



CPNMD Boil Advisory Incident Report

5/14/2024 – 5/17/2024

ABSTRACT

A summary of events, next steps, and lessons learned.

Nathan Travis

District Manager, Castle Pines North Metropolitan District

Event Summary

On the evening of Tuesday May 14th, CPNMD and ESI planned a scheduled shut-down to facilitate the connection of a replacement water main to our existing system. Precautions were taken to ensure that water was shut down, so that the work could be completed safely and efficiently.

At 8:00 pm, the necessary valves to isolate the main for the tie in were closed. CPNMD operations staff, then “verified” that the water was shut off by opening two immediately adjacent fire hydrants and confirming that there was no water flow, and that the area had been isolated.

Shortly after, ESI began the process of removing the existing water main, to make the connection when the line ruptured, and water began to pour out of the existing piping and into the excavation. To date, we do not yet know how it is possible that this line remained under pressure. The CPNMD operators that were present on site immediately called for assistance, and then began “falling back” closing additional valves.

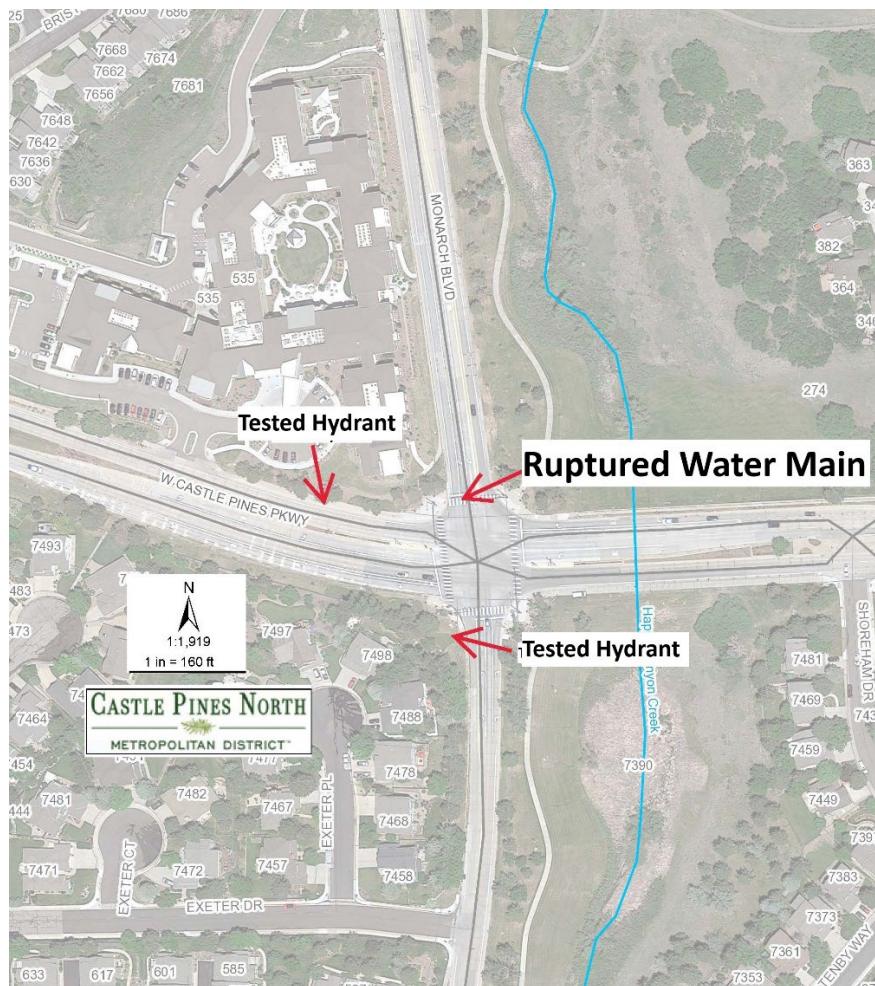


Figure 1: Location of Damaged Pipe

Shortly after calling for assistance TW Summit was able to send a crew with two vehicles to assist with the shutdown. CPNMD had two staff members already on site, they were joined by a third. The CPNMD Operations Manager, though not on site, coordinated the shut-down efforts of the four crews. During this process it was discovered that two valves at the intersection of Tenby and Monarch were missing operating nuts. After all other possible sources had been closed, TW Summit was able to replace the operating nuts, and close the two remaining valves, finally isolating the ruptured line.

Once isolated, ESI pumped the water out of the excavation and exposed the piping. Unfortunately, not all of the parts needed to make repairs were available on site, delaying the repair. ESI staff worked diligently to get the needed components, though this effort took several hours.

Because of the uncertainty of the source of the additional water, it could not be definitively determined what areas would be impacted by the expanded shut-down. To estimate the number of homes impacted, staff tracked the locations resident “no-water” calls.

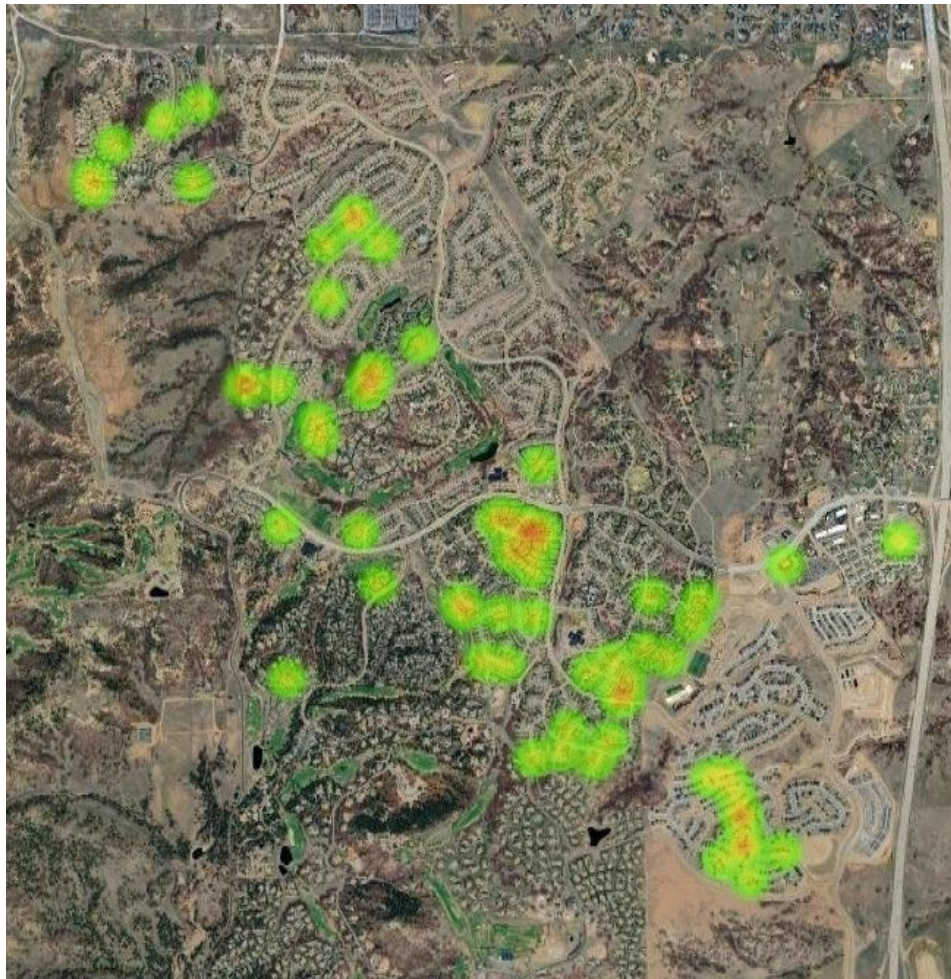


Figure 2: Location of "No-Water" calls (5/14 - 5/17)

The morning of Wednesday May 15th, the estimated percentage of service connections without water surpassed 20% of the total number of service connections. This triggers a requirement for water providers to self-report the system pressure loss to the Colorado Department of Health and Education (CDPHE). The report was made, and a Boil Water Advisory was issued shortly thereafter.

As quickly as possible CPNMD sent notifications across all available channels. Notification was posted to our website, an Email blast was sent out, press releases were sent to all major local media, Douglas County Emergency Management Services were notified, a CODE RED (reverse 911) was sent out, traffic sign boards were posted to all entrances and exits of the district, and notifications were posted to all of our social media accounts. We also worked to update the City of Castle Pines as frequently as possible as they also posted information diligently.

Repairs were completed by early afternoon on May 15th. Subsequently, CPNMD flushed water from the water distribution system, and collected bacteriological water quality samples. Crews continued flushing to clear discolored water from our water mains throughout the remainder of the afternoon.

These kinds of water quality samples take approximately 24 hours to process and incubate. On the afternoon of Thursday, May 16th the district was contacted by the lab, and informed that the samples had passed. Having fully satisfied the CDPHE requirements, the Boil Advisory was lifted. Notice of the order being lifted was communicated to the public via the same communication channels utilized to announce the initiation of the advisory.

Timeline of Events

*Estimated outage percentage was determined by the location, of residents reporting that they have no water service.

*Denotes Public Communication

Tuesday 5/14/2024

- 20:00
 - Valves are closed for scheduled tie-in.
- 20:15
 - Nearby fire hydrants are opened to verify isolation, no water flow observed.
- 20:30
 - Work begins to remove section of existing water main, and tie-in new line.
- 21:00
 - Existing waterline ruptures, on site CPNMD operator calls for assistance and begins “falling back” closing additional valves.
- 21:15
 - CPNMD District Manager notified.
 - **Emergency notification posted to website. RE: Service interruption anticipated discolored water.**
- 21:30
 - TW Summit (valve contractor) arrives on site with 2-man crew, and supervisor.

- Estimated Service Outage 12%
- 22:00
 - E-mail blast sent to residents. RE: Service interruption anticipated discolored water.
 - Social and Web Update
- 23:30
 - Two damaged valves are discovered; TW Summit begins repairs.

Wednesday 5/15/2024

- 01:00
 - Valve repairs are completed, valves are closed.
- 01:30
 - Ruptured pipe is successfully isolated, water stops flowing.
 - Estimated service outage 15%.
- 04:00
 - Waterlines are re-exposed, and the trench is pumped out. Contractor determines parts needed for repairs are not available on site.
- 06:30
 - Estimated service outage 18%.
- 07:01
 - Update (email, social, web) RE: more details about the event.
- 07:30
 - Estimated service outage 22%. Exceeding 20% triggers requirement to self-report to CDPHE.
 - Parts needed for repairs are delivered to job-site.
- 07:40
 - CDPHE is notified and Boil Advisory is issued.
 - Emergency notification posted to website. RE: Boil Advisory
- 08:40
 - Douglas County/ Douglas County Sheriff's Office notified; CODE RED (reverse 911) requested.
- 08:50
 - Operations begins work to re-instate service to areas that can be done safely.
 - System flushing operations begin.
 - Boil Advisory Notification sent out via email.
 - Press Release Sent
 - Drinking Water Warning Sent
 - Update (email, social, web) RE: Boil Water Advisory Sent Out
- 10:00
 - Repair is made, and tie-in is completed.
 - Work begins to open the remaining closed valves.
 - Water quality sampling begins, following behind flushing crews.
- 10:30

- CODE RED (reverse 911) begins rollout.
- 6 Traffic Control Trailer Signs are posted at District entry and exit points, notifying residents of Boil Advisory.
- 13:45
 - Service fully restored; water quality sampling completed.
- 14:13
 - Update (email, social, web) RE: informing residents service was restored, boil advisory still in effect.
- 14:30
 - Water quality samples delivered to State Certified Lab (results attached).
- 15:45
 - Update (email, social, web) RE: Prospective timeline to lift Boil Advisory
- 16:30
 - 2 Bottled water pallets delivered to CPNMD offices, available for free to residents.
- 17:00
 - Flushing operations for removal of discolored water end for the day.

Thursday 5/16/2024

- 09:23
 - Update (email, social, web) RE: Notification that samples are at the lab, and notice may be lifted pending results.
- 13:30
 - Water quality sample results received; all samples pass testing.
 - CDPHE is notified of completed water quality samples, and results.
- 14:00
 - CDPHE Rescinds Boil Water Notice, Notifies CPNMD
 - Press Release sent out.
 - Update (email, social, web) RE: Boil Advisory Lifted
- 14:15
 - CODE RED (reverse 911) initiated: RE Boil Advisory Lifted
- 14:30
 - Traffic Control Signs updated RE: Boil Advisory Lifted

Next Steps

Unfortunately, we still do not know the source of the water that pressurized the pipe. We will develop and execute a plan to verify valve isolation across the district, with an immediate focus on the Monarch & Castle Pines Pkwy intersection. In the process, we hope to determine any additional unknown piping or valving configurations.

This highlights the need for the continued Capital Replacement of these distribution system assets. There are already plans in place to replace the remainder of our problematic distribution system transmission mains, by the end of 2026. Working in conjunction with the City of Castle Pines roadway reconstruction projects.

Lessons Learned- What can we do better?

As a result of a combination of staff experiences and resident feedback we have identified some areas of improvement that will increase our effectiveness.

1. Develop a defined emergency communications protocol.
 - a. Our communications team has already developed a draft communication protocol, including phone numbers, contact lists, and priorities.

2. Notify residents using billing system information provided (phones and email addresses)
 - a. Currently, only residents that have pro-actively signed up for our email notifications receive them. CPNMD staff plans to meet with Daupler in the coming weeks to discuss implementation of their emergency communications module. This module is capable of pulling that information from our billing system and sending direct notifications to all our residents.

We already use Daupler for after hours, and emergency call handling, so this would likely be a simple addition to our existing service.

3. Solve readability issues in email notifications and newsletters.
 - a. Following this event, we have already identified, and begun using a service outside of Streamline. This will solve the persistent readability and image degradation issues.

Final Thoughts

CPNMD owes a debt of gratitude to several partners that were vital in navigating this emergency. Michael Penny and his staff consistently asked us to verify information prior to the City releasing it, essentially giving us an almost zero effort additional avenue to reach the community with this vital information.

Douglas County Emergency Management Services couldn't have been more helpful. With quick, concise communication, web postings, Next Door posts, and even assistance drafting the Reverse 911 messaging. A sincere thank you to all of you both with the County and Sherrif's Department, your assistance was vital.

It is also worth noting that we were commended by CDPHE staff as well. They congratulated CPNMD on a job well done, with one long time State of Colorado employee telling us "In all of (my) years with the state, I have never seen a District issue a Tier 1 public notification this quickly."

I would also like to commend CPNMD staff, and operations for an astounding job facing an incredible challenge. Endless phone calls and emails were answered with competence, patience and understanding. Our field operators were quick and decisive in their decision making, ensuring that a challenging emergency was not nearly as devastating as it could have been.



Individual Bacteriological Certified Laboratory Report Form
WQCD - Drinking Water CAS
 Submit Online at <http://www.wgcdcompliance.com/login>
 Coliform Positive Hotline: (303) 692-3308

Revised 4/13/2015

Section I (Supplied or Completed by Public Water System)		Section II (Supplied or Completed by Certified Laboratory)						
Public Water System Information		Certified Laboratory Information						
PWSID#: CO0118006		Laboratory ID: CO015						
System Name: Castle Pines North MD		Laboratory Name: Colorado Analytical Laboratory						
Contact Person: Will Parker		Contact Person: Customer Service						
Phone #: 303-681-2253		Phone: 303-659-2313						
Comments:		Comments:						
Section III (Supplied or Completed by Public Water System)								
Sample Date: 5/15/24								
Collector: Mark D								
Section IV (Supplied or Completed by Certified Laboratory)								
Lab Receipt Date: 5/15/24		Lab Analysis Date: 5/16/24						
Section V (Supplied or Completed by Public Water System)		Analytical Method: SM 9223						
Sample Type	Sample Time	Facility ID On Schedule	Sample Pt ID On Schedule	Street Address	*Disinfectant Residual	Laboratory Sample ID #	Analyte Name	Result
RT	12:30 PM	DS001	RTOR	CPN #11	0.67	240515144-01	Total Coliform (3100)	Absent
							E. Coli (3014)	Absent
RT	12:38 PM	DS001	RTOR	CPN #12	0.52	240515144-02	Total Coliform (3100)	Absent
							E. Coli (3014)	Absent
RT	12:45 PM	DS001	RTOR	CPN #13	0.58	240515144-03	Total Coliform (3100)	Absent
							E. Coli (3014)	Absent
RT	12:51 PM	DS001	RTOR	CPN #14	0.49	240515144-04	Total Coliform (3100)	Absent
							E. Coli (3014)	Absent
RT	12:59 PM	DS001	RTOR	CPN #15	0.63	240515144-05	Total Coliform (3100)	Absent
							E. Coli (3014)	Absent

Laboratory: Please call Hotline with any PRESENT results (Total Coliform, E. Coli or Fecal).
 Sample Type: RT (Routine), RP (Repeat), SP (Special Purpose).
 *Disinfectant Residual: Report in mg/L
 Use Separate form if samples are collected on different dates.

LA: Lab Accident - Please resample.
 CG: Confluent Growth - Please resample.
 TNTC: Too Numerous To Count - Please resample.
 H: Holding time has been exceeded - Please resample.

Present: Coliform / E. Coli / Fecal detected
 Absent: Coliform / E. Coli / Fecal not detected
 NT: Not Tested

Section V (Supplied or Completed by Public Water System)				Section VI (Supplied or Completed by Certified Lab)				
Sample Type	Sample Time	Facility ID On Schedule	Sample Pt ID On Schedule	Street Address	*Disinfectant Residual	Laboratory Sample ID #	Analyte Name	Result
RT	1:11 PM	DS001	RTOR		0.70	240515144-06	Total Coliform (3100)	Absent
							E. Coli (3014)	Absent
RT	1:21 PM	DS001	RTOR		0.64	240515144-07	Total Coliform (3100)	Absent
							E. Coli (3014)	Absent
RT	1:30 PM	DS001	RTOR		0.63	240515144-08	Total Coliform (3100)	Absent
							E. Coli (3014)	Absent

Laboratory: Please call Hotline with any PRESENT results (Total Coliform, E. Coli or Fecal).
 Sample Type: RT (Routine), RP (Repeat), SP (Special Purpose).
 *Disinfectant Residual: Report in mg/L.
 Use Separate form if samples are collected on different dates.

LA: Lab Accident - Please resample.
 CG: Confluent Growth - Please resample.
 TNTC: Too Numerous To Count - Please resample.
 H: Holding time has been exceeded - Please resample.

Present: Coliform / E. Coli / Fecal detected
 Absent: Coliform / E. Coli / Fecal not detected
 NT: Not Tested

Drinking Water Chain of Custody



LABORATORIES, INC.

Commerce City Lab
10411 Heinz Way
Commerce City CO 800640

Lakewood Service Center
12860 W. Cedar Dr., Suite 100A
Lakewood CO 80228

Phone: 303-659-2313

www.coloradolab.com

Report To Information		Bill To Information (If different from report to)		Project Information	
Company Name: <u>Semcoor Inc.</u>		Company Name: <u>Semcoor Inc.</u>		PWSID: <u>CO0118006</u>	
Contact Name: <u>Will S. Parker</u>		Contact Name: <u>Will S. Parker</u>		System Name: <u>CASTLE PINES NORTH MD</u>	
Address: 3995 S. Castlewood Canyon Road City: <u>Castle Rock</u> State: <u>CO</u> Zip: <u>80104</u>		Address: 3995 S. Castlewood Canyon Road City: <u>Castle Rock</u> State: <u>CO</u> Zip: <u>80104</u>		Compliance Samples: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Send Results to CDPHE: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Phone: <u>303-681-2253</u>		Phone: <u>303-681-2253</u>		Task Number (Lab Use Only) CAL Task 240515144	
Email: <u>willsemcoor@hotmail.com</u>		Email: <u>willsemcoor@hotmail.com</u>		KES	
Sample Collector: <u>Mark Dufrenne</u>		PO Number:			
Sample Collector: <u>Phone: 303-319-6244</u>					

PHASE I, II, V Drinking Water Analyses (check requested analysis)

Date	Time	Client Sample ID / Sample Pt ID	No. of Containers	Residual Chlorine (mg/L) P/A Samples Only	Total Coliform P/A	504.1 EDB/DBCP	505 Pests/PCBs	515.4 Herbicides	524.2 VOCs	525.2 SOCs-Pest	531.1 Carbamates	547 Glyphosate	548.1 Endothall	549.2 Diquat	524.2 TTHMs	552.2 HAA5s	Lead/Copper	Nitrate	Nitrite	Fluoride	Inorganics	Alk/Lang Index (Circle)	TOC, DOC (Circle)	SUVA, UV 254 (Circle)	Gross Alpha/Beta	Radium 226/228	Radon	Uranium	Chlorite
5/15/24	12:30	CPN #1	1	0.67	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5/15/24	12:35	CPN #2	1	0.42	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5/15/24	12:45	CPN #3	1	0.58	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5/15/24	12:57	CPN #4	1	0.49	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5/15/24	12:57	CPN #5	1	0.65	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5/15/24	1:11	CPN #2	1	0.70	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5/15/24	1:21	CPN #4	1	0.64	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5/15/24	1:30	CPN #7	1	0.65	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Instructions: Residual Chlorine reported as Total Chlorine
Special Purpose - !!RUSH!! Please report verbally to 303-319-6244 and 303-901-2178 as soon as you have results.

Seals Present Yes No Headspace Yes No

Delivered Via: Hand

C/S Charge

Temp. 9.8 °C/°F

Sample Pres. Yes No

Relinquished By: <u>[Signature]</u>	Date/Time: <u>5/15 1:00</u>	Received By: <u>[Signature]</u>	Date/Time: <u>5/15 1:00</u>	Relinquished By: <u>[Signature]</u>	Date/Time: <u>5/15 02:24</u>	Received By: <u>[Signature]</u>	Date/Time: <u>5/15/24 1425</u>
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