The background of the slide is a light gray gradient with several realistic water droplets of various sizes scattered across it. The droplets have highlights and shadows, giving them a three-dimensional appearance.

UIC CLASS V AQUIFER STORAGE AND RECOVERY IN EPA REGION 8 THE PAST, THE PRESENT AND THE FUTURE

SUBSURFACE WATER STORAGE SYMPOSIUM 2024

DOUGLAS MINTER, EPA REGION 8 WATER DIVISION MANAGER

FEBRUARY 22, 2024

OUTLINE

- BASICS OF UIC PROGRAM AND CLASS V ASR
- REGION 8 CLASS V ASR RULE AUTHORIZATIONS AND PERMITS
- EXISTING PERMITS IN COLORADO
- EMERGING CONTAMINANTS
 - NITROSAMINES
 - PFAS/PFOS

UNDERGROUND INJECTION CONTROL

- **THE UNDERGROUND INJECTION CONTROL PROGRAM WAS ESTABLISHED IN 1974 UNDER THE SAFE DRINKING WATER ACT (SDWA) TO PROTECT USDWS FROM CONTAMINATION RELATED TO UNDERGROUND INJECTION ACTIVITIES.**
- **“UNDERGROUND SOURCES OF DRINKING WATER”:** DEFINED AS AN AQUIFER OR ITS PORTION, WHICH SERVES AS A SOURCE OF DRINKING WATER, OR CONTAINS A SUFFICIENT QUANTITY OF WATER TO SUPPLY A PUBLIC WATER SYSTEM AND CONTAINS FEWER THAN 10,000 MG/L OF TOTAL DISSOLVED SOLIDS.
- **INJECTION WELL:** AN INJECTION WELL IS USED TO PLACE FLUID UNDERGROUND INTO POROUS GEOLOGIC FORMATIONS.
- **WELL:** A BORED, DRILLED, OR DRIVEN SHAFT, OR A DUG WELL OR DUG HOLE WHERE THE DEPTH IS GREATER THAN THE LARGEST SURFACE DIMENSION; OR AN IMPROVED SINKHOLE; OR A SUBSURFACE DISTRIBUTION SYSTEM.
- **ENDANGERMENT OF A USDW CAN OCCUR WHEN A CLASS V INJECTION WELL MAY CAUSE A VIOLATION OF PRIMARY DRINKING WATER REGULATIONS (E.G., MCL) OR MAY OTHERWISE ADVERSELY AFFECT PUBLIC HEALTH. IN SUCH CASES, THE INJECTOR SHALL BE REQUIRED TO OBTAIN A PERMIT, MAY BE ORDERED TO TAKE ACTIONS...TO PREVENT THE VIOLATION, ETC.**

AQUIFER STORAGE AND RECOVERY

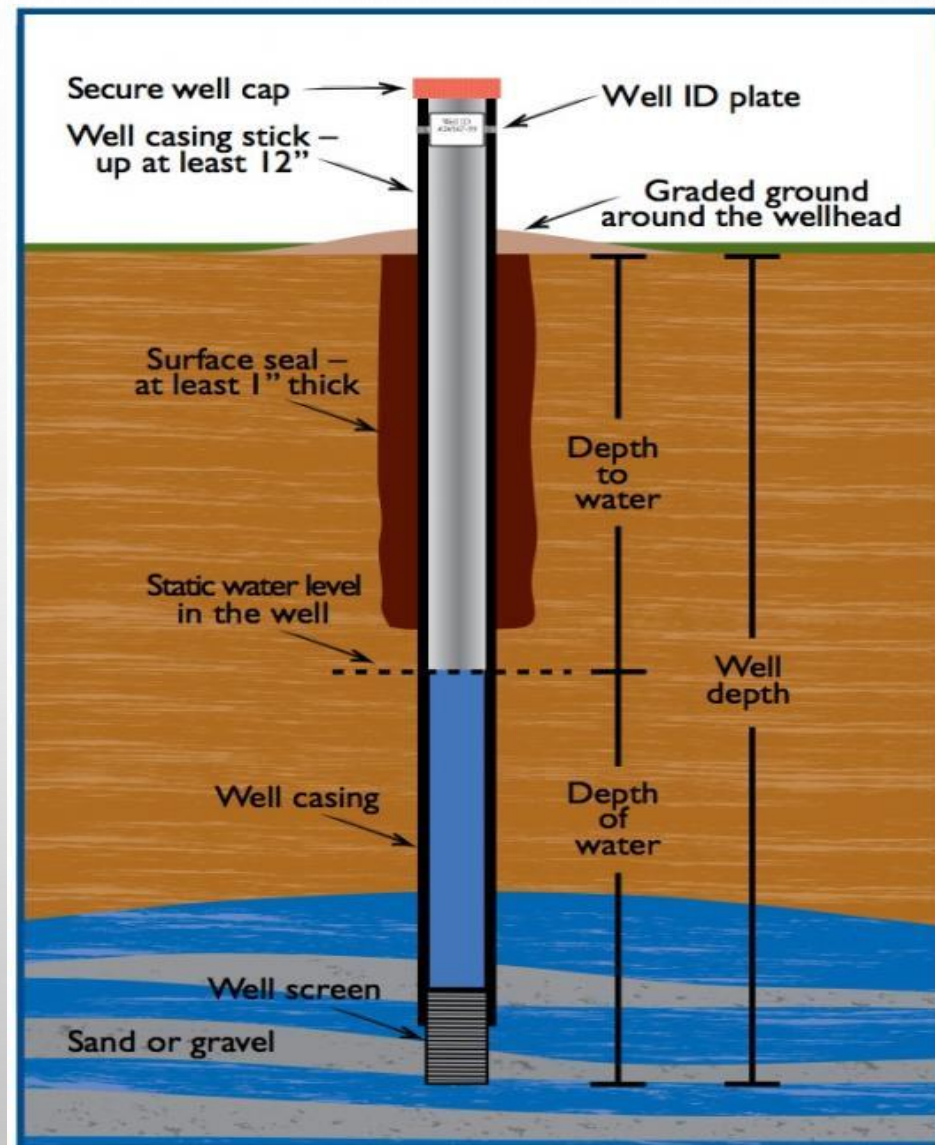
AQUIFER STORAGE AND RECOVERY (ASR) IS A SPECIFIC TYPE OF AQUIFER RECOVERY (AR) FOR AUGMENTING GROUND WATER RESOURCES AND RECOVERING THE WATER IN THE FUTURE FOR VARIOUS USES. WHILE AN AR WELL IS USED ONLY TO REPLENISH THE WATER IN AN AQUIFER, ASR WELLS ARE USED TO ACHIEVE TWO OBJECTIVES:

(1) STORING WATER IN THE GROUND; AND

(2) RECOVERING THE STORED WATER EITHER USING THE SAME WELL OR BY PAIRING INJECTION WELLS WITH RECOVERY WELLS LOCATED ON THE SAME WELLFIELD.

CLASS V WELLS

- **CLASS V: ALL INJECTION WELLS THAT DO NOT MEET THE DEFINITIONS OF CLASSES I, II, III, IV, OR VI**
- **MOST WELLS ARE SHALLOW AND LOW-TECH AND MOST INJECT INTO OR ABOVE USDWS.**
- **EXISTING CLASS V ASR WELLS INJECT TREATED GROUNDWATER INTO DEEPER USDWS.**



GENERAL REGULATIONS

40 CFR 144.11
Prohibition of
Unauthorized
Injection

40 CFR 144.12
Prohibition of
Movement of
Fluid into USDW

40 CFR 144.16
Waiver of
Requirements by
Director

40 CFR 144.33
Area Permits

40 CFR 144.51
Conditions
Applicable to All
Permits

40 CFR 144.52
Establishing
Permit Conditions

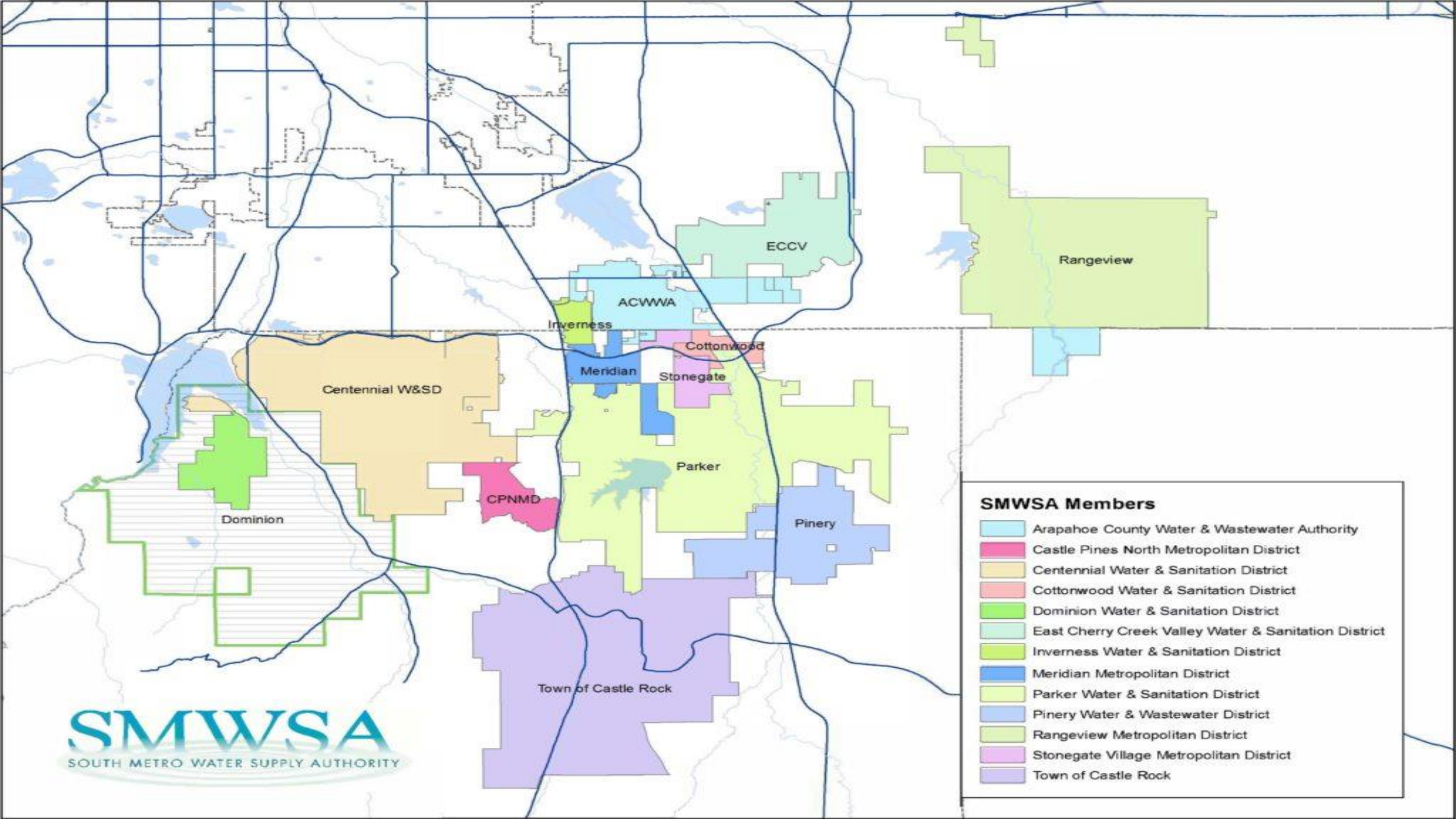
REGION 8 ASR
PROJECTS IN
COLORADO

AUTHORIZATION
BY RULE
(2 PROJECTS)
VS.
PERMIT
(6 PROJECTS)

REQUIREMENTS	RULE	PERMIT
Inventory Information	X	X
Additional Information	40 CFR 144.27	X
30 Day Public Comment Period		X
Specified Duration of Authorization		X
Structured Operation: Logging and Testing Requirements, Monitoring, Reporting		X
Prohibition of Endangerment	X	X
ESA & NHPA Evaluations		X
Enforcement Actions	X	X

REGION 8 CLASS V ASR PROJECTS

PERMITTED PROJECTS	AUTHORIZATION BY RULE PROJECTS
Meridian Metropolitan District	Centennial Water and Sanitation District
Town of Castle Rock	Keystone Utilities
East Cherry Creek Valley	
Cottonwood Water and Sanitation District	
Stonegate Village Metropolitan District	
Inverness Water and Sanitation District	



SMWSA
SOUTH METRO WATER SUPPLY AUTHORITY

SMWSA Members

- Arapahoe County Water & Wastewater Authority
- Castle Pines North Metropolitan District
- Centennial Water & Sanitation District
- Cottonwood Water & Sanitation District
- Dominion Water & Sanitation District
- East Cherry Creek Valley Water & Sanitation District
- Inverness Water & Sanitation District
- Meridian Metropolitan District
- Parker Water & Sanitation District
- Pinery Water & Wastewater District
- Rangeview Metropolitan District
- Stonegate Village Metropolitan District
- Town of Castle Rock



BENEFITS OF ASR PERMITS

- PUBLIC INFORMATION
- OPERATION CONTROLS
- MONITORING: WELL INTEGRITY & WATER QUALITY
- ADDITION OF A NEW WATER SOURCE AND/OR NEW WELL
- IMPROVED PERMIT TEMPLATE
- LIMITED PERMIT DURATION
- KNOWLEDGE OF EMERGING CONTAMINANTS

WHAT ARE NITROSAMINES? WHY IS EPA CONCERNED?

- NITROSAMINES (PROBABLE CARCINOGENS) CAN FORM IN WATER AS BY-PRODUCTS OF CHLORAMINATION.
- LOW LEVEL DETECTIONS OF N-NITROSODIMETHYLAMINE (NDMA) HAVE BEEN REPORTED IN WATER FROM DENVER AREA WATER TREATMENT PLANTS.
- BENCHSCALE TESTING AND QUARTERLY TESTING FOR NITROSAMINES IS REQUIRED FOR THE INJECTATE AND FORMATION WATER IN CLASS V ASR PERMITS.
- EPA REGION 8, AS THE UIC REGULATORY AUTHORITY, HAS ESTABLISHED THE NDMA TRIGGER = 7 NG/L.
- TO DATE, SAMPLING FOR NITROSAMINES HAS NOT BEEN CONSISTENT AT ANY OF THE PERMITTED FACILITIES (DUE TO COVID INTERRUPTIONS AND OPERATIONAL ISSUES).

PER- AND POLYFLUORINATED SUBSTANCES (PFAS)

- UCMR 5 RULE, ISSUED DECEMBER 27, 2021
- REQUIRES THE MONITORING OF 29 PFAS CONSTITUENTS PLUS LITHIUM AT LARGE (SYSTEM SERVES >3,300 PERSONS) AND SELECT SMALLER (SERVES <3,300 PERSONS) WATER TREATMENT PLANTS.
- CONSTITUENTS CAN BE ANALYZED USING A TOTAL OF THREE (3) METHODS (EPA 533, 537.1 (REV. 2.0) AND EPA 200.7).
- MCLS FOR 6 OF THE 29 PFAS PLUS LITHIUM CONSTITUENTS RULE TO BE FINALIZED IN 2024.
- PFAS MONITORING WILL BE INCLUDED IN RENEWALS AND NEW CLASS V ASR PERMITS.

REGION 8 UIC TEAM CONTACT INFORMATION

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QUESTIONS?