performance of this procedure generates the following record(s):

- Attachment 1, Example Field Parameter Measurement Summary Report
- Attachment 2, Example Field Parameter Measurement for Specific Conductance and Temperature
- Attachment 3, Example Field Parameter Measurement for pH
- Attachment 4, Example Field Parameter Measurement for Specific Gravity
- Attachment 5, Example Final Sample Checklist
- Attachment 6, Example Final Sample Labels
- Attachment 7, Example Combined Chain of Custody/ Request for Analysis
- Sample tracking documentation (waybills, carrier's electronic tracking history, analytical laboratory notification)
- DMW data package

Records generated by this procedure are kept on file within the Operating Record, as required by the Waste Isolation Pilot Plant (WIPP) Hazardous Waste Facility Permit (Permit). Information and analytical data generated by the DMP classify as quality records.

2.0 REFERENCES

DOCUMENT NUMBER AND TITLE	BASELINE DOCUMENT	REFERENCED DOCUMENT	KEY STEP
ASTM Method D1429-08, Standardized Test Method for Specific Gravity of Water and Brine	✓		
EQASOP FieldCalibrat3, Standard Operating Procedure Calibration of Field Instruments EPA Methods	✓		
Hazardous Waste Facility Permit,NM48090139088-TSDF	✓		
Standard Method 2550 B, Temperature – Laboratory and Field Methods	✓		
Standard Method 4500-H+ B, pH Value – Electrometric Method	✓		
Orion Star™ and Star Plus Meter – Users Guide Thermo Fisher Scientific, Inc., Beverly, MA. 2008.	✓		
Orion Star™ Plus M Navigator21 – Software Manual. Thermo Fisher Scientific, Inc., Beverly, MA. 2008.	✓		
Orion VersaStar™ Advanced Electrochemistry Benchtop Meter – Reference Guide. Thermo Fisher Scientific, Inc., Beverly, MA. 2011.	✓		
Orion Star Com – Software Manual. Thermo Fisher Scientific, Inc., Beverly, MA. 2013.	✓		
WP 02-1, WIPP Groundwater Monitoring Program Plan	✓		
WP 02-EM3001, Administrative Processes for Environmental Monitoring and Hydrology Programs		✓	
WP 04-AD3030, Pre-job Briefings and Post-job Review		✓	
WP 10-AD3029, Calibration and Control of Monitoring and Data Collection Equipment		✓	
WP 12-IH.01, WIPP Chemical Hygiene Plan		✓	
WP 13-1, Waste Isolation Pilot Plant Quality Assurance Program Description	✓		
WP 15-RM, WIPP Records Management Program Plan		✓	
02-EM1010-JHA Job Hazard Analysis, Field Parameter Measurements and Final Sample Collection	✓		

2.1 ABBREVIATIONS AND ACRONYMS

ATC	automated temperature compensation
COA	Certificate of Analysis
CofC	Chain of Custody
DI H_2O	deionized water
DMP	Detection Monitoring Program
DMW	Detection Monitoring Wells
EPA	U.S. Environmental Protection Agency
GW	Groundwater
H_2SO_4	Sulfuric acid
HCI	Hydrochloric acid
HDPE	high density polyethylene
HNO_3	Nitric acid
JHA	Job Hazard Analysis
K	constant
M&DC	monitoring and data collection
NIST	National Institute of Standards and Technology
Permit	Hazardous Waste Facility Permit
QA	Quality Assurance
QC	Quality Control
RFA	Request for Analysis
RIDS	Records Inventory and Disposition Schedule
SC	Specific conductivity
SECM&H	Site Environmental Compliance Monitoring and Hydrology
SDS	Safety Data Sheets
SG	specific gravity
SU	standard unit
VOA	volatile organic analyte
VOC	volatile organic compound
WBV	well bore volumes
WIPP	Waste Isolation Pilot Plant

3.0 PRECAUTIONS AND LIMITATIONS

- Only personnel with current EM-23 Field Parameter Measurements and Sample Collection qualifications can perform this procedure unsupervised. Personnel in training (unqualified) may perform this procedure only in the presence of, and under the direct supervision of a qualified individual.
- Personnel must contact the Site Environmental Compliance Monitoring and Hydrology (SECM&H) Manager if unable to perform this procedure as written, or if abnormal conditions are observed.
- Safety Data Sheets (SDS), Job Hazard Analysis (JHA) and a copy of WP 12-IH.01, WIPP Chemical Hygiene Plan are bound and readily accessible to personnel working in the field laboratory.
- Personnel must conduct a pre-job safety briefing per WP 04-AD3030, Pre-job Briefings and Post-job Review and include a review of 02-EM1010-JHA before starting work.
- Personnel must wear safety glasses, chemical resistant gloves, full-length pants and closed-toe shoes while performing the final sampling of this procedure. Exceptions are as follows:
  - Chemical-resistant gloves may be removed when labeling sample containers (applying labels and protective tape)
- Flow cell and glassware must be washed using a phosphate-free detergent (e.g., Liqui-Nox®, Citranox®, or Contrad 70®) and rinsed with deionized water (Dl-H_2O) after use.
  - A dilute solution (less than 10%) of HNO_3, HCl or aqua regia (three parts HCl to one part HNO_3) may also be used, followed by a rinse with Dl-H_2O.
- Rinsate from washing measurement equipment should be captured in a container (e.g., beaker) and emptied between rinsing events.
- No hazardous wastes are generated by this procedure. All reagents are non-hazardous and are disposed with purged groundwater (GW).
- Measurement instruments are to be calibrated and maintained daily per WP 10-AD3029, Calibration and Control of Monitoring and Data Collection Equipment, manufacturer's specification or if required by Permit.
- Field measurements and final samples from each Detection Monitoring Wells (DMW) are collected through a dedicated sample line and under atmospheric conditions (pressure, temperature).
- Purge each DMW no more than three well bore volumes (WBV), or until field parameters stabilize, whichever occurs first.
  - A WBV is defined as the volume of water from the static water level to the bottom of the well sump.
  - Well stabilization occurs when field parameters are within plus or minus 5% for three consecutive measurements.

- When instructed to record data on any attachment of this procedure, personnel understand that the electronic version of the attachment is where data entry takes place.

4.0 PREREQUISITE ACTIONS

4.1 **WHEN PERFORMING** field activities,
ENSURE the field activities section of WP 02-EM3001, Administrative Processes for Environmental Monitoring and Hydrology Programs, is followed.

4.2 **PROVIDE** sample collection plans, shipping, and delivery dates in advance to analytical laboratories.

4.3 **ENSURE** monitoring and data collection (M&DC) equipment is calibrated and working properly.

4.4 **VERIFY** chemicals, reagents, and standards are **NOT** expired.

4.5 **ENSURE** safety equipment (spill control kit, first aid kit, and eyewash station) for field lab is available and working properly before each Detection Monitoring Program (DMP) round.

4.6 **PREPARE** electronic Attachments 1 through 6, and Attachment 7 as time allows, for each Detection Monitoring Wells (DMW) prior to the start of fieldwork.

4.7 **VERIFY** DMW stability criterion is met before collecting final samples.

4.8 Equipment List

- SAFETY
  - Chemical Resistant gloves
  - Chemical spill kit
  - Portable eyewash station
  - Safety glasses (with side shields)
- GROUNDWATER PURGING
  - Dedicated sampling line (inert material), in-line filter holder (47-mm, stainless steel) and support frame or equivalent
  - Flow cell (in-line), Geotech Multi-probe Flowblock Sampling System or equivalent

- MEASUREMENT
  - Digital thermometer or equivalent
  - Multimeter capable of measuring pH, temperature and specific conductance, or equivalent probe
  - Conductivity cell
  - Epoxy automated temperature compensation (ATC) probe or equivalent
  - pH electrode, with or without built-in ATC feature
  - Hydrometer, scale 1.000 to 1.220 or equivalent
  - Hydrometer cylinder, plastic or glass

NOTE

Acids, solutions, and standards are obtained commercially and vendors provide Certificate of Analysis (COA).

- ACIDS, SOLUTIONS, AND STANDARDS
  - Deionized water (DI-H_2O)
  - Electrode filling solution, electrode dependent (e.g., 3M KCl), or equivalent
  - pH buffer solutions (NIST traceable; pH 4, 7 and 10)
  - Specific Conductivity (SC) standards (NIST traceable; 1,000 µmhos/cm [1K], 10,000 µmhos/cm [10K] and 100,000 µmhos/cm [100K])
  - Hydrochloric acid (HCl), 37% Vialservatives™ (EP Scientific), trace-metal grade, or equivalent
  - Nitric acid (HNO_3), 70% Vialservatives™ (EP Scientific), trace-metal grade, or equivalent
  - Sulfuric acid (H_2SO_4), 48% Vialservatives™ (EP Scientific), trace-metal grade, or equivalent

- OTHER CONSUMABLES
  - Glass stir rods or disposable transfer pipets
  - Graduated cylinder Beakers, plastic (disposable) or glass
  - pH strips, full range
  - Paper Towels (e.g. WypAlls™ or KimWipes™), or equivalent
  - Phosphate-free detergent (e.g. Liqui-Nox®, Citranox®, or Contrad®), or equivalent
  - Wash bottles, Nalgene™, or equivalent
  - Inedible pens and markers
  - Laptop computer, printer and paper

NOTE

The analytical laboratory provides sample containers, with preservative added if required, for hazardous constituents. Radionuclide sample containers are purchased to meet Level 1 Environmental Protection Agency (EPA) quality assurance (QA) washing and treatment standards. Pre-rinse not required for any containers.

- FINAL SAMPLING AND SHIPPING
  - Sample containers: amber bottles, high-density polyethylene (HDPE) bottle/jugs and volatile organic analyte (VOA) vials (supplied by analytical laboratory)
  - Filters, cellulose nitrate, 0.45-µm
  - Tweezers
  - Sample labels
  - Chain of Custody/Request for Analysis forms (CofC/RFA)
  - Custody seals or custody tape, tamper-proof (adhesive backs which are destroyed when removed or the container is opened)
  - Packing materials (e.g., butcher paper, bubble wrap, sample container cushion sleeves, clear packing tape, duct tape)
  - Ice and/or ice packs
  - Zip-seal plastic bags
  - Waterproof, insulated coolers (supplied by analytical laboratory)

5.0 PERFORMANCE

NOTE

Field parameters (pH, specific conductivity, and temperature) are measured simultaneously through an in-line flow cell, and specific gravity is measured using classical techniques. Sequence of performing calibrations and recording measurements is at discretion of sampler(s).

5.1 SPECIFIC CONDUCTANCE CALIBRATION

5.1.1 **COMPLETE** the following sections on Attachment 2, Example Field Parameter Measurement for Specific Conductance and Temperature:

- Detection Monitoring Wells (DMW) Sampling Information
- Equipment Specifics/ Calibration Standards

5.1.2 **REMOVE** conductivity standards from storage and equilibrate to room temperature.

NOTE

Calibration verifies that the conductivity cell and meter system work properly. Performing a 1 or 3-point calibration before using the instrument is necessary because measured cell constant varies from the nominal cell constant (K). Variations between measured (K/cm) and nominal constants (K) are due to environmental conditions and may change over time.

Conductance is the ability of aqueous solutions to carry electrical currents. This ability depends strongly upon the presence of ions, the total concentration of the ions, their mobility, ionic charge, and temperature. The common practice is to report specific conductivity (SC) values referenced to 25°C.

5.1.3 **CALIBRATE** (1 or 3-point) the multimeter/cell in accordance with the instrument's operation manual and/or software guide.

NOTE

Nominal cell constants (K) are dependent upon cell-type used. True SC calibration standard values should be plus or minus 10% from their certified concentrations after correcting for constant differences.

5.1.4 **OBTAIN** "true" SC calibration standard values using the following equation (See Attachment 2, Example Field Parameter Measurement for Specific Conductance and Temperature: the electronic version automatically calculates for the following steps).

SC, µmhos/cm = (Conductivity, µS) X (Measured cell constant, K/CM)

[A] **VERIFY** SC calibration standards are within plus or minus 10% of their certified concentrations, corrected to 25°C.

5.1.5 **PERFORM** a quality control (QC) check,
TO VERIFY calibration in accordance with the instrument's operation manual and/or software guide.

[A] **VERIFY** QC check standard is within 10% of expected concentrations.

[B] **IF** QC check result is **NOT** within expectations,
THEN consult the multimeter manual and/or cell user guide for troubleshooting assistance,
AND RETURN TO Step [B] when QC passes.

5.1.6 **RECORD** data under the Equipment Calibration/QC Checks section on Attachment 2, Example Field Parameter Measurements for Specific Conductance and Temperature,
OR OBTAIN data from multimeter report (Section 5.4, Printing Mulitmeter Reports),
AND RECORD when time permits.

5.1.7 **RINSE** SC cell with deionized water (DI-H_2O);
THEN blot dry.

5.1.8 **PLACE** SC cell into appropriate flow cell well,
AND FINGER-TIGHTEN well-cap nut unless using the cell for automated temperature compensation (ATC) during pH calibration (Section 5.2, pH Calibration).

5.1.9 **WHEN** calibrations for all parameters to be measured are complete,
THEN GO TO Section 5.3, Continuous Measurements and Post Testing QC,
AND PERFORM continuous measurements.

5.2 PH CALIBRATION

5.2.1 **COMPLETE** the following sections on Attachment 3, Example Field Parameter Measurement for pH.:

- DMW Sampling Information
- Equipment Specifics/Calibration Buffers

5.2.2 **REMOVE** buffer solutions from storage,
AND EQUILIBRATE to room temperature.

NOTE

Calibration verifies that the electrode and multimeter system work properly. Performing a 3-point calibration before using the instrument ensures reliability. An acceptable calibration has an average electrode slope of 92% to 102% and a QC check no greater than plus or minus 0.2 pH units from its known value (may differ due to calibration buffer tolerances).

Temperature affects pH measurement in many ways, but the two most common are (1) mechanical effects caused by changes in electrode properties (e.g., slope, temperature sensor errors), and (2) chemical and/or physical effects due to equilibrium changes (e.g., buffers, samples, and reference element drift).

5.2.3 **CALIBRATE** (3-point) the multimeter/electrode in accordance with the instrument's operation manual and/or software guide.

[A] **VERIFY** average slope of calibration is 92% to 102%.

5.2.4 **PERFORM** a QC check to verify calibration in accordance with the instrument's operation manual and/or software guide.

[A] **VERIFY** QC check standard is no greater than plus or minus 0.20 standard unit (SU) of the certified value, corrected to 25°C.

- QC limit is determined by tolerance of the buffer used and may differ from guideline above.
- **IF** necessary,
THEN CHECK accuracy limits of buffers,
AND ADJUST QC range accordingly.

[B] **IF** QC check result is not within specification,
THEN consult multimeter manual and/or electrode user guide for troubleshooting assistance,
AND RETURN TO Step 5.2.5 when QC passes.

5.2.5 **RECORD** calibration/QC data under the Equipment Calibration/QC Checks section on Attachment 3, Example Field Parameter Measurement for pH,
OR OBTAIN data from multimeter report (Section 5.4, Printing Multimeter Reports),
AND RECORD when time permits.

5.2.6 **RINSE** pH electrode and automated temperature compensation (ATC) source with Dl-H_2O;
THEN blot dry.

5.2.7 **PLACE** pH electrode and ATC source in to appropriate flow cell wells
AND FINGER-TIGHTEN well-cap nut.

5.2.8 **WHEN** calibrations for all parameters to be measured are complete,
THEN GO TO Section 5.3, Continuous Measurements and Post Testing QC,
AND PERFORM continuous measurements.

5.3 CONTINUOUS MEASUREMENTS AND POST-TESTING QC

5.3.1 **DIVERT** groundwater (GW) flow through flow cell by turning T-valve of dedicated sampling line to the open position.

5.3.2 **ALLOW** several flow cell volumes (cell capacity ≈ 40 mL) of GW to pass through in-line sampling system.

[A] **ENSURE** multimeter probes are sufficiently immersed in the GW sampling stream inside the flow cell.

[B] **ENSURE** flow cell is void of air pockets; however, minute air bubbles due to native GW properties are allowed.

5.3.3 **PLACE** multimeter in the continuous measurement mode as instructed by the instrument's operation manual and/or the software user guide.

[A] **PROGRAM** the multimeter
TO OBTAIN SC, temperature, and pH readings every five minutes.

[B] **COLLECT** readings until SC, temperature, and pH values are within plus or minus 5% for 3 consecutive measurements.

- **ENTER** SC and temperature readings on Attachment 2, Example Field Parameter Measurement for Specific Conductance and Temperature,
  AND pH readings on Attachment 3, Example Field Parameter Measurement for pH, to calculate percent change between readings (Section 5.6, Stabilization Calculations).

5.3.4 **PERFORM** post-testing QC checks for SC and pH in accordance with the instrument's operation manual and/or software guide.

[A] **VERIFY** SC QC check is within 10% of its certified concentration, corrected to 25°C.

[B] **VERIFY** pH QC check standard is no greater than plus or minus 0.20 SU from its certified value, corrected to 25°C.

[C] **IF** QC check results are not within specifications,
THEN consult multimeter manual and/or cell or electrode user guide for troubleshooting assistance.

5.3.5 **RINSE** SC cell and pH electrode with Dl-H_2O and prepare for storage as specified in their respective users guide.

5.4 PRINTING MULTIMETER REPORTS

5.4.1 **PRINT** calibration, measurement and QC results for SC and pH as instructed by the software's user's guide.

5.4.2 **SAVE** report files using the following example as a guide.

Example: DMW ID-DMP Round#-Day Measured_Testing.*

Save Report As: WQ6-R31-D1_pH.*

NOTE

Instrument reports may be printed after all testing has been performed. Data integrity is not affected because of time- and date-stamped results.

5.4.3 **INITIAL/SIGN AND DATE** reports. Analyst should include the following on each page:

- DMW Identification (ID)
- Detection Monitoring Program (DMP) round #
- Day measured (e.g. D1, D2, D3)

5.4.4 **TRANSFER** data to Attachments 2, Example Field Parameter Measurement for Specific Conductance and Temperature and Attachment 3, Example Field Parameter Measurement for pH, **AND/OR VERIFY** previously entered data on attachments when time permits, as needed to complete the data package.

5.4.5 **REPORT** data as follows:

- SC to nearest µmhos/cm
- pH to nearest hundredth SU
- Temperature to nearest tenth, degree Centigrade
- Testing times using 24-hour format

5.4.6 **PLACE** calibration, measurement, and QC reports directly behind their corresponding attachments in data package.

5.4.7 **EXIT** instrument software program, **AND SHUTDOWN** multimeter.

5.4.8 **CLEAN** in-line flow cell with detergent, **AND/OR DILUTE** acid.

5.4.9 **RINSE** thoroughly with DI-H_2O; **THEN** air dry.

5.5 SPECIFIC GRAVITY MEASUREMENT

5.5.1 **COMPLETE** the following sections on Attachment 4, Example Field Parameter Measurement for Specific Gravity:

- DMW Sampling Information
- Equipment Specifics

5.5.2 **DIVERT** GW flow from the in-line flow cell discharge into clean hydrometer cylinders.

5.5.3 **COLLECT** approximately 0.5 L to 1 L of sample into separate hydrometer cylinders. Sample should be collected in duplicate.

5.5.4 **RECORD** GW collection time(s) on Attachment 4, Example Field Parameter Measurement for Specific Gravity.

NOTE

Degassing time varies amongst DMWs, but is generally about 20 minutes when collected from a continuous flowing source. Highly carbonated GW may require longer degassing periods. Degassing is complete when air bubbles are minimally visible on inner surface of hydrometer cylinder.

5.5.5 **SET** hydrometer cylinder aside,
AND ALLOW GW to degas using guidelines above.

- **ACCELERATE** degassing by gently tapping on cylinder's outer surface to dislodge air bubbles.

5.5.6 **IMMERSE** hydrometer into cylinder containing degassed GW.

5.5.7 **PRESS DOWN** (slightly) on hydrometer stem while simultaneously giving hydrometer a quick spin. This action causes hydrometer to "bob".

5.5.8 **ALLOW** sufficient time for hydrometer to equilibrate with degassed GW.

5.5.9 **OBTAIN** specific gravity (SG) reading as follows:

[A] **ENSURE** hydrometer is not touching inner surface of cylinder.

[B] **OBSERVE** reading at intersecting plane of the horizontal liquid surface and hydrometer stem (eye level).

5.5.10 **OBTAIN** GW temperature (°C) using digital temperature probe or equivalent instrumentation.

5.5.11 **RECORD** the following testing information on Attachment 4, Example Field Parameter Measurement for Specific Gravity:

- Test time, 24-hour format
- Temperature to nearest tenth, degree Centigrade
- Hydrometer reading (SG) to nearest thousandth (unitless)

5.5.12 **CALCULATE** degas time using following equation (Attachment 4, Example Field Parameter Measurement for Specific Gravity, automatically performs this calculation in the electronic version):

Degas Time = Test Time – GW Collection Time

5.5.13 **DISCARD** tested GW,
WASH hydrometer cylinder,
AND TRIPLE RINSE with DI-H_2O.

NOTE

Determining GW stabilization is a “real-time” event and takes place during field parameter measurement. Each DMW is purged no more than three WBV or until field parameters stabilize, whichever occurs first.

Should file parameters not stabilize after three WBV have purged, sampler(s) will make a notation on field data sheets, and proceed with final sampling.

5.6 STABILIZATION CALCULATIONS

5.6.1 **PERFORM** testing described in the following sections:

- Section 5.1 Specific Conductance Calibration
- Section 5.2 pH Calibration
- Section 5.3 Continuous Measurements and Post-Testing QC
- Section 5.4 Printing Multimeter Reports
- Section 5.5 Specific Gravity Measurement

NOTE

Attachments 2 through 4 will automatically perform stabilization calculations in the electronic version after measurement data is recorded.

5.6.2 **ENTER** measurement data on the following Attachments:

- Attachment 2, Example Field Parameter Measurement for Specific Conductance and Temperature
- Attachment 3, Example Field Parameter Measurement for pH
- Attachment 4, Example Field Parameter Measurement for Specific Gravity

5.6.3 **DETERMINE** if GW from DMW has stabilized **BY PERFORMING** the following calculation for each field parameter measured.

[A] Percentage Change

[1] Calculate percentage change between three consecutive field-analyzed parameters using the following equation:

Percentage change = {(Max – Min of Last 3 Readings)/Last Reading} X 100

[2] Record results for each parameter measured on Attachments 2 through 4.

5.6.4 Stabilization occurs when percentage change is plus or minus 5% of three consecutive measurements.

5.6.5 **IF** percentage change is **NOT** within ±5% for three consecutive measurements,
THEN continue field-testing,
AND RETURN to Substep 5.6.3[A]
AND REPEAT percentage change calculation.

5.6.6 **GO TO** Section 5.8, Collecting and Preserving Unfiltered Final Samples,
AND THEN to Section 5.8, Collecting and Preserving Filtered Final Samples,
COLLECT final samples when percentage change results are acceptable.

NOTE

Sample number development conducted in advance of the DMP round.

5.7 SAMPLE NUMBER DEVELOPMENT

5.7.1 **DEVELOP** unique DMW final sample numbers using Substeps 5.7.1[A][1]through 5.7.1[A][4].

NOTE

A DMW sample number consists of the following, compiled in descending order:

- Subprogram code – “GW” followed by a dash.
- Location Code – Three alphanumeric characters (to identify DMW) followed by a dash.
- Zone code – One or two letter code (to identify the geologic formation member) followed by a dash.
- DMP round number code – the letter “R” followed by round number and dash.
- Sample ID code – letter “N” followed by number to identify samples for specific analysis.
  - Example: GW-WQ6-C-R7-N5

[A] **GO TO** Attachment 5, Example Final Sample Checklist and Attachment 6, Example Final Sample Labels and perform the following:

[1] **RECORD** subprogram code (i.e., GW), followed by a dash.

NOTE

For DMW (WQSP-1 through -6), only “WQ” is used for the location code. WQ6 is a sample from well WQSP-6.

For radionuclide samples, “BU” is used in place of the location code for blank samples only. BU6 is a blank sample of DI-H_2O collected during final sampling at well WQSP-6.

[2] **RECORD** location code, followed by a dash.

NOTE

The zone is designated by a one or two letter code for the water-bearing geologic formation member (e.g., “C” for the Culebra, “M” for Magenta, “DL” for Dewey Lake, “SR” for Santa Rosa or “O” for Other).

[3] **DETERMINE** and record zone code, followed by a dash.

NOTE

Primary sample codes identify samples using the letter “N” followed by a number. There may be more than one primary sample for each analysis. The primary sample is used for the Matrix Spike/Matrix Spike Duplicate.

Duplicate sample codes are identical to primary sample number, except the letter “D” is added after the sample number. Duplicate samples are used for precision of combined sampling and analysis. There may be more than one duplicate sample for each specific analysis.

[4] **DETERMINE** and record primary and/or duplicate sample codes.

WARNING

Chemical-resistant gloves and safety glasses are required. Refer to Precautions and Limitations section for exceptions.

NOTE

Final samples are collected annually from each DMW identified in the Hazardous Waste Facility Permit. Split or duplicate samples are provided to oversight agencies upon request.

5.8 COLLECTING AND PRESERVING UNFILTERED FINAL SAMPLES

5.8.1 **IF** installed**,**
THEN DISCONNECT in-line flow cell from dedicated sampling line.

5.8.2 **INSPECT** the dedicated filter holder visually for contaminants and/or damage before installation.

5.8.3 **WASH** filter holder with phosphate-free detergent and/or diluted acid,
IF REQUIRED, RINSE thoroughly with DI-H_2O.

5.8.4 **INSTALL** clean dedicated filter holder without the inner support/frit **AND CLAMP** to support frame.

5.8.5 **DIVERT** GW flow **BY TURNING** valve of dedicated sampling line to the open position.

5.8.6 **COMPLETE** the upper section of Attachment 5, Example Final Sample Checklist, (items 1 through 9).

5.8.7 **CONSULT** Attachment 5, Example Final Sample Checklist, for sample containers and preservatives required for each DMW sample number (items 10, 11, and 14 through 18).

NOTE

The analytical laboratory provides all sample containers and vials for hazardous constituents. Sample containers and vials received either are pre-acidified (preserved) or non-acidified (non-preserved) depending on the parameter of interest.

The sampling team collects additional GW samples for other analyses. Samples are collected in certified-clean containers and if required, preserved with certified acids (certification provided by vendor). To maintain consistency of all with sampling techniques, preservative is also added to containers from sources other than the analytical laboratory before collecting the samples.

5.8.8 Non-Preserved Sample Collection

[A] **FILL** non-preserved sample container(s) to shoulder height by alternating sample containers under GW stream during collection process and cap.

[B] **RECORD** collection time for each parameter on Attachment 5, Example Final Sample Checklist (item 19).

[C] **AFFIX** a label to each dry sample container with the following information (e.g., Attachment 6, Example Final Sample Labels):

- Sample number
- Project name
- Zone
- DMW ID
- Matrix (DI-H_2O or GW)
- Samplers
- Sample date/Sample time
- Parameter or destination
- Preservative used
- Filtered (yes/no)
- Bottle number of sequence and total bottles required (1 of 6, 2 of 6, etc.)

[D] **PROTECT** labels with clear tape, **AND PREPARE** container(s) for shipping (Section 5.10, Shipping Final Samples and Storing Retains).

NOTE 1

Volatile organic compounds (VOCs) and their respective blanks require special vials and handling as addressed separately in Steps 5.8.9 and 5.8.10.

NOTE 2

Sample collection for VOC analysis occurs as a single process and once sealed, vials cannot be opened. Sample integrity is maintained by not checking the pH of sample after the vials have been filled.

5.8.9 Preserved (Pre-Acidified) Sample Collection for VOCs

[A] **FILL** pre-acidified sample vials slowly to the top rim so that a dome or convex meniscus is present.

- **IF** pre-acidified sample vial is not available, **THEN ADD** one premeasured HCI Vialservative™ (≈ 0.5 mL each), **OR** five to six drops (≈ 0.5 mL) of trace-metal HCI before sample collection to each sample vial.
- **FILL** vial as described above in 5.8.9[A].

[B] **ENSURE** inner vial cap/septum makes contact with sample when sealing.

[C] **RECORD** collection time for each parameter on Attachment 5, Example Final Sample Checklist (item 19).

[D] **TURN** vials upside down
AND VERIFY that only minute or no air bubbles exist.

[E] **LABEL** sample containers as described in Steps 5.8.8[C] and 5.8.8[D].

NOTE

Field and trip blanks apply **ONLY** to VOC analysis.

5.8.10 VOC Field and Trip Blanks

[A] **ACQUIRE** trip blanks from analytical laboratory.

- Trip blanks are pre-filled with DI-H_2O, sealed and labeled at analytical laboratory.
- Trip and field blanks **MUST** stay with the VOC sample containers/coolers throughout the entire sampling event.

[B] **FILL** field blanks, as described in Steps 5.8.9[A] through 5.8.9[D], using DI-H_2O as the matrix.

[C] **LABEL** sample containers as described in Steps 5.8.8[C] and 5.8.8[D].

5.8.11 **IF** filtered samples are required,
GO TO Section 5.8, Collecting and Preserving Filtered Final Samples.

5.8.12 **IF** sampling is complete,
THEN perform the following:

[A] **DISASSEMBLE** and clean filter holder with detergent and/or dilute acid.

[B] **RINSE** thoroughly with DI-H_2O and air dry.

[C] **STORE** the dedicated filter holder assembly in a zip seal plastic bag.

WARNING

Chemical-resistant gloves and safety glasses are required. Refer to Precautions and Limitations section for exceptions.

NOTE

Filtered final samples are for radionuclide analysis only unless otherwise specified by lead chemist or their designee.

5.9 COLLECTING AND PRESERVING FILTERED FINAL SAMPLES

5.9.1 **IF** installed,
DISCONNECT in-line flow cell from dedicated sampling line.

5.9.2 **INSPECT** the dedicated filter holder visually for contaminants, **AND/OR** damage before installation.

5.9.3 **WASH** filter holder with phosphate-free detergent,
AND/OR RINSE with diluted acid solution,
IF REQUIRED, RINSE thoroughly with DI-H_2O.

5.9.4 **DISASSEMBLE** filter holder
AND PLACE a 0.45-µm filter on inner frit using clean tweezers.

5.9.5 **WET** filter surface thoroughly with DI-H_2O to prevent air locks.

5.9.6 **REASSEMBLE** filter holder **AND CLAMP** to support frame.

5.9.7 **DIVERT** GW flow **BY TURNING** valve of dedicated sampling line to the open position.

5.9.8 **COMPLETE** the upper section of Attachment 5, Example Final Sample Checklist (items 1 through 9).

5.9.9 **CONSULT** Attachment 5, Example Final Sample Checklist, for sample container and preservative requirements for each DMW sample number (items 10, 11, and 14 through 18).

NOTE

Prior to radionuclide sample collection:

Add 1 premeasured Vialservative™ of required diluted acid (≈ 2 mL each) or ≈ 1 mL of the concentrated trace-metal acid required to each sample container.

Acid volume suggested is per Liter of GW. Adjust added volume of preservative according to the volume of sample collected.

5.9.10 Preserved, filtered Sample collection radionuclides

[A] **FILL** sample container(s) to shoulder height by alternating sample containers under GW stream during collection process and cap.

[B] **RECORD** collection time for each parameter on Attachment 5, Example Final Sample Checklist (item 19).

[C] **INVERT** each container gently several times to mix.

[D] **UNCAP** one of the first two sample containers from each parameter after filling,
AND VERIFY final pH requirements with a pH test strip.

[1] **DO NOT IMMERSE** pH test strip into sample container.

[2] **OBTAIN** testing aliquot with a clean glass stir rod **OR DISPOSABLE** transfer pipet.

[3] **IF** sample pH greater than 2,
ADD ≈ 1.0 mL from another premeasured Vialservative™ (diluted acid)
OR ≈ 0.5 mL of concentrated trace-metal acid.

[E] **RECAP** sample and repeat Steps 5.9.10[C] and 5.9.10[D] until sample pH less than 2.

[F] **ADD** the same amount of preservative (relative) to each sample container of that parameter based on the results of Steps 5.9.10[C] and 5.9.10[D], if required.

[G] **LABEL AND PREPARE** sample containers for delivery as described in Steps 5.8.8[C] and 5.8.8[D].

[H] **IF** sampling is complete,
THEN discard the used filter
AND GO TO Step 5.8.12 for cleaning and storage guidance.

NOTE

A combined Chain of Custody (CofC)/ Request for Analysis (RFA) form shall accompany samples. The form provides a document trail, including the date/time of sample transfers and persons having custody of the samples. Samples are considered under custody if (1) in an authorized person's possession; (2) within view after being in possession; (3) in possession and locked up by an authorized person or sealed with tamper evident custody seal; or (4) in a designated secure area accessible only to authorized personnel.

5.10 SHIPPING FINAL SAMPLES AND STORING RETAINS

5.10.1 **SIGN AND DATE** custody seals with an indelible pen or marker when required on seal.

5.10.2 **AFFIX** custody seals around or across sample container or package.

- **NEVER** place custody seals over VOA vial septa.

5.10.3 **VERIFY** sample number on each container corresponds to sample number listed on the CofC/RFA form(s).

5.10.4 **PACKAGE** sample containers for shipping as follows:

- **PLACE** high-density polyethylene (HDPE) sample containers in zip-seal plastic bags.
- **PLACE** glass sample containers in bubble wrap sleeves or other cushioning material before placing in zip-seal plastic bags.

5.10.5 **PLACE** sample containers **UPRIGHT** in shipping cooler.

5.10.6 **SECURE** sample containers with packing material to prevent movement (or tipping) during transit. Leave room for cooling material.

5.10.7 **PLACE** doubled zip-seal plastic bags of ice, freezer packs or both inside the cooler.

- **PACK** cooler to maintain sample temperature at 4°C plus or minus 2°C until arrival at analytical laboratory.

5.10.8 **IF** shipping final samples to analytical laboratory,
PERFORM the following:

[A] **ENTER** signature, date, and time on the original CofC/RFA form to relinquish sample custody.

[B] **KEEP** the “pink” copy of the CofC/RFA.

[C] **IF** shipping more than one cooler,
SEPARATE signed originals CofC/RFA forms (white and yellow copies).

[D] **PLACE** forms inside zip-seal plastic bags and tape to inner lid of cooler(s).

- **ENSURE** that each cooler contains a copy (original, filed, or photocopy) of the completed multipart CofC/RFA form(s) when shipping.

[E] **SEAL** cooler by wrapping duct tape completely around cooler on both ends.

[F] **PREPARE** carrier’s waybill.
ENTER the DMW ID and DMP round number as the billing reference.

NOTE

Samples must ship “priority overnight” to ensure samples remain properly cooled and arrive at laboratory before analyses hold times expire.

[G] **TRANSPORT** samples to carrier’s drop-off location.

[H] **RETAIN** original copy of carrier’s waybill.

[I] **CONFIRM** the receipt of samples via e-mail from analytical laboratory and/or via carrier’s online tracking history.
INCLUDE a copy of each communication in the appropriate section of the DMW data package.

5.10.9 **IF** samples are hand-delivered to analytical laboratory, **PERFORM** the following:

[A] **COMPLETE** the CofC/RFA form but, **DO NOT** sign or date.

[B] **PLACE** samples upright in a suitable transportation container based on their storage requirements (cooled vs. room temperature),
AND TRANSPORT to analytical laboratory.

[C] **RELINQUISH** custody of samples by signing the CofC/RFA in the presence of the laboratory's sample receiving personnel.

[D] **OBTAIN** signature from the laboratory's receiving representative.

[E] **RETAIN** the "pink" copy of the CofC/RFA.

5.10.10 **PLACE** forms (CofC/RFA, carrier waybill, tracking history) in appropriate section of DMW package.

5.10.11 **PERFORM** the following for the RETAIN sample:

[A] **COMPLETE** a CofC/RFA (where applicable),
AND ENTER "RETAIN" or "HOLD" under the Comments Section.

[B] **PLACE** the CofC/RFA in the appropriate section of DMW data package.

[C] **PLACE** the RETAIN sample in lockable storage cabinet.

[D] **KEEP** RETAIN sample for at least one year.

[E] **EXAMINE** RETAIN samples periodically.

- **SEGREGATE** RETAIN samples with illegible labels and mark as **DO NOT USE**.
- **REPLACE** sample label that is deteriorated, but still legible, with a new identical label.
- **DOCUMENT** any finding on the CofC/RFA for the RETAIN sample.

5.10.12 **RECORD** disposition of the RETAIN sample upon disposal on the CofC/RFA. **SIGN AND DATE** the entry.

5.10.13 **PLACE** completed RETAIN CofC/RFA form in appropriate section of DMW Data Package.

NOTE

Final measurement results import automatically into Attachment 1, Example Field Parameter Measurement Summary Report.

5.11 FIELD DATA MANAGEMENT

5.11.1 **ONCE** field measurements and data entry are complete, **THEN PRINT** the following attachments:

- Attachment 1, Example Field Parameter Measurement Summary Report
- Attachment 2, Example Field Parameter Measurement for Specific Conductance and Temperature
- Attachment 3, Example Field Parameter Measurement for pH
- Attachment 4, Example Field Parameter Measurement for Specific Gravity

5.11.2 **REVIEW** transcribed data for accuracy (Attachments 1 through 4 and instrument printouts).

5.11.3 **INITIAL** beside each typewritten name listed under “Sampler” with indelible ink on each attachment.

5.11.4 **VERIFY** Attachment 5, Example Final Sample Checklist is complete.

5.11.5 **PREPARE** field laboratory summary report.

5.11.6 **MAKE** copies of the field summary report, Attachments 1 through 5, multimeter data reports, and other supporting documents (e.g., equipment usage log, WBV stats, etc.) for check print review.

5.11.7 **STAMP** “Check Print” on copies of the summary report, attachments, multimeter data reports, and supporting documents.

5.11.8 **PLACE** original documents and check print copies in the appropriate sections of the DMW data package.

NOTE

The validator shall be familiar with the current revision of this procedure and knowledgeable with the field process.

Data used outside SECM&H, verified or not, must be marked or noted as "INFORMATION ONLY," "PRELIMINARY," or "DRAFT."

5.12 QUALITY ASSURANCE/QUALITY CONTROL IMPLEMENTATION

5.12.1 Data Sheet Verification

[A] Validator, **CHECK** print data and summary report for the following:

- Correctly entered and/or transcribed data
- Complete entries on attachments and other documentation
- Corrections made with a single-line mark through, dated, and initialed
- Correct mathematical calculations, where applicable

[B] Validator, **IDENTIFY** (highlighter, pen, sticky note) any discrepancy found.

[C] Validator, **SIGN OR INITIAL, AND DATE** on check printed pages and return to Sampler or designee.

[D] Sampler or qualified designee, **MAKE CORRECTIONS** and **PROVIDE** Validator with the corrected data and/or report for secondary review.

- **RETURN** all copies (corrected original, first check print showing discrepancies, new corrected check print, etc.) to Validator.

[E] **REPEAT** Steps 5.12.1[A] through 5.12.1[D] until all errors are corrected,
AND RETURN to Step 5.12.1[F] when complete.

NOTE

Calculations cannot change after final resolution of check print corrections.

[F] Validator, **RETURN VERIFIED** data package to Sampler or designee for completion.

NOTE

The DMW field data package is complete when all three copies of the multipart CofC/RFA have been merged together for hazardous constituent testing only.

An original photocopy of the CofC/RFA form is acceptable for completion since the original CofC/RFA (white copy) **MUST** remain with the hazardous constituent data package.

5.13 FIELD DATA PACKAGE COMPLETION AND FINALIZATION

5.13.1 Sampler or designee, **COMPLETE** the DMW field data package as follows:

[A] **OBTAIN** a copy of the original CofC/RFA from the hazardous constituent data package and merge with other copies of the CofC/RFA form.

[B] **VERIFY** all documents within the field data package are stamped.

[C] **VERIFY** that project records are complete and appropriately stored in the project files.

[D] **STORE, PROTECT, AND MAINTAIN** data packages and field data sheets (records) as prescribed in WP 15-RM, WIPP Records Management Program Plan.

ATTACHMENTS

Attachments 1 through 4 are reconstructed as individual worksheets within a single file. Worksheets contain mathematical and logical formulas required to obtain the calculated results for field parameters of interest. Attachment 5 is reconstructed as individual worksheets within a single file for all DMWs. Attachment 6 is an example taken from a standard label template used to make final sample labels.

Format and appearance of these Attachments (1 through 6) may differ slightly between programs; however, all information is included on the worksheet. Slight differences in appearance are due to the formatting capabilities of each application.

Attachment 7 is a preprinted, multipart CofC/RFA (combined format) associated with final sample custody and analysis requested from analytical laboratories.

Attachment 1 – Example Field Parameter Measurement Summary Report

DMW Sampling Information

DMW ID:_____ Date:_____

Zone: _____ DMP Round #:_____

Day Measured:_____ Sampler:_____

Field Parameter	Unit	Final Field Measurement[a]	Date Tested	Time Tested	Sampler
Specific Conductance @ 25 C	µmhos/cm				
Temperature	°C				
pH	SU				
Specific Gravity		@ °C			

[a] Data represent last measurement (after determining parameters have stabilized).

Remarks:_____

Attachment 2 – Example Field Parameter Measurement for Specific Conductance and Temperature

DMW Sampling Information

DMW ID:_____ Date:_____

Zone: _____ DMP Round #:_____

Day Measured:_____ Sampler:_____

Equipment Specifics/Calibration Standards

Meter: M&DC ID, Serial #:_____ Calibration Date:_____

Conductivity Cell: Vendor, Model #, Serial #: _____

Temperature Probe: Vendor, Model #, Serial #:_____

1K Standard: Vendor, Lot #: _____ Expiration Date: _____

10K Standard: Vendor, Lot #: _____ Expiration Date: _____

100K Standard: Vendor, Lot #: _____ Expiration Date: _____

Daily Equipment Calibration/QC Checks

Standard	Test Time	Temperature, °C	Conductivity, uS	Cell Constant, K/cm	SC, µmhos/cm @ 25°C[a]
1K					
10K					
100K					
Circle One **QC 1:** 1K 10K 100K			N/A		
Circle One **QC 2:** 1K 10K 100K					

[a] SC, µmhos/cm = [(Conductivity, uS) x (Measured Cell Constant, K/cm)]

GW Measurements

GW Test ID	Test Time	SC, µmhos/cm @ 25°C	Temperature, °C	Percentage Change[b]
SC-0				N/A
SC-1				N/A
SC-2				N/A
SC-3				
SC-4				
SC-5				
SC-6				
SC-7				
SC-8				
SC-9				
SC-10				
SC-11				
SC-12				

[b] Percentage Change = {(Max – Min of Last 3 Readings)/Last Reading} x 100

Remarks_____

Attachment 3 – Example Field Parameter Measurement for pH

DMW Sampling Information

DMW ID:_____ Date:_____

Zone: _____ DMP Round #:_____

Day Measured:_____ Sampler:_____

Equipment Specifics/Calibration Buffers

Meter: M&DC ID, Serial #:_____ Calibration Date:_____

Electrode: Vendor, Model #, Serial #:_____ Electrode Filling Solution:_____

Temperature Probe: Vendor, Model #, Serial #:_____

pH 4 Buffer: Vendor, Lot #:_____ Expiration Date:_____

pH 7 Buffer: Vendor, Lot #:_____ Expiration Date: _____

pH 10 Buffer: Vendor, Lot #: _____ Expiration Date:_____

Daily Equipment Calibration/QC Checks

Buffer	Buffer Type	Test Time	Temperature, °C	pH Value, SU	Average Electrode Slope, %
pH 4	Calibration				N/A
pH 7	Calibration				
pH 10	Calibration				N/A
QC 7.0 Check 1	QC Check				
QC 7.0 Check 2	QC Check				

GW Measurements

GW Test ID	Test Time	Temperature, °C	pH Value, SU	Percentage Change[a]
pH-0				N/A
pH-1				N/A
pH-2				N/A
pH-3				
pH-4				
pH-5				
pH-6				
pH-7				
pH-8				
pH-9				
pH-10				
pH-11				
pH-12				

[a] Percentage Change = {(Max – Min of Last 3 Readings)/Last Reading} x 100

Remarks_____

Attachment 4 – Example Field Parameter Measurement for Specific Gravity

DMW Sampling Information

DMW ID:_____ Date:_____

Zone:_____ DMP Round #:_____

Day Measured_____ Sampler:_____

Equipment Specifics

Thermometer: M&DC ID, Serial #:_____ Calibration Expiration Date:_____

Hydrometer: M&DC ID, Serial #:_____ Calibration Expiration Date: _____

GW Measurements

GW Test ID	GW Collection Time	Degas Time	Test Time	Temperature, °C	Hydrometer Reading (SG)	Percentage Change[a]
SG-0						N/A
SG-1						N/A
SG-2						N/A
SG-3						
SG-4						
SG-5						
SG-6						
SG-7						
SG-8						
SG-9						
SG-10						
SG-11						
SG-12						

[a] Percentage Change = {(Max – Min of Last 3 Readings)/Last Reading} x 100

Remarks_____

_____

Attachment 5 – Example Final Sample Checklist

(1) **Project Name:** WIPP/DMP

(2) **DMW ID:** WQSP-

(3) **DMP Round #:**

(4) **Zone:** Culebra

(5) **Filter Type:** Whatman, cellulose nitrate

(6) **Pore Size:** 0.45 µm

(7) **Lot #:**

(8) **Samplers:**

(9) **Date Sampled:**

(10) Sample Number	(11) Parameter	(12) Matrix	(13) Destination	Sample Containers (14) # Required	(15) Volume	(16) Container Type	(17) Filtered	(18) Preservative	(19) Collection Time
GW-WQ1-C-R34-N1	VOC	GW	Lab Name	6	40 mL	VOA	No	HCl pH<2	
GW-WQ1-C-R34-N1D	VOC	GW	Lab Name	4	40 mL	VOA	No	HCl pH<2	
GW-WQ1-C-R34-N2	VOC Field Blank	DI-H_2O	Lab Name	4	40 mL	VOA	No	HCl pH<2	
GW-WQ1-C-R30-N3	VOC Trip Blank	DI-H_2O	Lab Name	4	40 mL	VOA	No	HCl pH<2	
GW-WQ1-C-R34-N4	TOC	GW	Lab Name	4	40 mL	VOA	No	HCl pH<2	
GW-WQ1-C-R34-N4D	TOC	GW	Lab Name	2	40 mL	VOA	No	HCl pH<2	
GW-WQ1-C-R34-N5	SVOC	GW	Lab Name	6	1 Liter	Amber Glass	No	None	
GW-WQ1-C-R34-N5D	SVOC	GW	Lab Name	2	1 Liter	Amber Glass	No	None	
GW-WQ1-C-R34-N6	Metals	GW	Lab Name	2	500 mL	HDPE	No	HNO_3 pH<2	
GW-WQ1-C-R34-N6D	Metals	GW	Lab Name	2	500 mL	HDPE	No	HNO_3 pH<2	
GW-WQ1-C-R34-N7	General Chemistry	GW	Lab Name	1	1 Liter	HDPE	No	None	
GW-WQ1-C-R34-N7D	General Chemistry	GW	Lab Name	1	1 Liter	HDPE	No	None	
GW-WQ1-C-R34-N8	Radionuclides	GW	Lab Name	2	2 Liters	HDPE	Yes	HNO_3 pH<2	
GW-WQ1-C-R34-N8D	Radionuclides	GW	Lab Name	2	2 Liters	HDPE	Yes	HNO_3 pH<2	
GW-BU1-C-R34-N9	Radionuclides Blank	DI-H_2O	Lab Name	2	2 Liters	HDPE	Yes	HNO_3 pH<2	
GW-WQ1-C-R34-N10	HOLD	GW	RETAIN	1	2 Liters	HDPE	Yes	HNO_3 pH<2	
ACID/REAGENT BLANKS (Collect on first and last well of each DMP round)									
GW-WQ1-C-R34-N11	Metals Blank	DI-H_2O	Lab Name	1	1 Liter	HDPE	No	HNO_3 pH<2	
GW-WQ1-C-R34-N12	Metals Blank	DI-H_2O	Lab Name	1	1 Liter	HDPE	No	None	

PRESERVATIVES

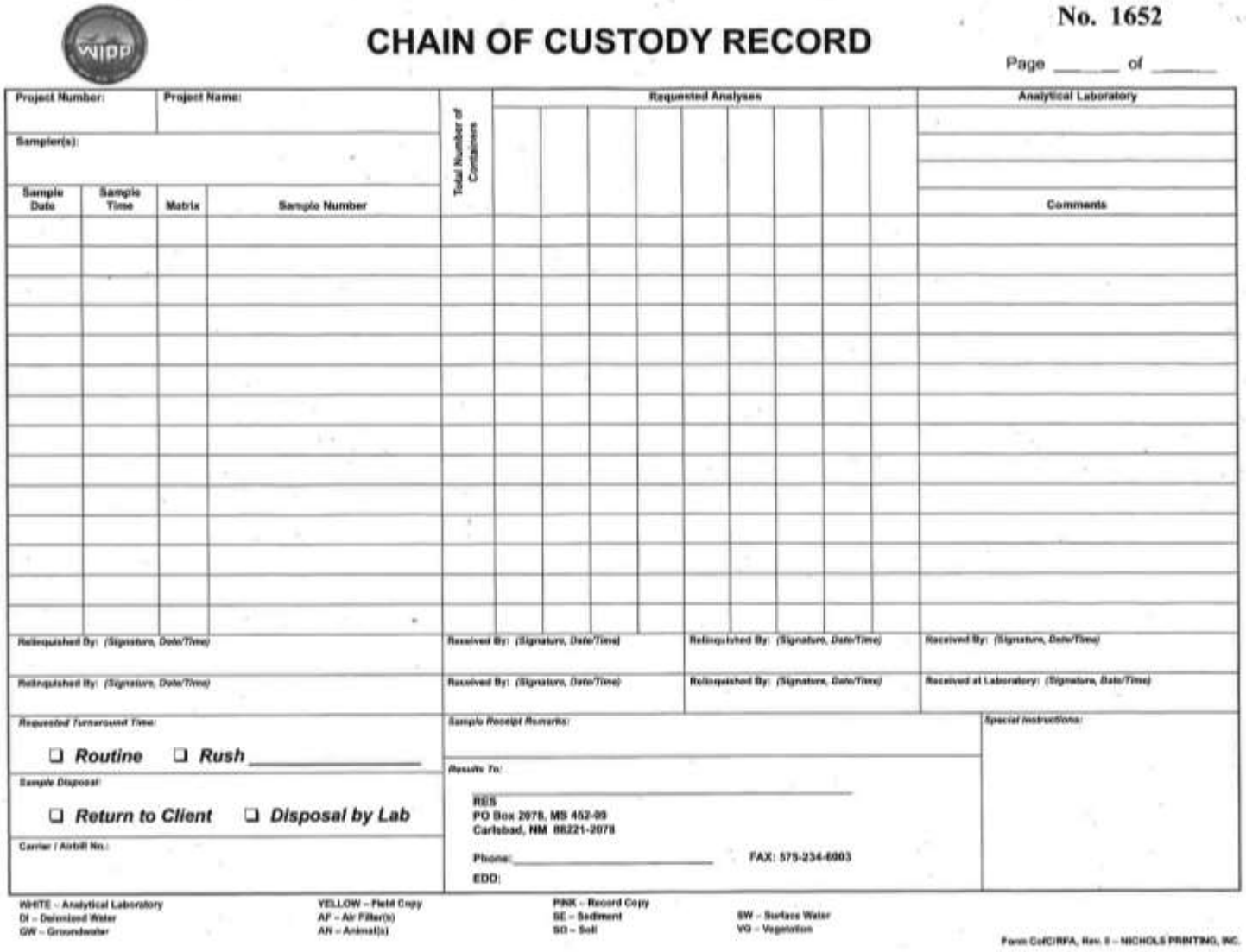
(20) Preservative	(21) Manufacturer	(22) Lot #	(23) Expiration Date	(24) Date Opened
Hydrochloric Acid (HCl)	Vendor Name			
Nitric Acid (HNO_3)	Vendor Name			
Sulfuric Acid (H_2SO_4)	Vendor Name			

Attachment 6 – Example Final Sample Labels

Sample No.:	**GW-WQ1-C-R34-N1**
Project Name: WIPP/DMP	Zone: Culebra
DMW ID.: WQSP-1	Matrix: Groundwater
Samplers: _____	
Sample Date: _____	Sample Time: _____
Parameter: **VOC**	Preservative: **HCl, pH < 2**
Filtered: NO	Bottle Number: **2** of 6
Temperature Requirements:	4°C ± 2°C

Sample No.:	**GW-WQ1-C-R34-8D**
Project Name: WIPP/DMP	Zone: Culebra
DMW ID.: WQSP-1	Matrix: Groundwater
Samplers: _____	
Sample Date: _____	Sample Time: _____
Parameter: **Radionuclides**	Preservative: **HNO_3, pH <2**
Filtered: YES	Bottle Number: **1** of 2
Temperature Requirements:	NONE

Attachment 7 – Example Combined Chain of Custody/Request for Analysis



WIPP

CHAIN OF CUSTODY RECORD

No. 1652

Page _____ of _____

Project Number:	Project Name:	Total Number of Containers	Requested Analyses	Analytical Laboratory
Sampler(s):				
Sample Date	Sample Time / Matrix / Sample Number			Comments

Relinquished By: (Signature, Date/Time)	Received By: (Signature, Date/Time)	Relinquished By: (Signature, Date/Time)	Received By: (Signature, Date/Time)
Relinquished By: (Signature, Date/Time)	Received By: (Signature, Date/Time)	Relinquished By: (Signature, Date/Time)	Received at Laboratory: (Signature, Date/Time)

Requested Turnaround Time:

❑ Routine ❑ Rush _____

Sample Disposal:

❑ Return to Client ❑ Disposal by Lab

Carrier / Airbill No.:

Sample Receipt Remarks:

Special Instructions:

Results To:

RES
PO Box 2078, MS 452-09
Carlsbad, NM 88221-2078

Phone:_____ FAX: 575-234-6003

EDD:

WHITE – Analytical Laboratory
DI – Deionized Water
GW – Groundwater

YELLOW – Field Copy
AF – Air Filter(s)
AN – Animal(s)

PINK – Record Copy
SE – Sediment
SO – Soil

SW – Surface Water
VG – Vegetation

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