Globeville Landing Outfall
Surface Water

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  – Oversees Denver’s monitoring and reporting  
  – Developing plans for long-term monitoring
• What is surface water?
  – Where does it go?
  – How is surface water regulated?

• CAG Questions
  – Surface water **quantity** at GLO – before and after GLO?
  – Surface water **quality** at GLO – before and after GLO?
  – South Platte River water **quality**?
  – Long-term monitoring?
  – Where can I get more information?

• Questions and Answers
Surface Water

• Sources
  – Large majority – runoff from rain and/or snow
  – Some from irrigation run-off (dry weather flow)
  – Some from groundwater (dry weather flow)

• Drains through streets and storm sewers to river
Figure 2: USGS Geologic Map of Denver (1979) showing alluvial soils pattern in yellow.
Surface Water Flow
Before GLO Construction
Construction: GLO Phases I and II Map

GLO is divided into 5 unique parts. This map shows 3 of those parts, parts of which are located within the OU2 Boundary.

LEGEND

- Approximate OU2 Boundary
- GLO Phases Approaching Construction (Phases 1 and 2)
- GLO Phases in Design (Phase 1B)
- GLO Phase IA (Drainage Improvements)
- GLO Phase IB (Park Improvements)
- GLO Phase II (Pipe Installation)
How does basin storm water get to the South Platte River?

**Current:**
- Globeville Landing Park existing channel via 40th & Blake pipe
- 38th Street Outfall
- RTD drainage Smaller outfalls
- Overland and street flow
- Trans-basin spillage/flow during major events
- Existing system has approximately 39% of 100 year flow capacity (will carry between 2 and 5 year flood.)

**Future**

<table>
<thead>
<tr>
<th>Location</th>
<th>2 Year</th>
<th>10 Year</th>
<th>100 Year</th>
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</thead>
<tbody>
<tr>
<td>Globeville Landing Outfall – after construction</td>
<td>1150 cfs</td>
<td>1740 cfs</td>
<td>3750 cfs</td>
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</tbody>
</table>
CAG Questions - Surface Water

- Flow volumes are monitored in the South Platte River
- No routine flow monitoring is done on the storm sewer conveyance system
- What information is available?
  - South Platte River flow volumes: https://nwis.waterdata.usgs.gov
  - Platte to Park Hill: https://www.denvergov.org/content/denvergov/en/platte-to-park-hill.html
Surface Water Quality
What do we know about the quality of existing surface water passing through GLO?

What information is available regarding S. Platte River quality?

What is monitored? Where? Frequency?

What do these data tell us?

What about downstream water users?

What will be monitored in the future?

What information is available?
How is surface water regulated?

- Clean Water Act gives EPA authority to protect streams and lakes (usually authority then is delegated to states)
- Permits containing standards and limits issued by CDPHE, some local
- Discharge must be safe for human health and aquatic life
- Businesses must prevent impacts from storm water collected on their properties (permits required)
- Cities must manage storm water drainage collected from homes, streets, and industrial discharges (permits required)
- Larger construction projects must prevent impacts from storm water running across construction site (permits required)
• The South Platte-Cherry Creek confluence sampled weekly, May-October and twice a month the rest of the year
• Bear Creek at the picnic shelter in Bear Creek Park sampled weekly May through October
• Sloans Lake sampled every other week, May-October
• Westerly Creek near the playground in great Lawn Park sampled once or twice a month from May to October
• Berkeley and Rocky Mountain Lakes sampled monthly from May to October
• A number of other sites on the South Platte River and Cherry Creek are sampled monthly and sites on Bear Creek are sampled once a quarter year-round.
DDPHE Monitoring Locations
DDPHE Stream Sampling

- Pathogens
  - E. coli
- Metals
  - Arsenic, Cadmium, Calcium, Chromium, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Potassium, Selenium, Silver, Sodium, Uranium, Zinc
- Inorganics
  - Alkalinity, Chloride, Hardness, Oil and Grease, pH, Specific Conductance, Sulfate, Temperature, Total Dissolved Solids, Total Suspended Solids
- Nutrients
  - Ammonia, Nitrite, Nitrate, Kjeldahl Nitrogen, Dissolved Oxygen, Phosphorus, Organic Carbon
South Platte River Sample Sites and Analytes for Discussion

- S29: South Platte downstream of Dartmouth
- N38: South Platte at 38th Street, upstream of GLO
- N46: South Platte at 46th Street, downstream of GLO
- Total Arsenic, Dissolved Lead, Nitrate, E. coli
E. Coli
South Platte River 2016 & 2017

E. coli cfu/100 ml

S29 Result  N38 Result  N46 Result  Standard

• National Monitoring Council
  – www.waterqualitydata.us

• Colorado Data Sharing Network
  – www.coloradowaterdata.org

• Denver Open Data
  – www.denvergov.org/opendata
Surface Water (Stormwater) Quality
N-443-E (GLO) Nitrate 2017

Nitrate mg/L

- Nitrate NO₃
- Water Supply Standard
Long-Term Monitoring Plans

• Storm Event Monitoring
  – Automated samplers
    • Triggered by rainfall and increase in flow
  – Samples analyzed for pollutants common in urban runoff
  – Installed on selected locations throughout City
    • GLO monitoring TBD

• Monitoring Plan Completion - Spring 2018
Questions?

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