Carroll County Water System Impovements
Status Update April 2024
by
Underwood Engineers

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Status update

- Evaluation of Existing Sources
- Contract #3 - County Building Meters
- Contract #4 – Meter/Chlorination Building and Tank Upgrades
- Hydrants
- Residential Meters
- Fire Pond
- Asset Management Plan (NHDES grant)
- Budget
- Schedule

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Water Source Evaluation -Bedrock Aquifer

- BRW-1 and BRW-2 hydraulically connected
- Capacity needs to be considered together
- 25 gpm (36,000 gpd) combined sustainable capacity
- Significantly depressed water table from summer 2023 pumping
- Some recovery was observed following some use of the dug well in the Fall of 2023

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Water Source Evaluation -Bedrock Aquifer

- Good Water Quality
  - Elevated radon (4,000-5,000 pCi/L) – unregulated
  - BRW #1 – Iron above SMCL in 1 sample (1.3 mg/l) but ND in other
  - BRW #1 – Manganese at SMCL in 1 sample (0.047 mg/l) below in the other (0.0068 mg/l)
  - pH 7.9 - 8.4

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Water Source Evaluation -Bedrock Aquifer

- Recommendations:
  - Recommended max individual well pumping rates:
    - BRW #1 – 20 gpm (throttle from 36 gpm)
    - BRW #2 – 25 gpm (throttle from 30 gpm)
- Install long-term GW level monitoring
- Maintain operating water levels above main fracture zones:
  - BRW #1 – 420 ft
  - BRW #2 – 434 ft
- BRW#1 siphoning in pump house after shut off

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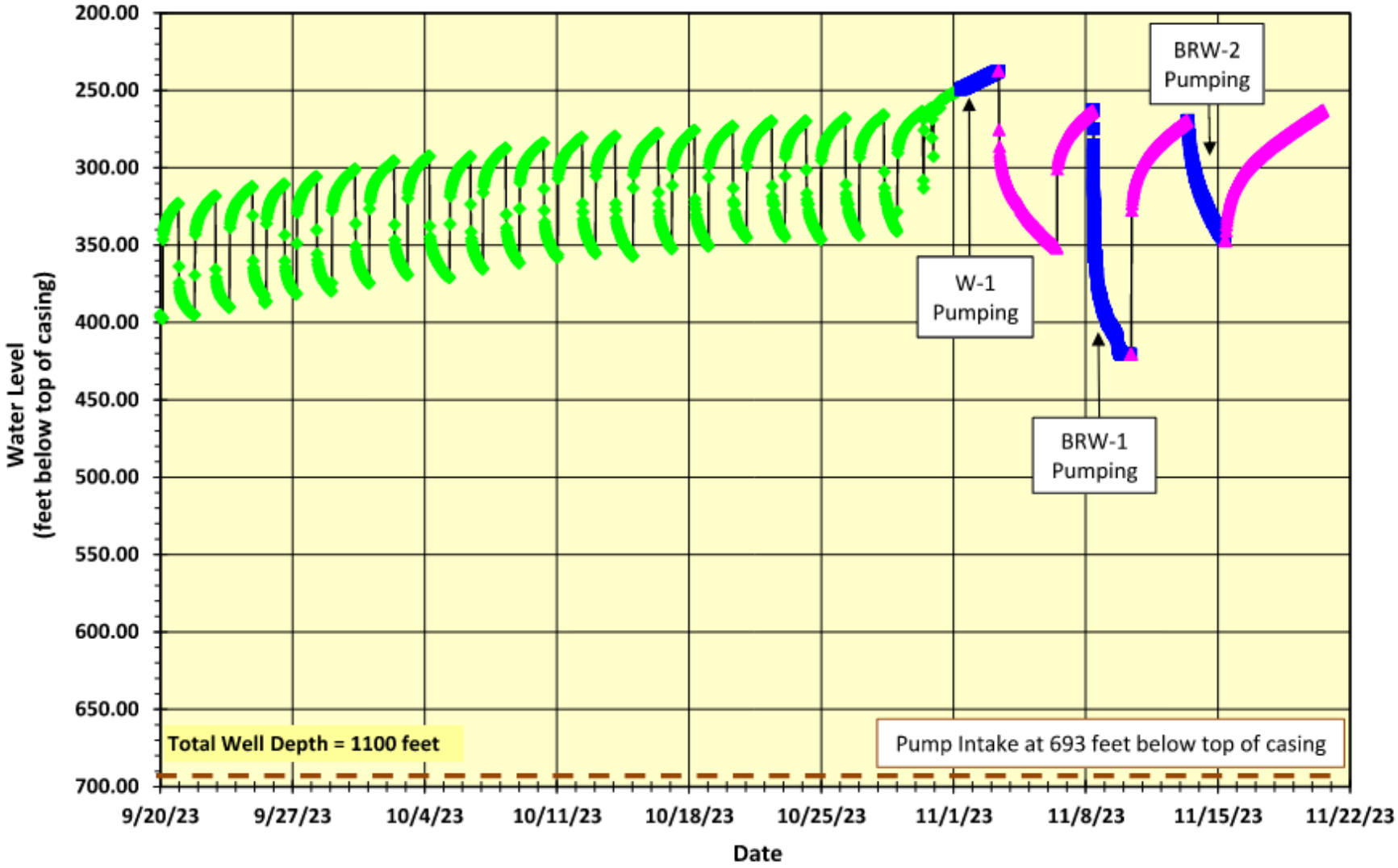
Long-Term Monitoring of BRW-1

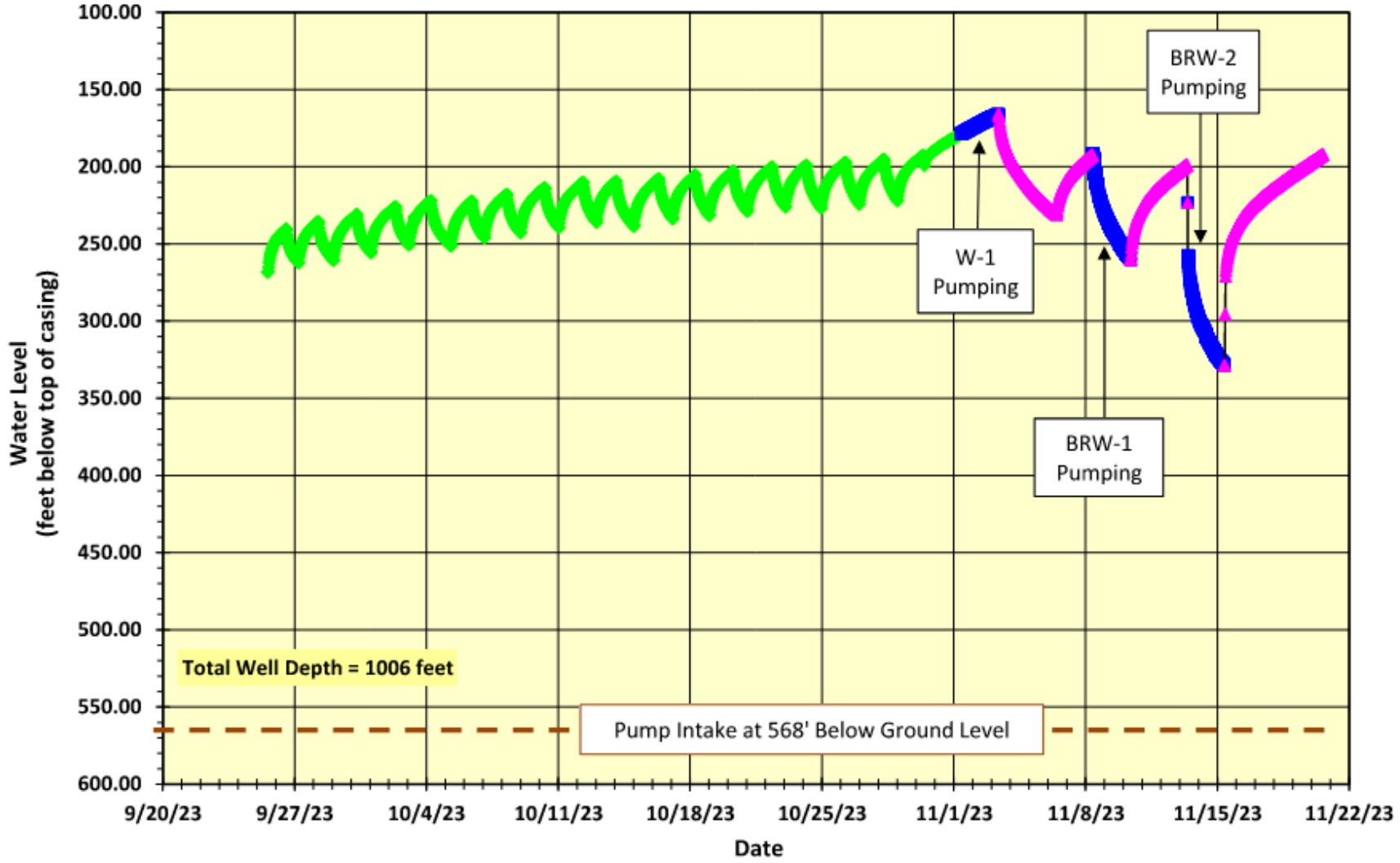


Plot of Water Level versus Time for September 20 to November 17, 2023

Carroll County Complex

Ossipee, New Hampshire

Long-Term Monitoring of Well BRW-2



Plot of Water Level versus Time for September 20 to November 17, 2023

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Water Source Evaluation – Dug Wells

- Shallow, unconsolidated aquifer is independent from bedrock wells
- Piping infrastructure between W-3, W-2 and W-1 is unknown
- Wells appear to be independent
- Sustainable capacity of W-1 is 12 gpm
  - Pump capacity and DES permitted capacity is also 12 gpm

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Water Source Evaluation – Dug Wells

- Good Water Quality
  - Shallow wells more vulnerable to near surface contamination
  - pH 5.4 - 6 (much lower than bedrock wells), lower alkalinity
  - Lower radon (1,000 pCi/L)

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Water Source Evaluation – Dug Wells

- Recommendations
  - Additional investigation to confirm if W-2 and W-3 are connected to W-1
  - Additional pump testing & monitoring to better evaluate sustainability during drought conditions
    - Install long – term level monitoring
    - Additional pump testing
  - Install water-tight covers for all 3 wells to prevent potential contamination
  - W-1 siphoning in pump house after shut off
  - Use W-1 regularly in spring/summer to reduce stress on bedrock aquifer

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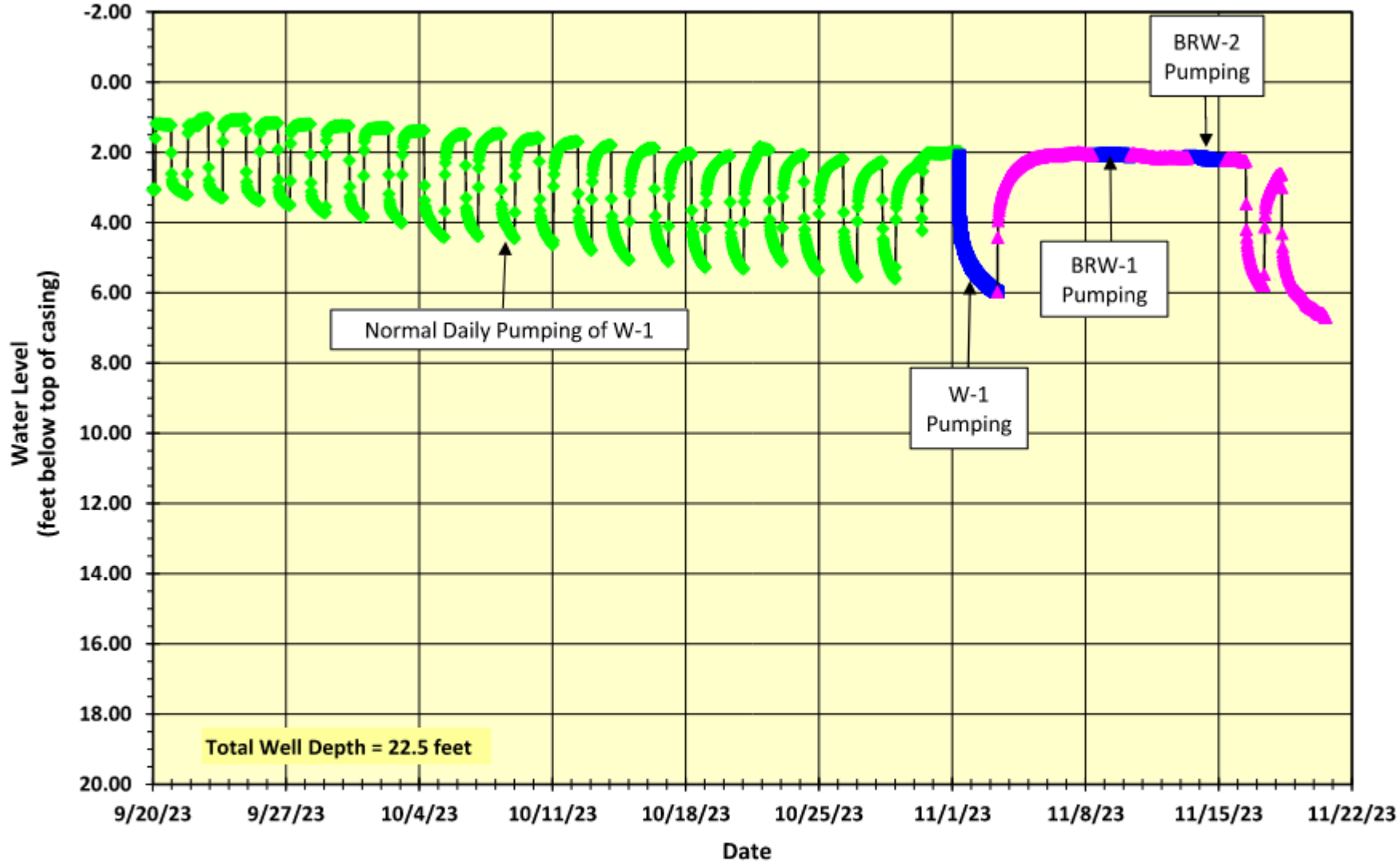
Long-Term Monitoring of Dug Well W-1



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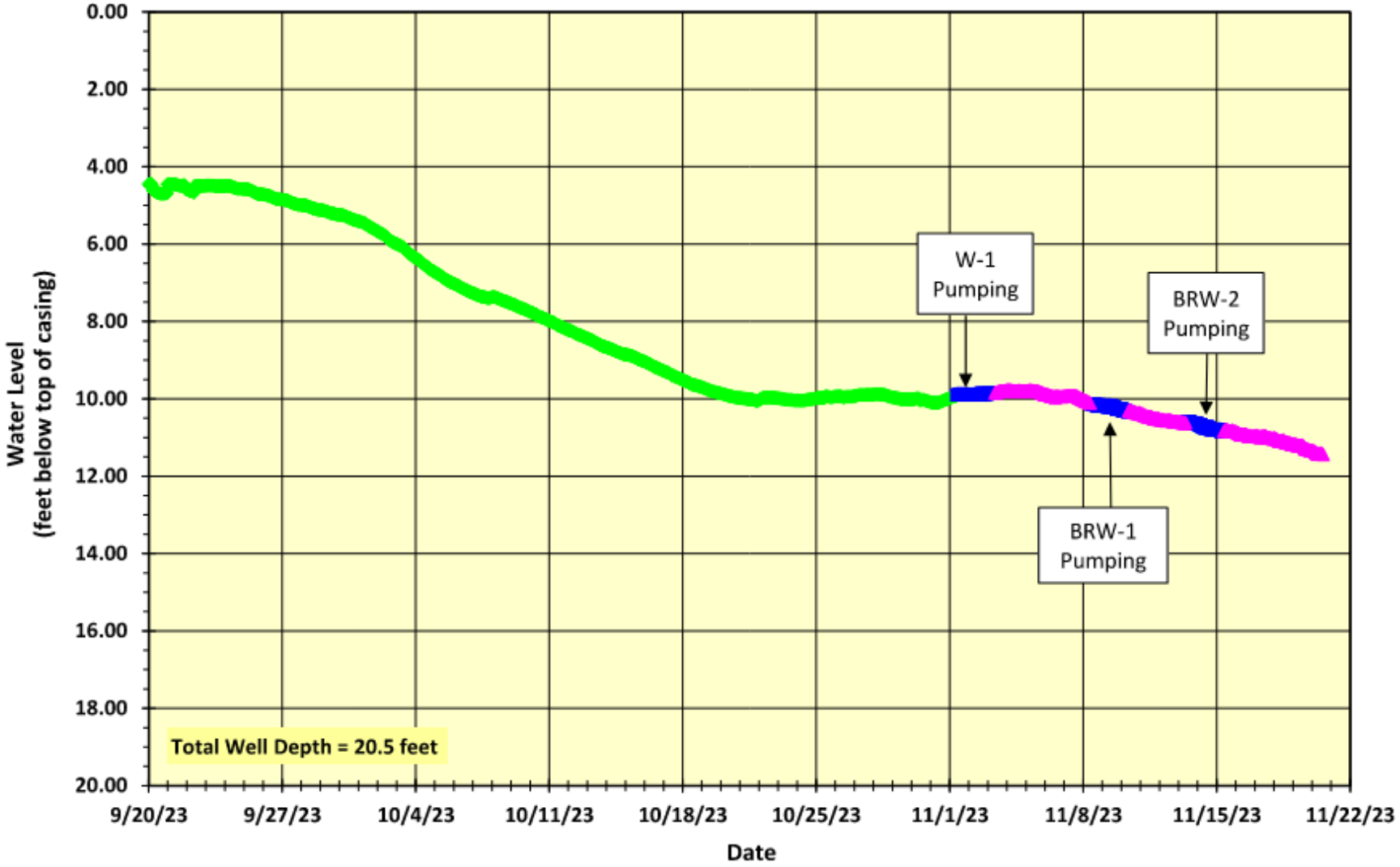
Long-Term Monitoring of Dug Well W-2



Plot of Water Level versus Time for September 20 to November 17, 2023

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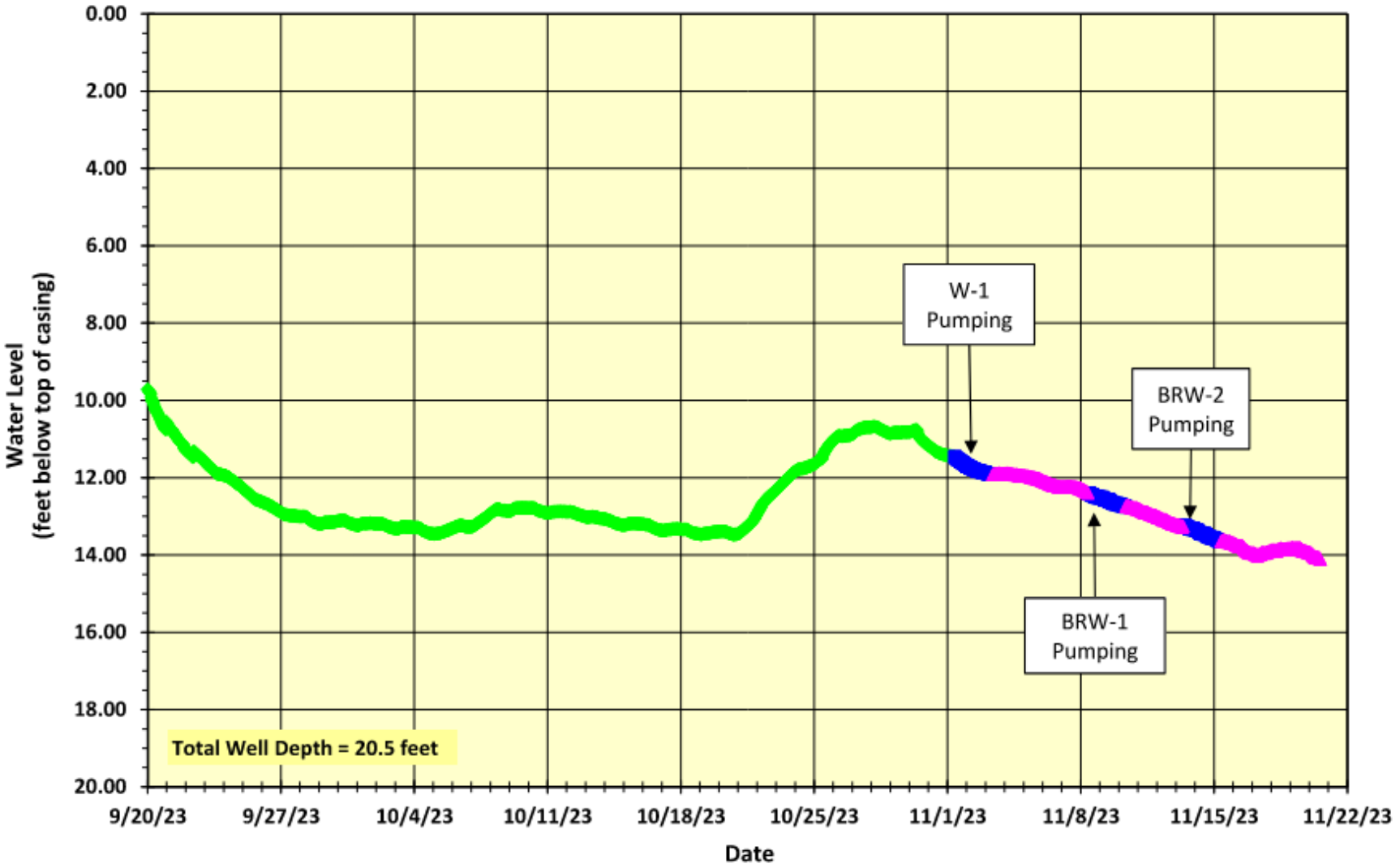
Long-Term Monitoring of Dug Well W-3



Plot of Water Level versus Time for September 20 to November 17, 2023

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Source Capacity Evaluation

Estimated Existing Demand		Future
Average Day	19,000 gpd	25,250 gpd
Maximum Day	26,000 gpd	

- Small Systems Env-Dw 405.1
  - 25-1,000 persons served and without fire protection
  - Required Capacity = 76,000 gpd
  - Available capacity = 53,280 gpd

- Large Systems Env-Dw 404.01(h)
  - Serving >1,000 people or with fire protection
  - ADD with largest source out of service => 19,000 gpd

    Available capacity = 46,080 gpd
  - MDD with all sources => 26,000 gpd

    Available capacity = 53,280 gpd

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Source Capacity Evaluation

- Existing source capacity appears sufficient for existing uses
- Caveats
  - Existing demands are based on monthly meter reading
  - Unknown impact of drought conditions on dug well system
  - Significant depression of bedrock water table observed after wet summer of 2023
  - Bedrock wells are hydraulically connected
- Make new source development part of any expansion
  - New source location would be away from existing wells

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Contract #3 – County Building Meters

- RFP Sent to 6 firms
- 2 Bids received
- Contract being executed with The Backflow Pro, LLC
- Work scheduled for early May

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Contract #4 – Meter/chlorination Building & Tank Repairs

- Meters and Piping completed under Contract #2
- Working on final design docs for:
  - Building repairs and upgrades
  - Site upgrades
  - Tank repairs, cleaning
  - SCADA upgrade
  - Dug well cleaning and repairs
- Summer 2024 construction

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Contract #5 – Old Route 28 Water Main Replacement

- 30% Design – received DOT comments
- Scheduling meetings with Town DPW
- Borings
- Bid late fall/winter
- Construction 2025

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Other projects

- Hydrant replacement
  - Hydrants purchased
  - No UE assistance to date
  - Installation this summer
- Residential meter replacements
  - Meters purchased
  - No UE assistance to date
  - Record meter changeouts in GIS software purchased w/ AMP grant
- Fire Pond
  - No work to date

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Asset Management Plan (NHDES grant)

- Field data collected and mapped
- Hardware and software purchased
- Training/workshop today

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Budget

- $2,110,000 Funding
  - $2,000,000 County ARPA
  - $50,000 Planning grant (100% disbursed – used for source evaluation)
  - $60,000 AMP grant (52% disbursed)
- $2,391,000 Budgeted/Estimated
- $392,437 spent to date (16%)
- Upcoming projects
  - $38,454 – Contract #3 County meters
  - $1,600,000 budgeted
    - Hydrant replacements (this summer)
    - Pump house/storage tank improvements (this summer)
    - Old Route 28 WM replacement (Summer 2025)

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Schedule

• Meter building/storage tank final design	April 2024
• Complex meters	May 2024
• Residential meter replacements	2024-2025
• Meter building/storage tank construction	Summer/Fall 2024
• Hydrant replacements	Summer 2024
• Old Route 28 Water Main final design	September 2024
• Old Route 28 Water Main construction	Summer 2025

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