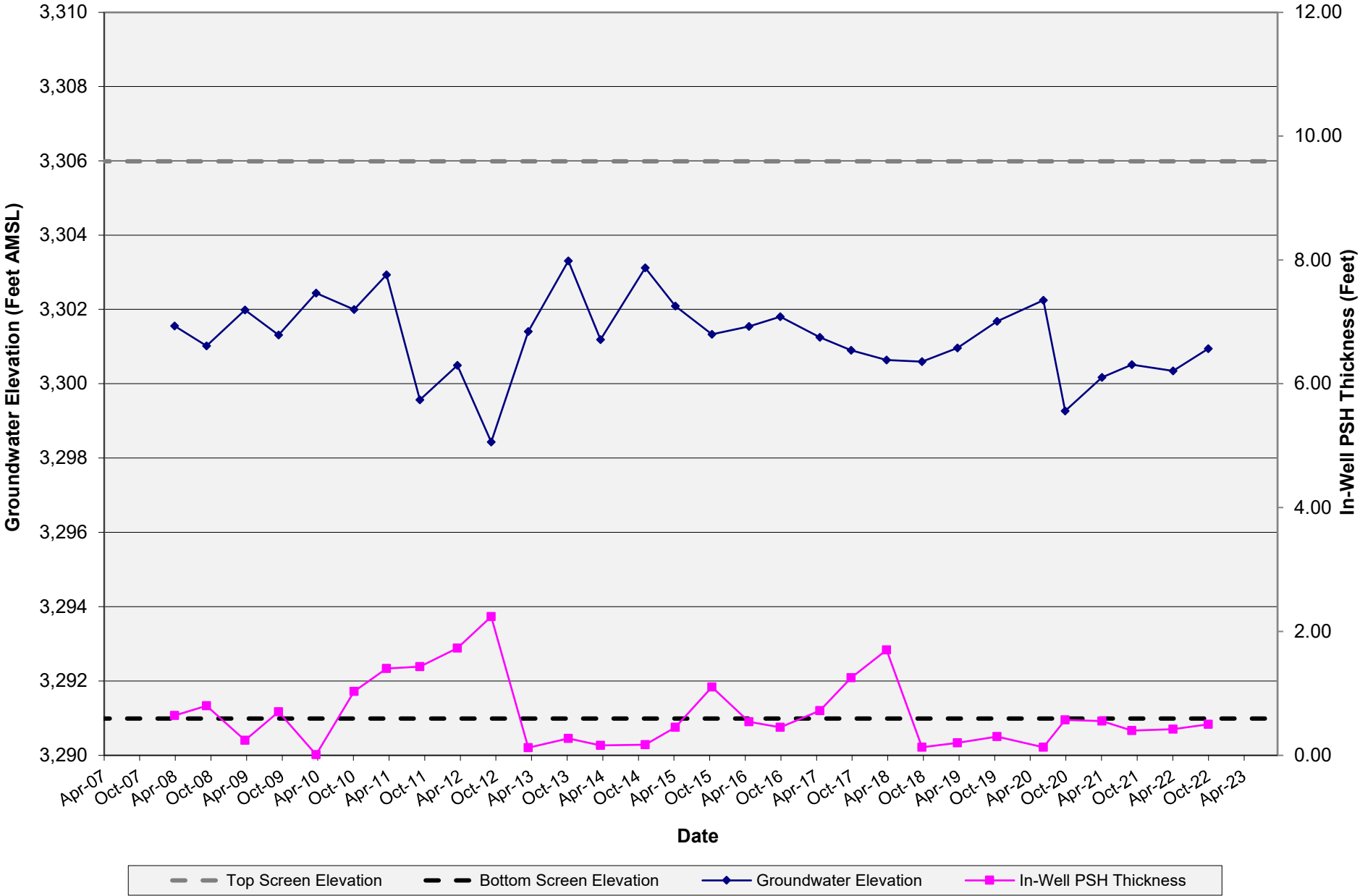


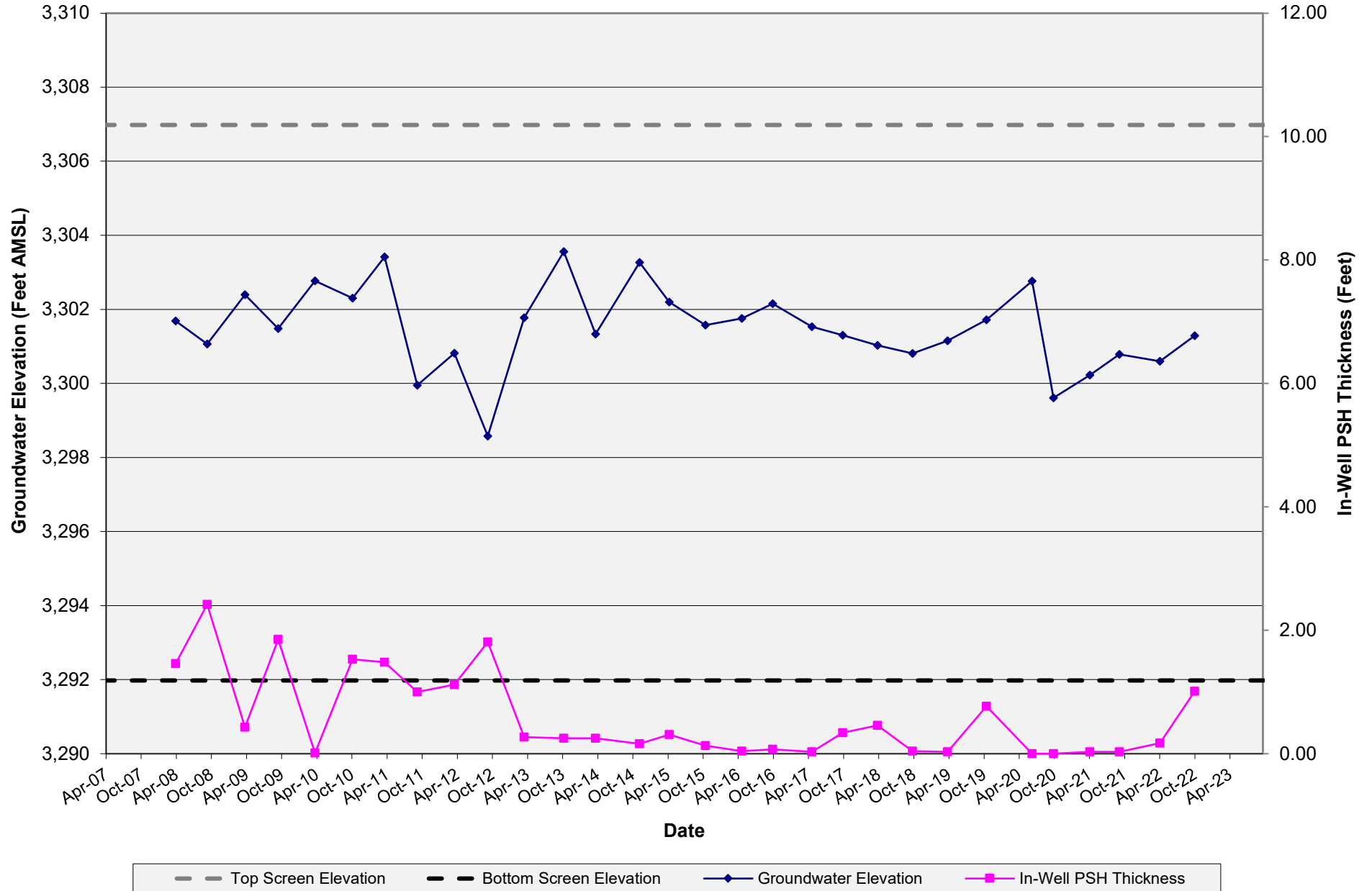
MW-85: Groundwater Elevations and In-Well PSH Thicknesses

HF Sinclair Navajo Refining LLC - Artesia Refinery
Evaporation Ponds



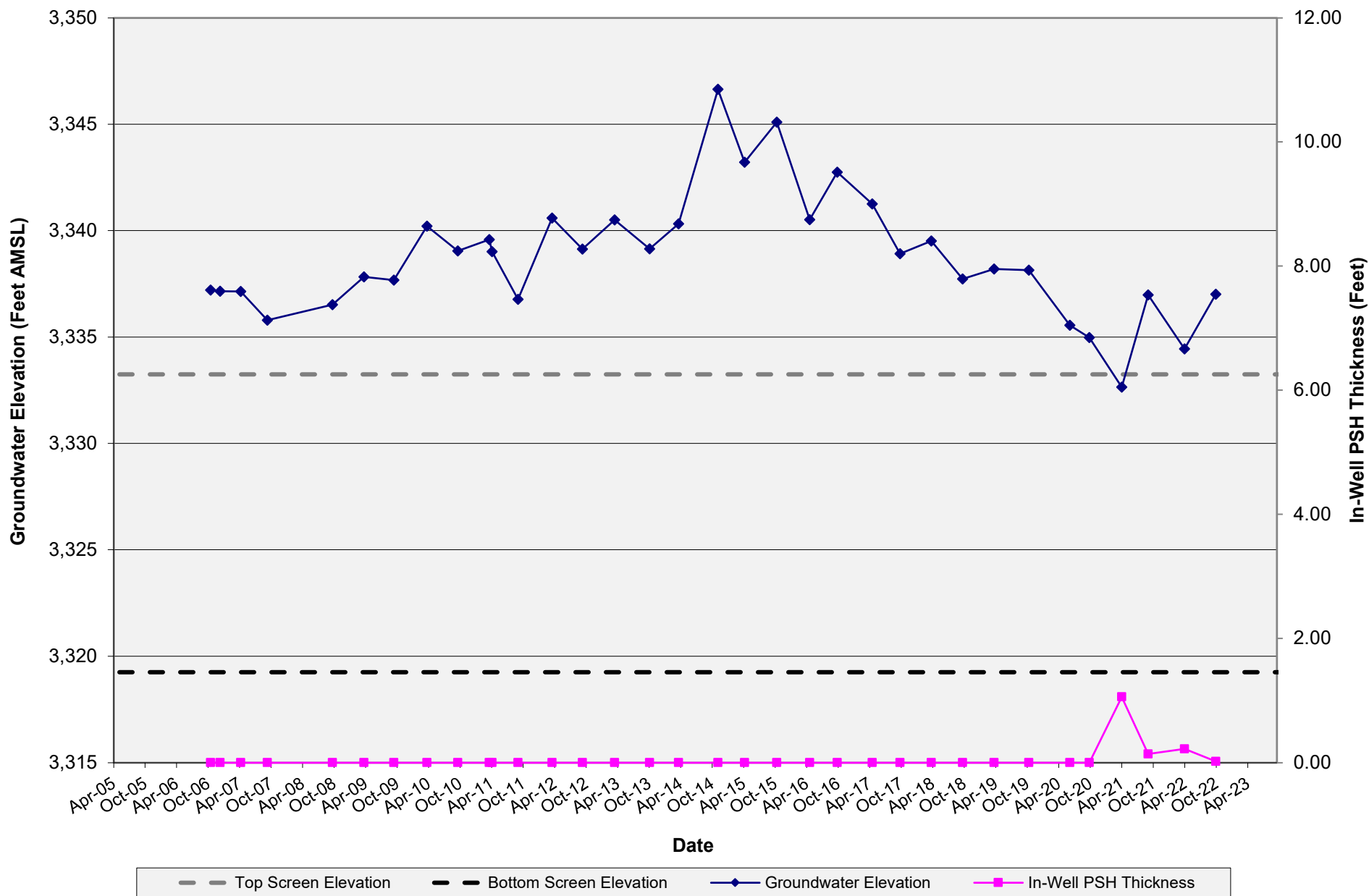
MW-86: Groundwater Elevations and In-Well PSH Thicknesses

HF Sinclair Navajo Refining LLC - Artesia Refinery
Evaporation Ponds



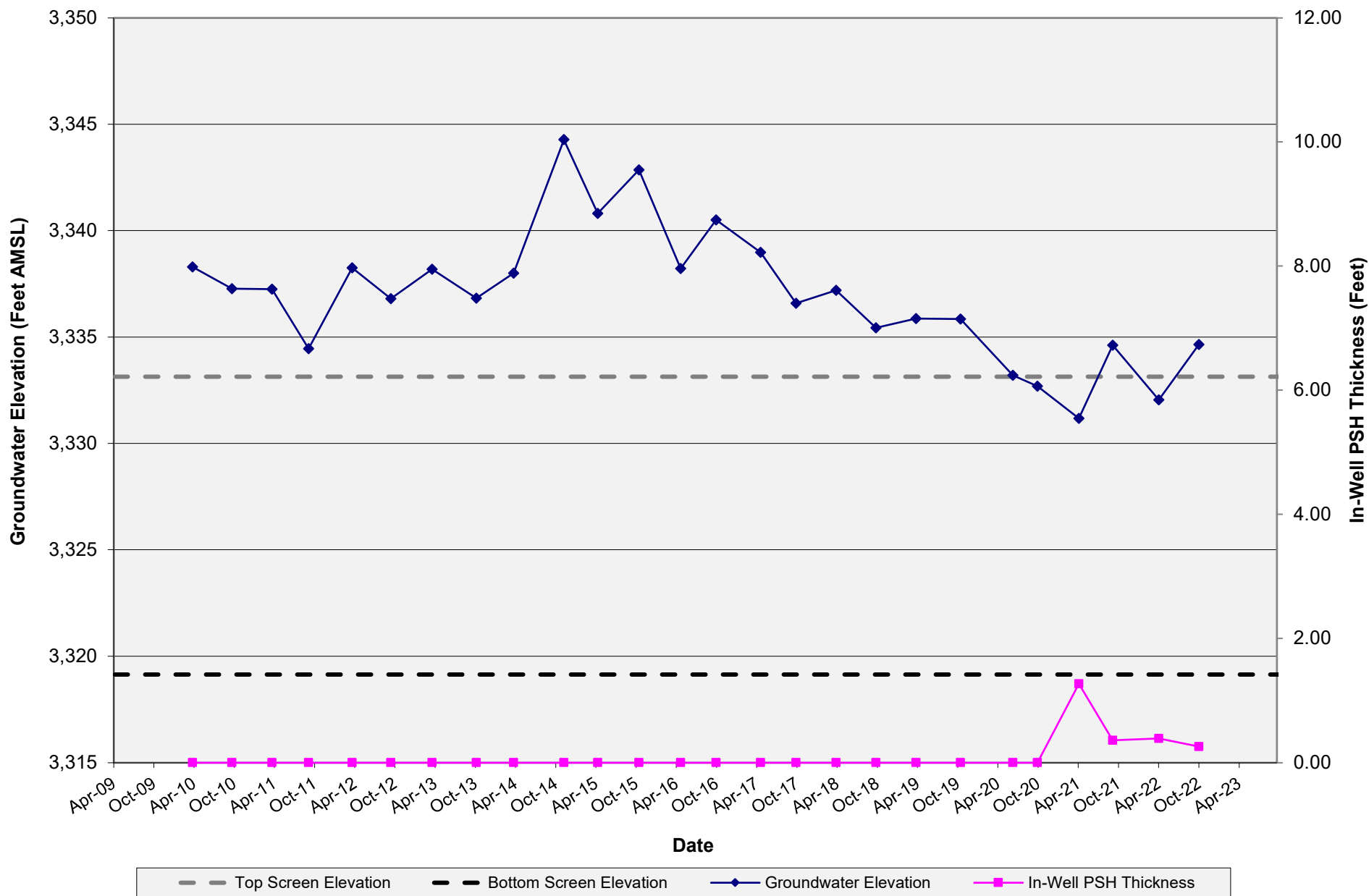
KWB-1A: Groundwater Elevations and In-Well PSH Thicknesses

HF Sinclair Navajo Refining LLC - Artesia Refinery
Field East of Refinery



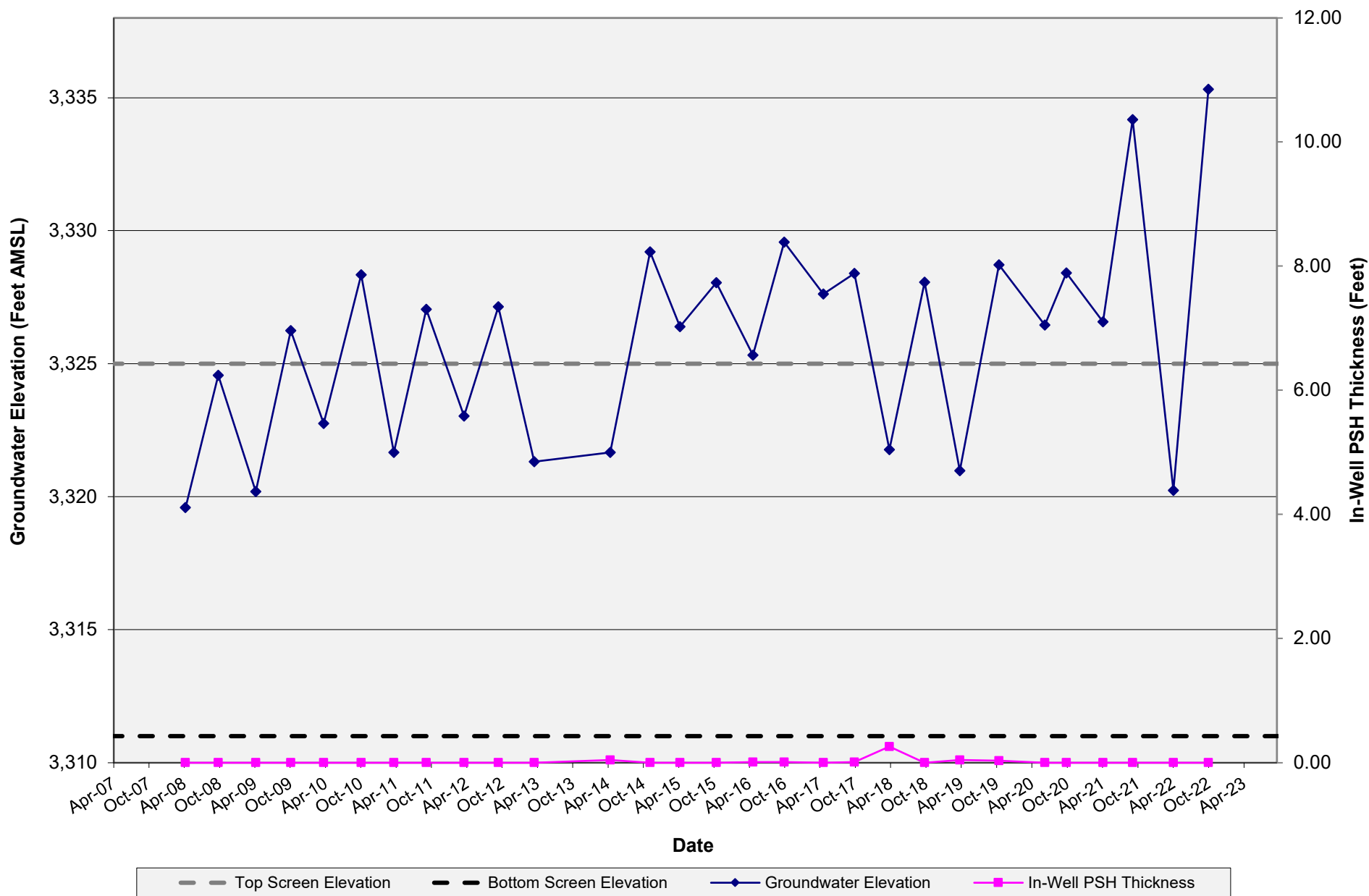
KWB-1B: Groundwater Elevations and In-Well PSH Thicknesses

HF Sinclair Navajo Refining LLC - Artesia Refinery
Field East of Refinery



KWB-7: Groundwater Elevations and In-Well PSH Thicknesses

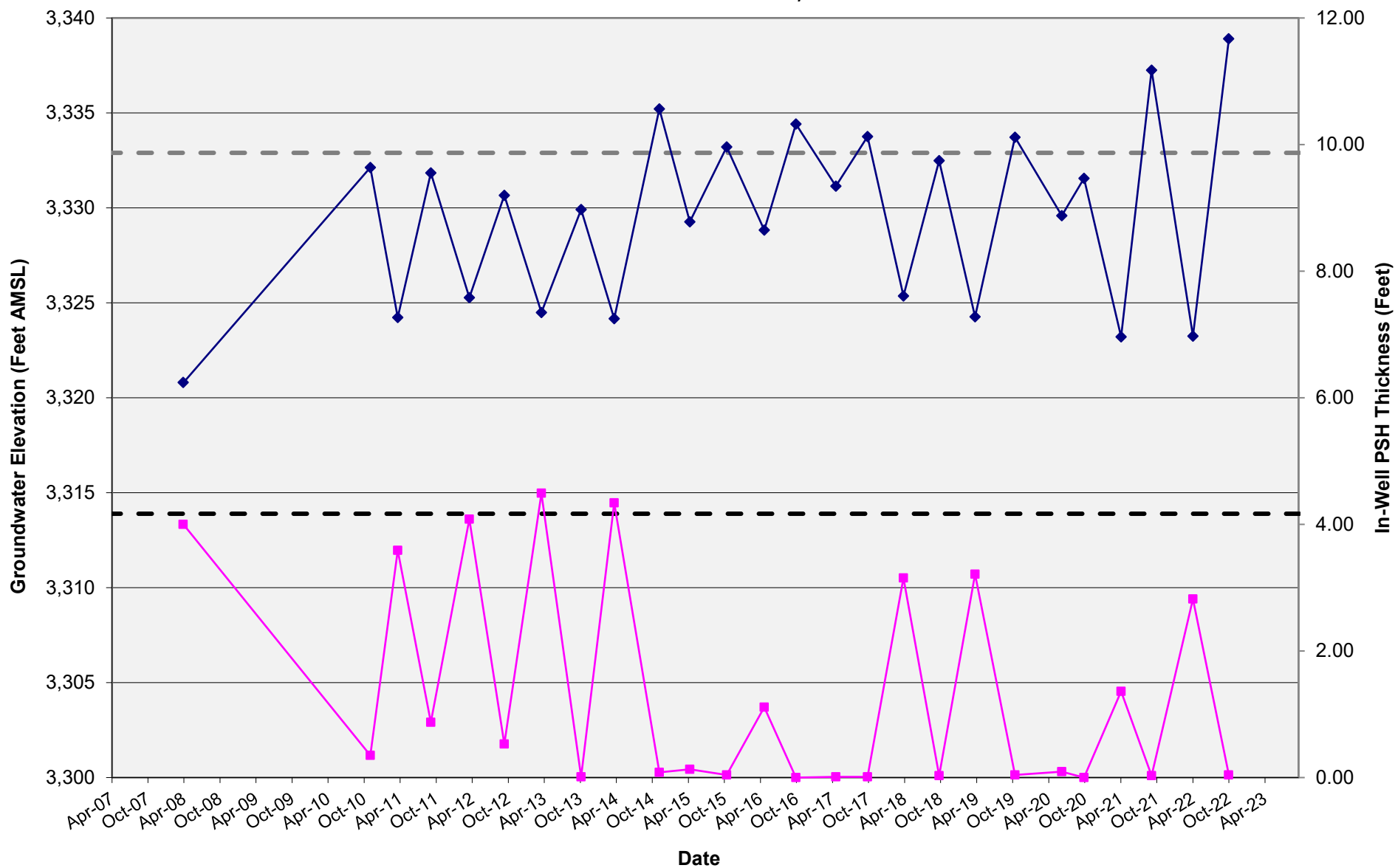
HF Sinclair Navajo Refining LLC - Artesia Refinery
Field East of Refinery



KWB-8: Groundwater Elevations and In-Well PSH Thicknesses

HF Sinclair Navajo Refining LLC - Artesia Refinery

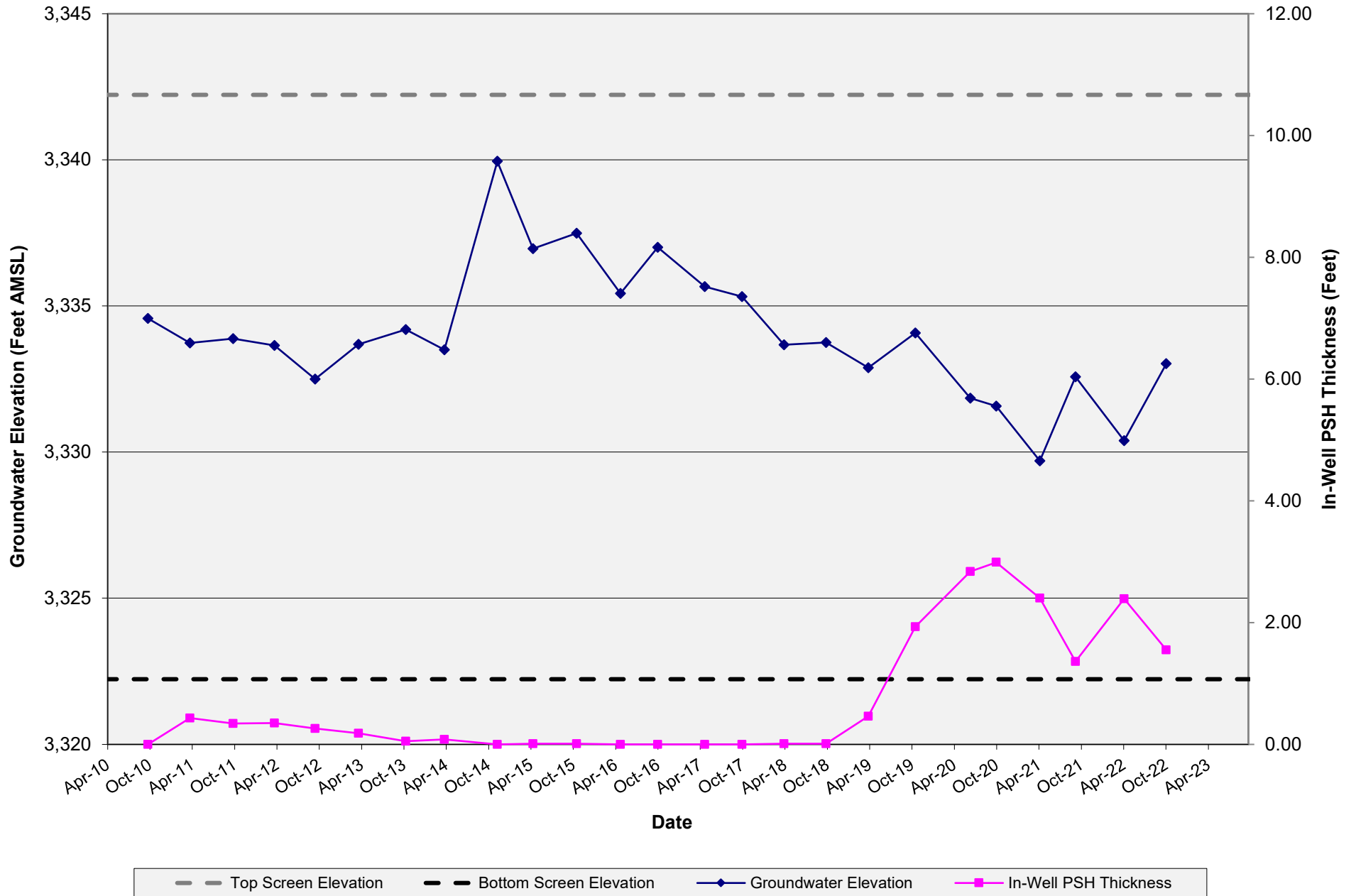
Field East of Refinery



Top Screen Elevation Bottom Screen Elevation Groundwater Elevation In-Well PSH Thickness

KWB-10R: Groundwater Elevations and In-Well PSH Thicknesses

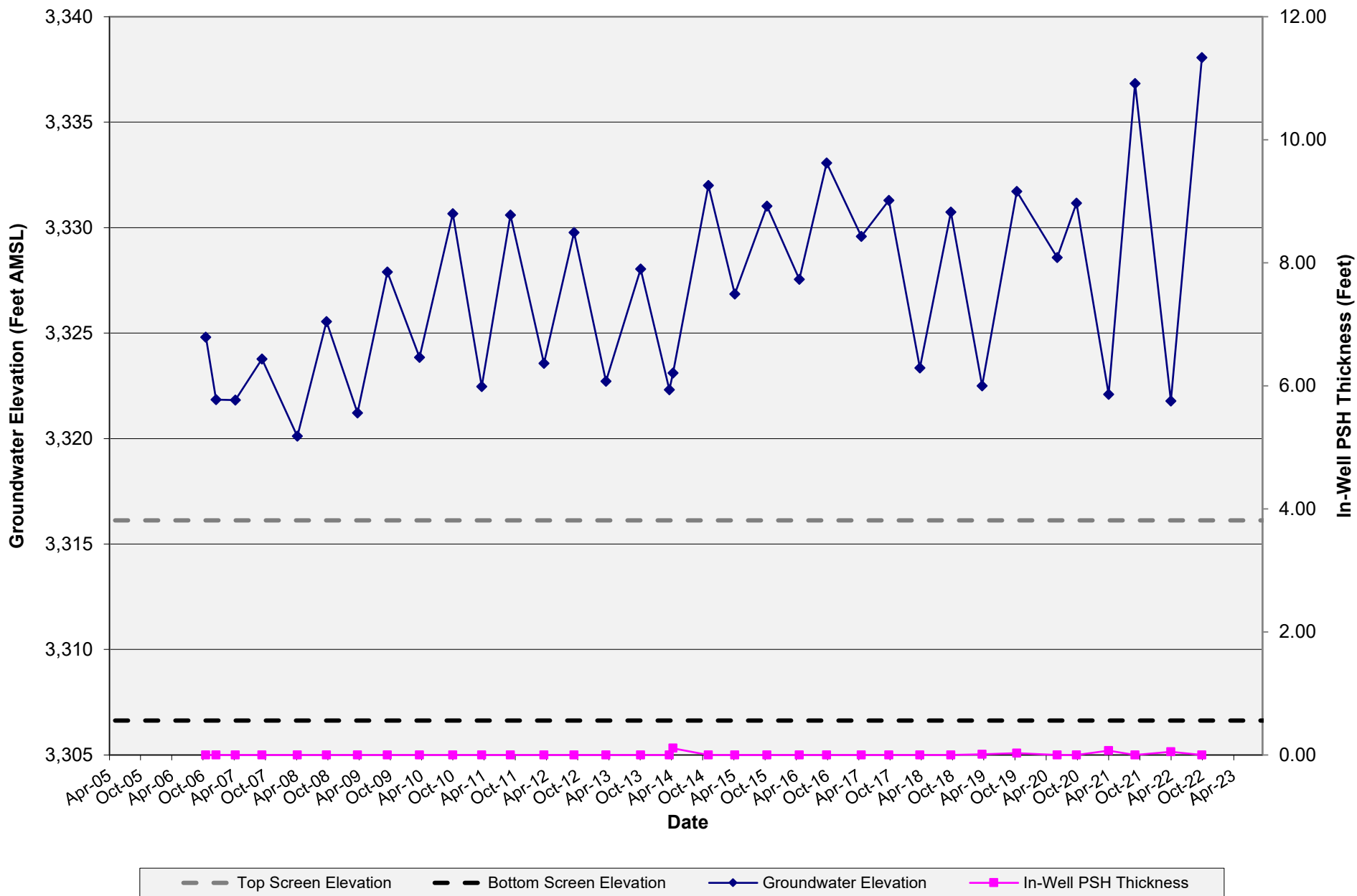
HF Sinclair Navajo Refining LLC - Artesia Refinery
Field East of Refinery



KWB-11A: Groundwater Elevations and In-Well PSH Thicknesses

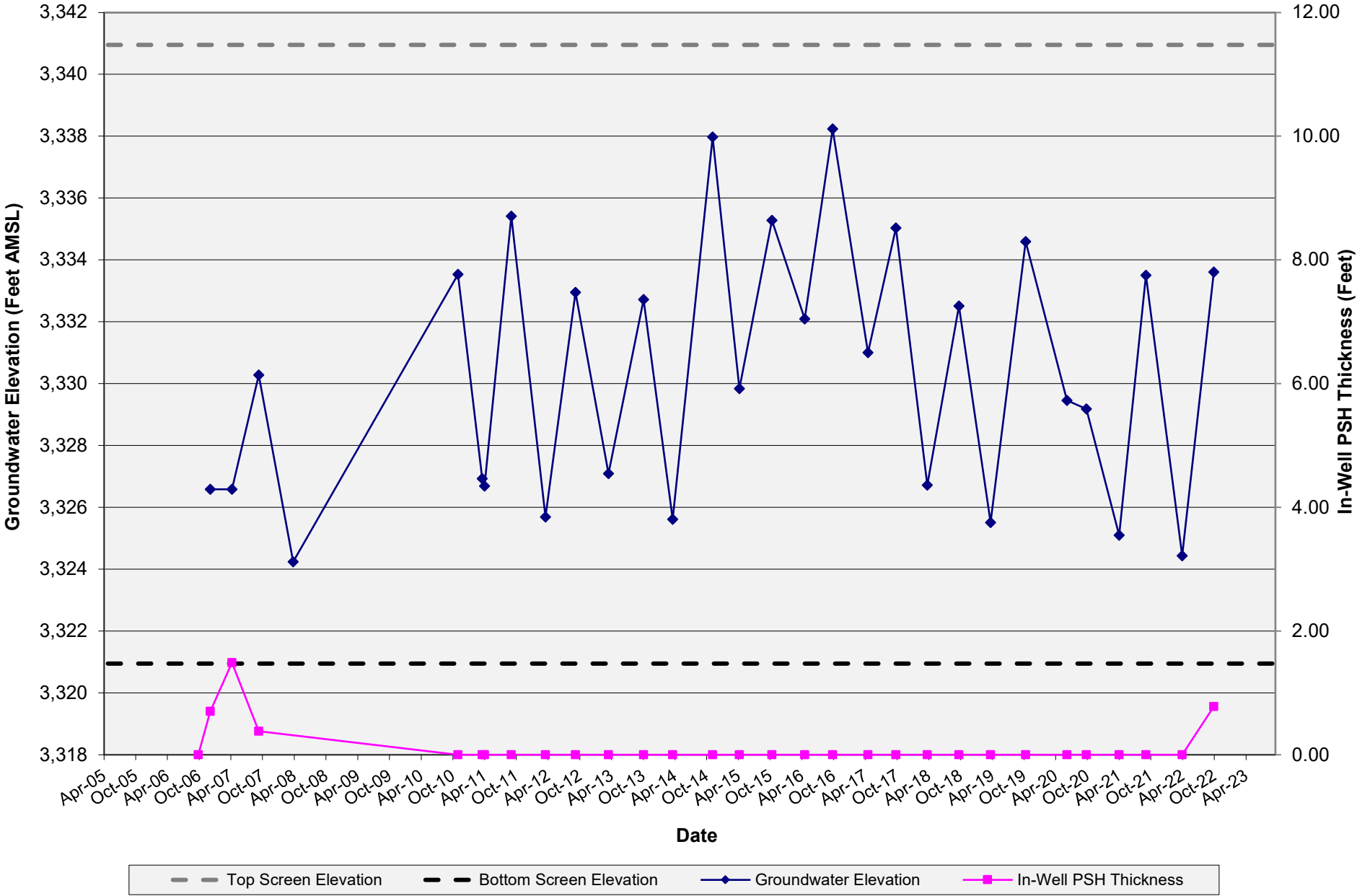
HF Sinclair Navajo Refining LLC - Artesia Refinery

Field East of Refinery



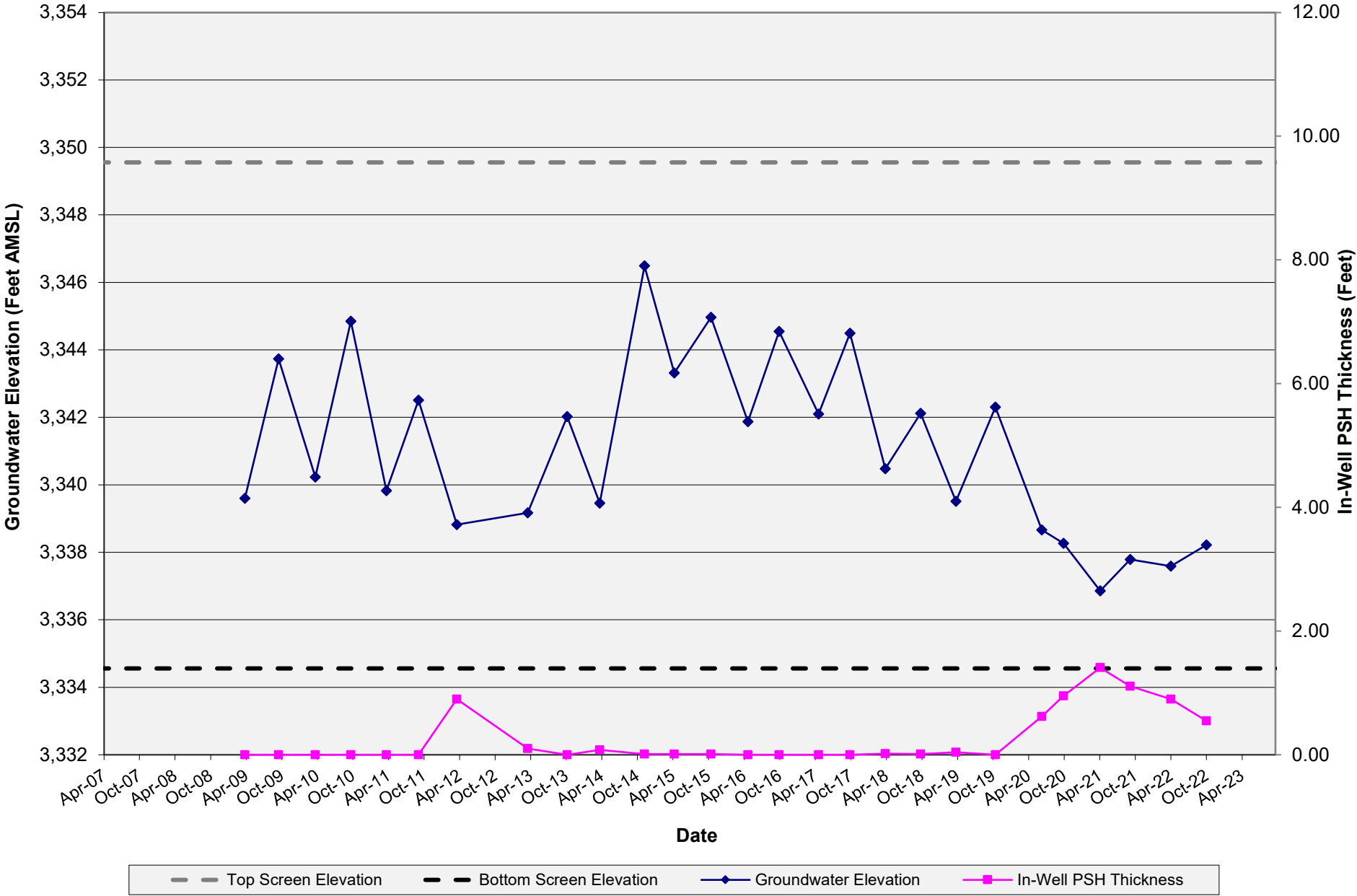
MW-57: Groundwater Elevations and In-Well PSH Thicknesses

HF Sinclair Navajo Refining LLC - Artesia Refinery
Field East of Refinery



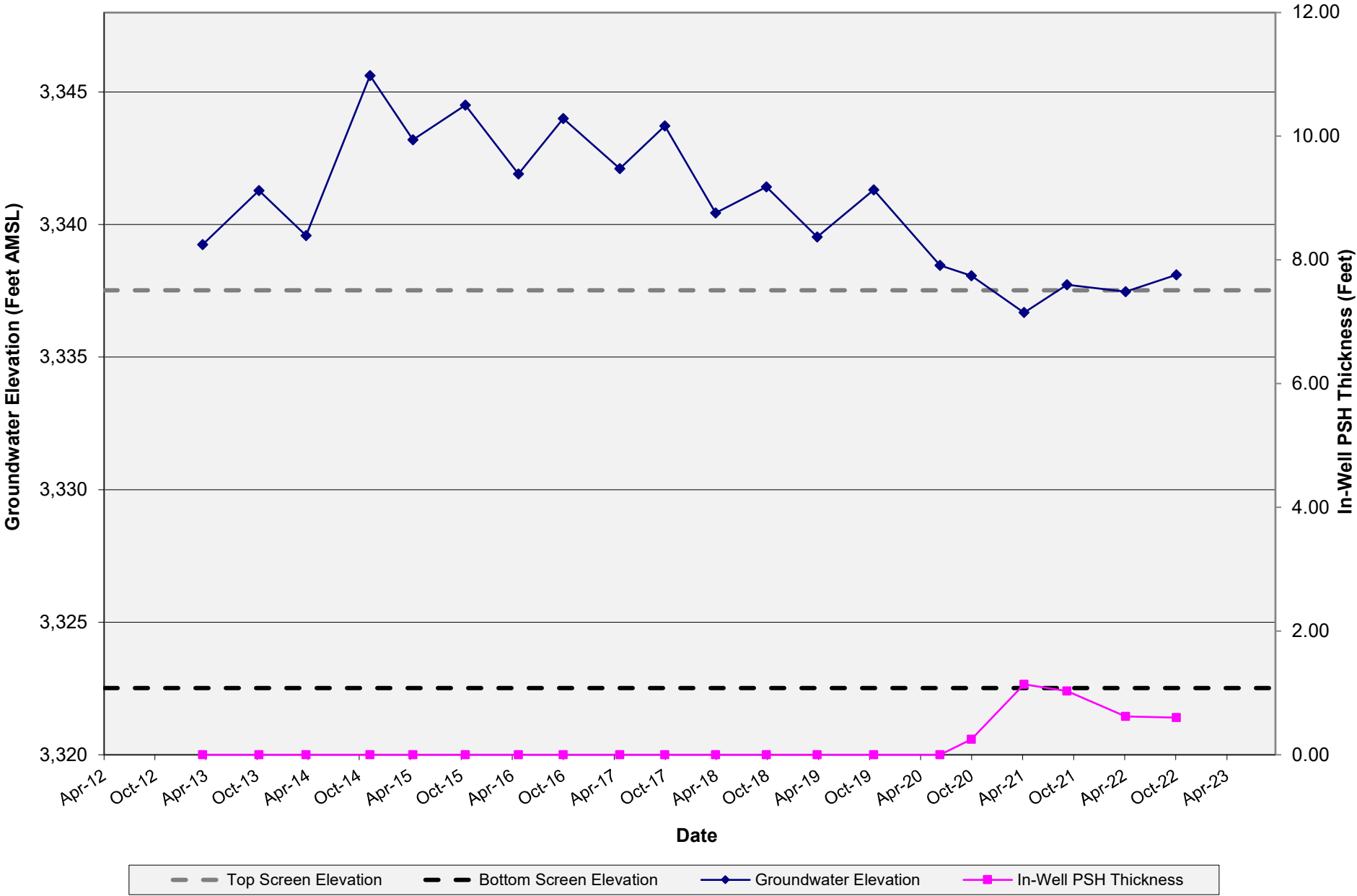
MW-58: Groundwater Elevations and In-Well PSH Thicknesses

HF Sinclair Navajo Refining LLC - Artesia Refinery
Field East of Refinery



MW-111: Groundwater Elevations and In-Well PSH Thicknesses

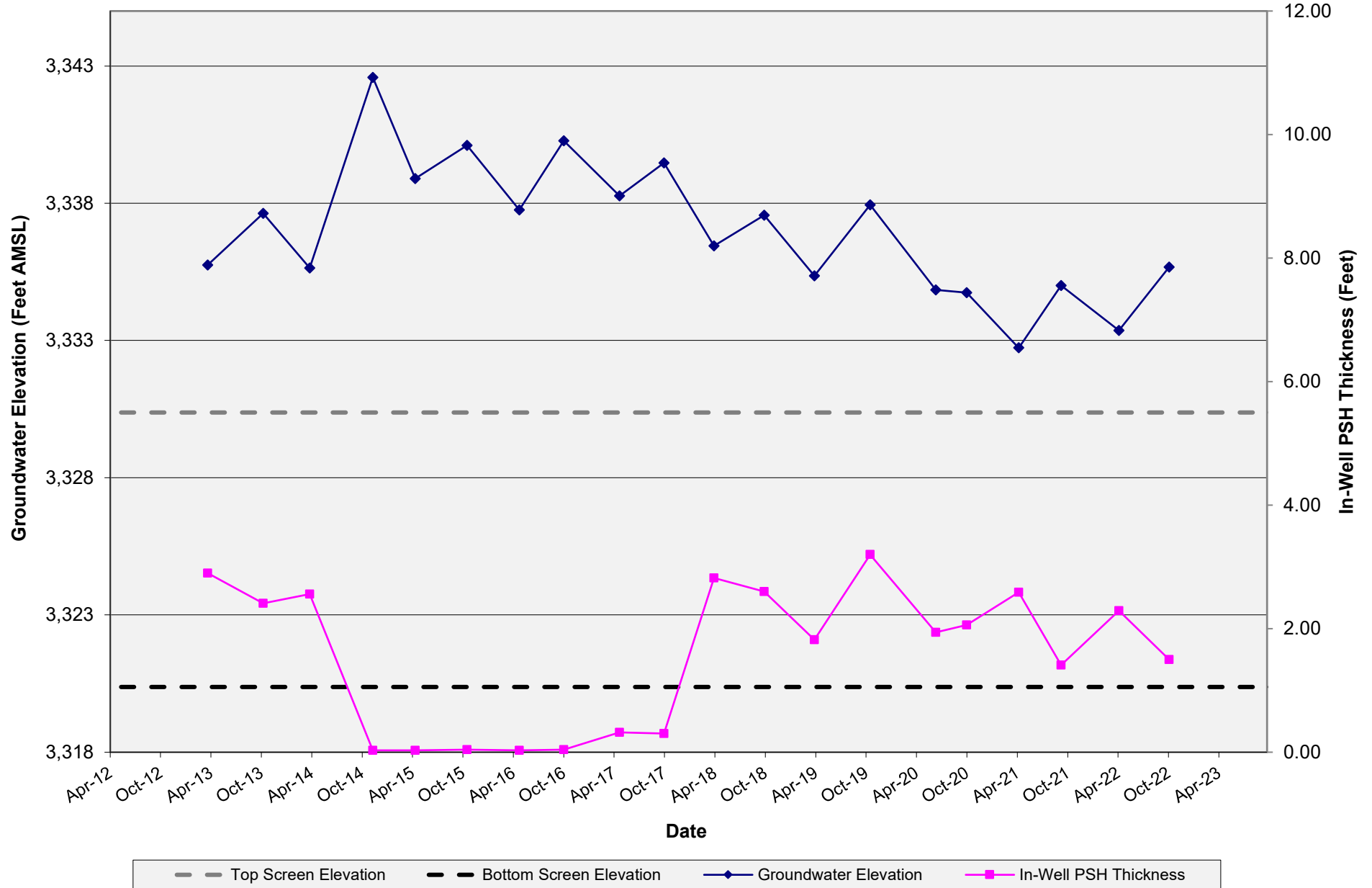
HF Sinclair Navajo Refining LLC - Artesia Refinery
Field East of Refinery



MW-112: Groundwater Elevations and In-Well PSH Thicknesses

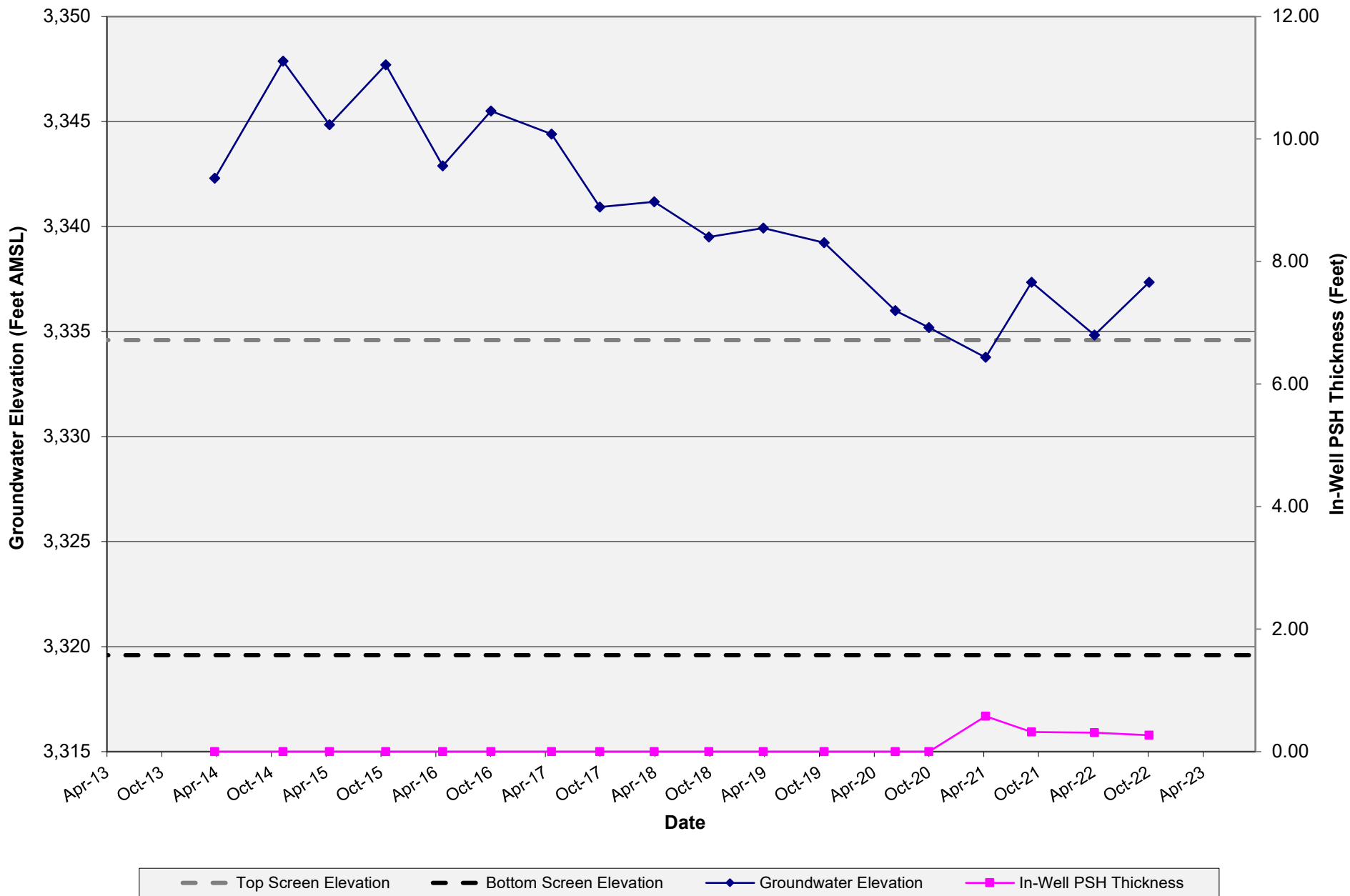
HF Sinclair Navajo Refining LLC - Artesia Refinery

Field East of Refinery



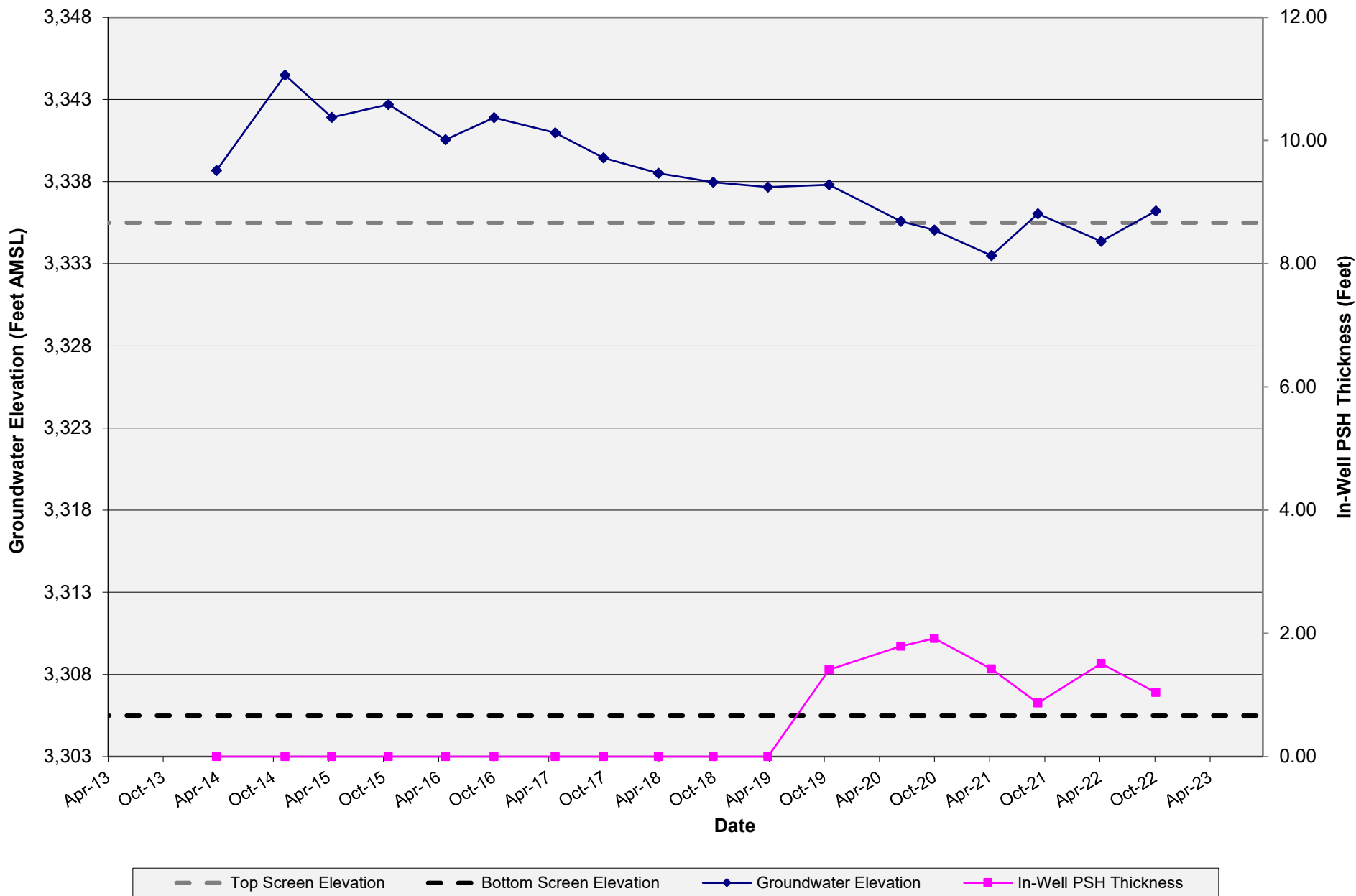
MW-126A: Groundwater Elevations and In-Well PSH Thicknesses

HF Sinclair Navajo Refining LLC - Artesia Refinery
Field East of Refinery



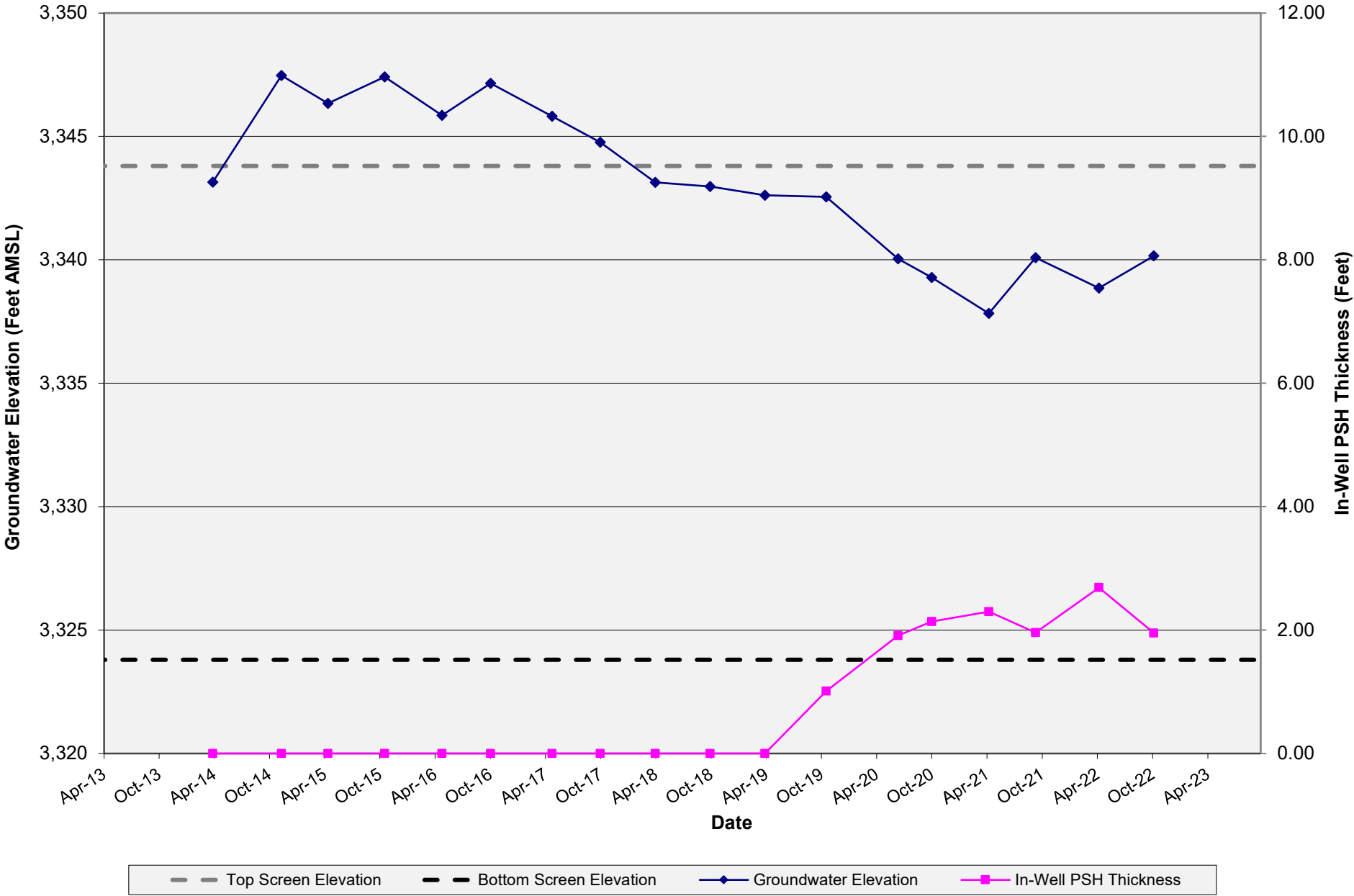
MW-127: Groundwater Elevations and In-Well PSH Thicknesses

HF Sinclair Navajo Refining LLC - Artesia Refinery
Field East of Refinery



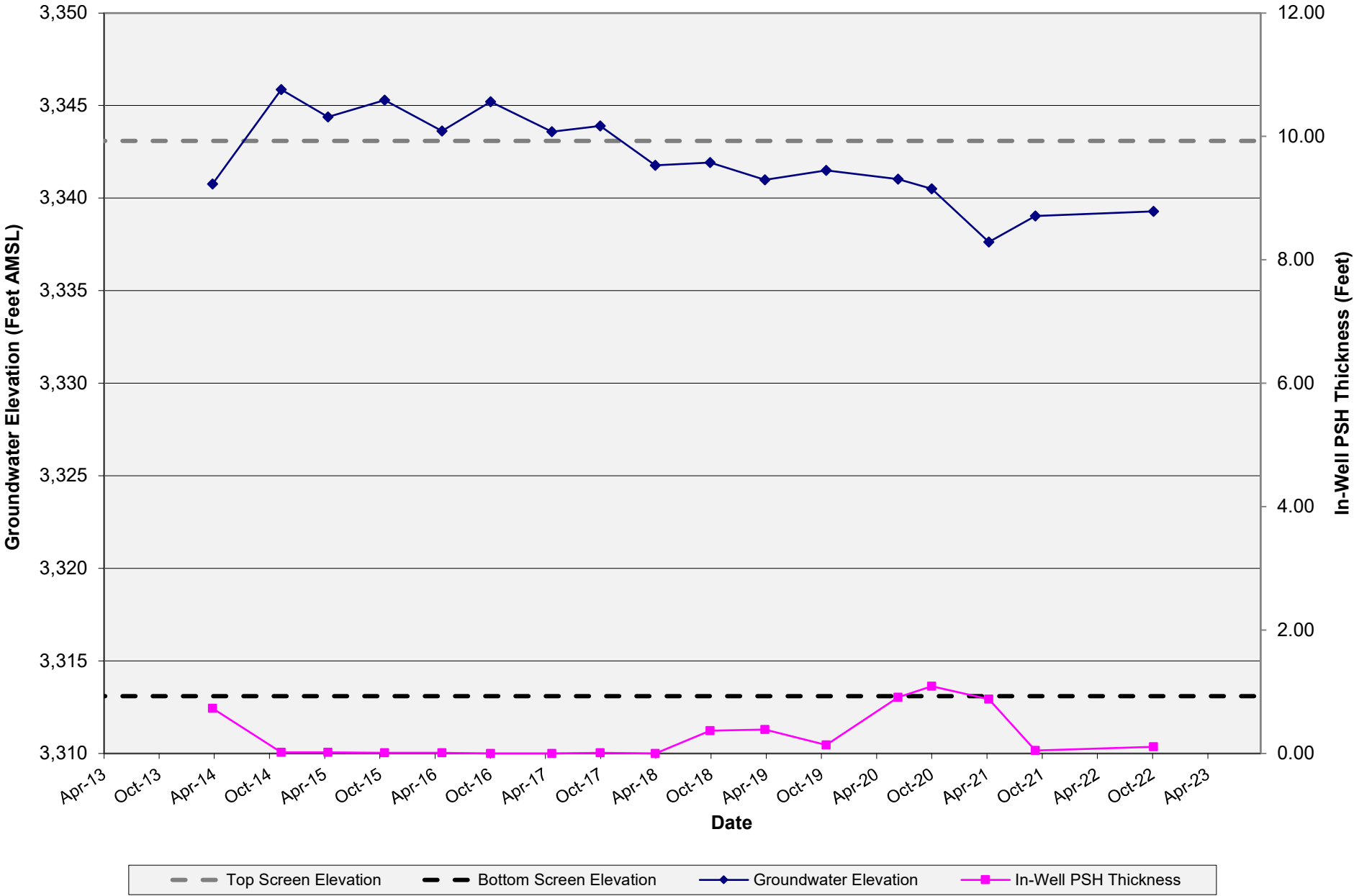
MW-128: Groundwater Elevations and In-Well PSH Thicknesses

HF Sinclair Navajo Refining LLC - Artesia Refinery
Field East of Refinery



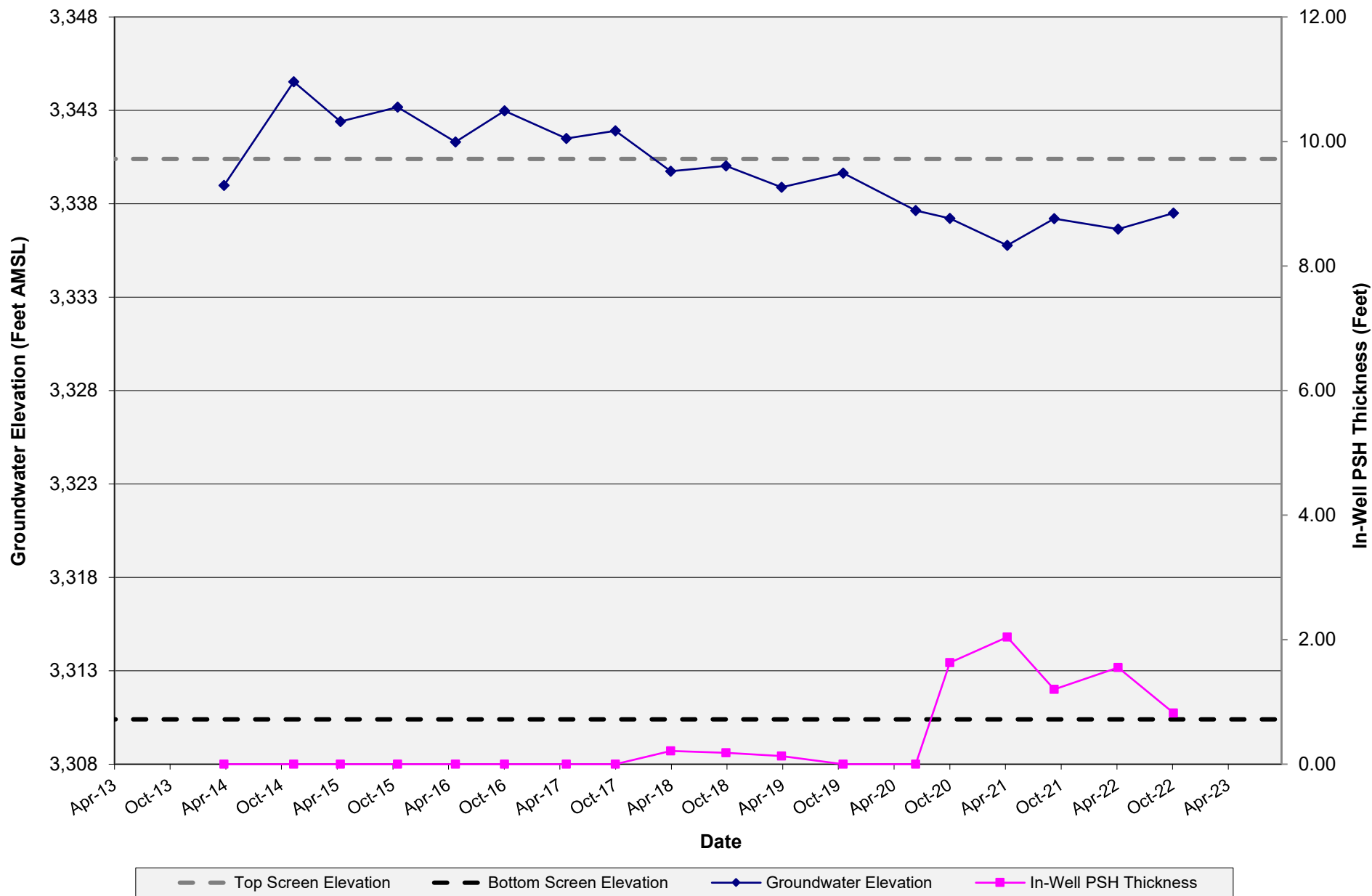
MW-129: Groundwater Elevations and In-Well PSH Thicknesses

HF Sinclair Navajo Refining LLC - Artesia Refinery
Field East of Refinery



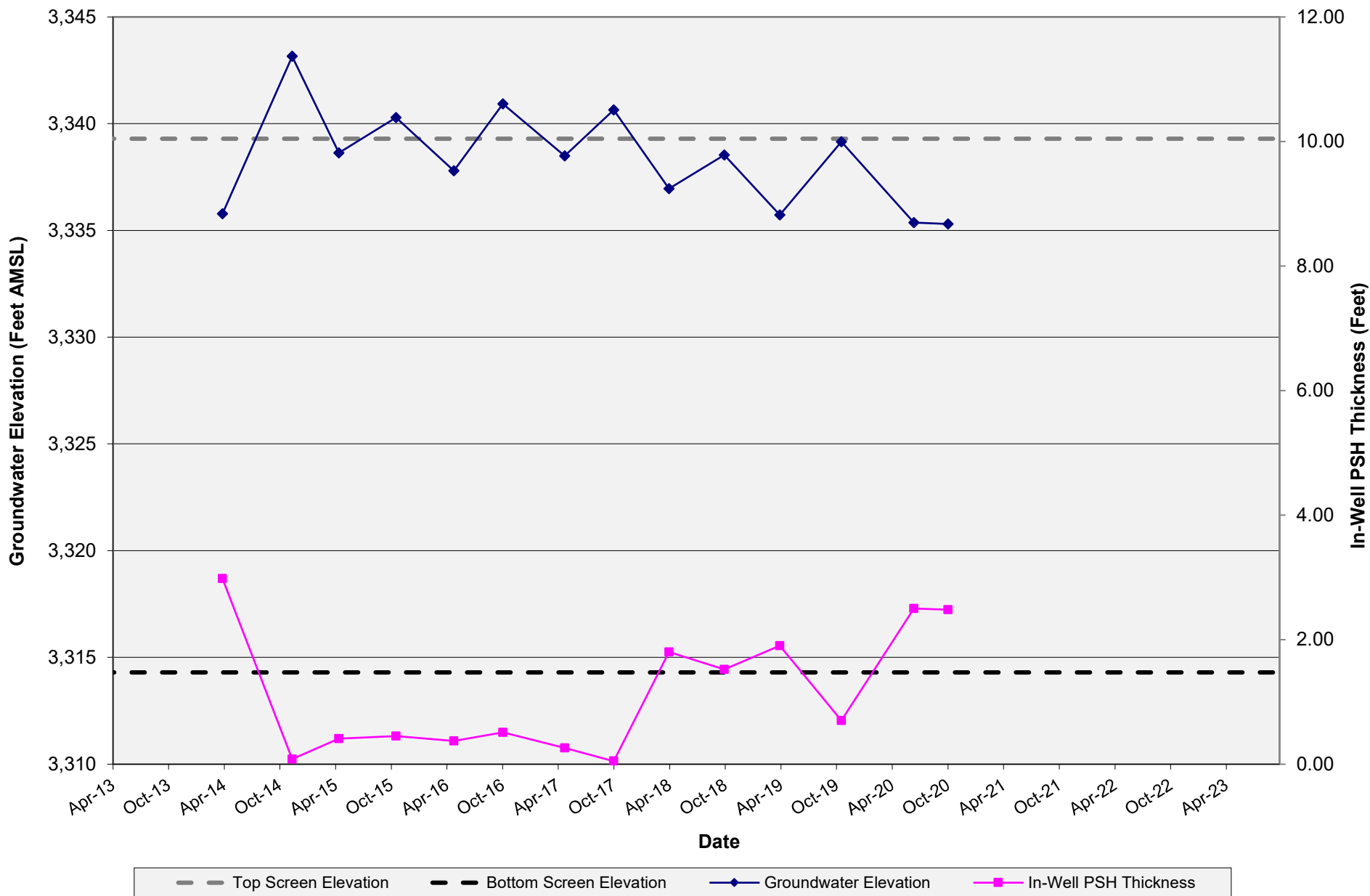
MW-131: Groundwater Elevations and In-Well PSH Thicknesses

HF Sinclair Navajo Refining LLC - Artesia Refinery
Field East of Refinery



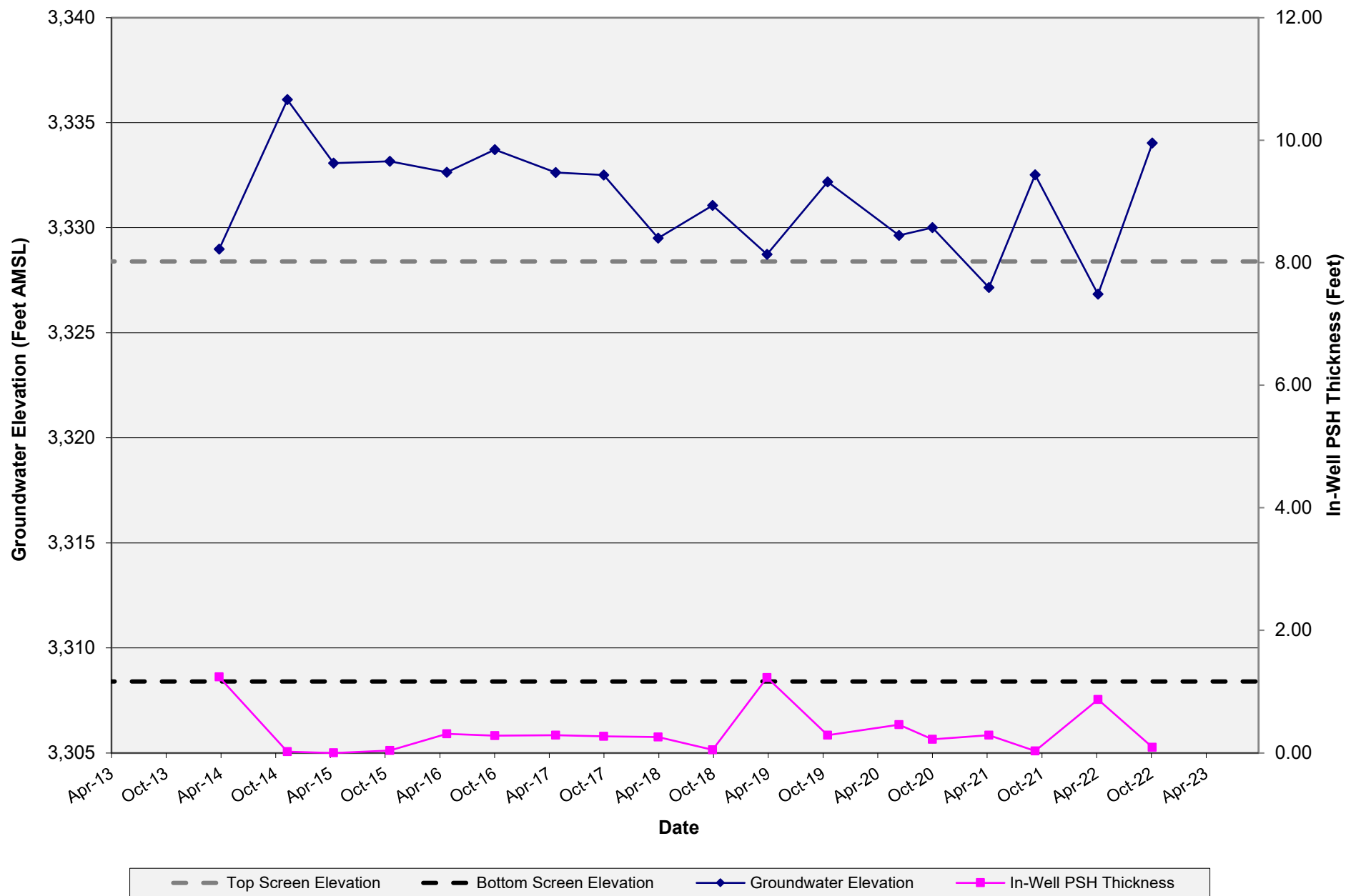
MW-132: Groundwater Elevations and In-Well PSH Thicknesses

HF Sinclair Navajo Refining LLC - Artesia Refinery
Field East of Refinery



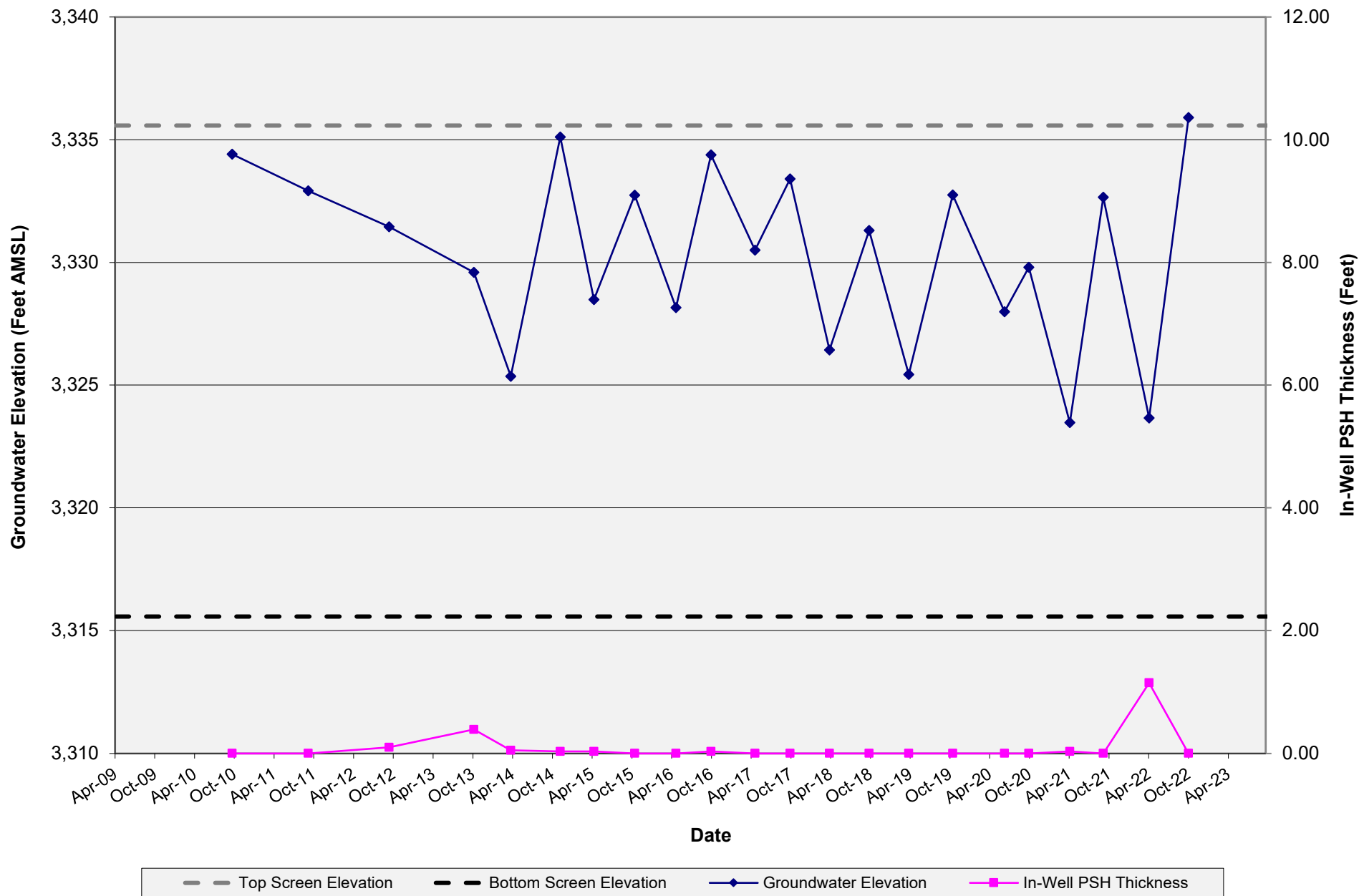
MW-133: Groundwater Elevations and In-Well PSH Thicknesses

HF Sinclair Navajo Refining LLC - Artesia Refinery
Field East of Refinery



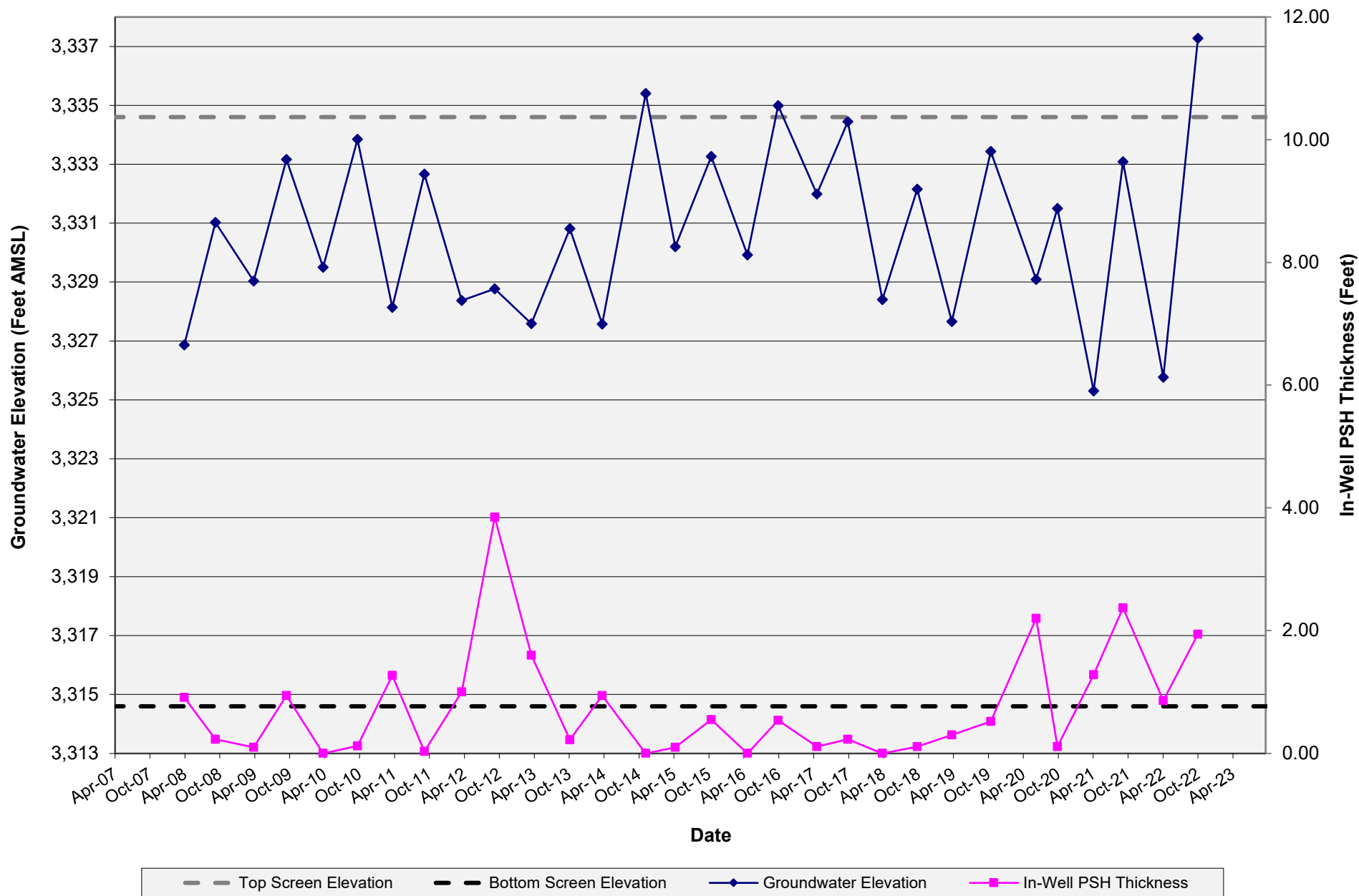
RW-12 & RW-12R: Groundwater Elevations and In-Well PSH Thicknesses

HF Sinclair Navajo Refining LLC - Artesia Refinery
Field East of Refinery



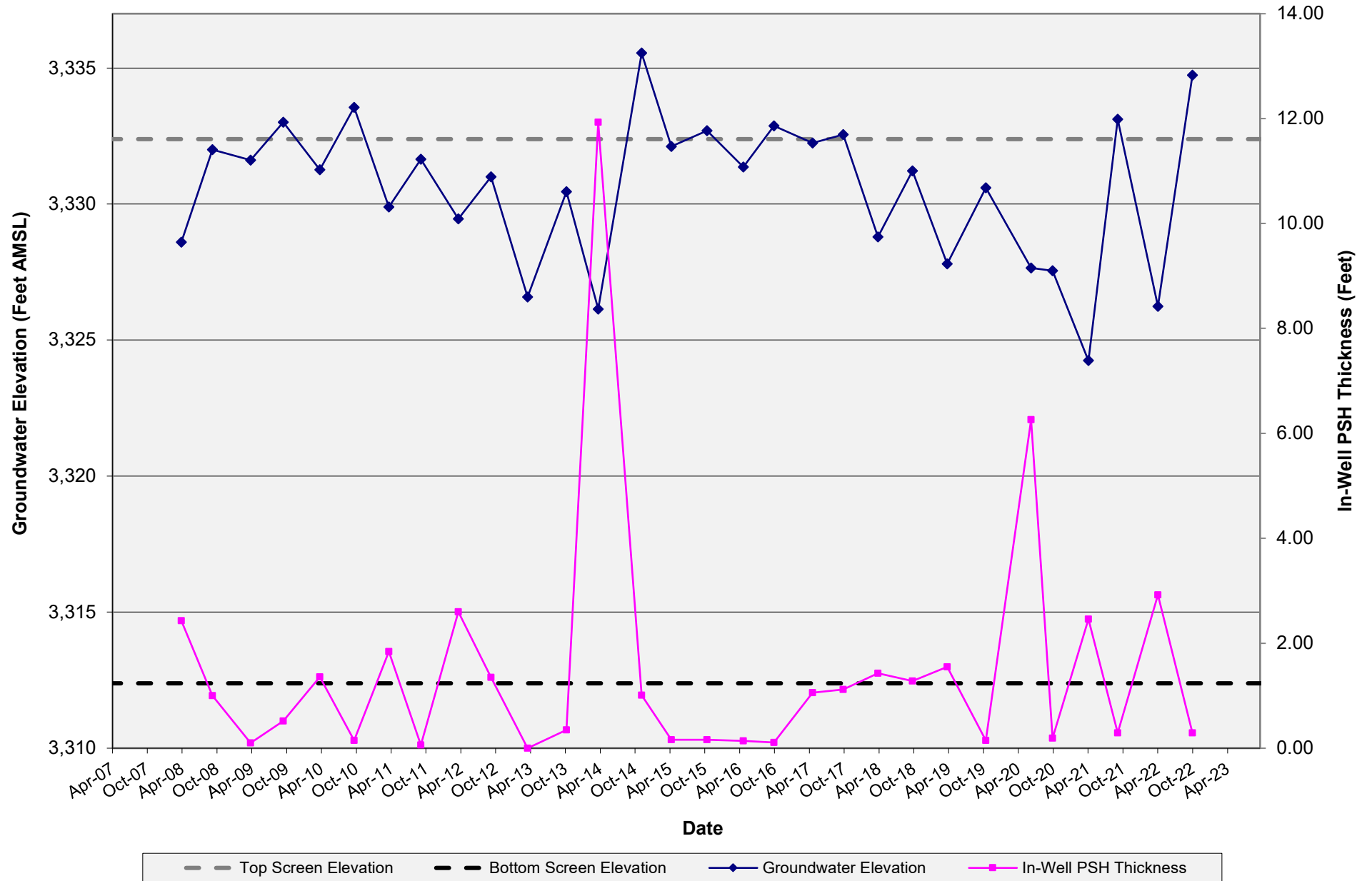
RW-13 & RW-13R: Groundwater Elevations and In-Well PSH Thicknesses

HF Sinclair Navajo Refining LLC - Artesia Refinery
Field East of Refinery



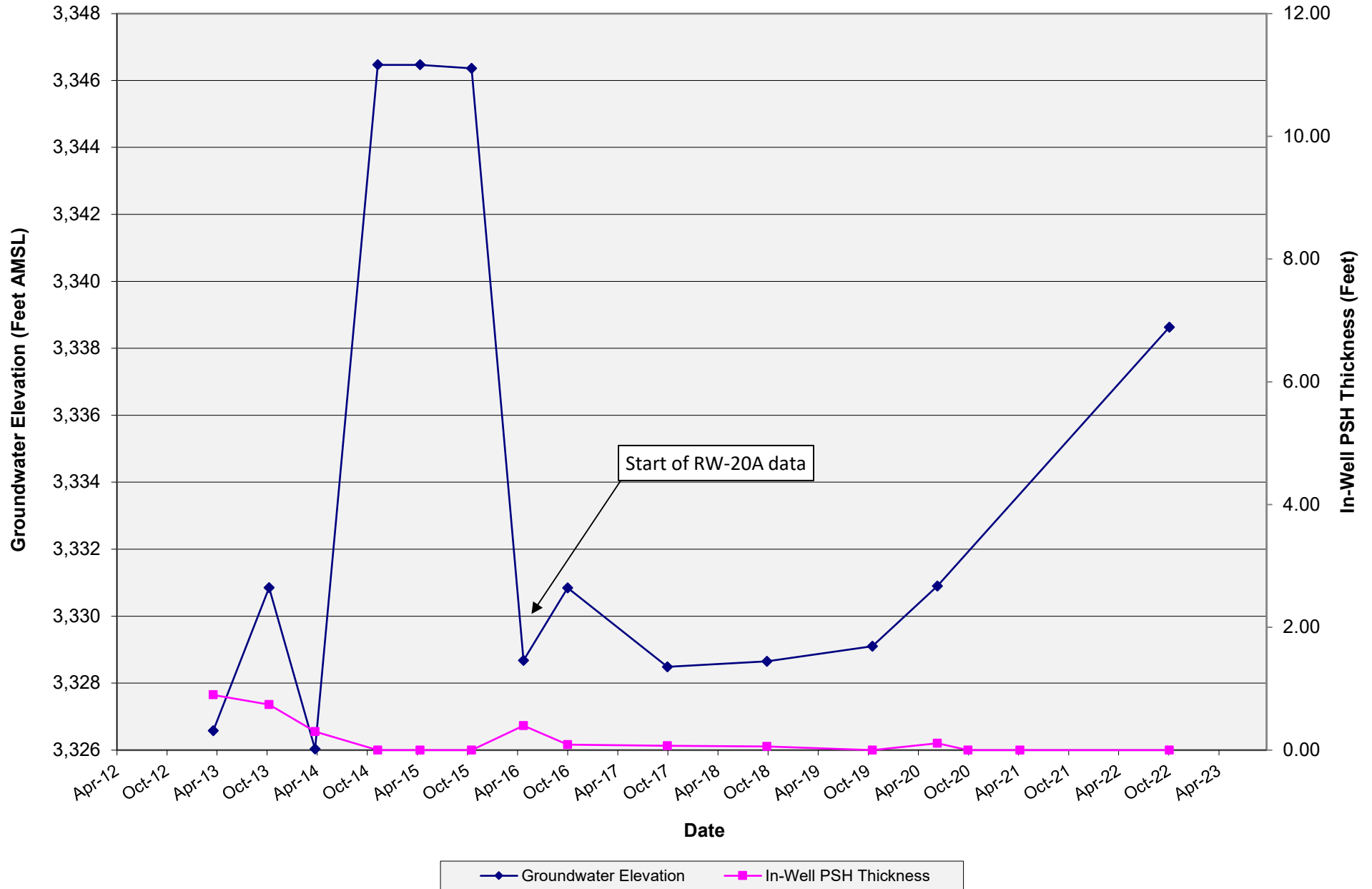
RW-14 & RW-14R: Groundwater Elevations and In-Well PSH Thicknesses

HF Sinclair Navajo Refining LLC - Artesia Refinery
Field East of Refinery



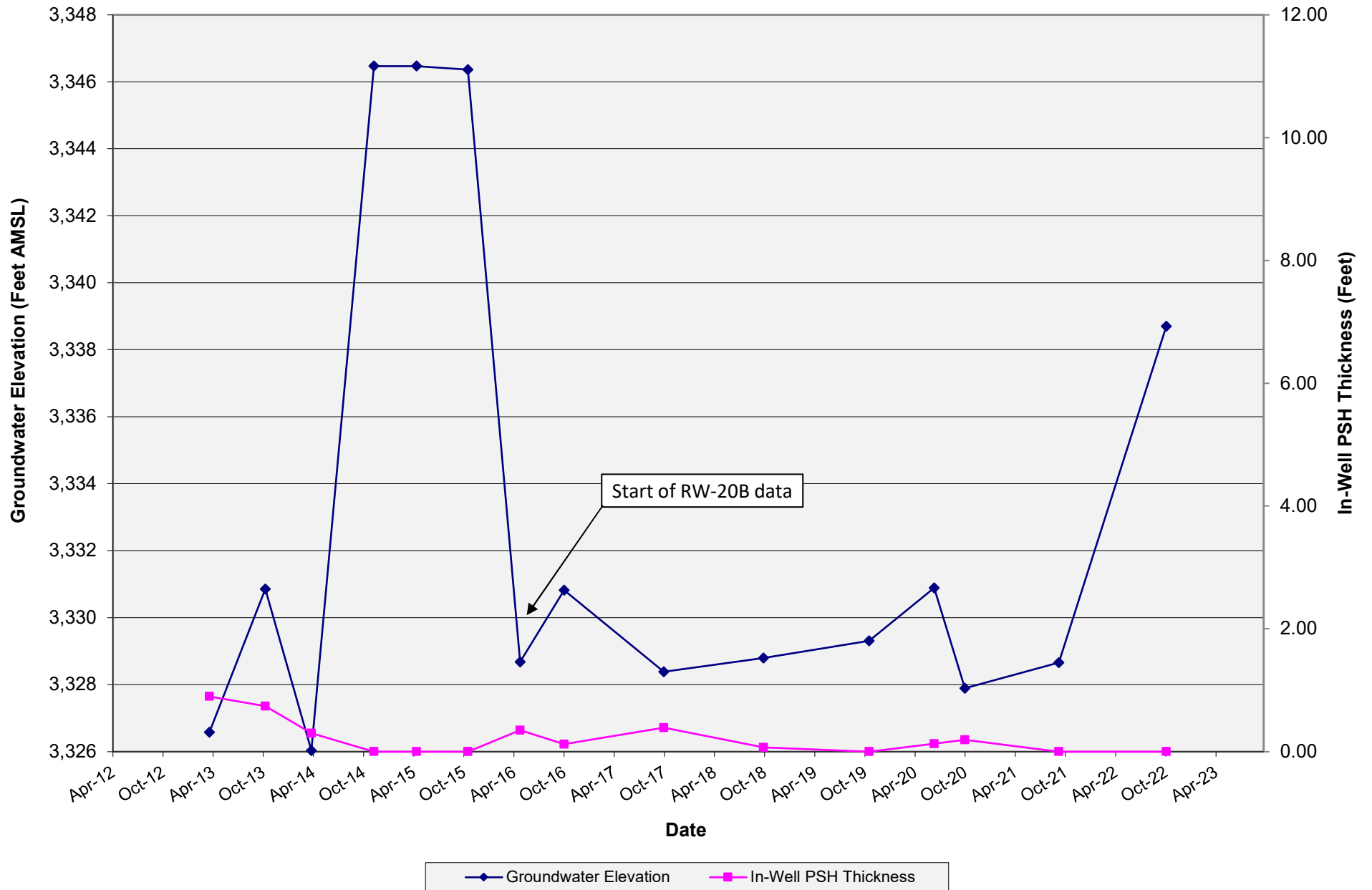
RW-20 & RW-20A: Groundwater Elevations and In-Well PSH Thicknesses

HF Sinclair Navajo Refining LLC - Artesia Refinery
Field East of Refinery



RW-20 & RW-20B: Groundwater Elevations and In-Well PSH Thicknesses

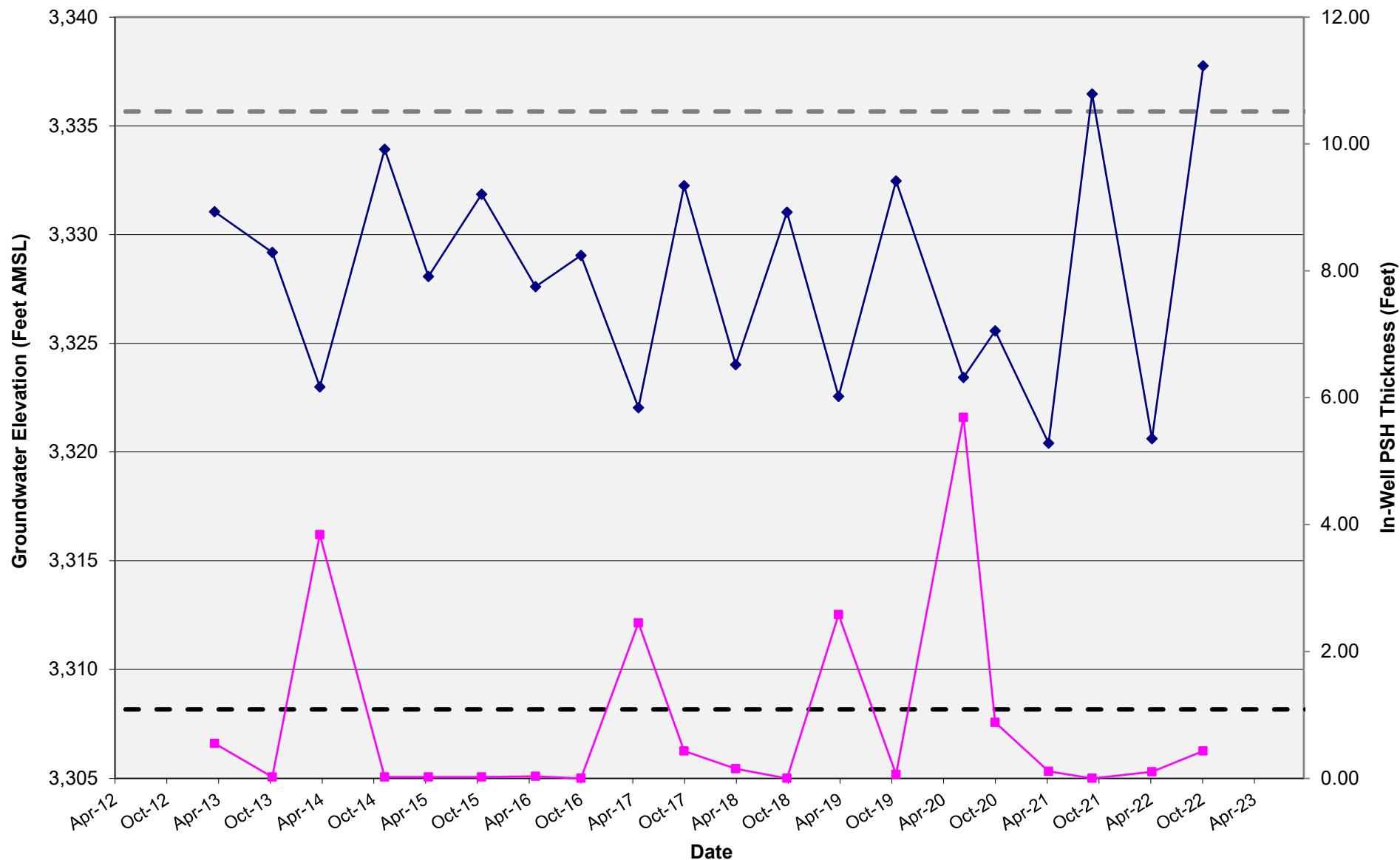
HF Sinclair Navajo Refining LLC - Artesia Refinery
Field East of Refinery



RW-22: Groundwater Elevations and In-Well PSH Thicknesses

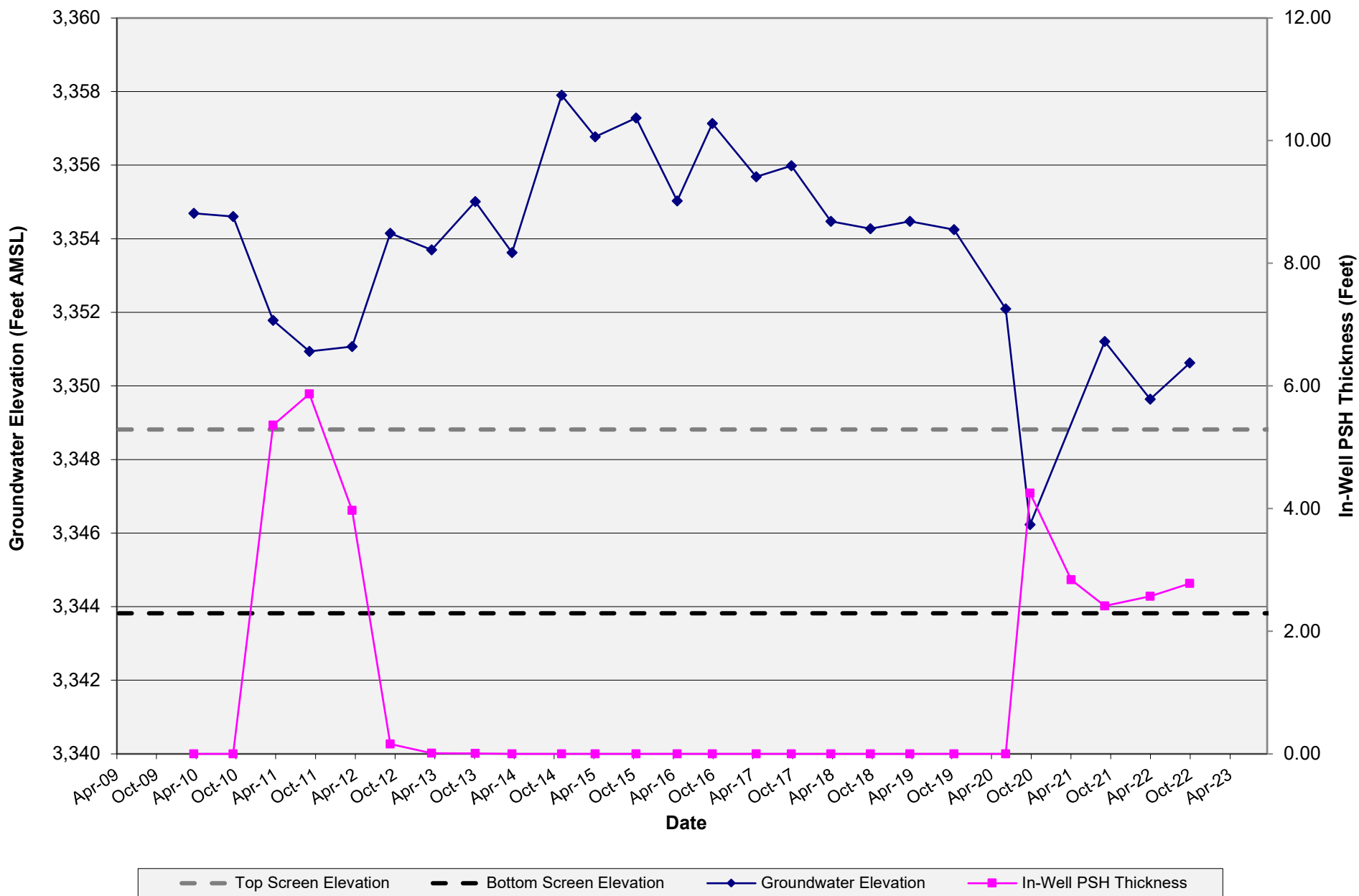
HF Sinclair Navajo Refining LLC - Artesia Refinery

Field East of Refinery



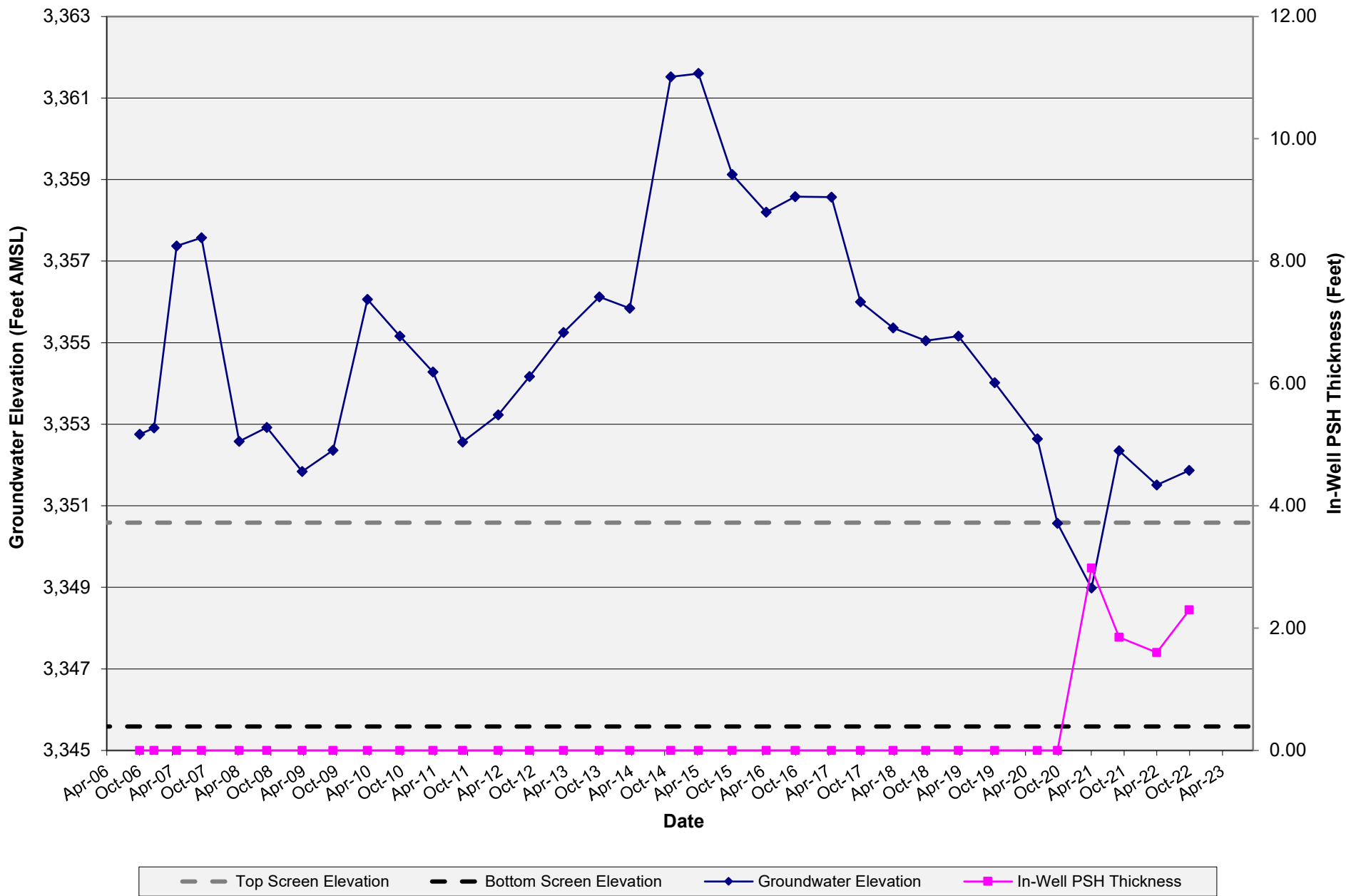
NCL-34A: Groundwater Elevations and In-Well PSH Thicknesses

HF Sinclair Navajo Refining LLC - Artesia Refinery
North Colony Landfarm



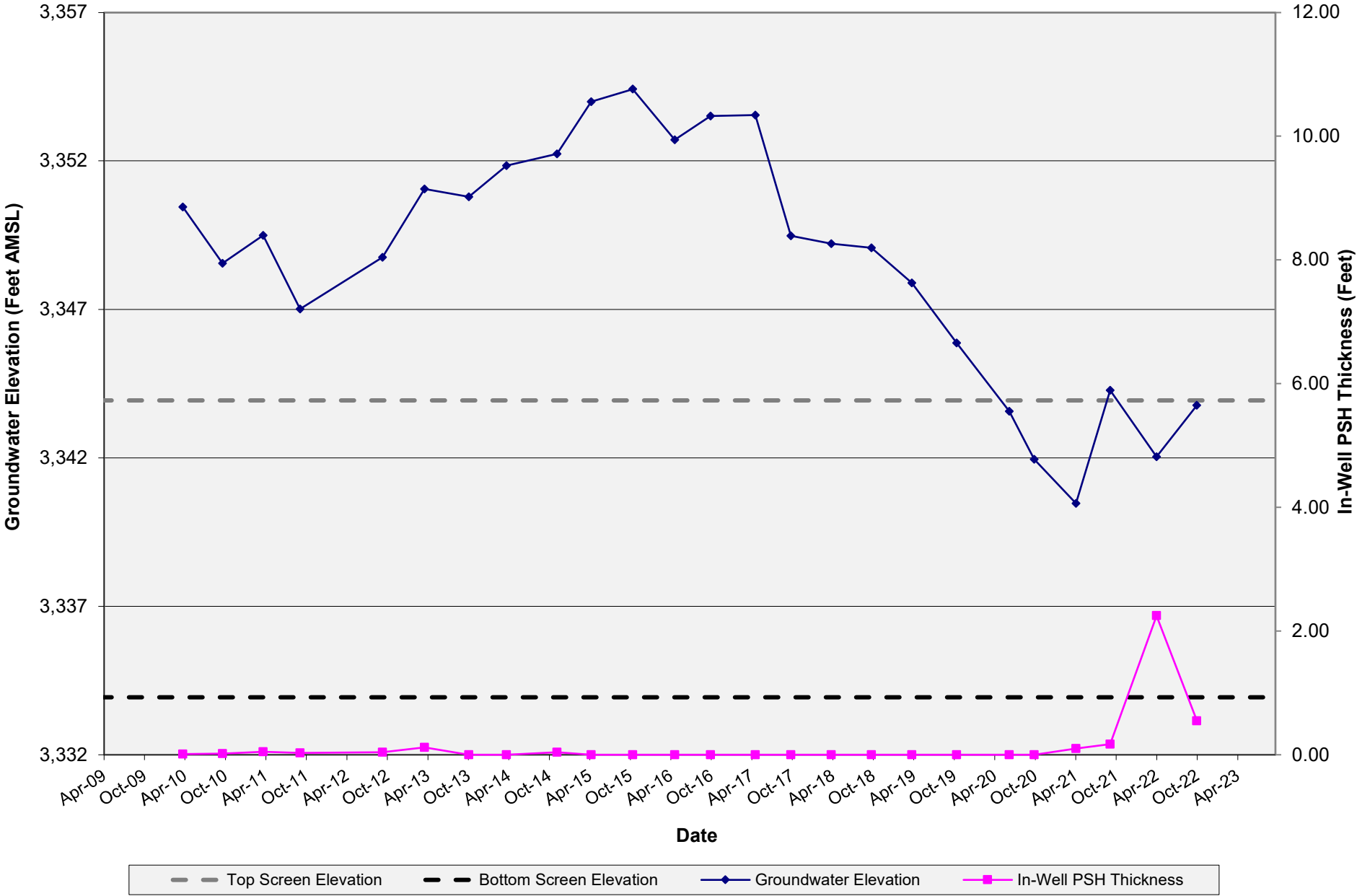
MW-23: Groundwater Elevations and In-Well PSH Thicknesses

HF Sinclair Navajo Refining LLC - Artesia Refinery
North Refinery



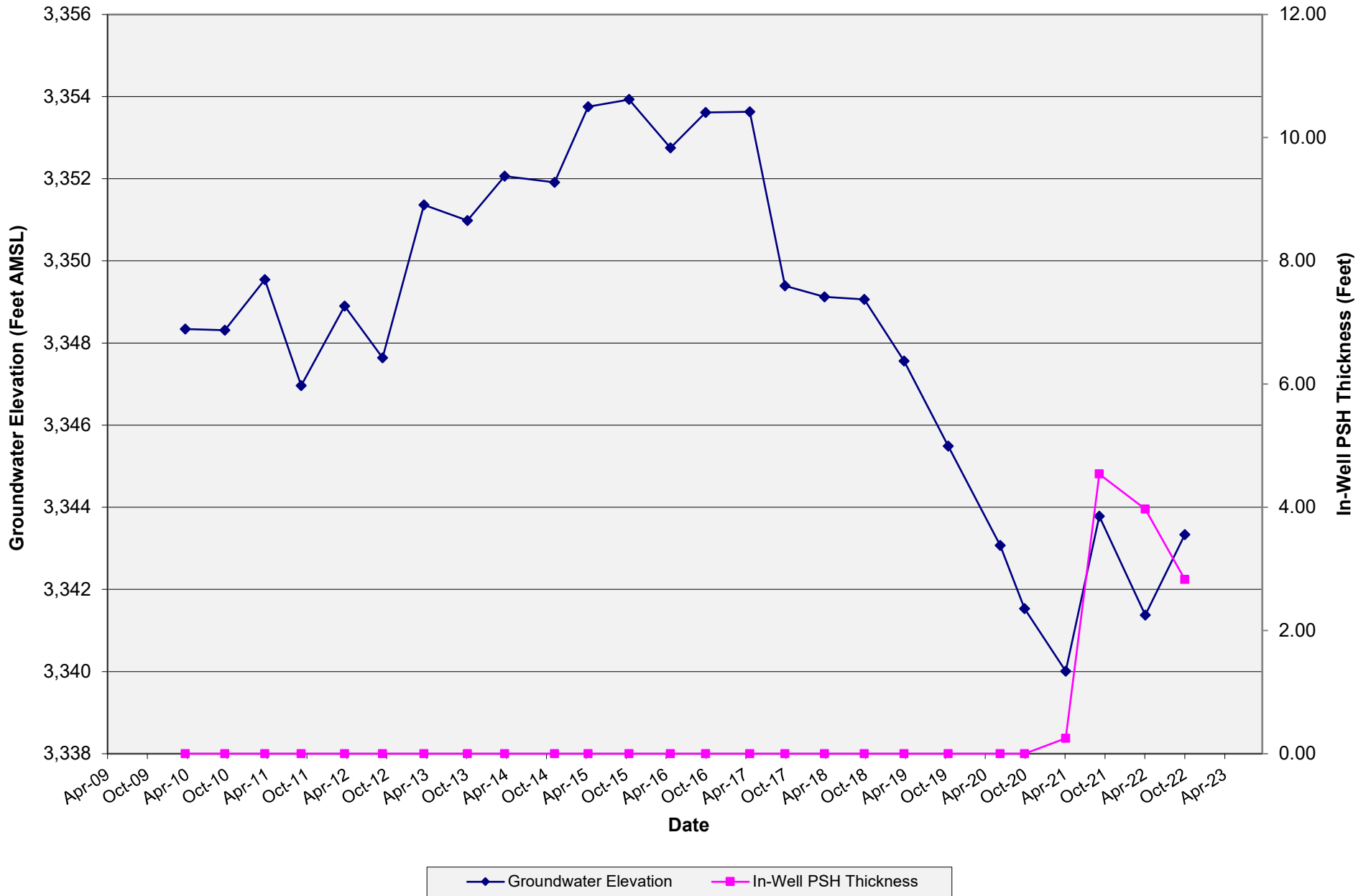
MW-39: Groundwater Elevations and In-Well PSH Thicknesses

HF Sinclair Navajo Refining LLC - Artesia Refinery
North Refinery



MW-40: Groundwater Elevations and In-Well PSH Thicknesses

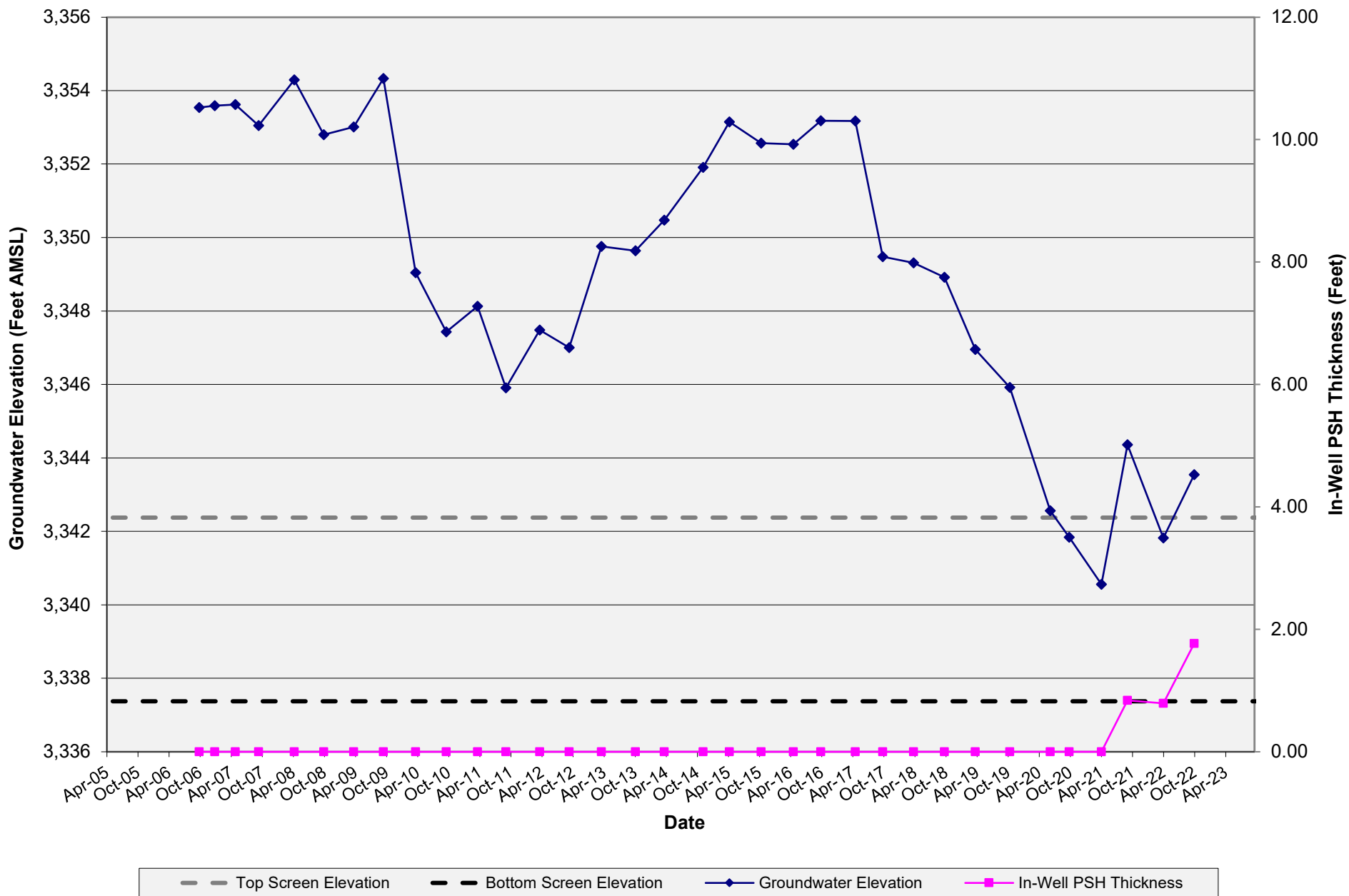
HF Sinclair Navajo Refining LLC - Artesia Refinery
North Refinery



MW-41: Groundwater Elevations and In-Well PSH Thicknesses

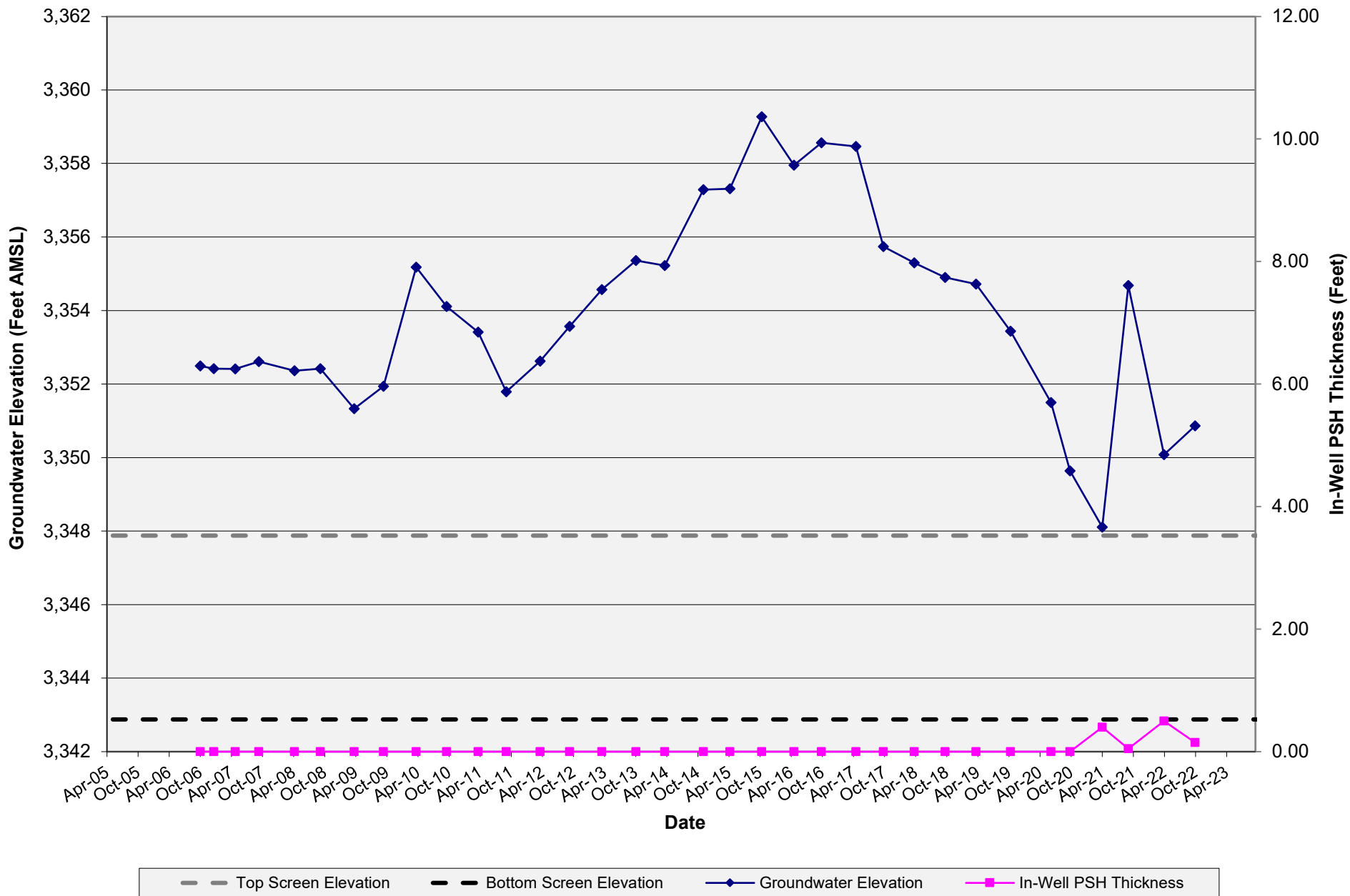
HF Sinclair Navajo Refining LLC - Artesia Refinery

North Refinery



MW-43: Groundwater Elevations and In-Well PSH Thicknesses

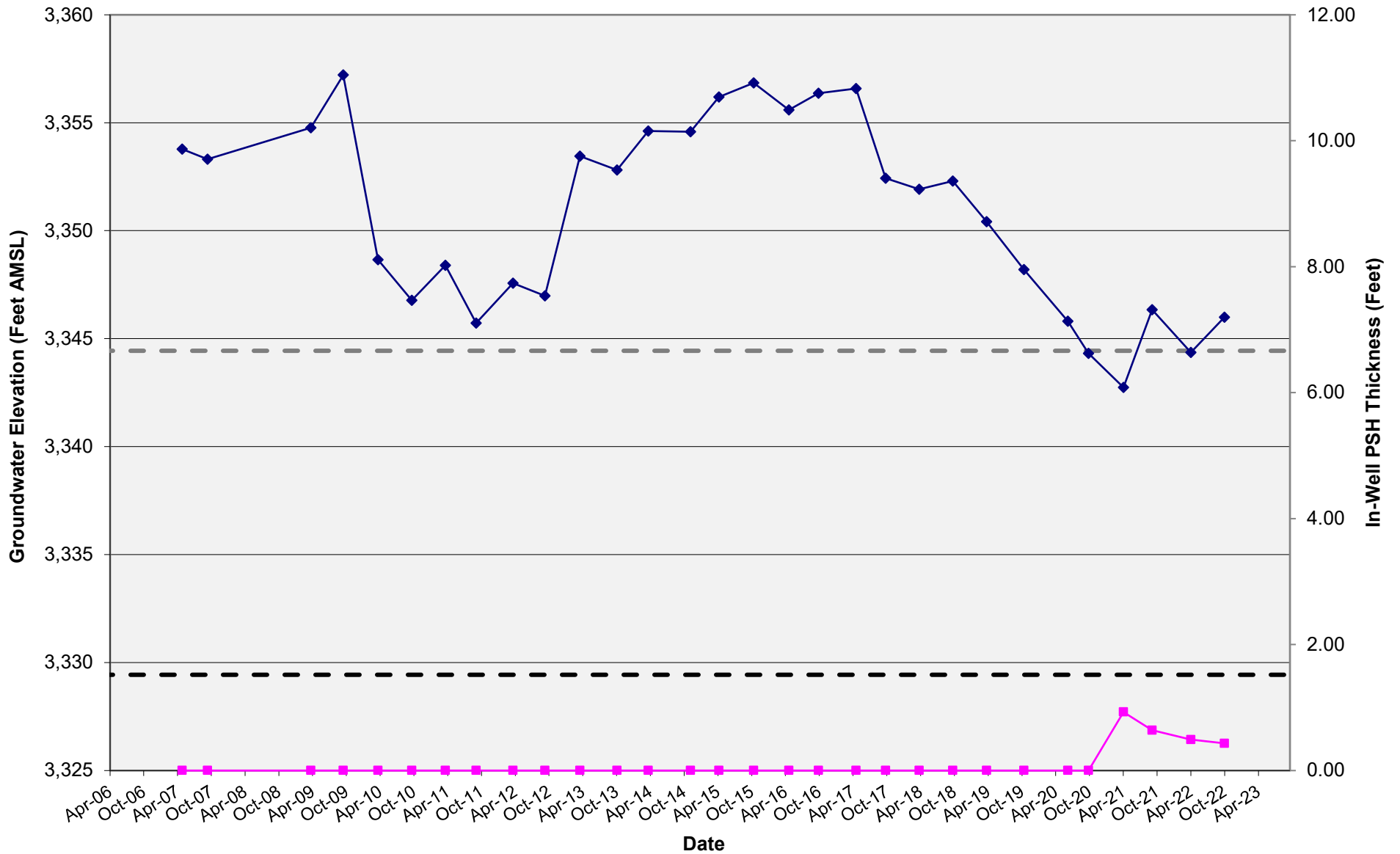
HF Sinclair Navajo Refining LLC - Artesia Refinery
North Refinery



MW-59: Groundwater Elevations and In-Well PSH Thicknesses

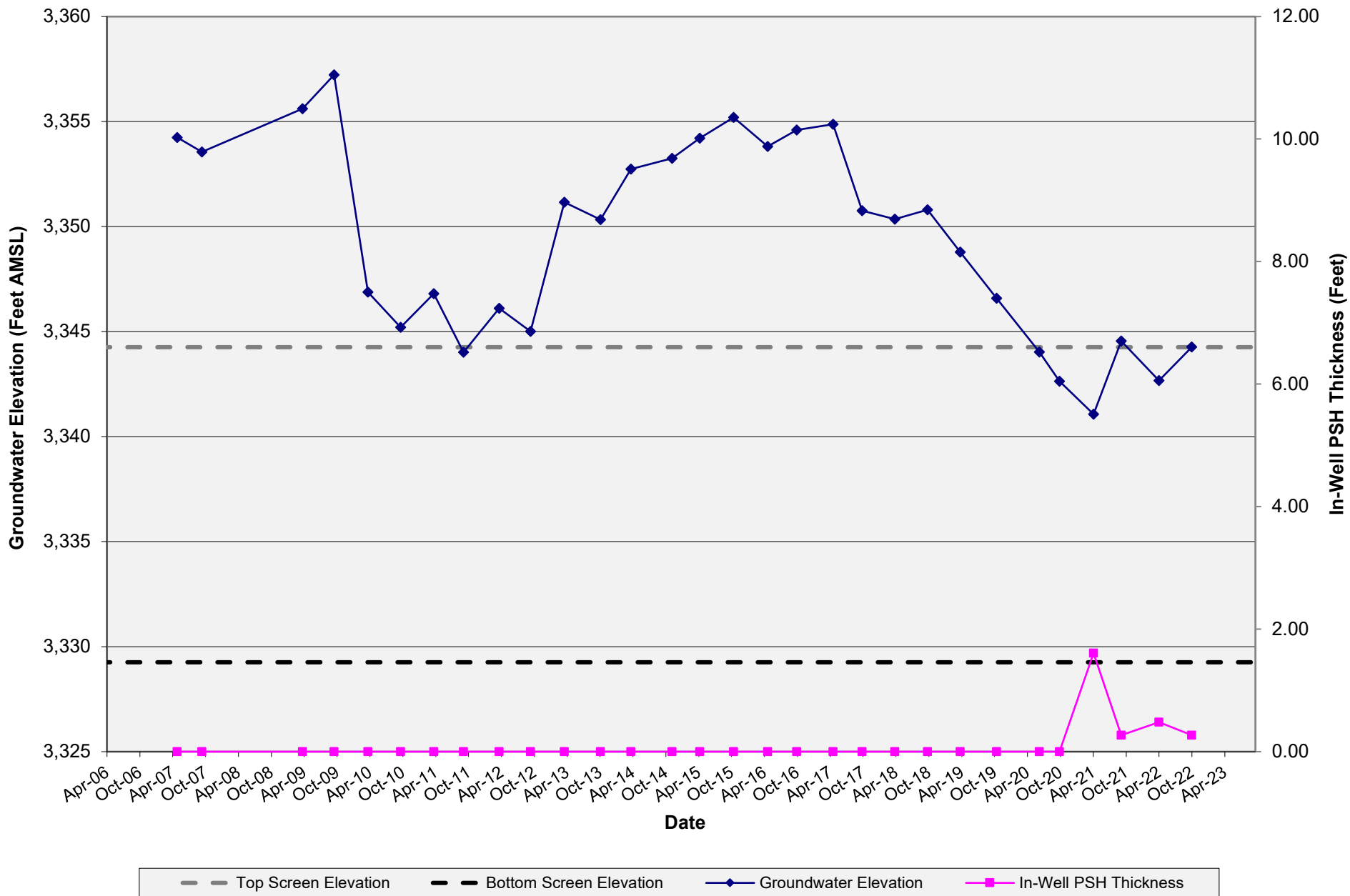
HF Sinclair Navajo Refining LLC - Artesia Refinery

North Refinery



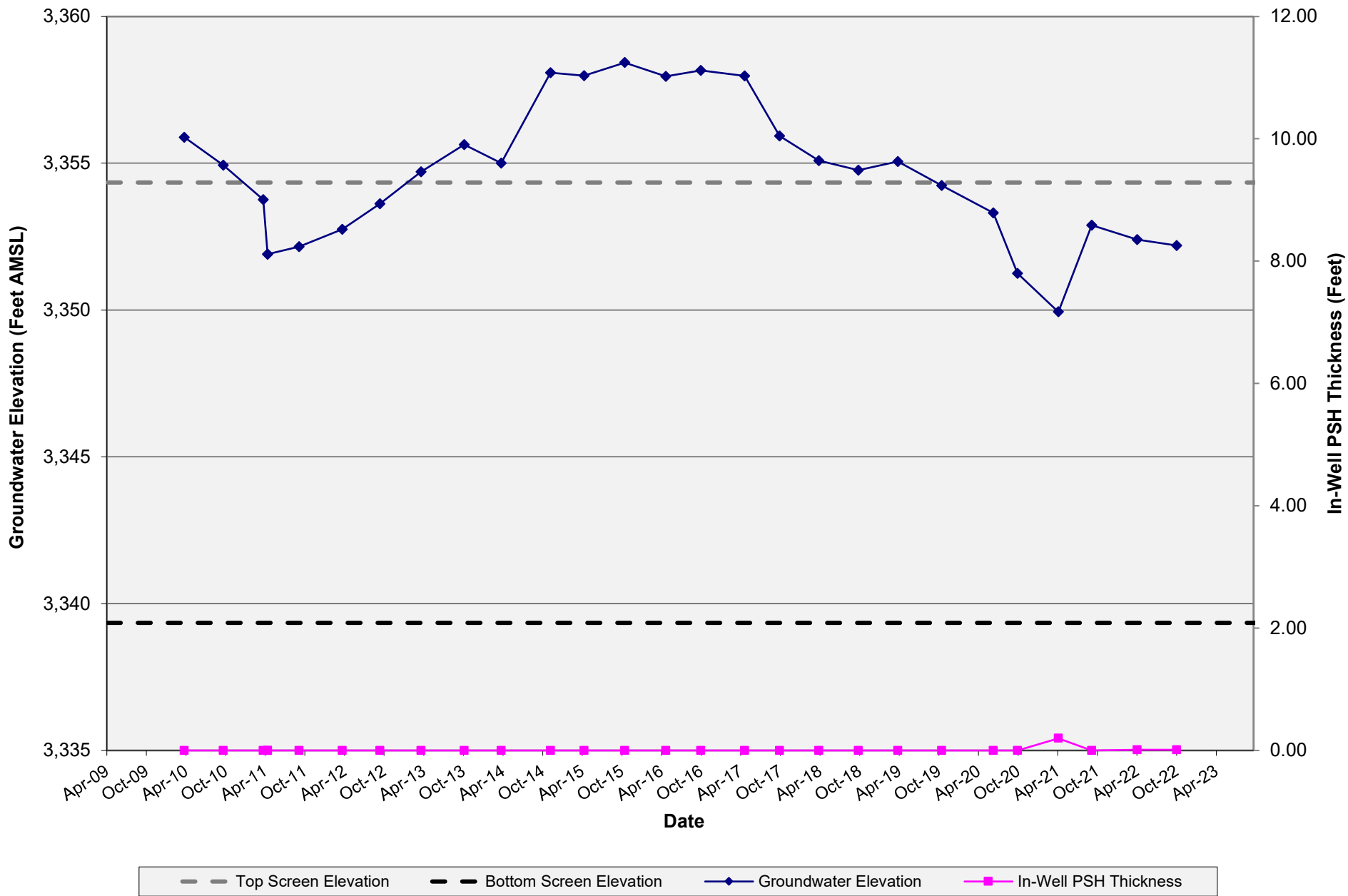
MW-60: Groundwater Elevations and In-Well PSH Thicknesses

HF Sinclair Navajo Refining LLC - Artesia Refinery
North Refinery



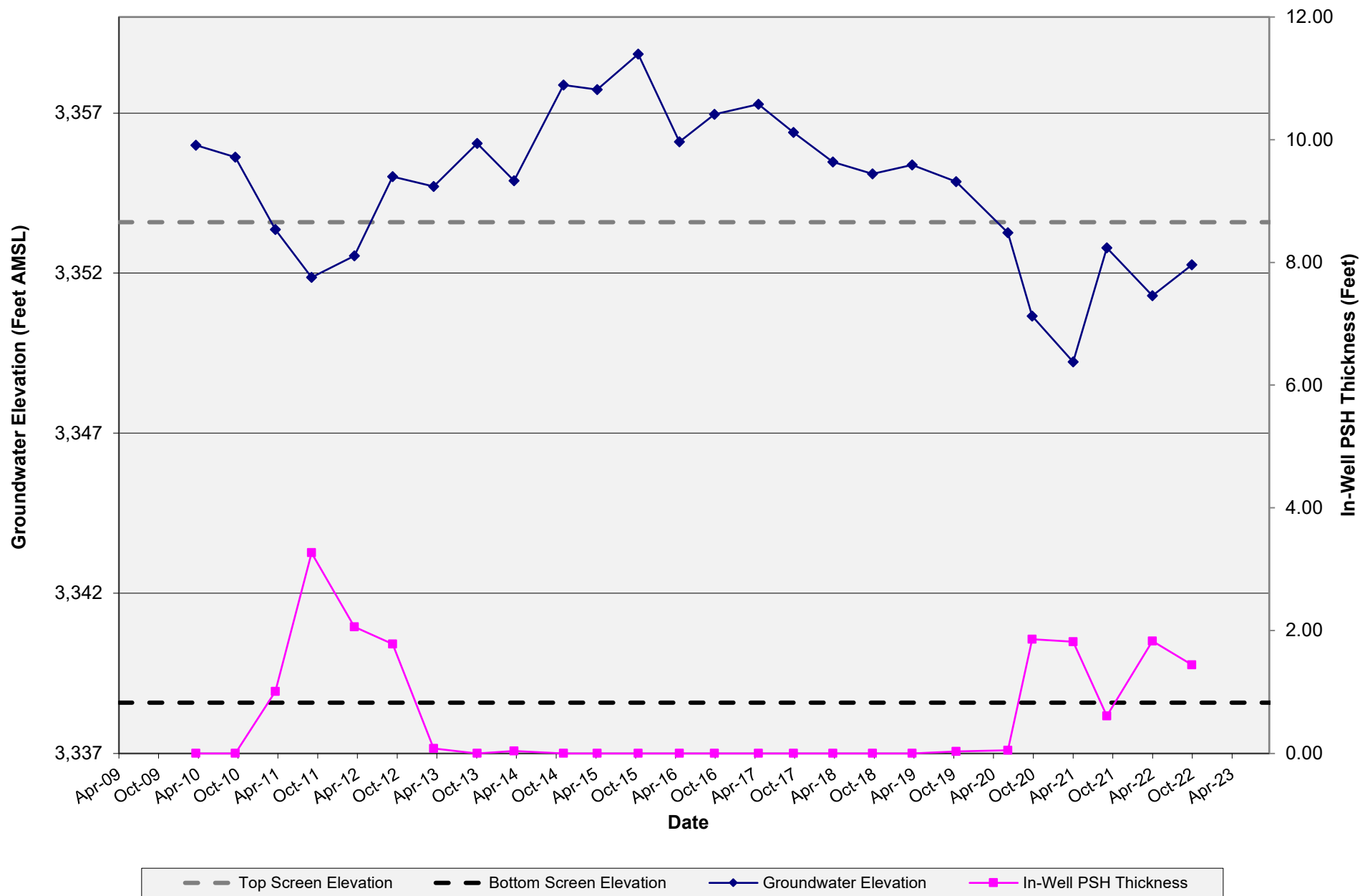
MW-62: Groundwater Elevations and In-Well PSH Thicknesses

HF Sinclair Navajo Refining LLC - Artesia Refinery
North Refinery



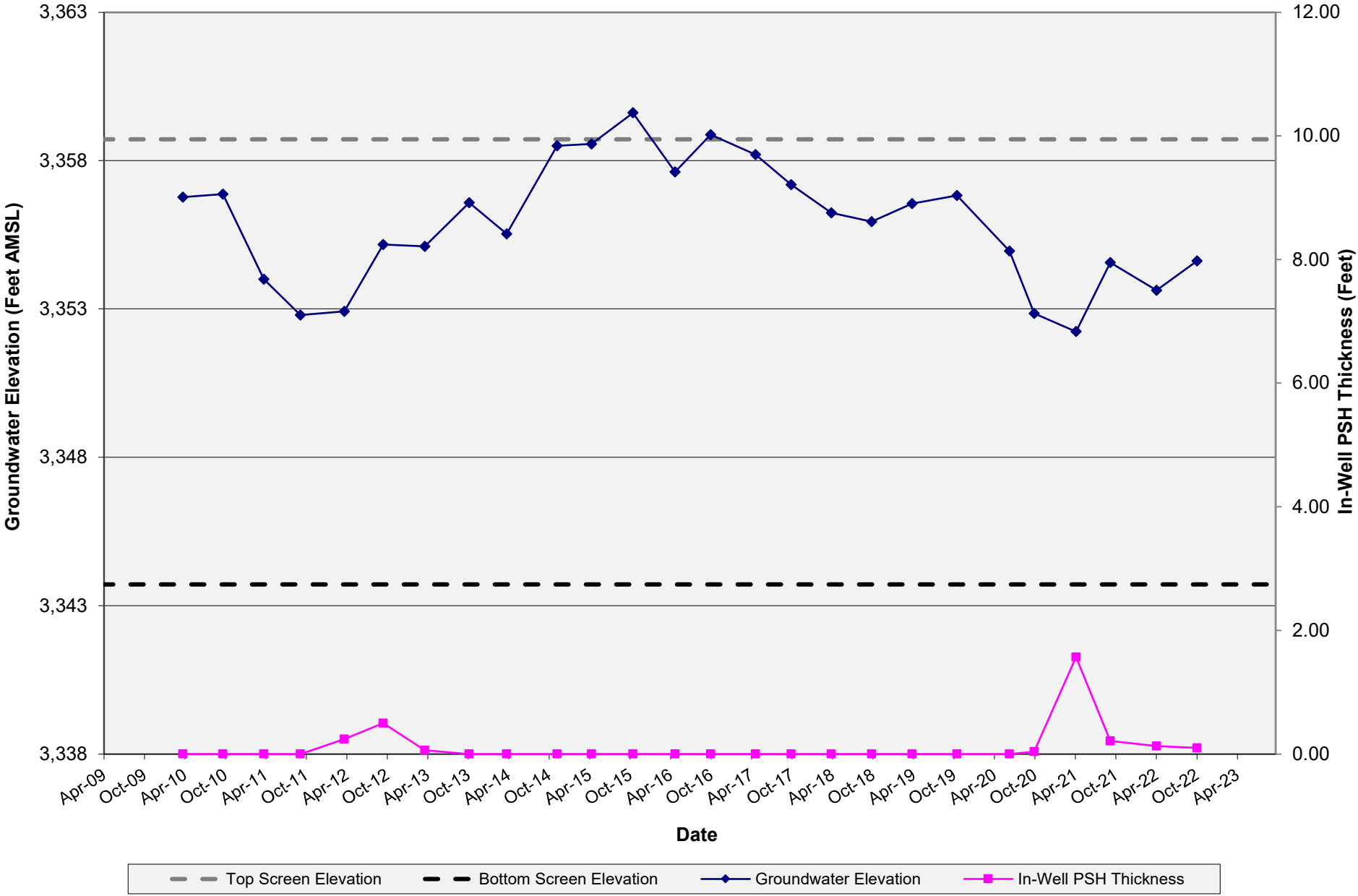
MW-67: Groundwater Elevations and In-Well PSH Thicknesses

HF Sinclair Navajo Refining LLC - Artesia Refinery
North Refinery



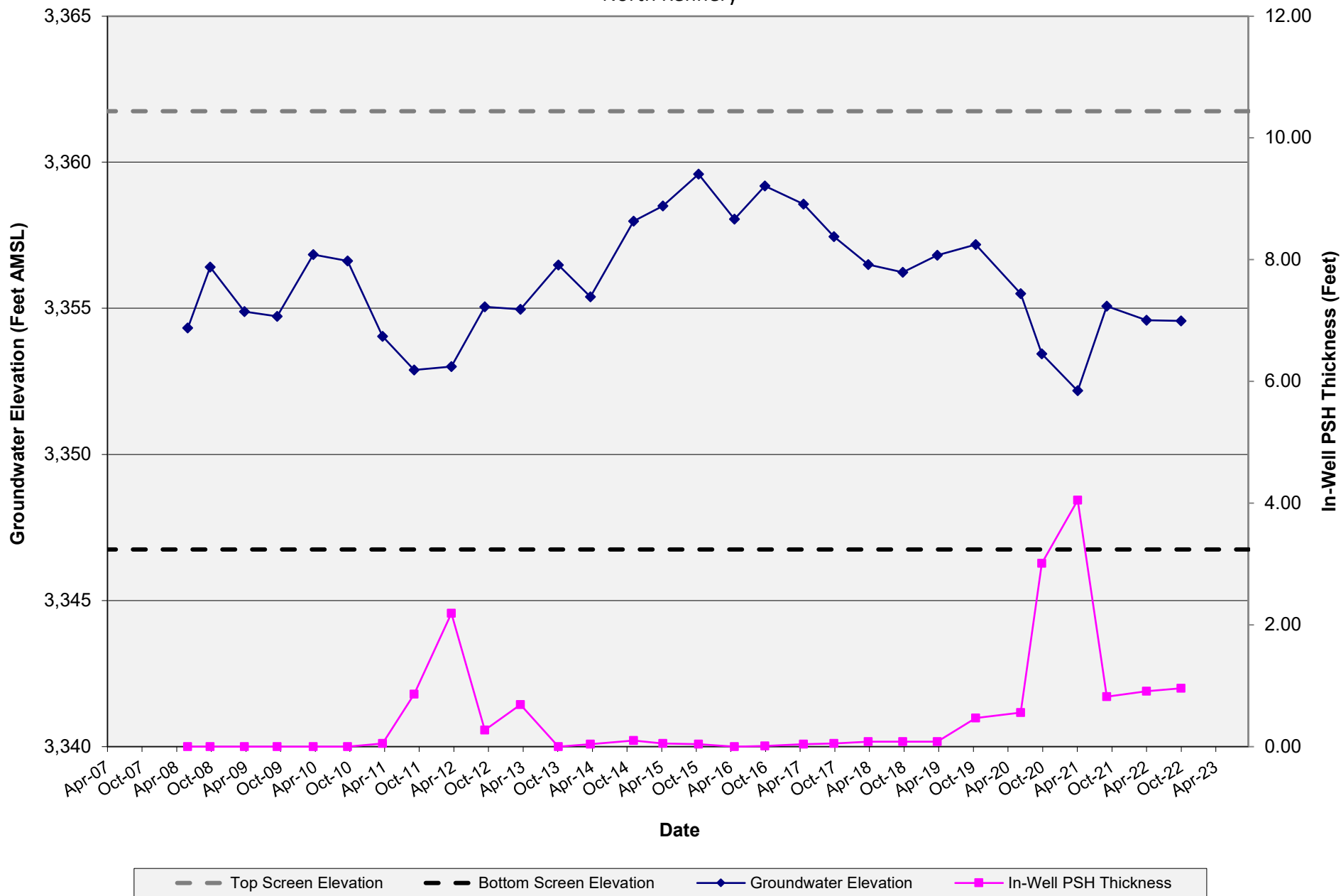
MW-91: Groundwater Elevations and In-Well PSH Thicknesses

HF Sinclair Navajo Refining LLC - Artesia Refinery
North Refinery



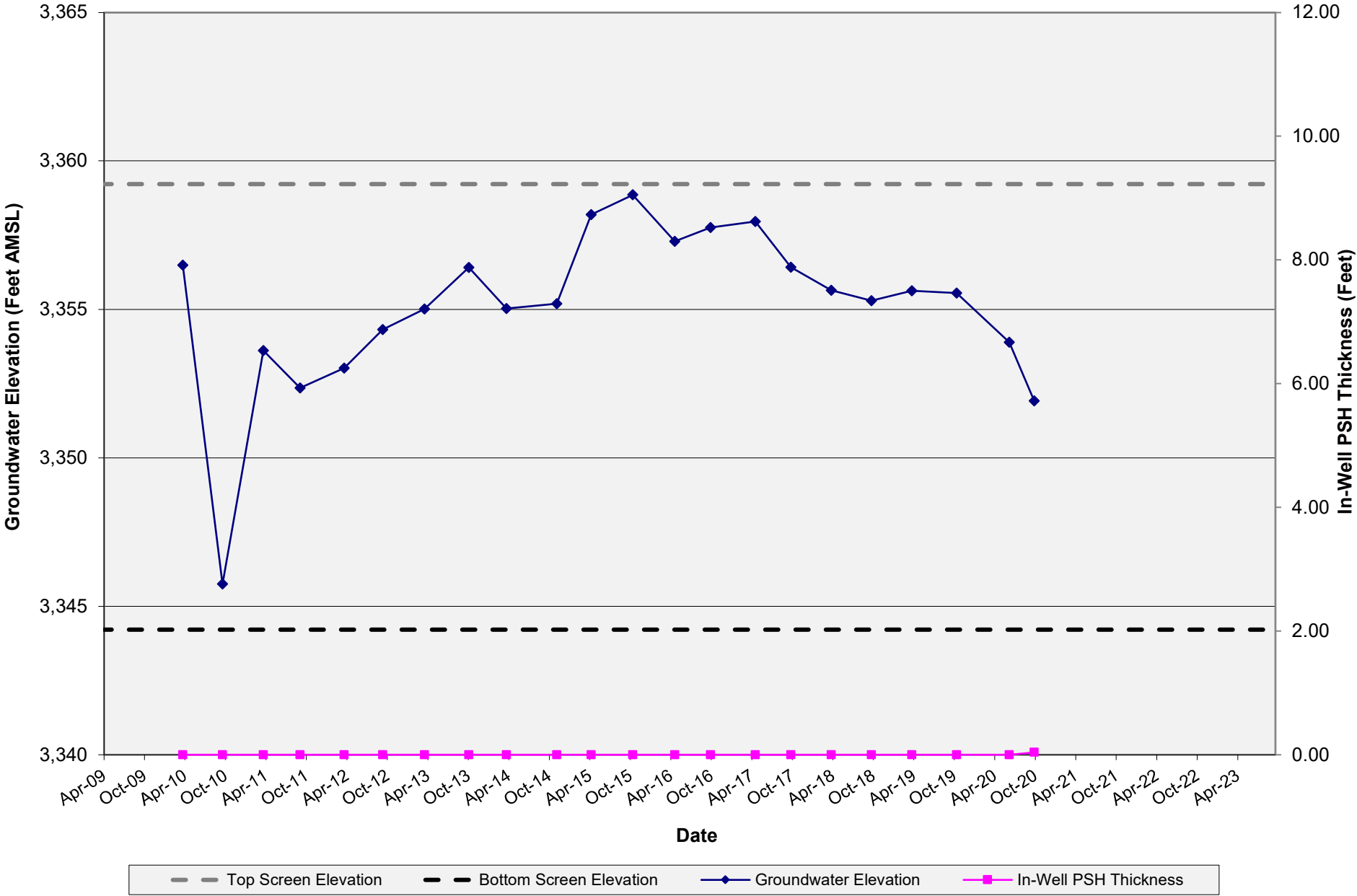
MW-92: Groundwater Elevations and In-Well PSH Thicknesses

HF Sinclair Navajo Refining LLC - Artesia Refinery
North Refinery



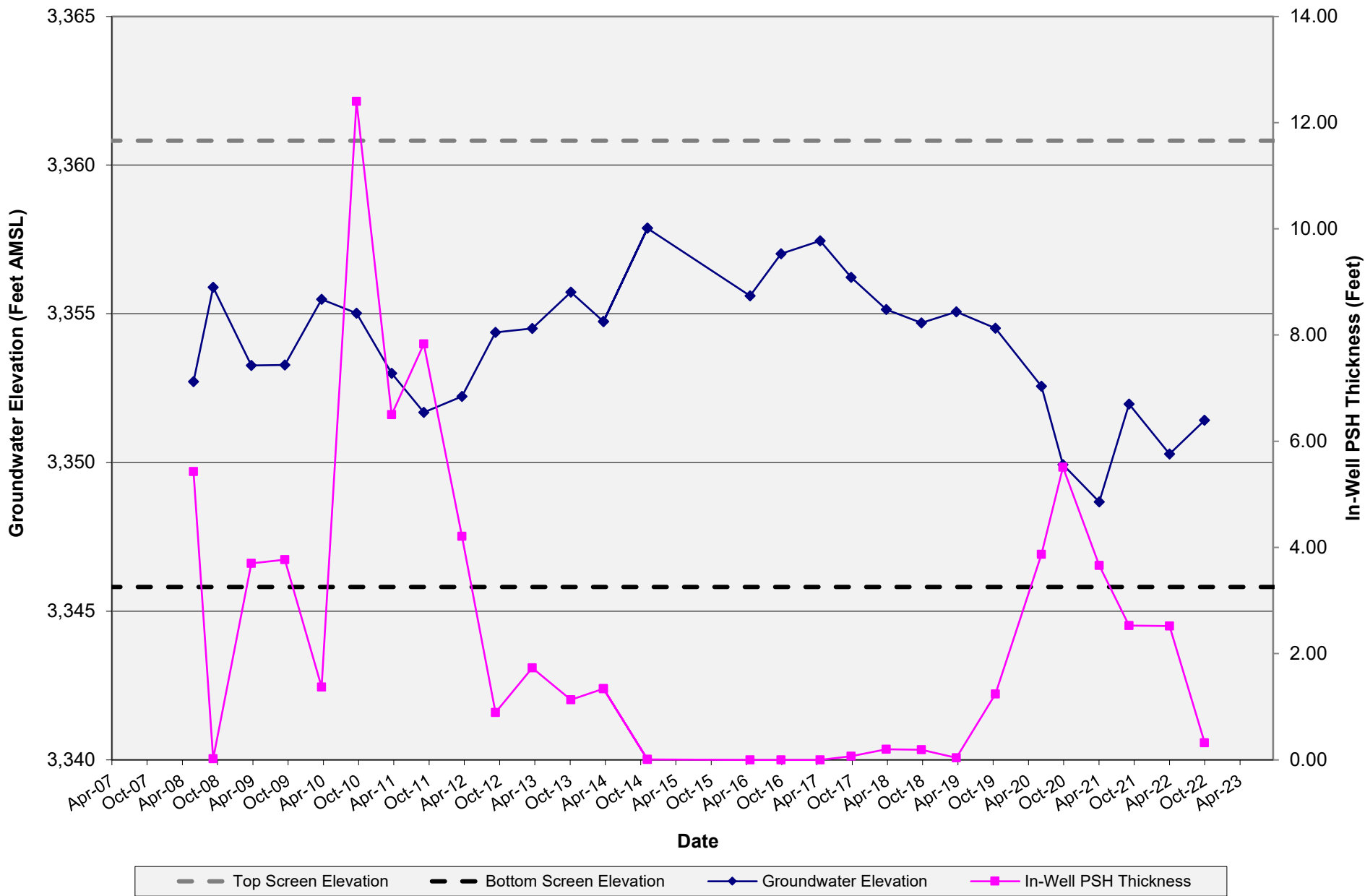
MW-93: Groundwater Elevations and In-Well PSH Thicknesses

HF Sinclair Navajo Refining LLC - Artesia Refinery
North Refinery



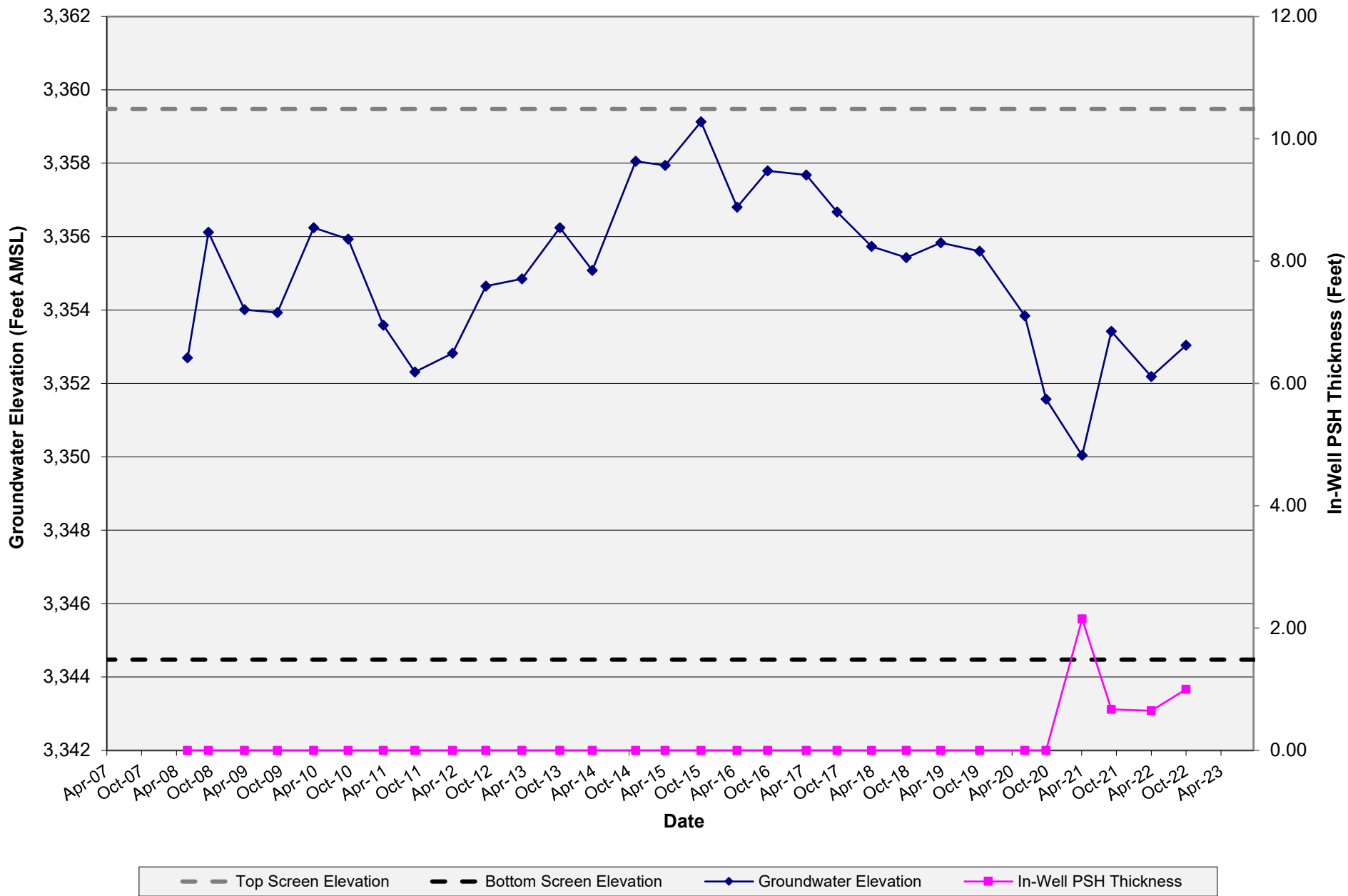
MW-94: Groundwater Elevations and In-Well PSH Thicknesses

HF Sinclair Navajo Refining LLC - Artesia Refinery
North Refinery



MW-95: Groundwater Elevations and In-Well PSH Thicknesses

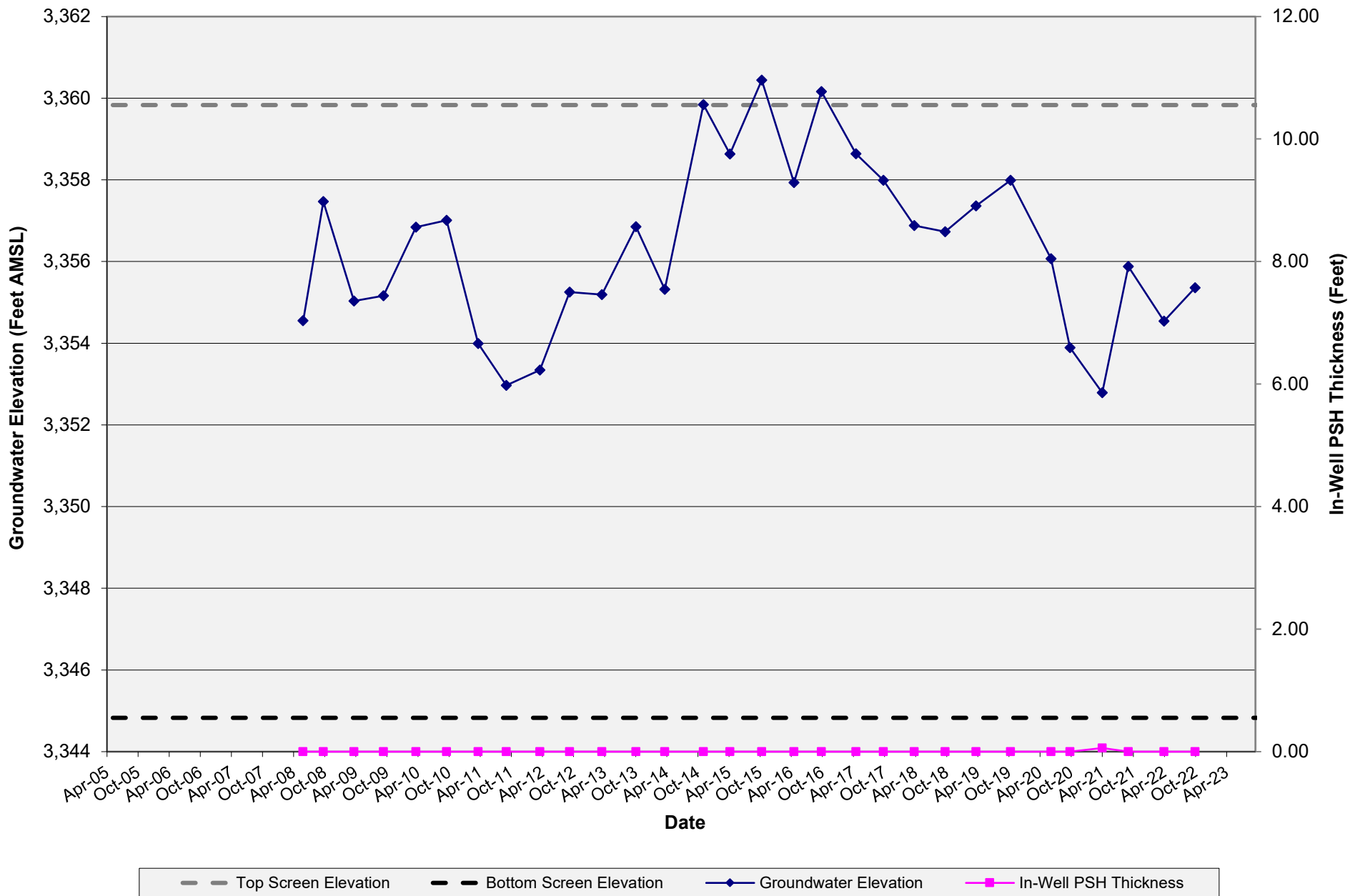
HF Sinclair Navajo Refining LLC - Artesia Refinery
North Refinery



MW-96: Groundwater Elevations and In-Well PSH Thicknesses

HF Sinclair Navajo Refining LLC - Artesia Refinery

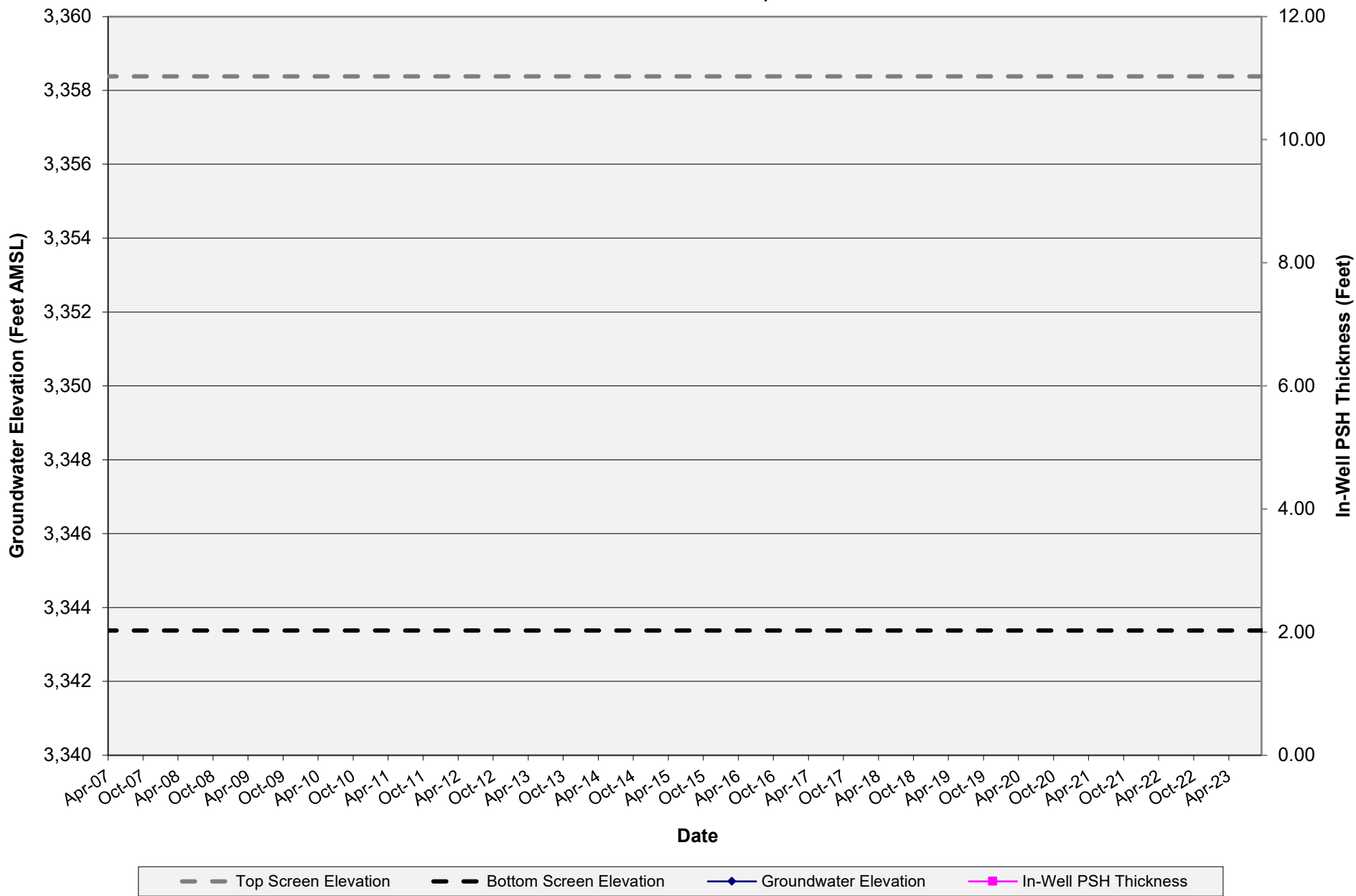
North Refinery



MW-97: Groundwater Elevations and In-Well PSH Thicknesses

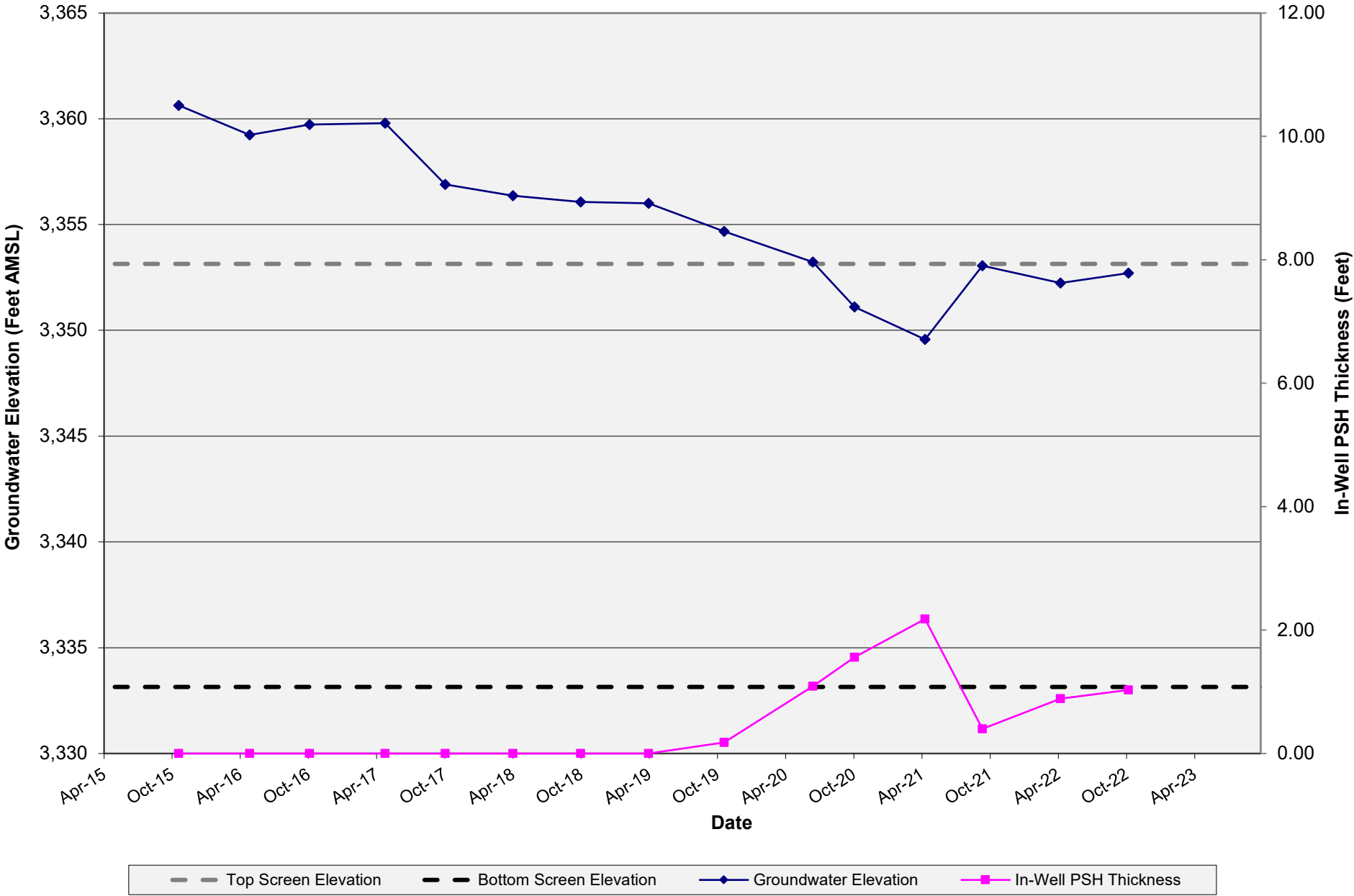
HF Sinclair Navajo Refining LLC - Artesia Refinery

North Refinery



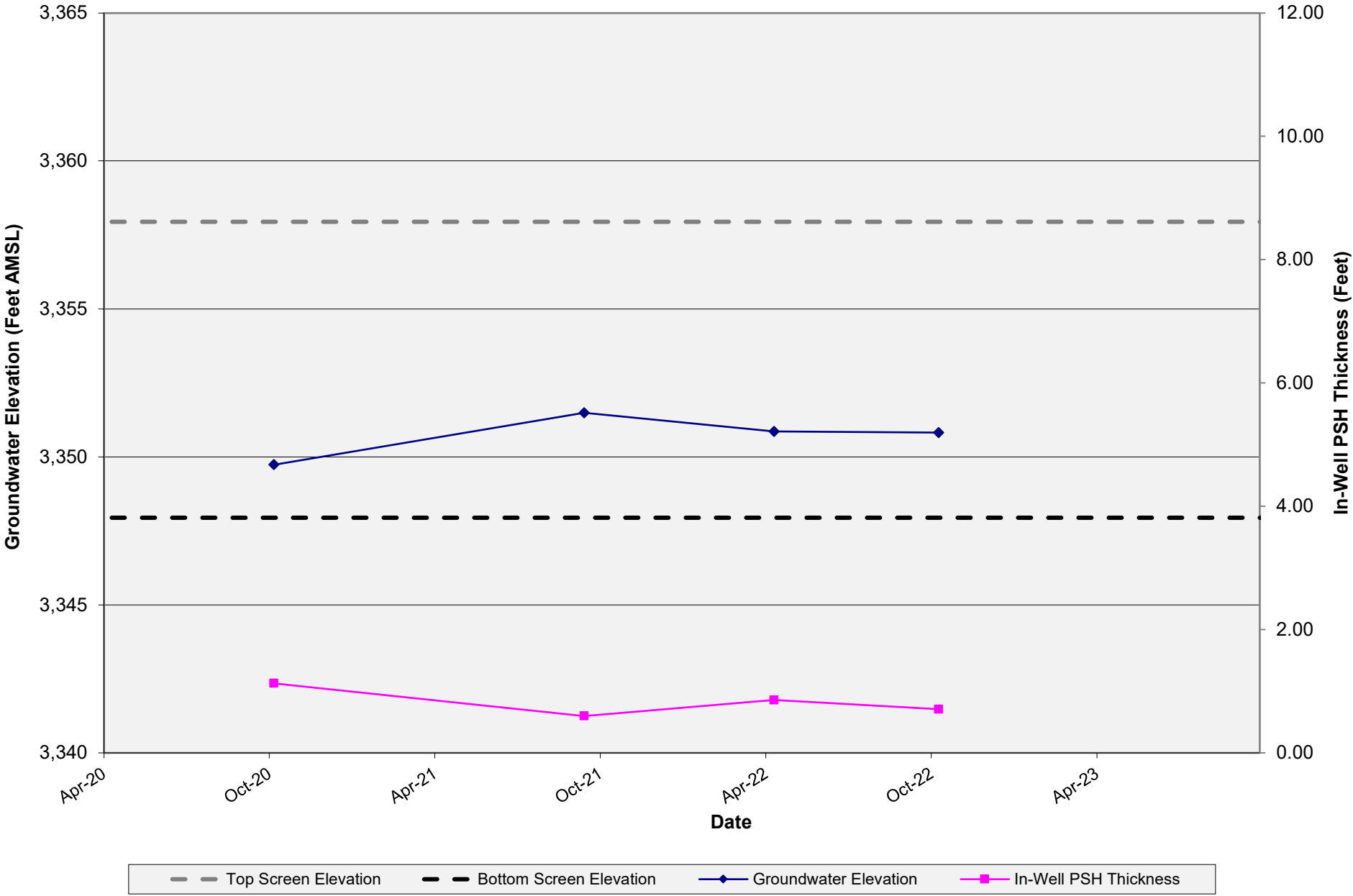
MW-137: Groundwater Elevations and In-Well PSH Thicknesses

HF Sinclair Navajo Refining LLC - Artesia Refinery
North Refinery



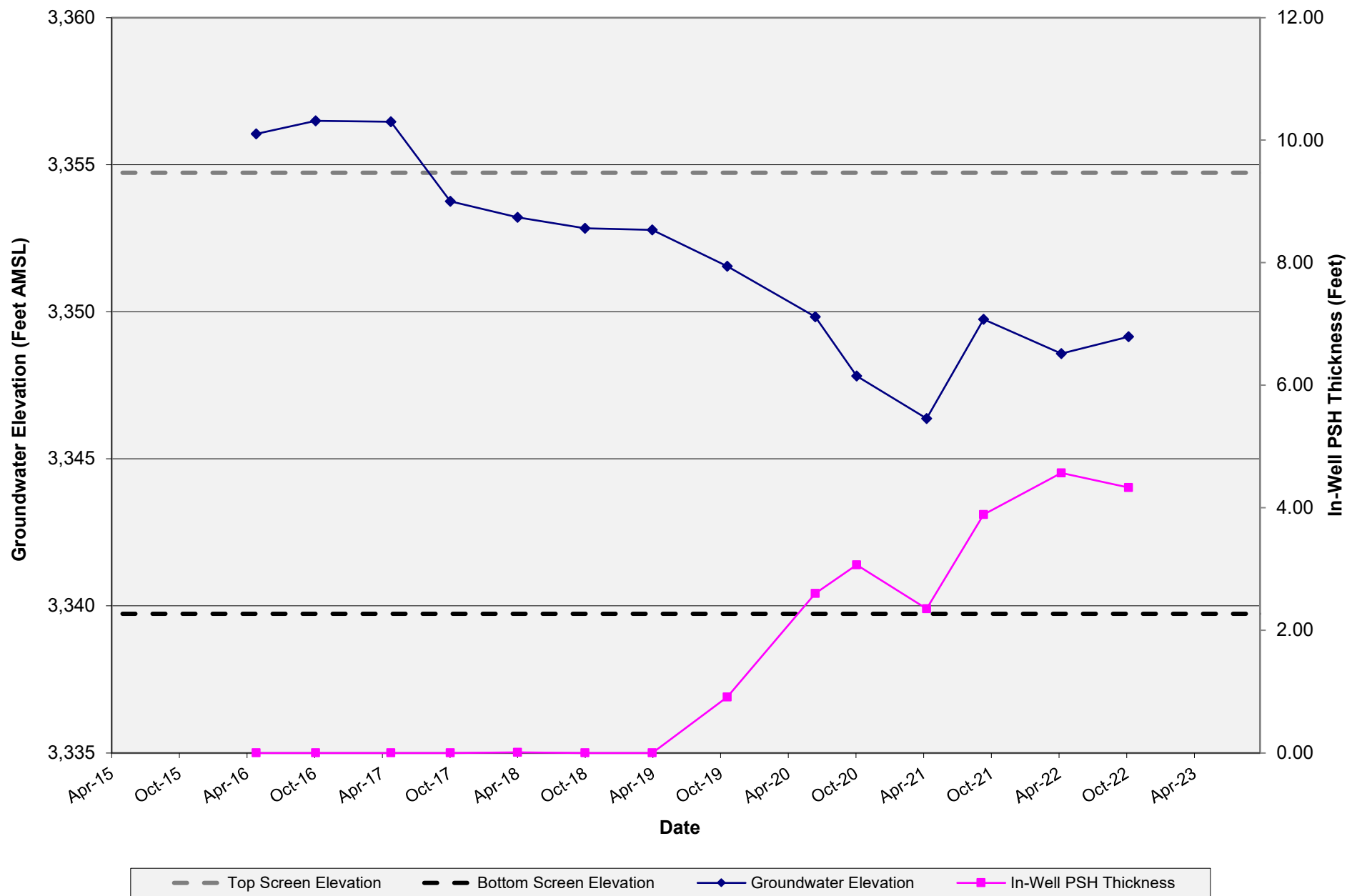
MW-137A: Groundwater Elevations and In-Well PSH Thicknesses

HF Sinclair Navajo Refining LLC - Artesia Refinery
North Refinery



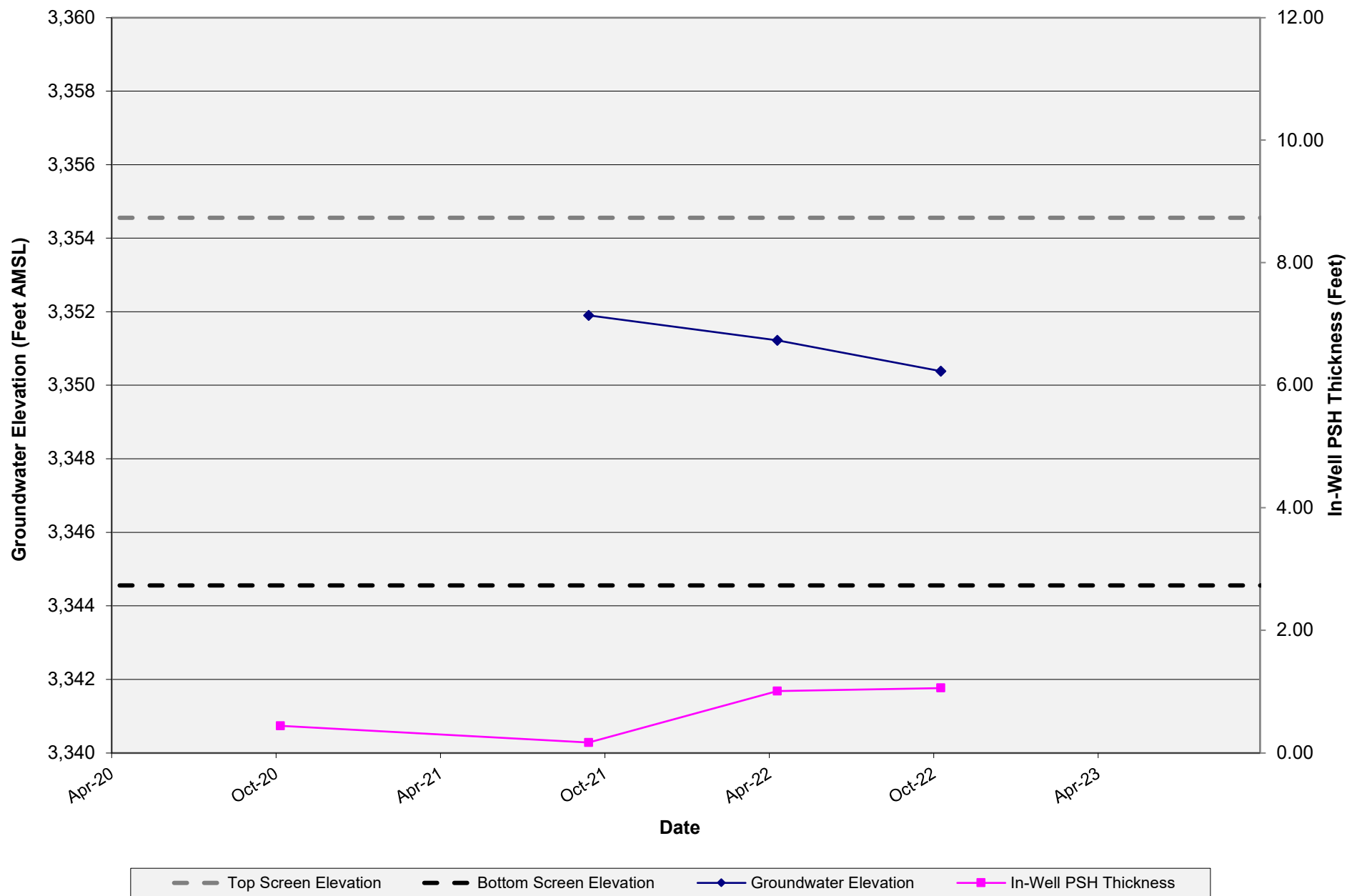
MW-138: Groundwater Elevations and In-Well PSH Thicknesses

HF Sinclair Navajo Refining LLC - Artesia Refinery
North Refinery



MW-138A: Groundwater Elevations and In-Well PSH Thicknesses

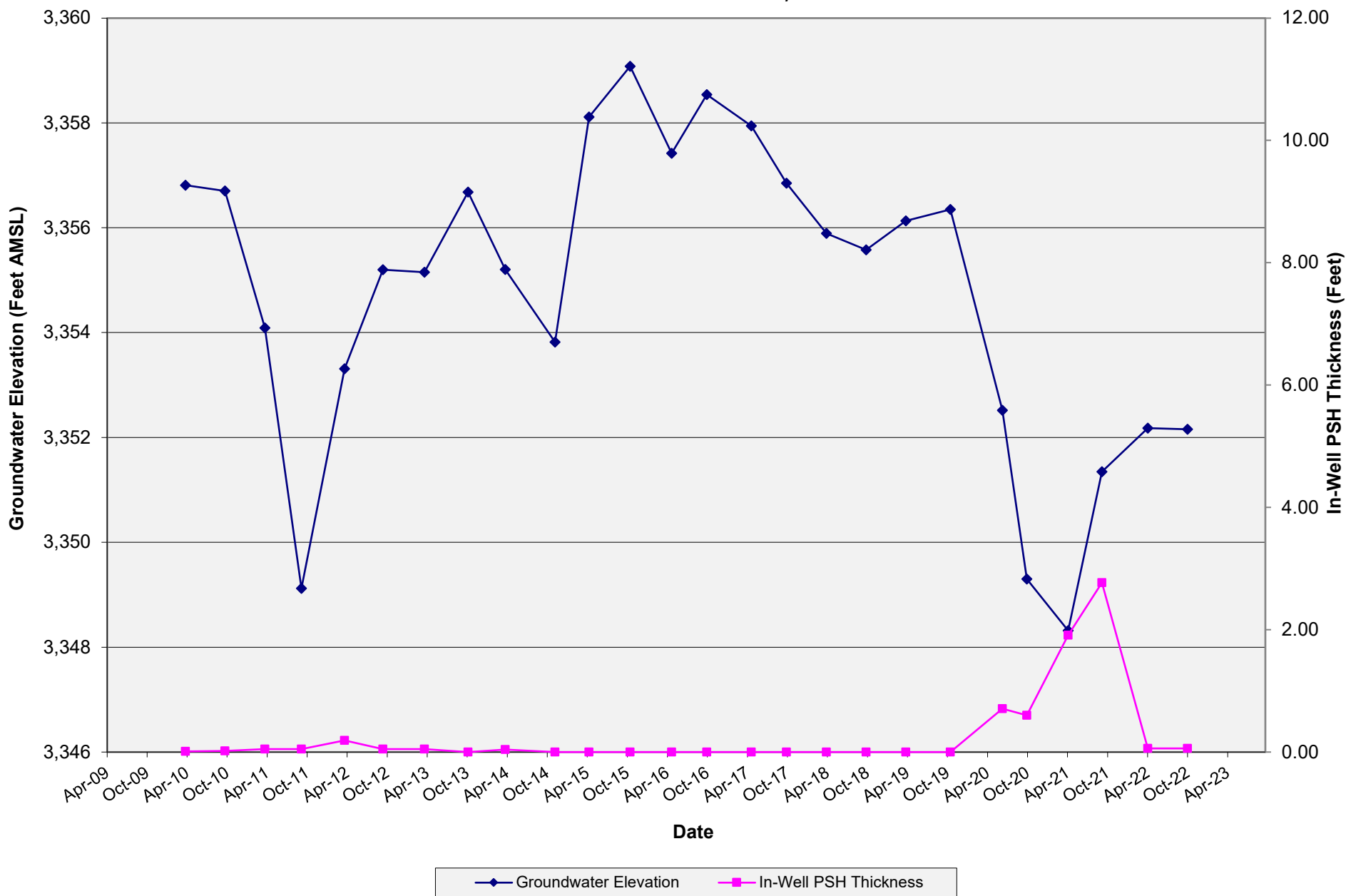
HF Sinclair Navajo Refining LLC - Artesia Refinery
North Refinery



RW-1 & RW-1R: Groundwater Elevations and In-Well PSH Thicknesses

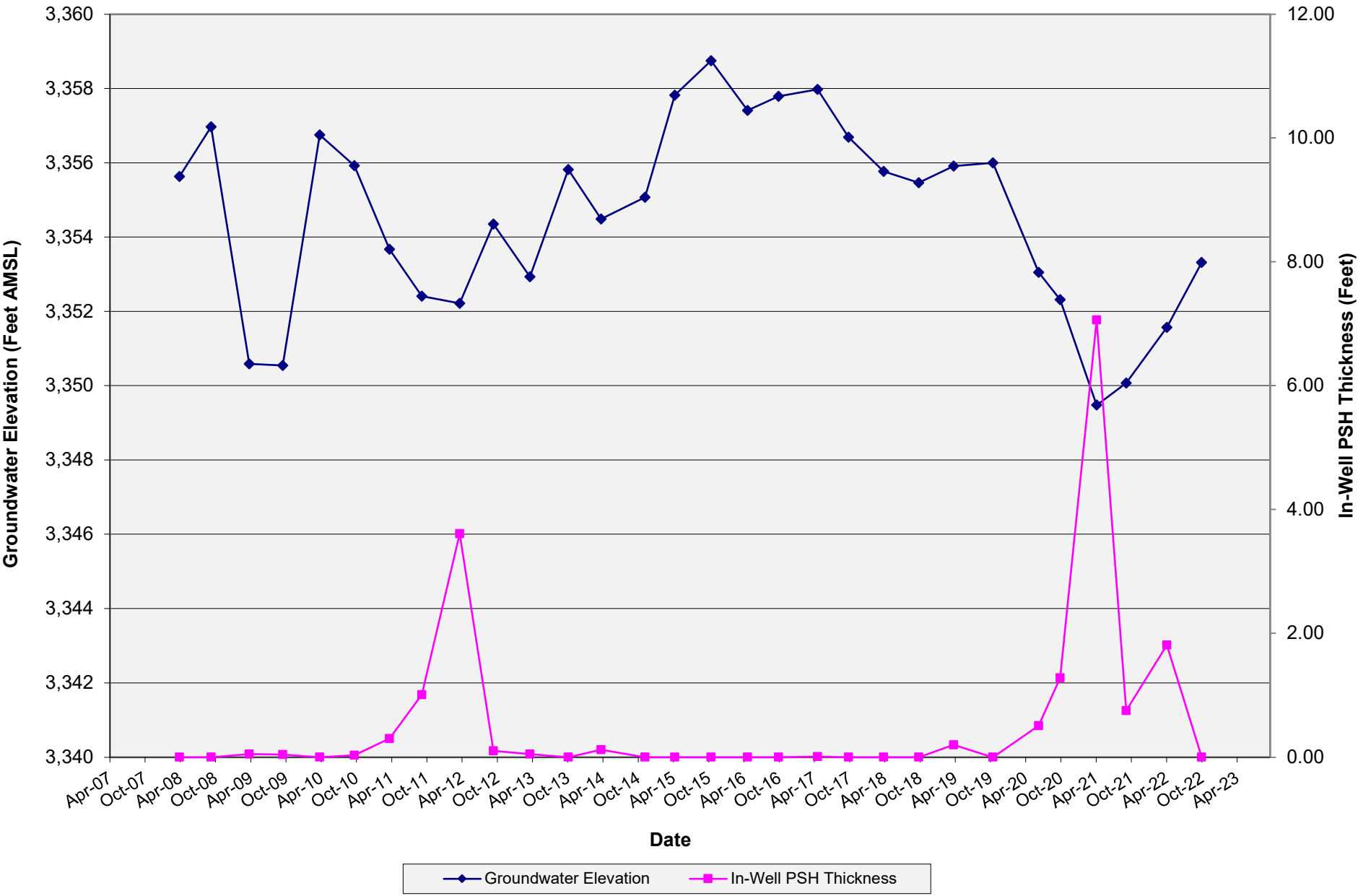
HF Sinclair Navajo Refining LLC - Artesia Refinery

North Refinery



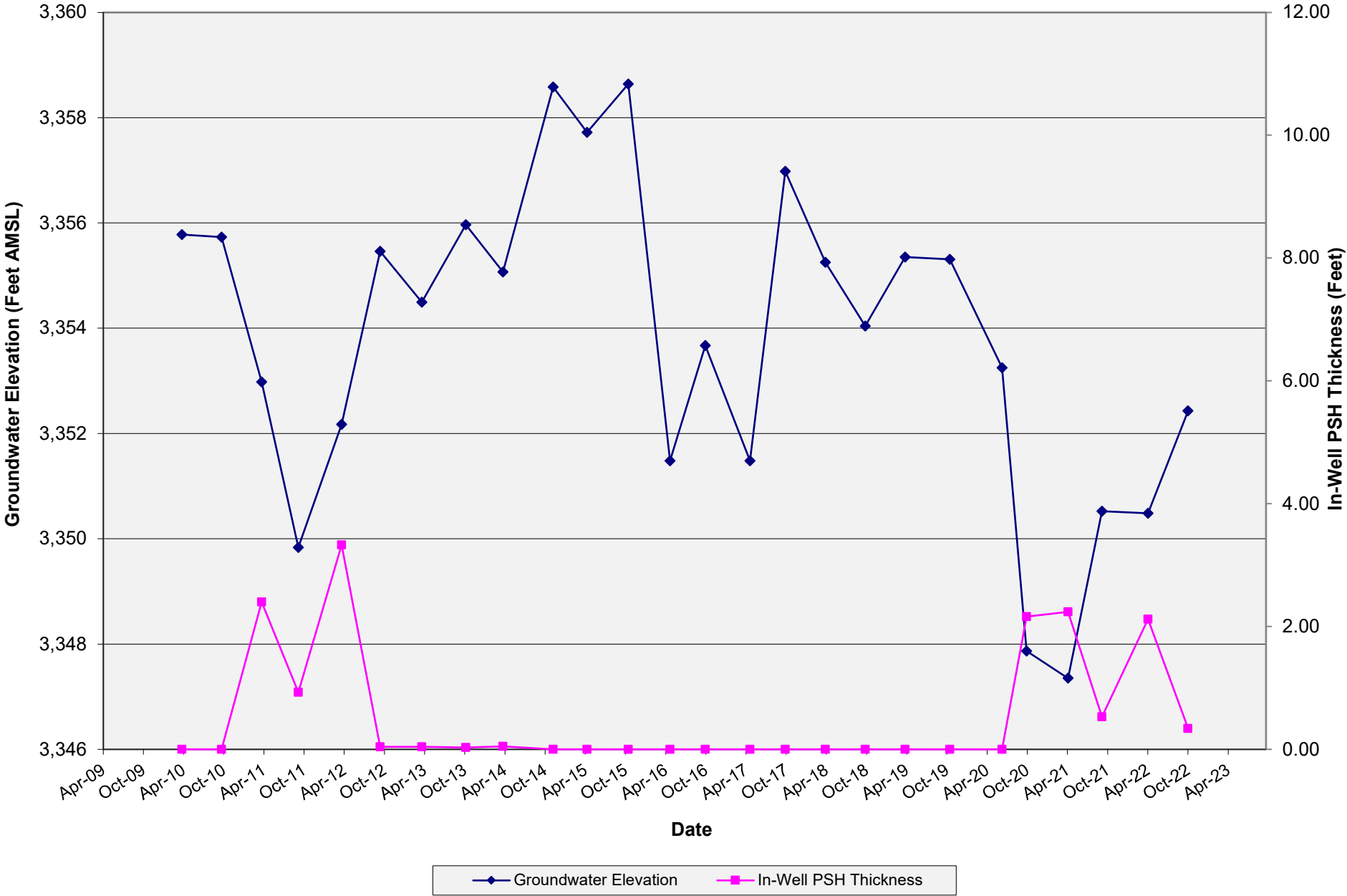
RW-2: Groundwater Elevations and In-Well PSH Thicknesses

HF Sinclair Navajo Refining LLC - Artesia Refinery
North Refinery



RW-7 & RW-7R: Groundwater Elevations and In-Well PSH Thicknesses

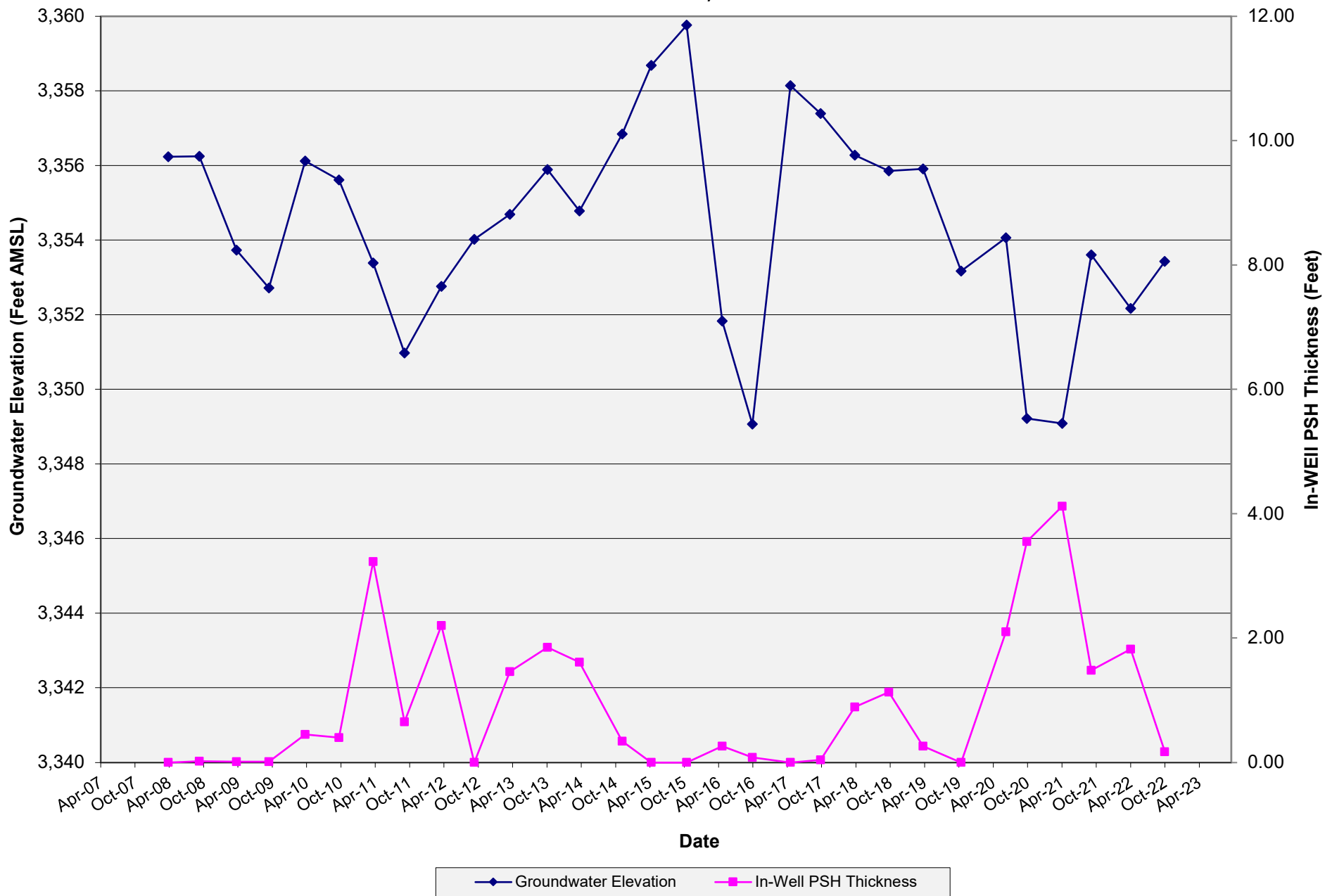
HF Sinclair Navajo Refining LLC - Artesia Refinery
North Refinery



RW-8: Groundwater Elevations and In-Well PSH Thicknesses

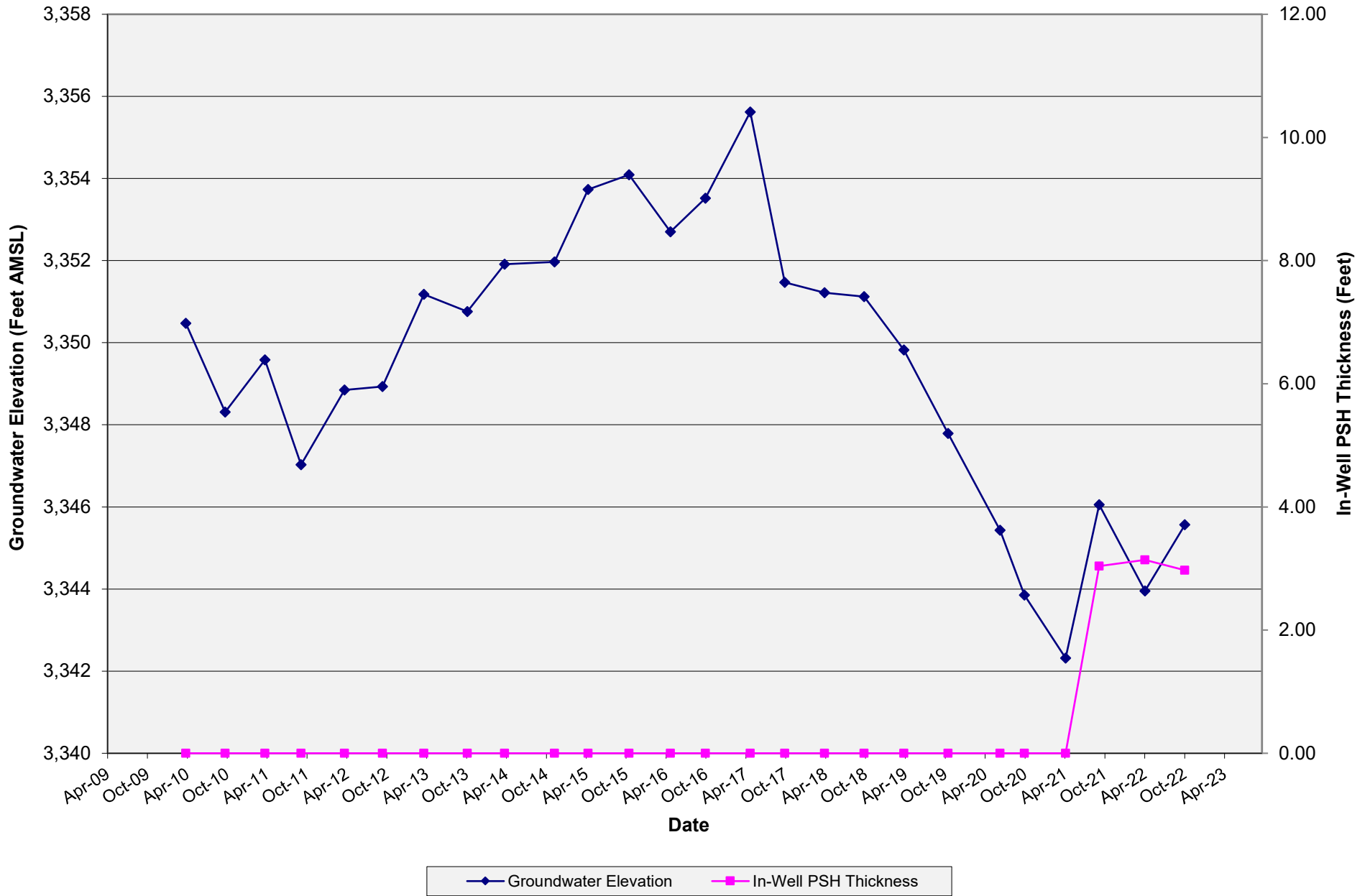
HF Sinclair Navajo Refining LLC - Artesia Refinery

North Refinery

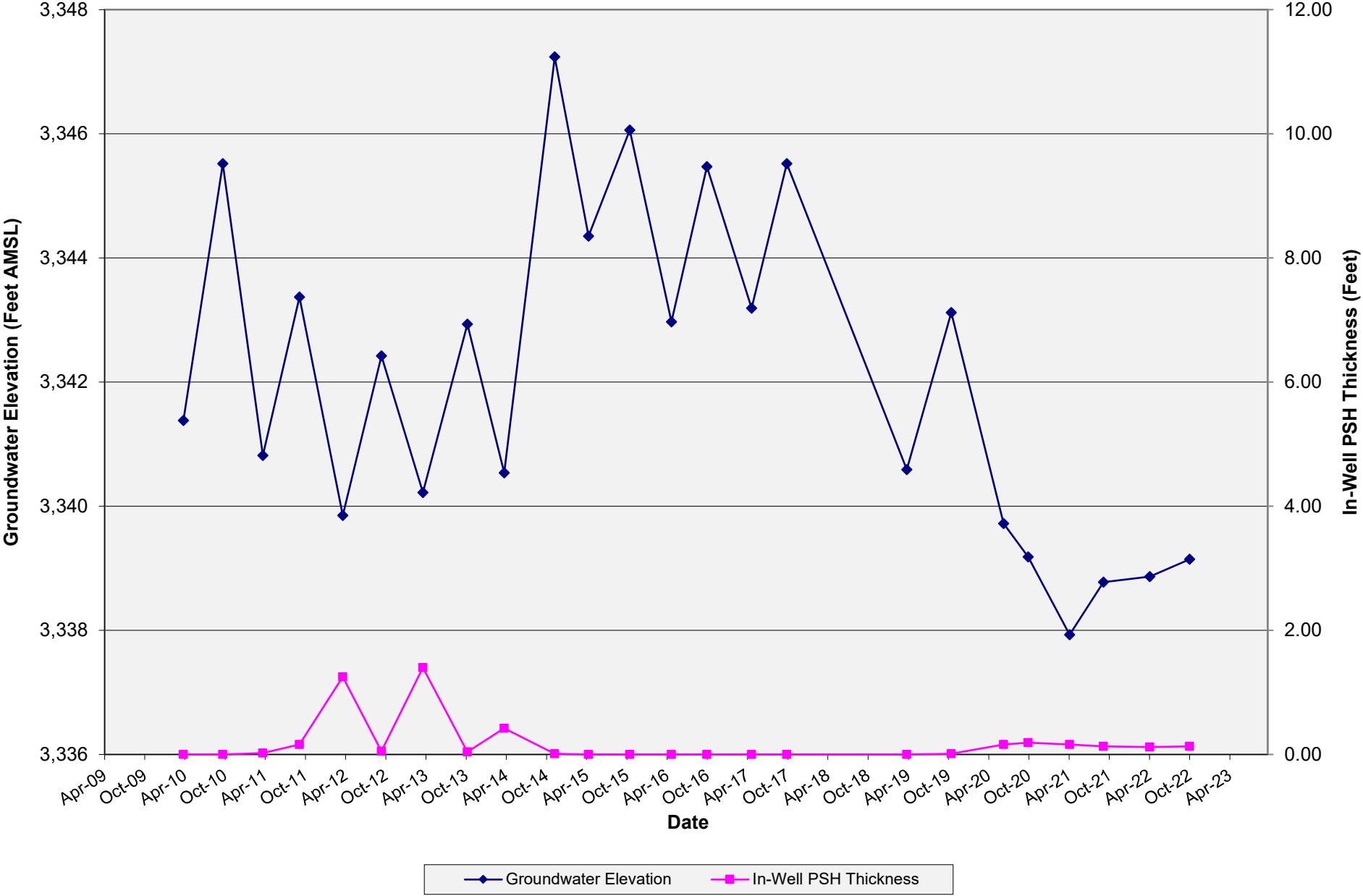


RW-10: Groundwater Elevations and In-Well PSH Thicknesses

HF Sinclair Navajo Refining LLC - Artesia Refinery
North Refinery

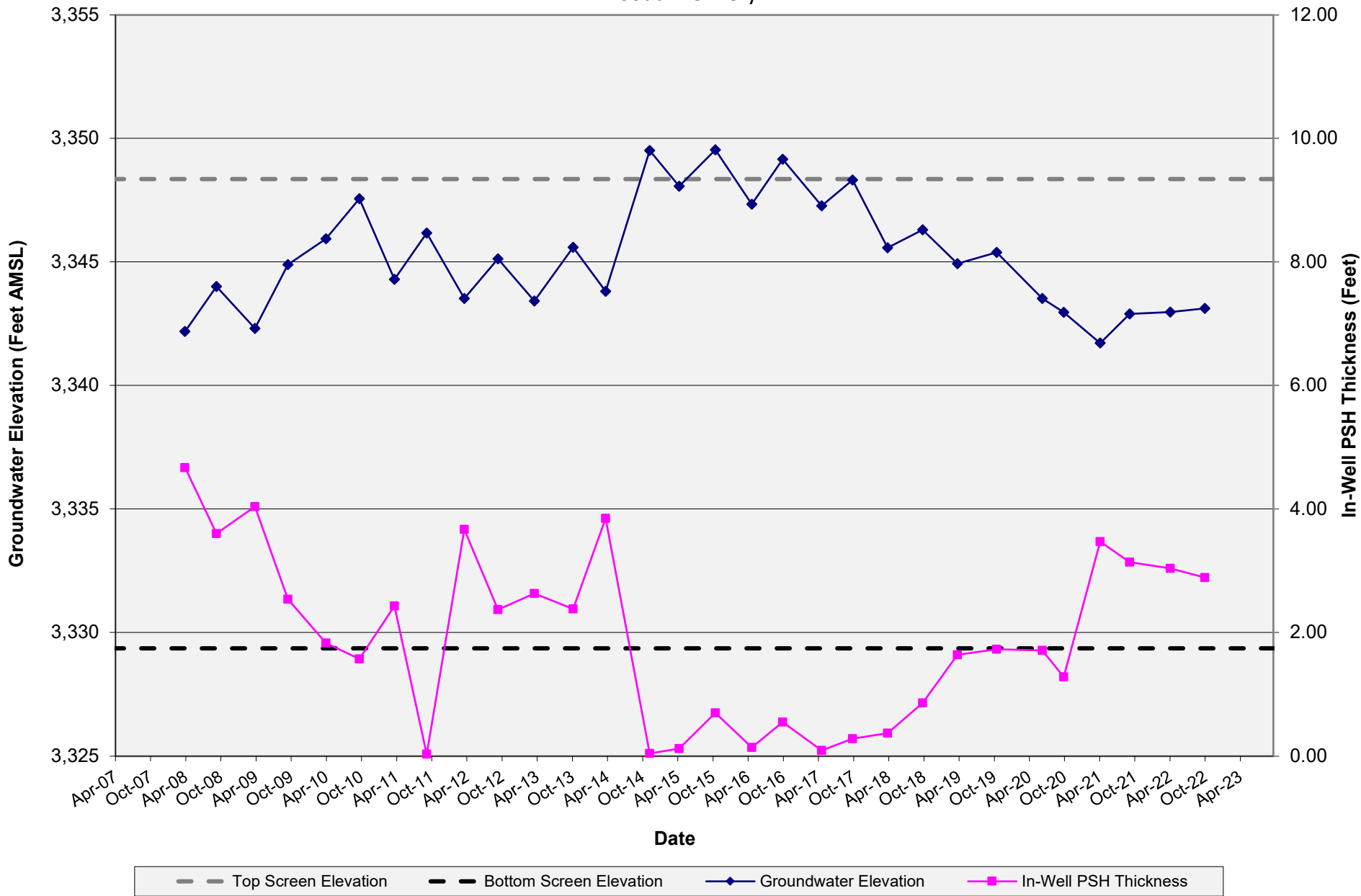


KWB-2R: Groundwater Elevations and In-Well PSH Thicknesses
HF Sinclair Navajo Refining LLC - Artesia Refinery
South Refinery



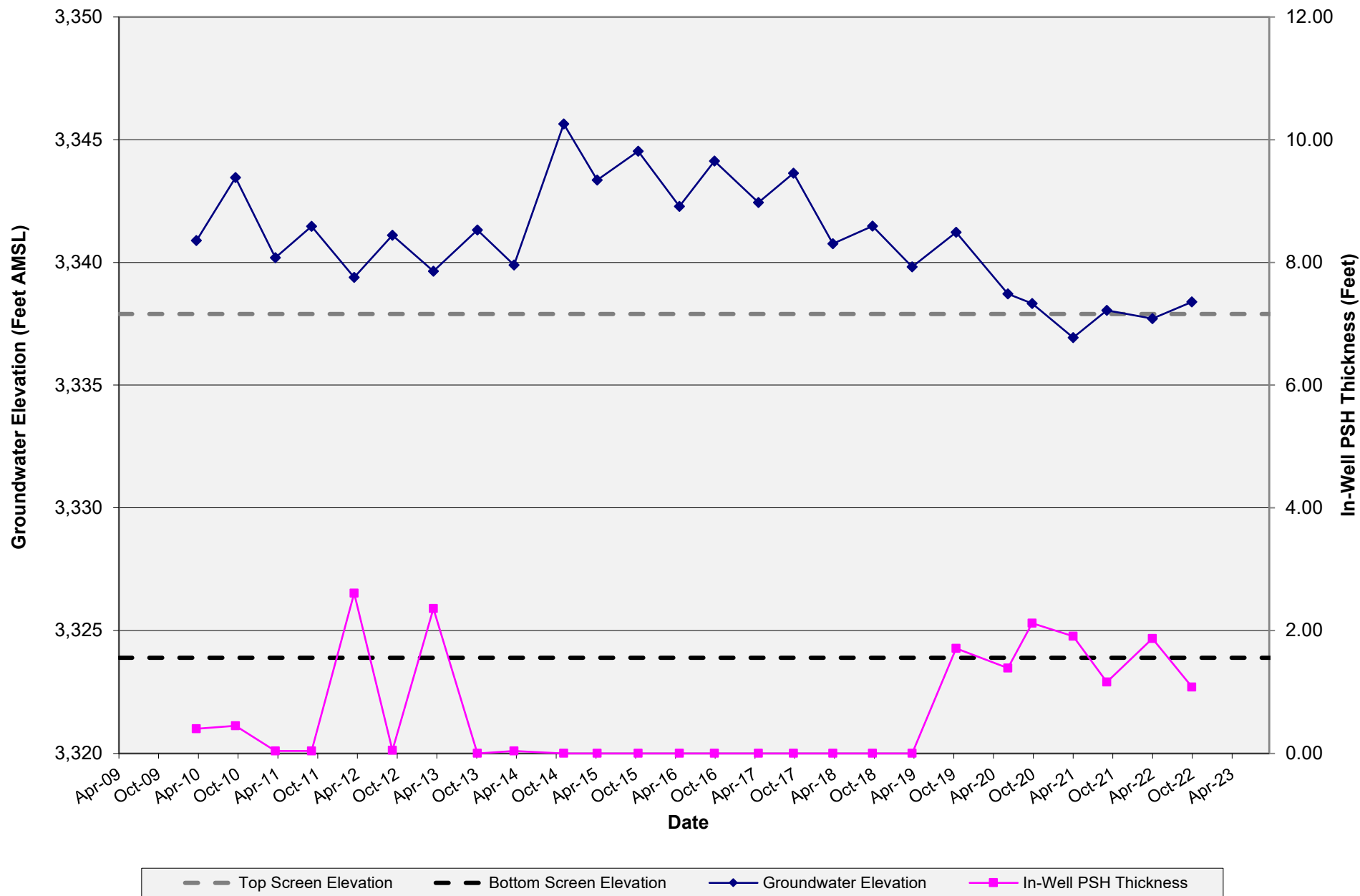
KWB-4: Groundwater Elevations and In-Well PSH Thicknesses

HF Sinclair Navajo Refining LLC - Artesia Refinery
South Refinery



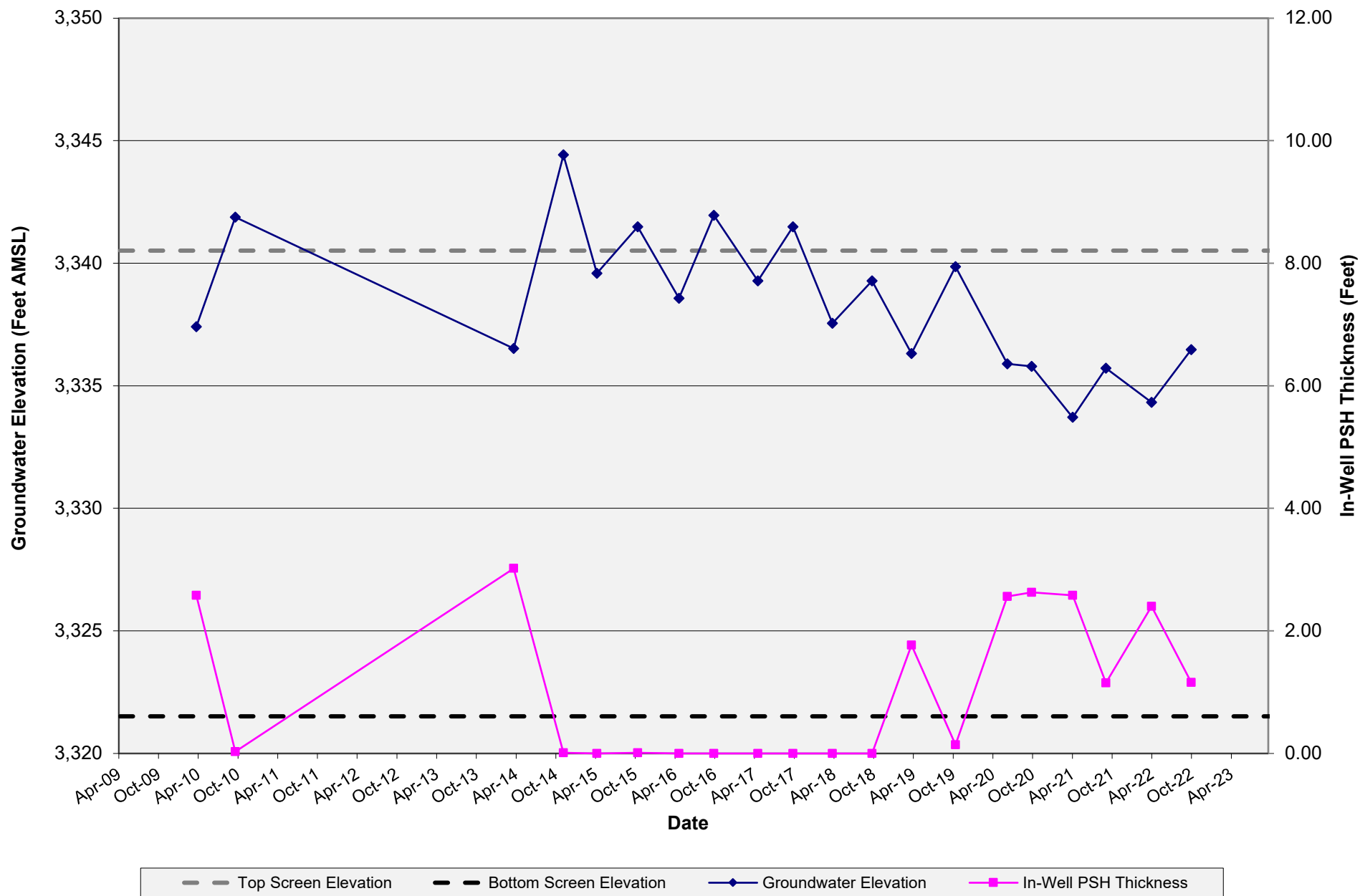
KWB-5: Groundwater Elevations and In-Well PSH Thicknesses

HF Sinclair Navajo Refining LLC - Artesia Refinery
South Refinery



KWB-6: Groundwater Elevations and In-Well PSH Thicknesses

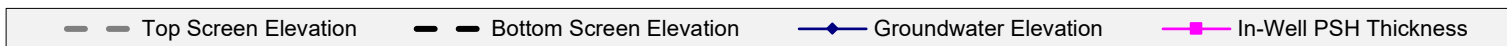
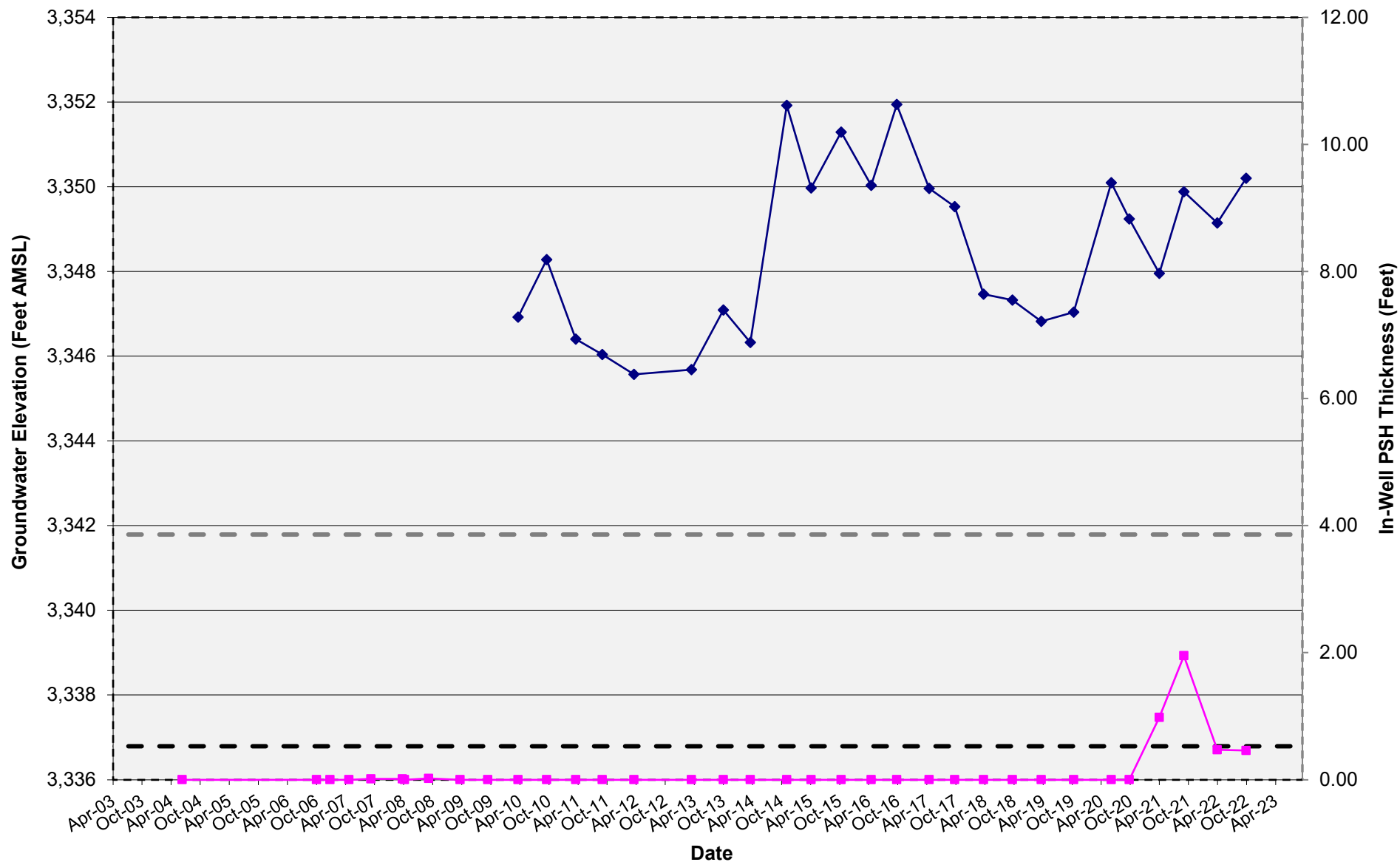
HF Sinclair Navajo Refining LLC - Artesia Refinery
South Refinery



MW-28: Groundwater Elevations and In-Well PSH Thicknesses

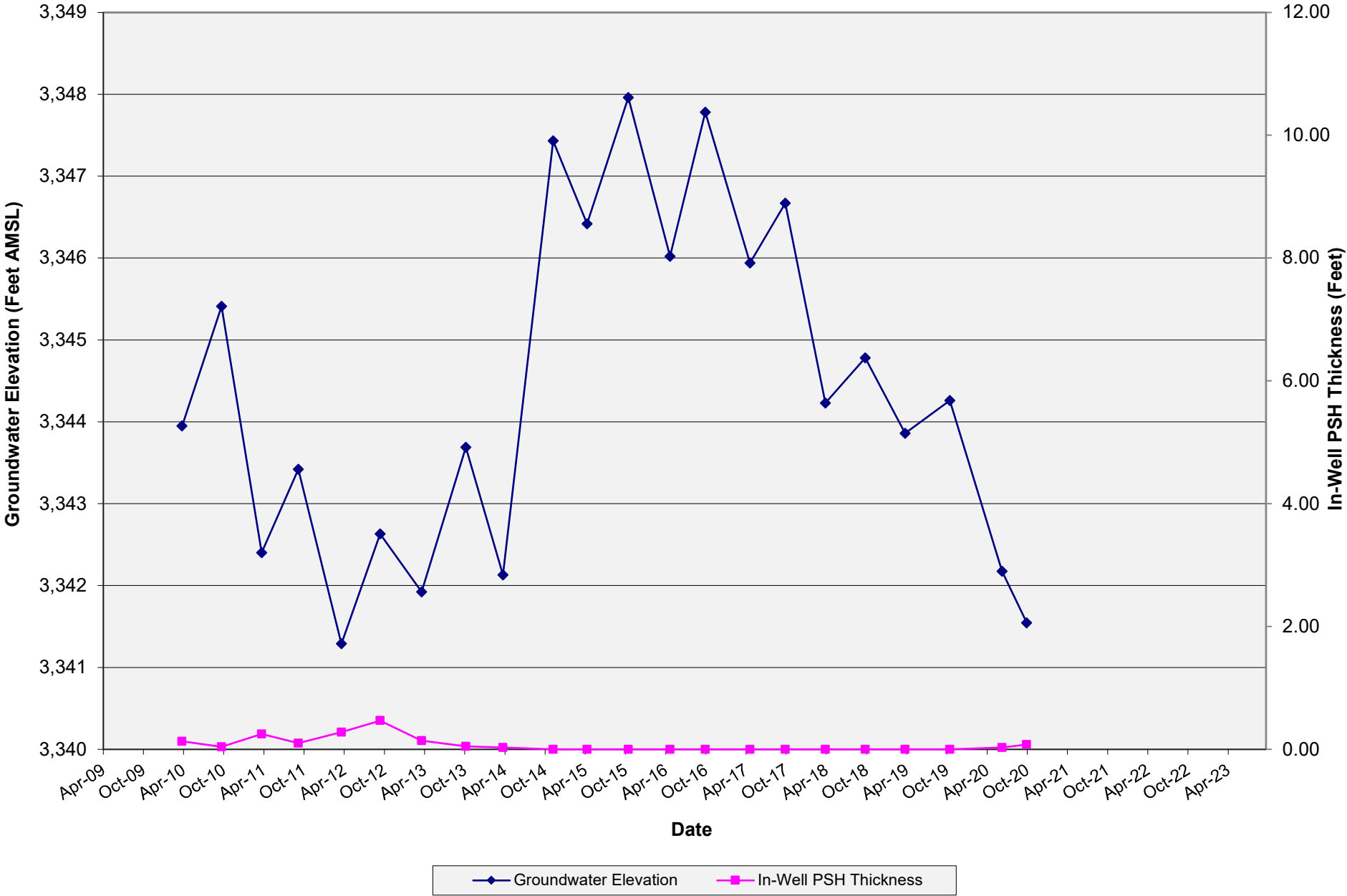
HF Sinclair Navajo Refining LLC - Artesia Refinery

South Refinery



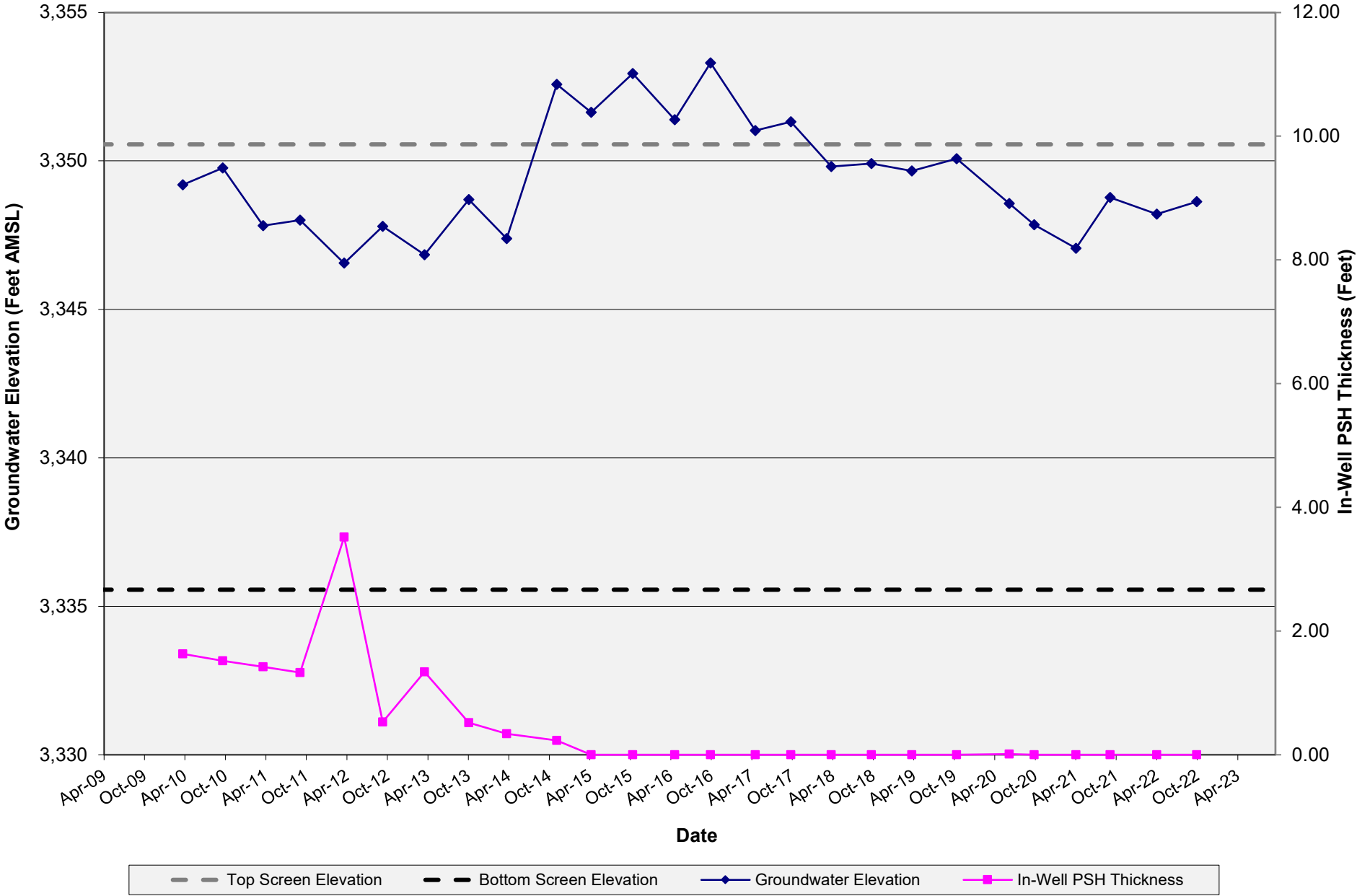
MW-48: Groundwater Elevations and In-Well PSH Thicknesses

HF Sinclair Navajo Refining LLC - Artesia Refinery
South Refinery



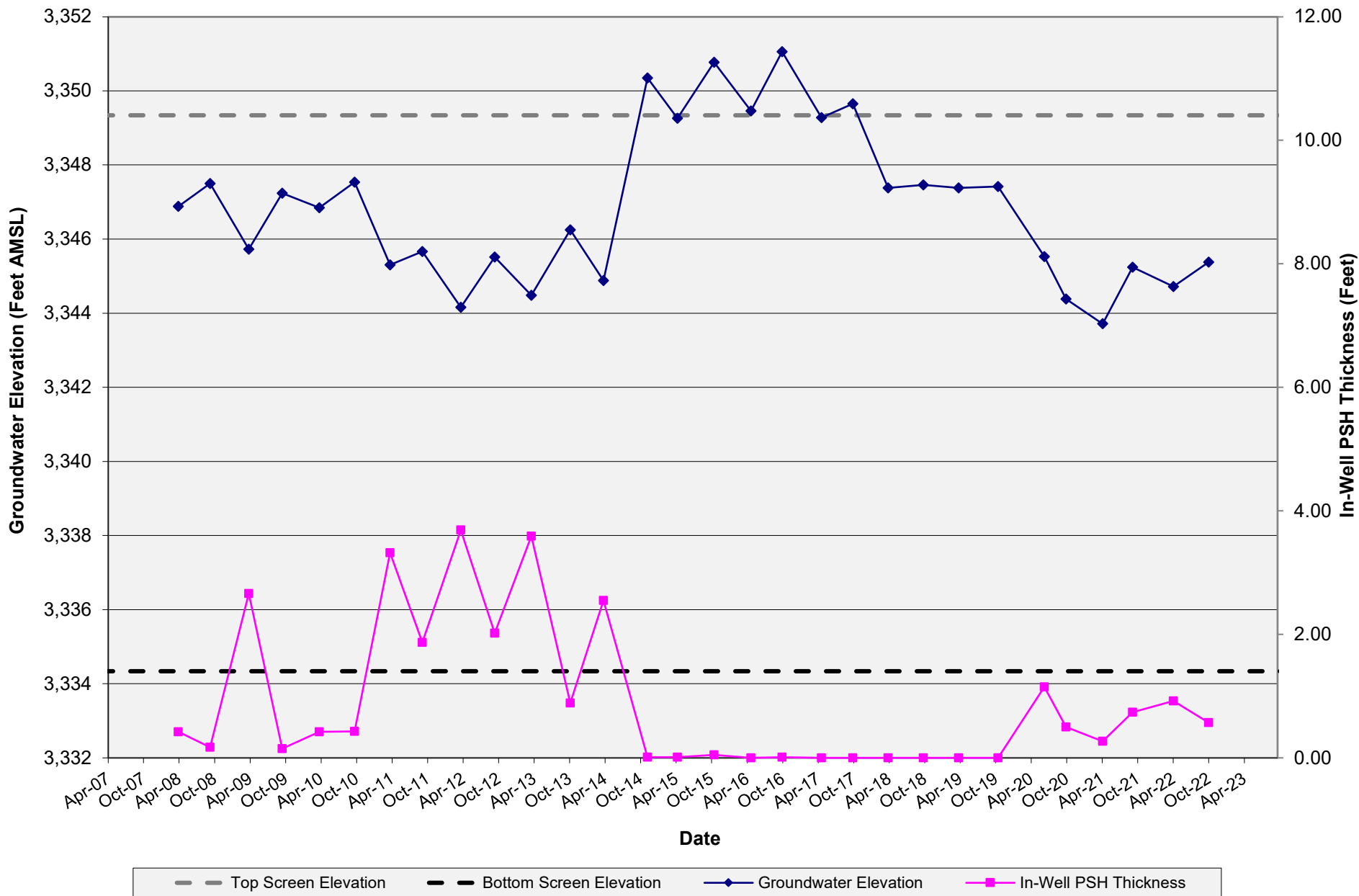
MW-64: Groundwater Elevations and In-Well PSH Thicknesses

HF Sinclair Navajo Refining LLC - Artesia Refinery
South Refinery



MW-65: Groundwater Elevations and In-Well PSH Thicknesses

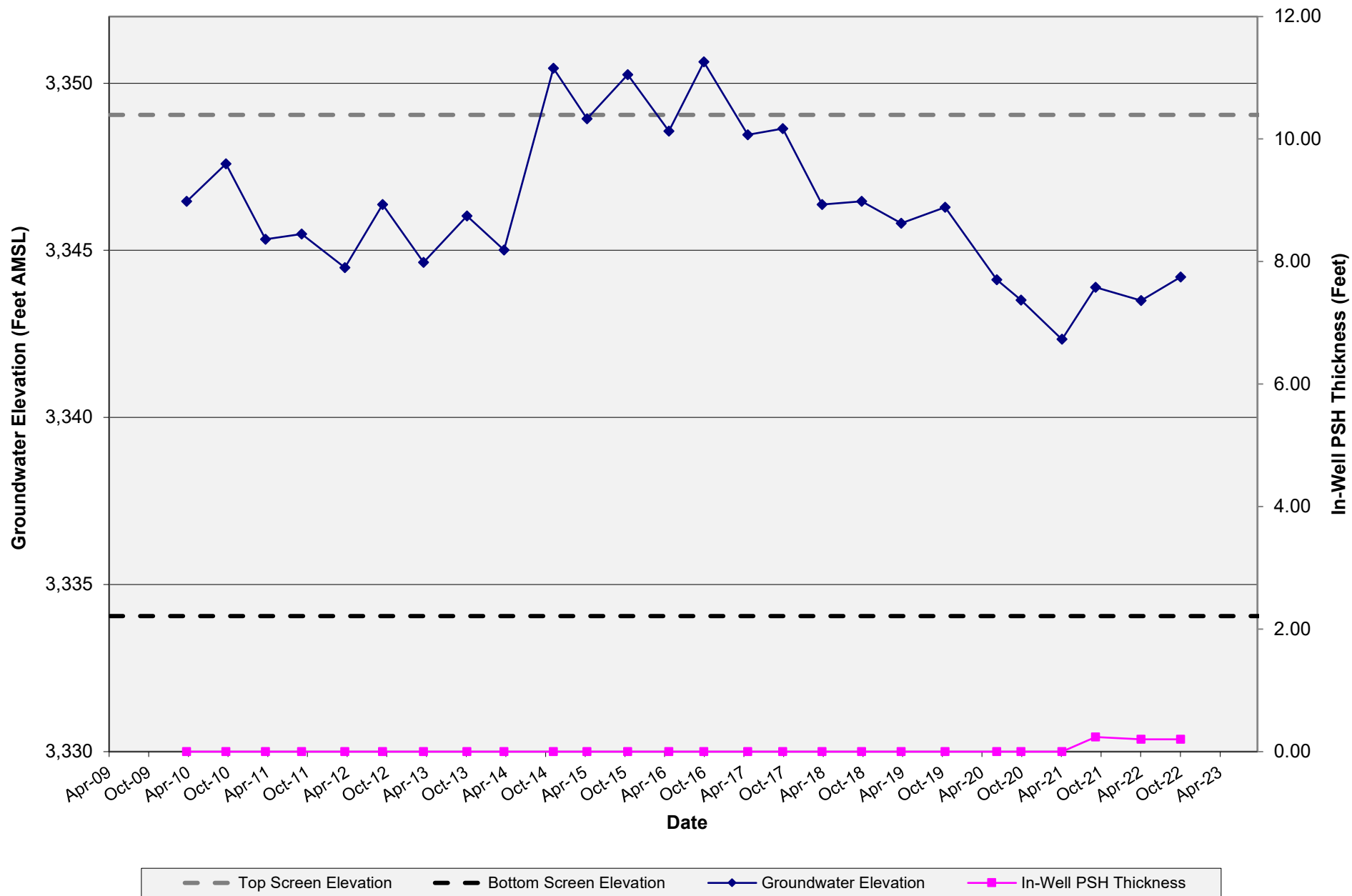
HF Sinclair Navajo Refining LLC - Artesia Refinery
South Refinery



MW-66: Groundwater Elevations and In-Well PSH Thicknesses

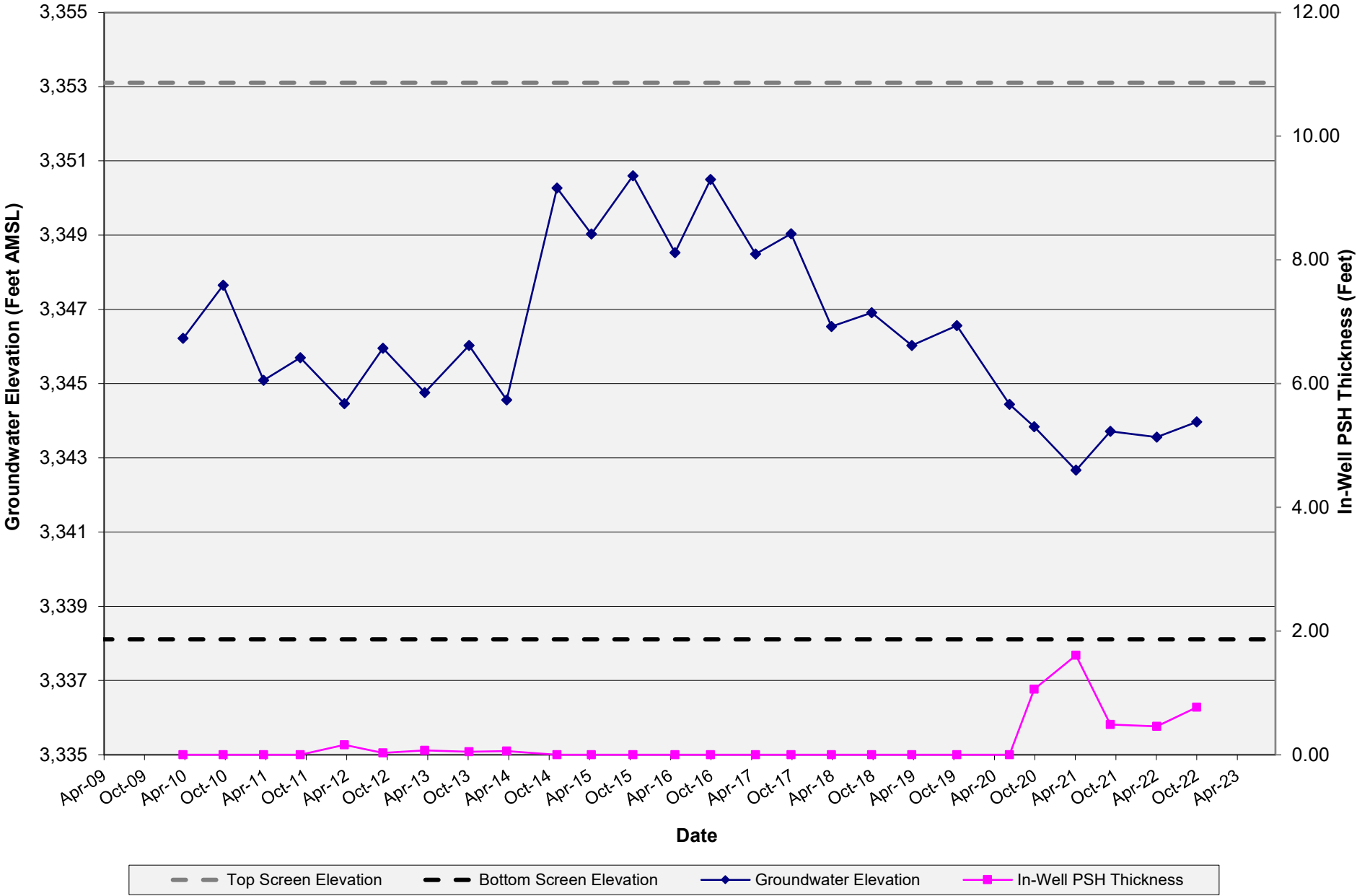
HF Sinclair Navajo Refining LLC - Artesia Refinery

South Refinery



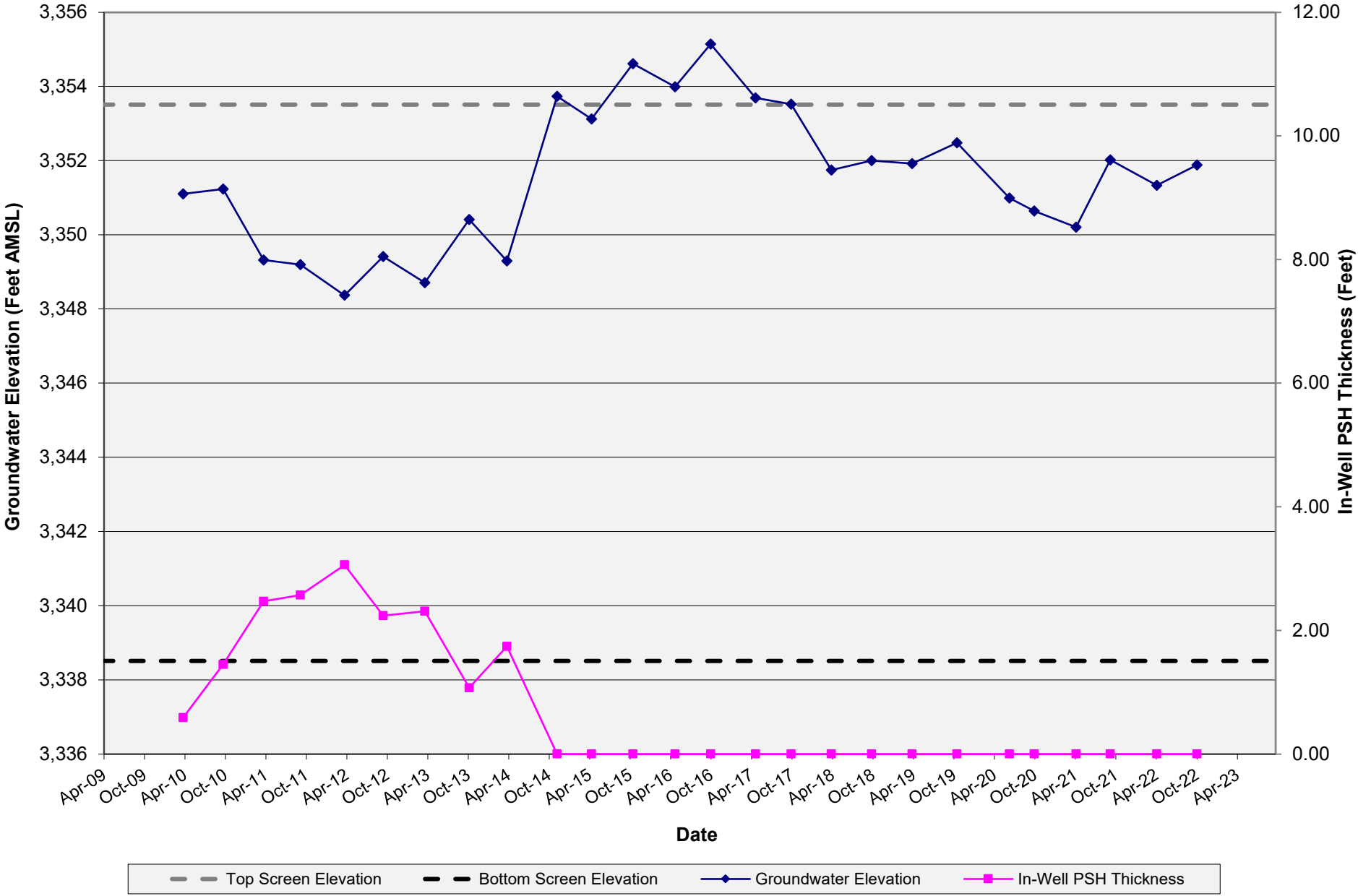
MW-99: Groundwater Elevations and In-Well PSH Thicknesses

HF Sinclair Navajo Refining LLC - Artesia Refinery
South Refinery



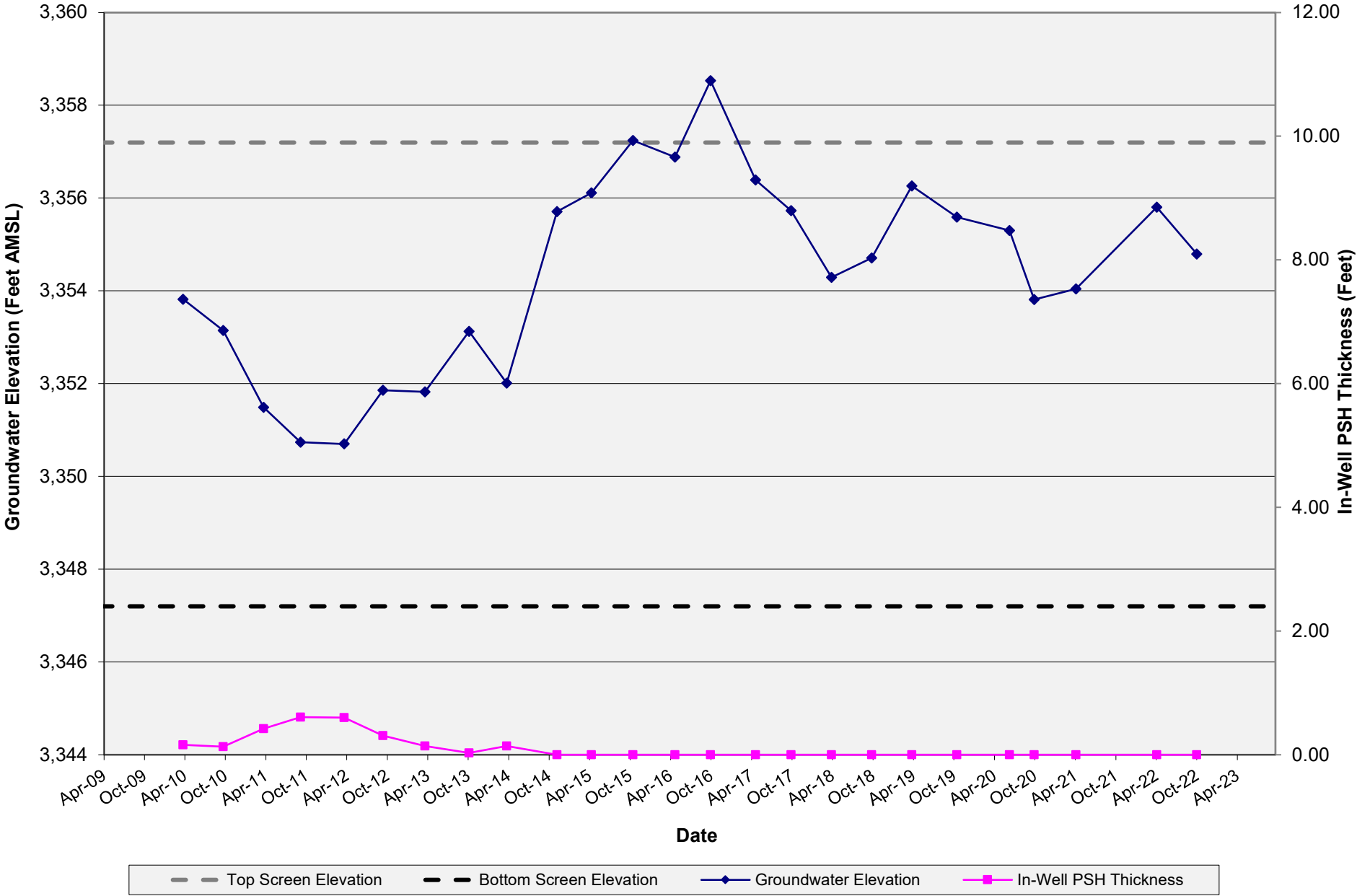
MW-102: Groundwater Elevations and In-Well PSH Thicknesses

HF Sinclair Navajo Refining LLC - Artesia Refinery
South Refinery



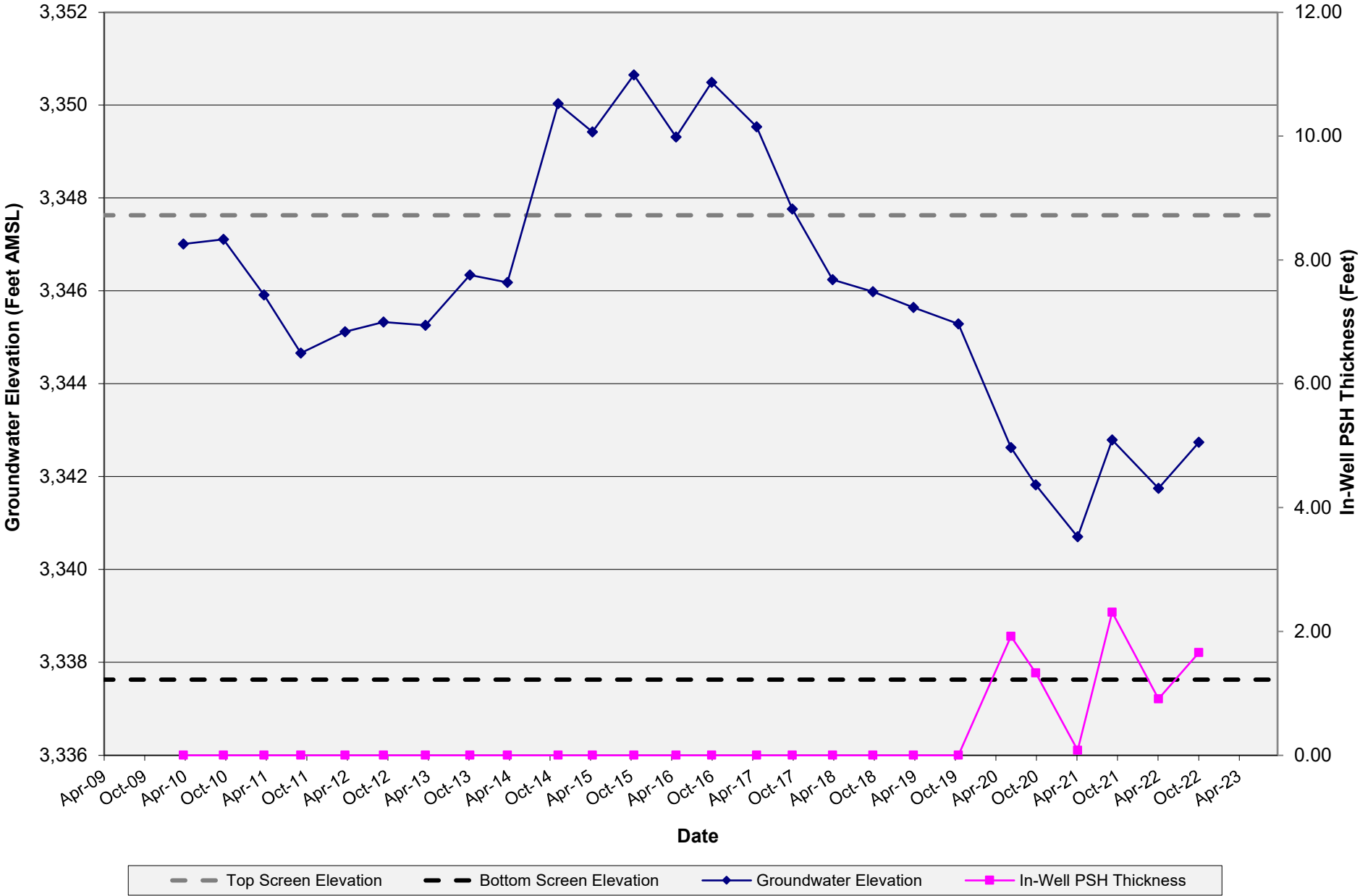
MW-105: Groundwater Elevations and In-Well PSH Thicknesses

HF Sinclair Navajo Refining LLC - Artesia Refinery
South Refinery



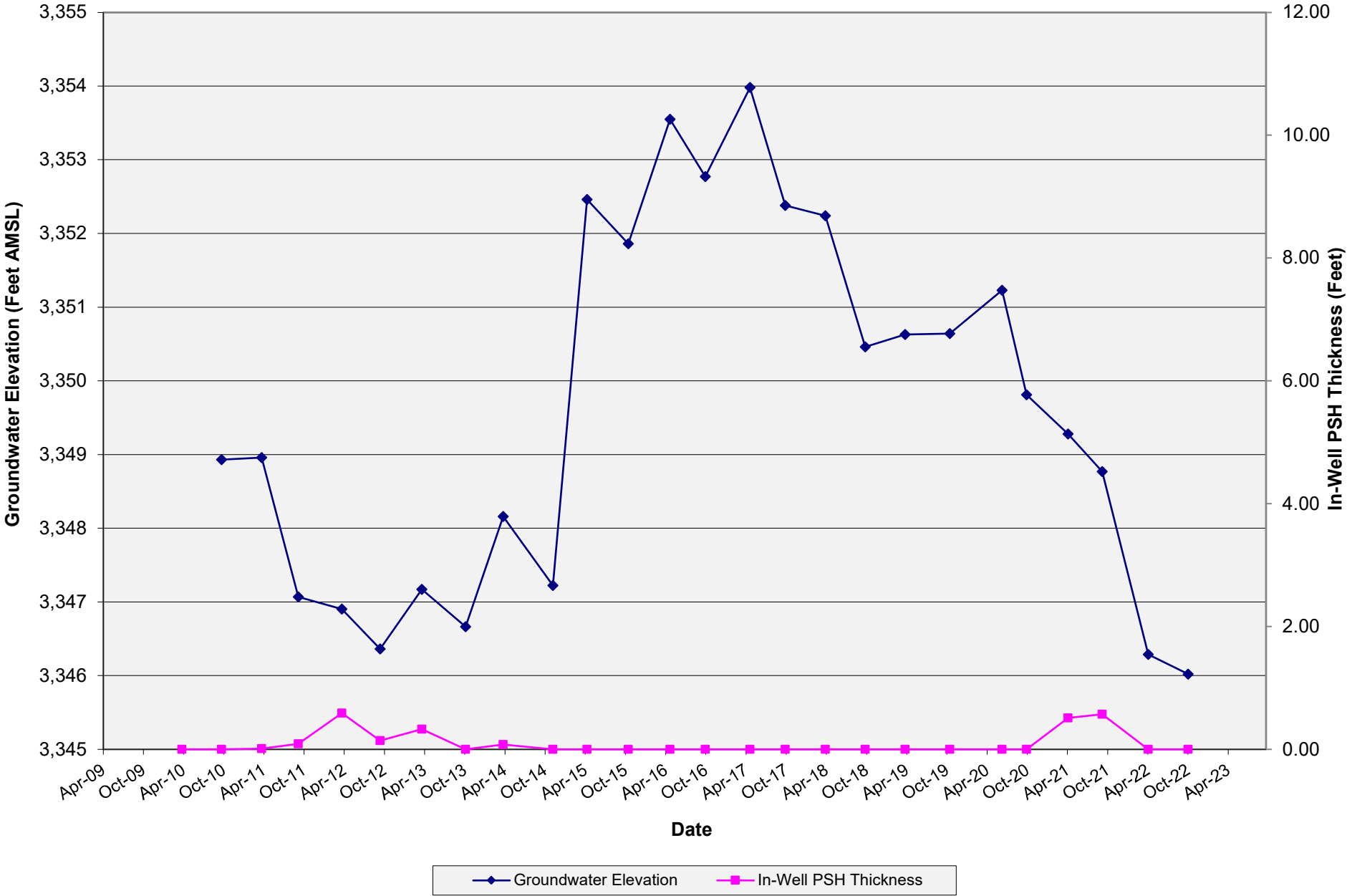
MW-107: Groundwater Elevations and In-Well PSH Thicknesses

HF Sinclair Navajo Refining LLC - Artesia Refinery
South Refinery



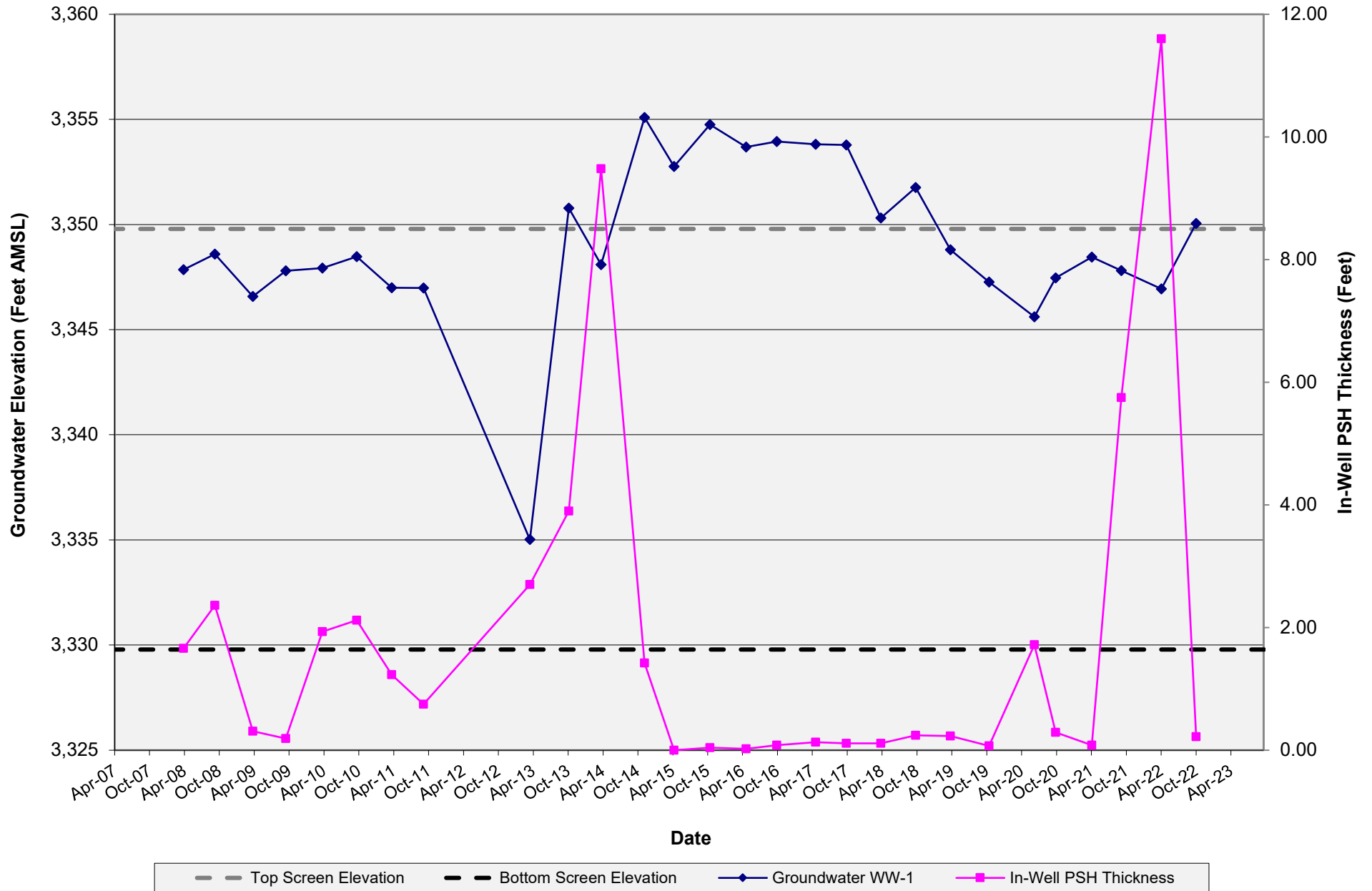
RW-4R: Groundwater Elevations and In-Well PSH Thicknesses

HF Sinclair Navajo Refining LLC - Artesia Refinery
South Refinery



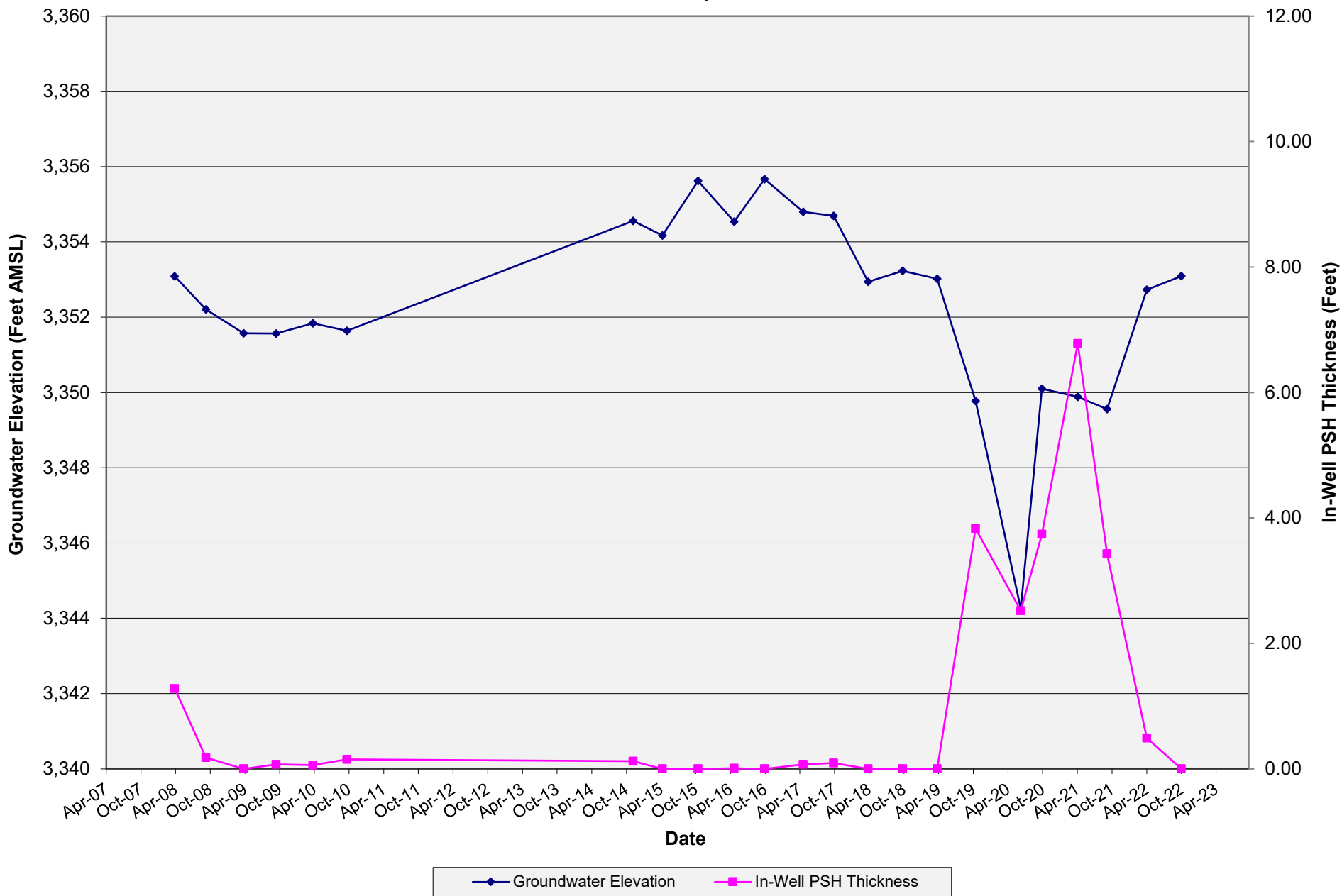
RW-5 & RW-5R: Groundwater Elevations and In-Well PSH Thicknesses

HF Sinclair Navajo Refining LLC - Artesia Refinery
South Refinery



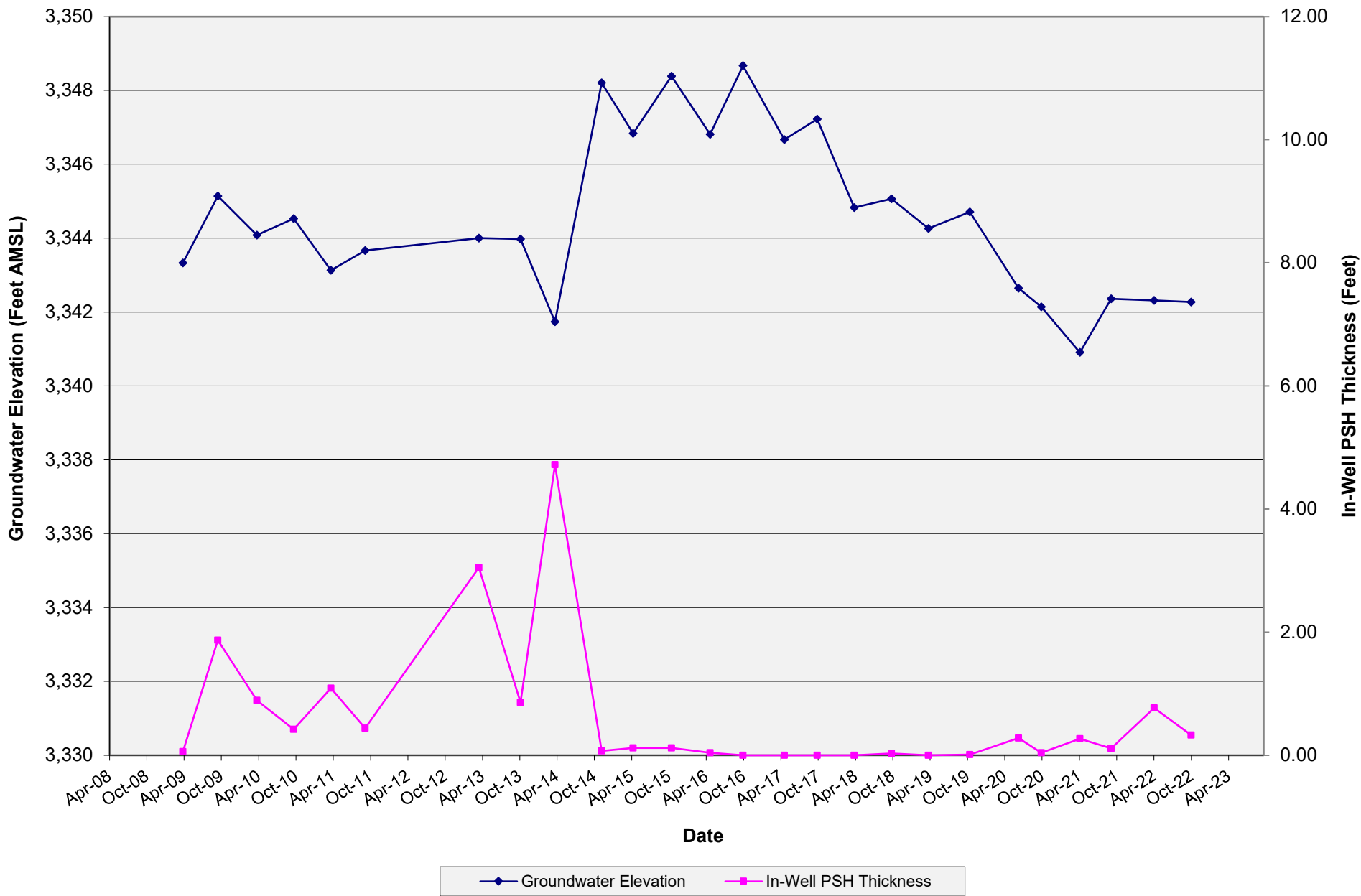
RW-6: Groundwater Elevations and In-Well PSH Thicknesses

HF Sinclair Navajo Refining LLC - Artesia Refinery
South Refinery



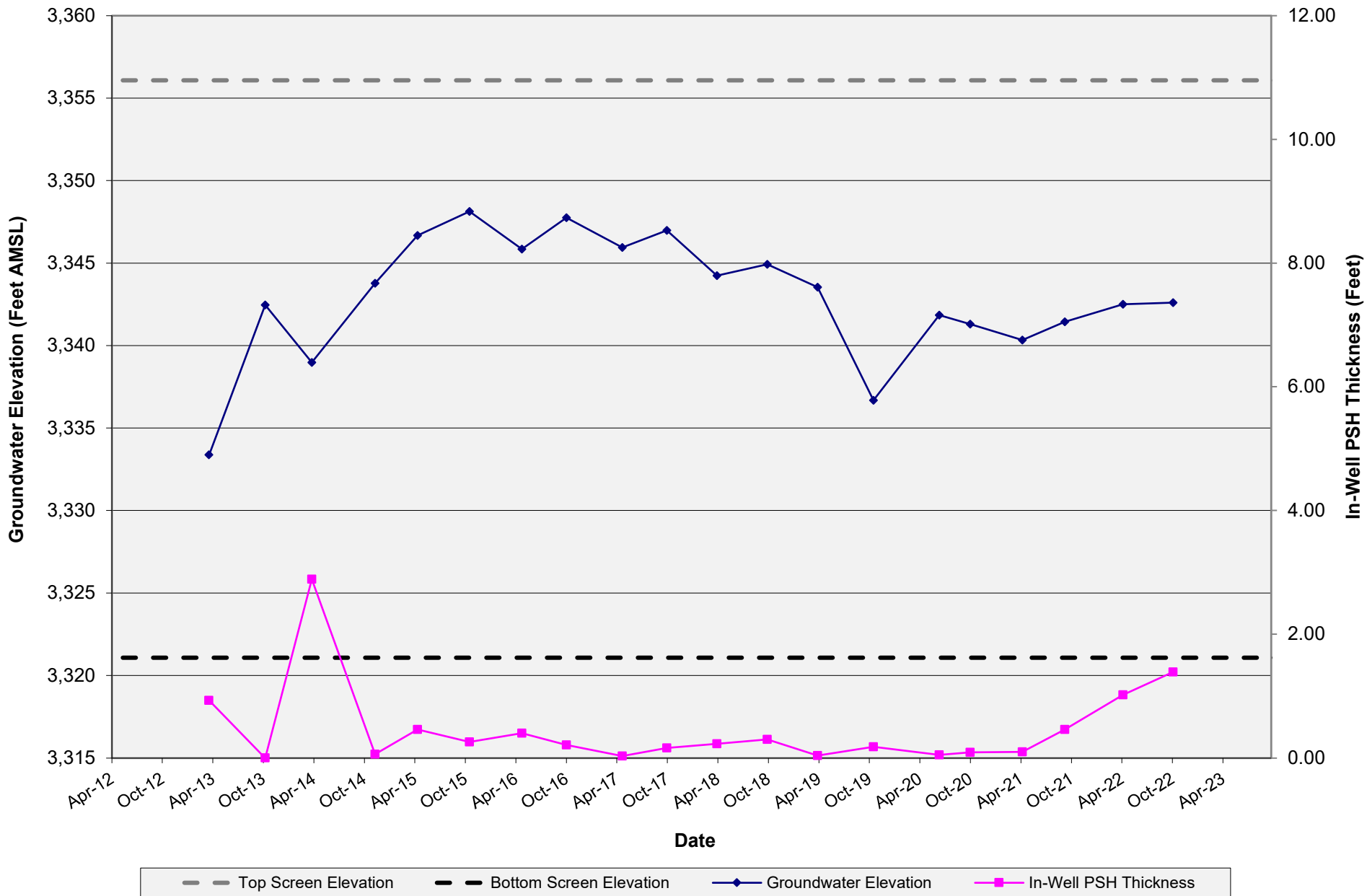
RW-15C: Groundwater Elevations and In-Well PSH Thicknesses

HF Sinclair Navajo Refining LLC - Artesia Refinery
South Refinery



RW-19: Groundwater Elevations and In-Well PSH Thicknesses

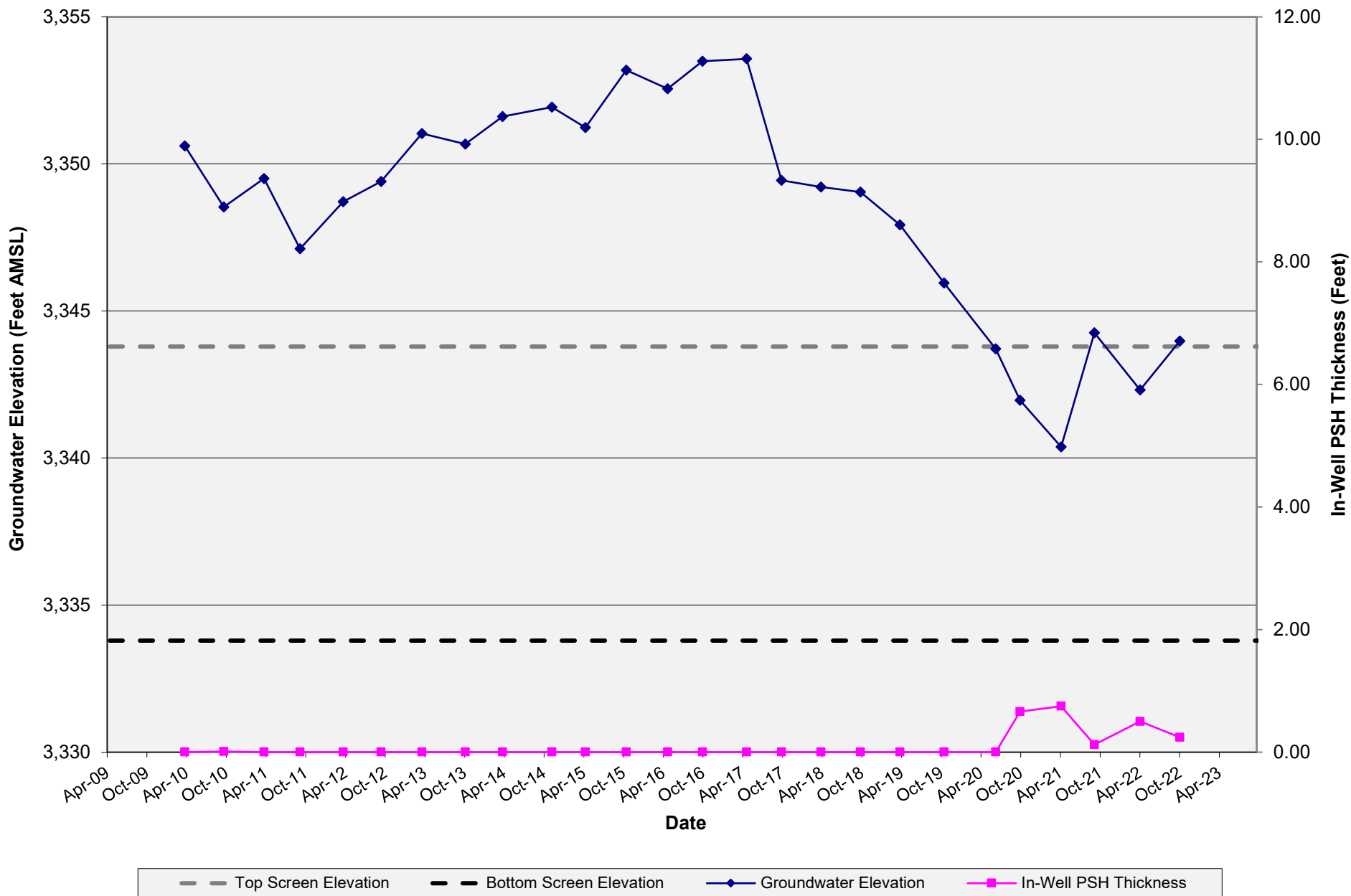
HF Sinclair Navajo Refining LLC - Artesia Refinery
South Refinery



TEL-1: Groundwater Elevations and In-Well PSH Thicknesses

HF Sinclair Navajo Refining LLC - Artesia Refinery

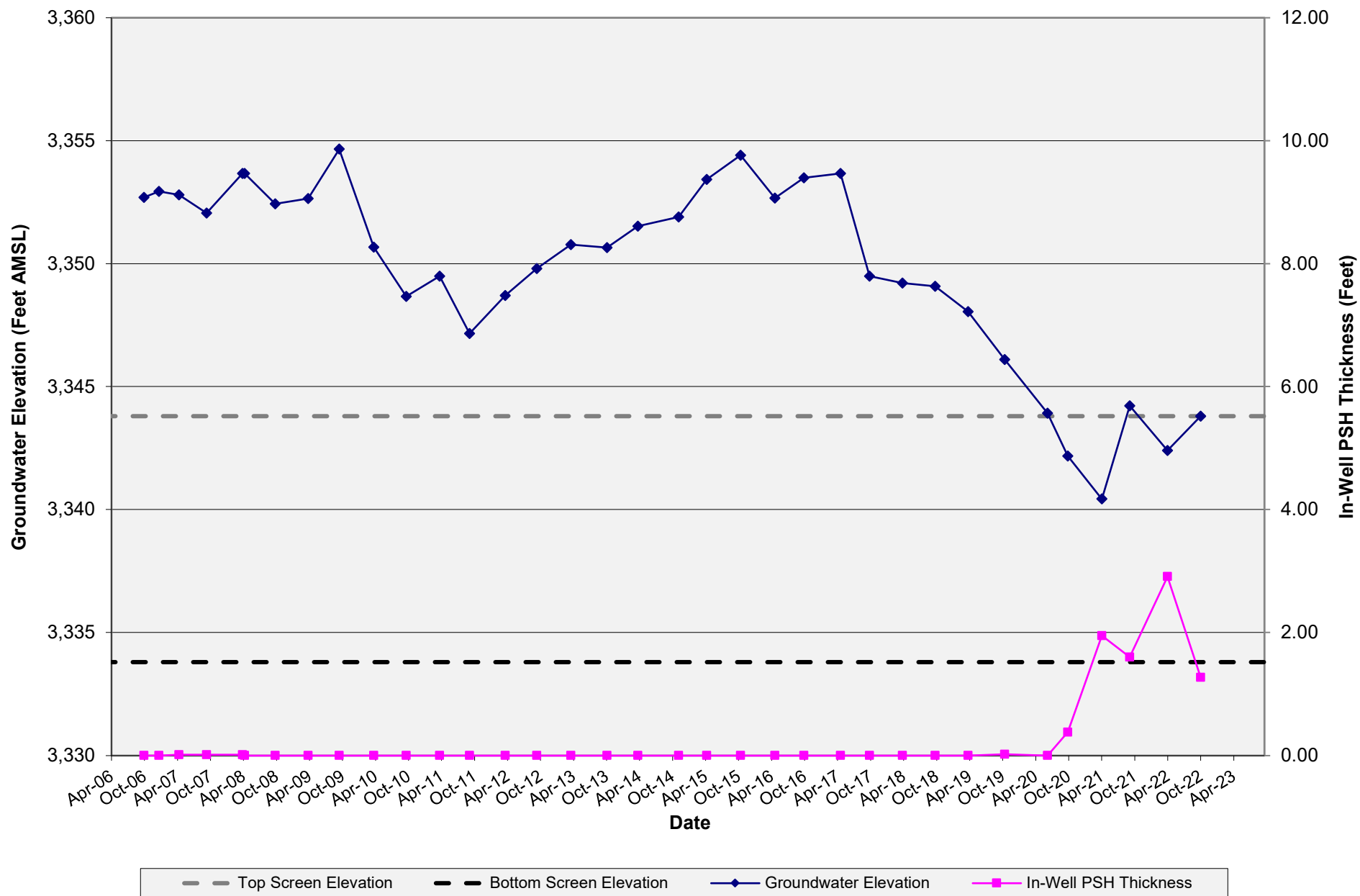
Tetra Ethyl Lead Surface Impoundment



TEL-2: Groundwater Elevations and In-Well PSH Thicknesses

HF Sinclair Navajo Refining LLC - Artesia Refinery

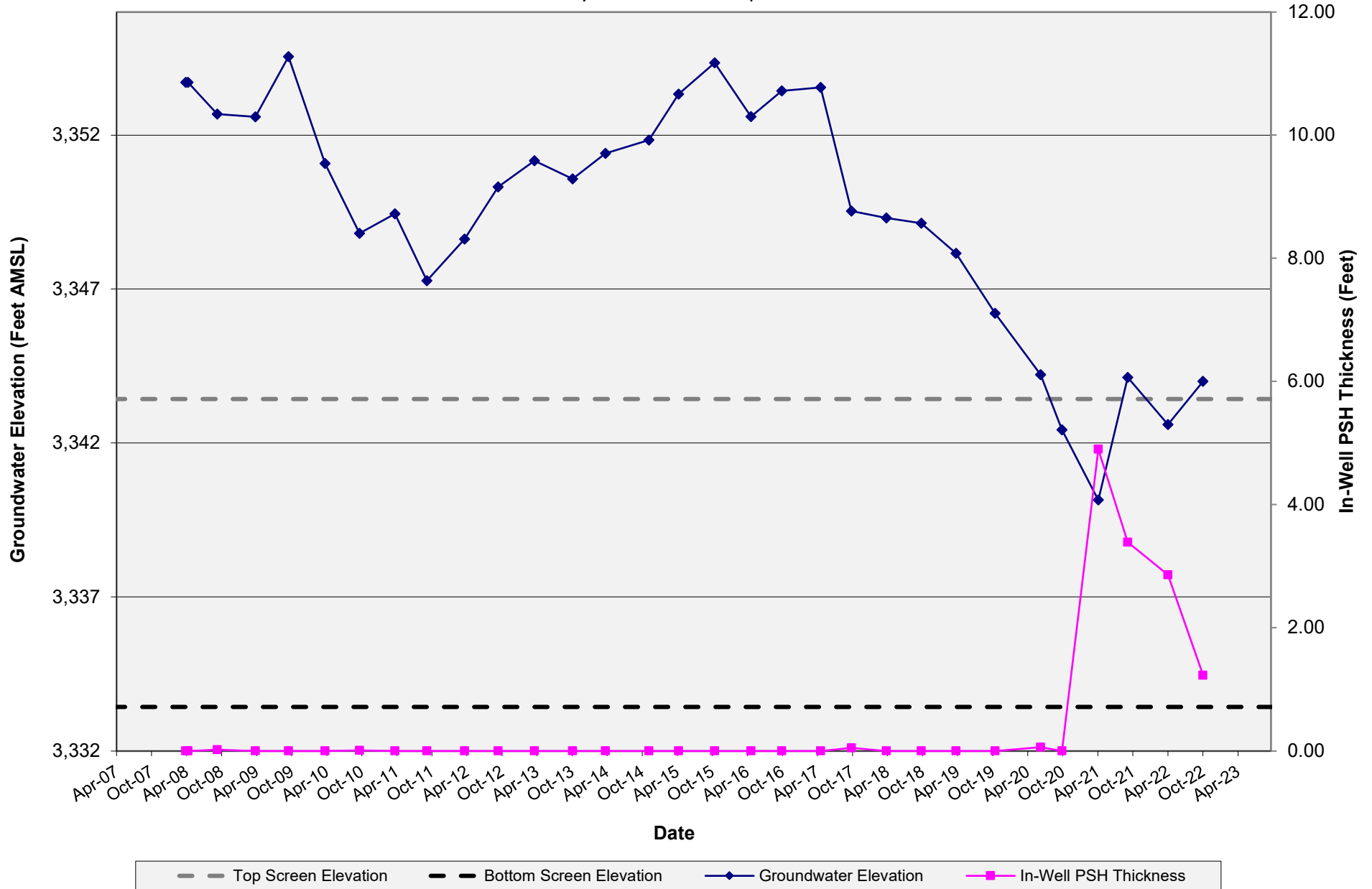
Tetra Ethyl Lead Surface Impoundment



TEL-3: Groundwater Elevations and In-Well PSH Thicknesses

HF Sinclair Navajo Refining LLC - Artesia Refinery

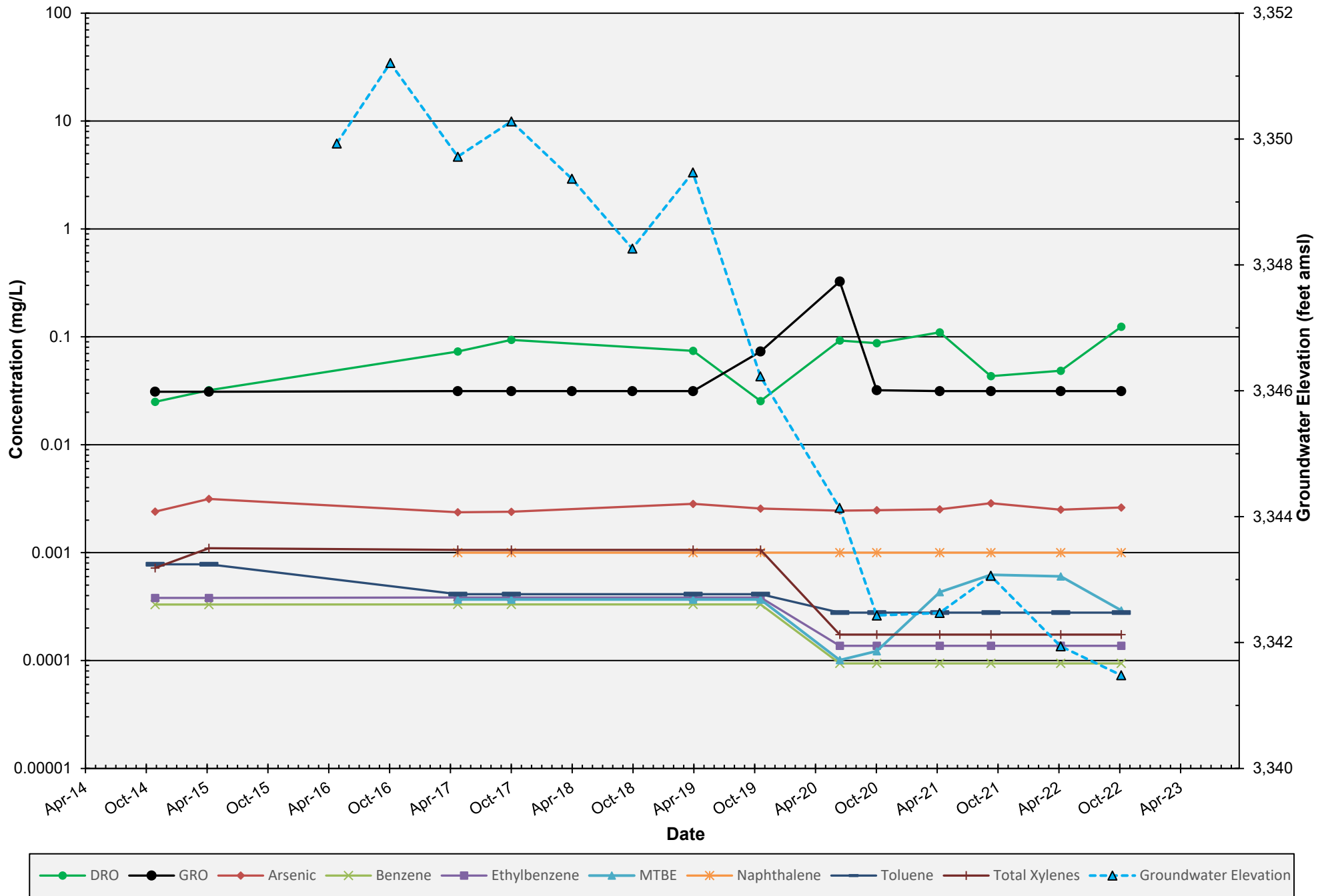
Tetra Ethyl Lead Surface Impoundment



MW-136: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery

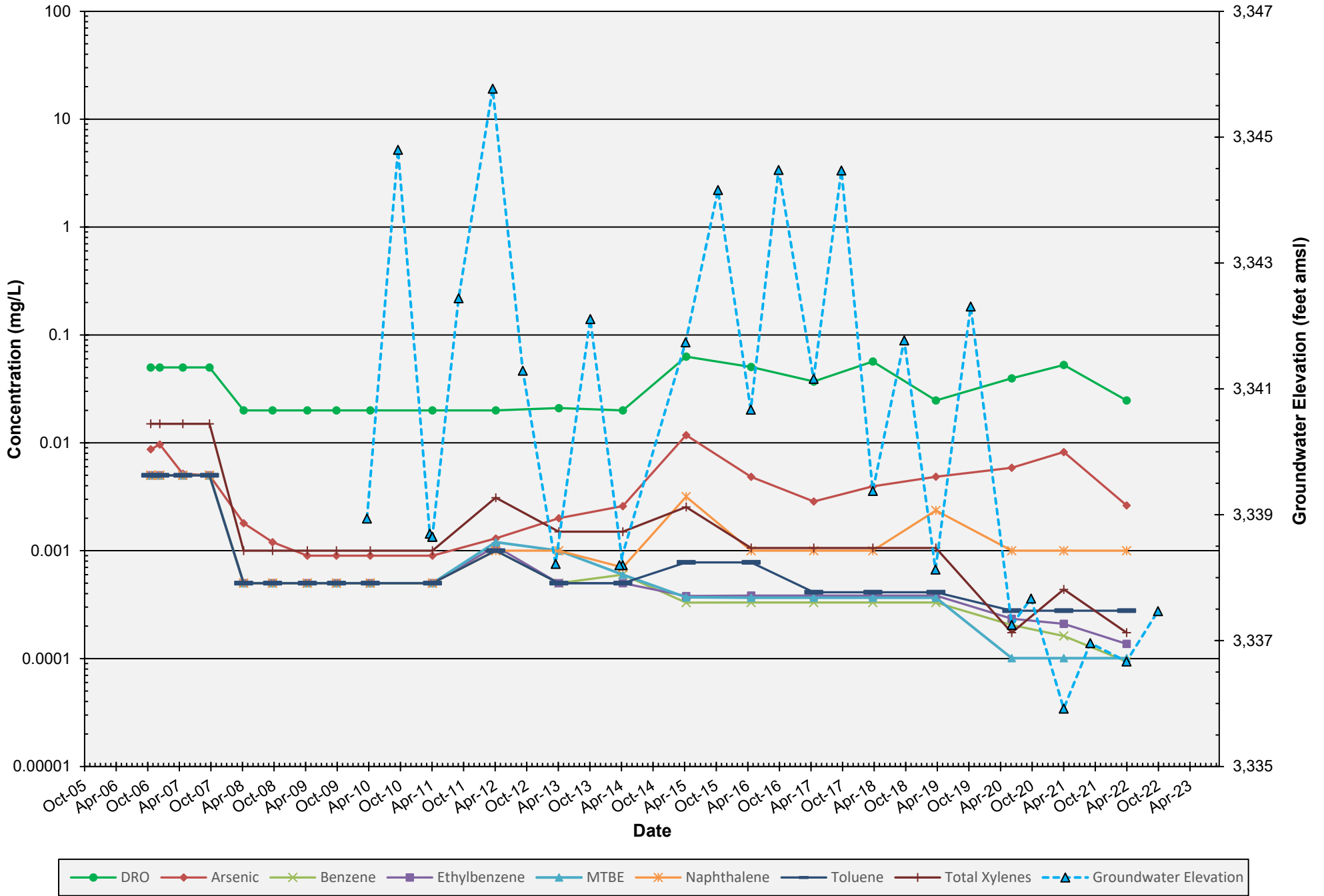
Up-Gradient of Refinery



KWB-13: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery

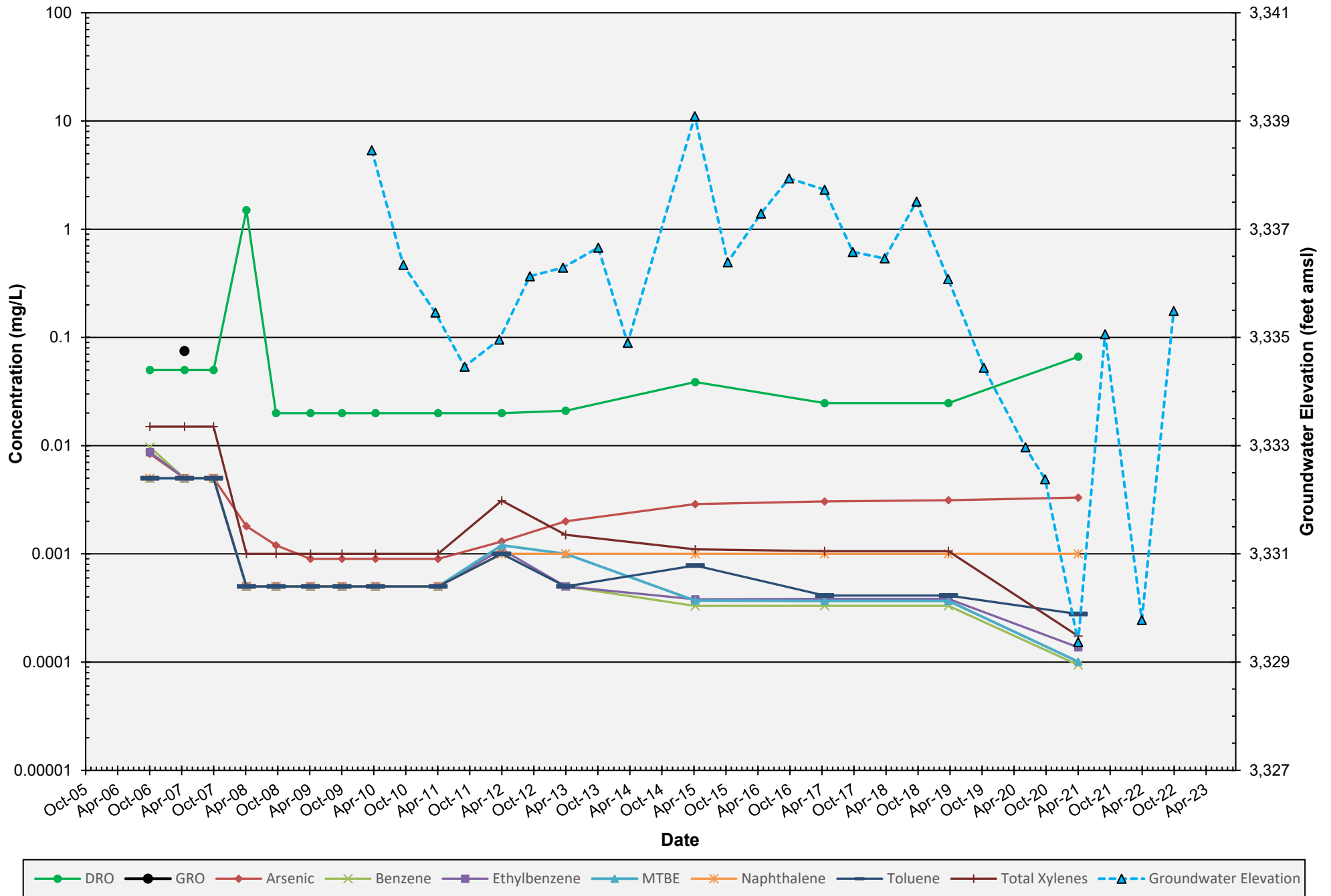
Cross-Gradient of Refinery



NP-5: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery

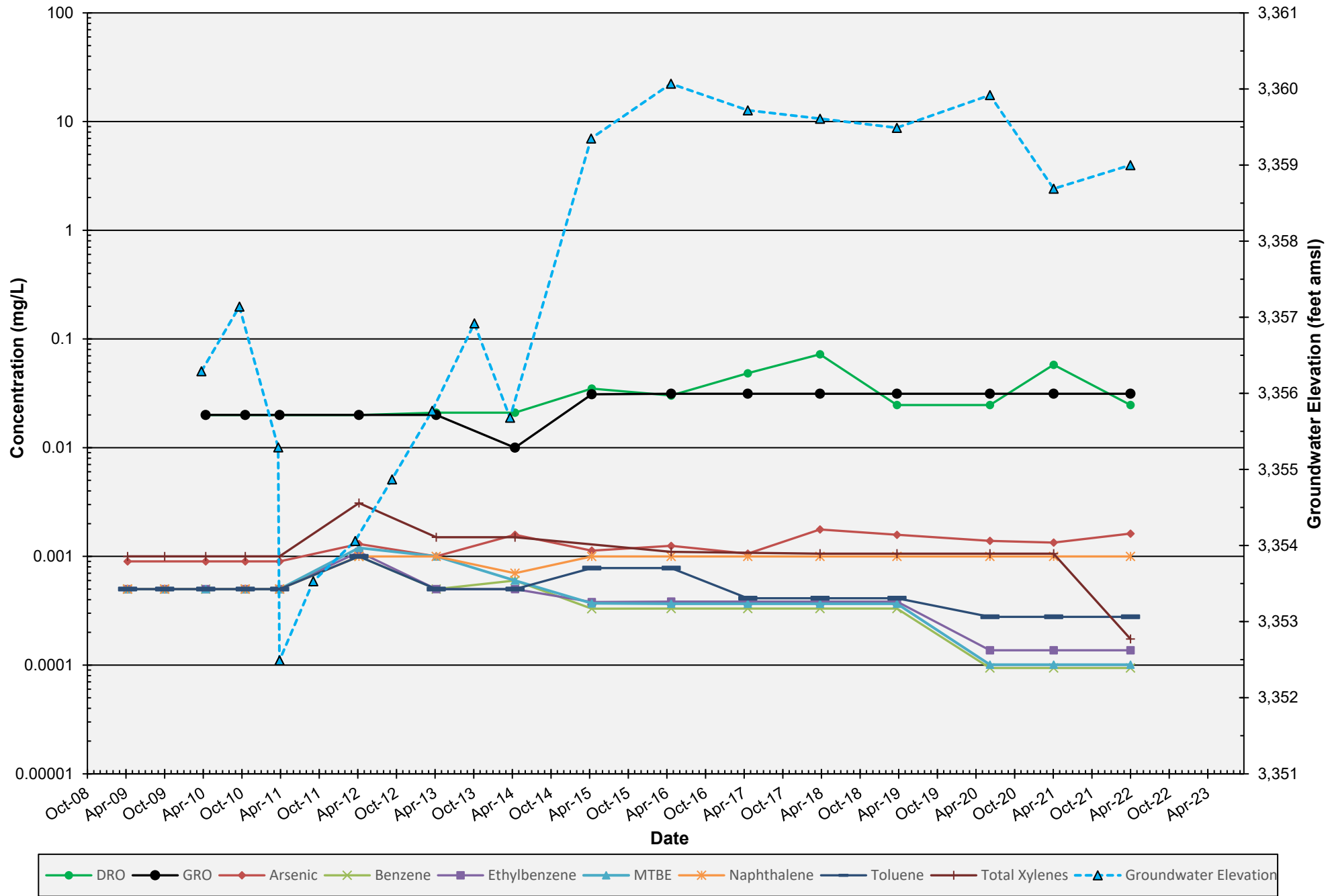
Cross-Gradient of Refinery



UG-1: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery

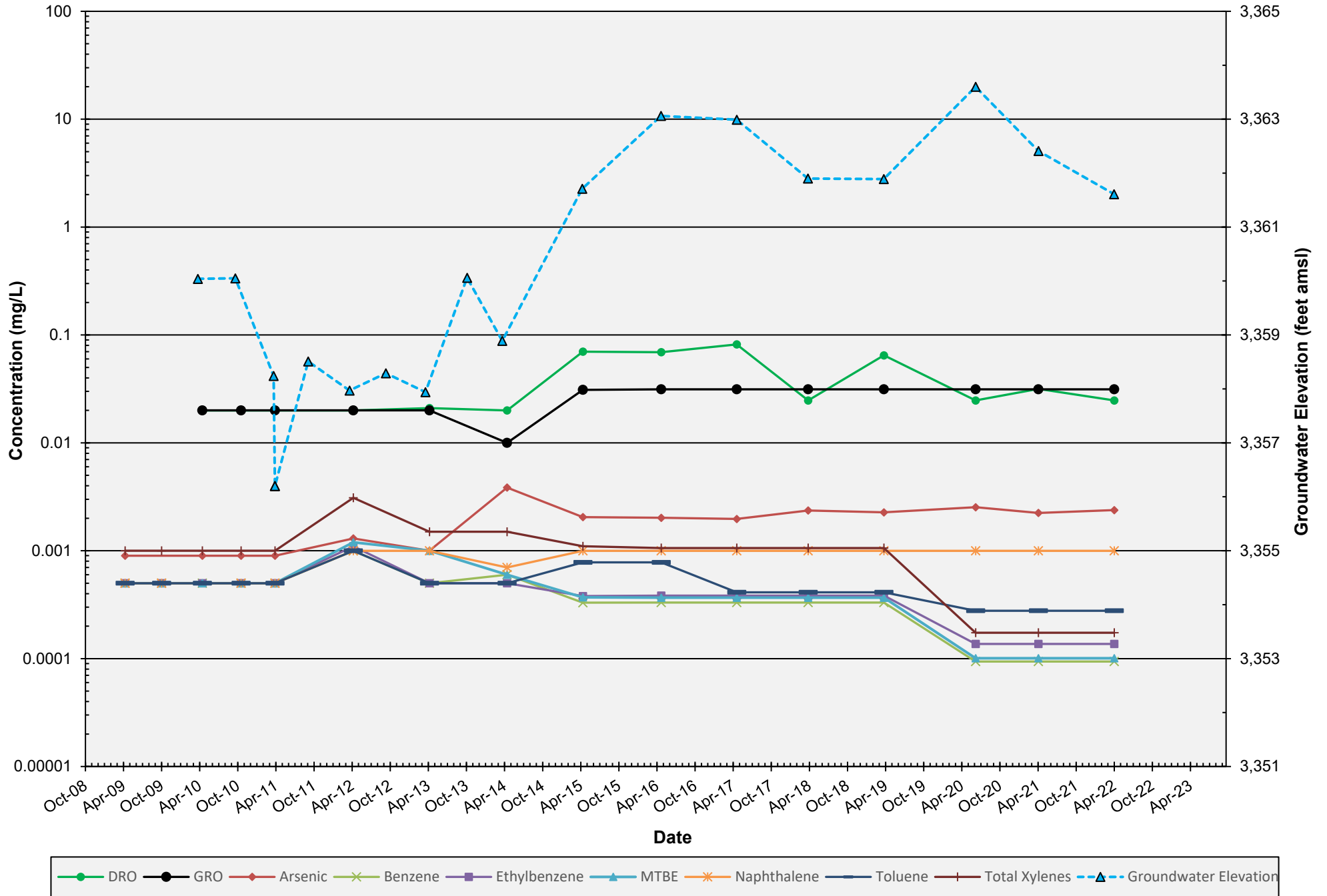
Up-Gradient of Refinery



UG-2: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery

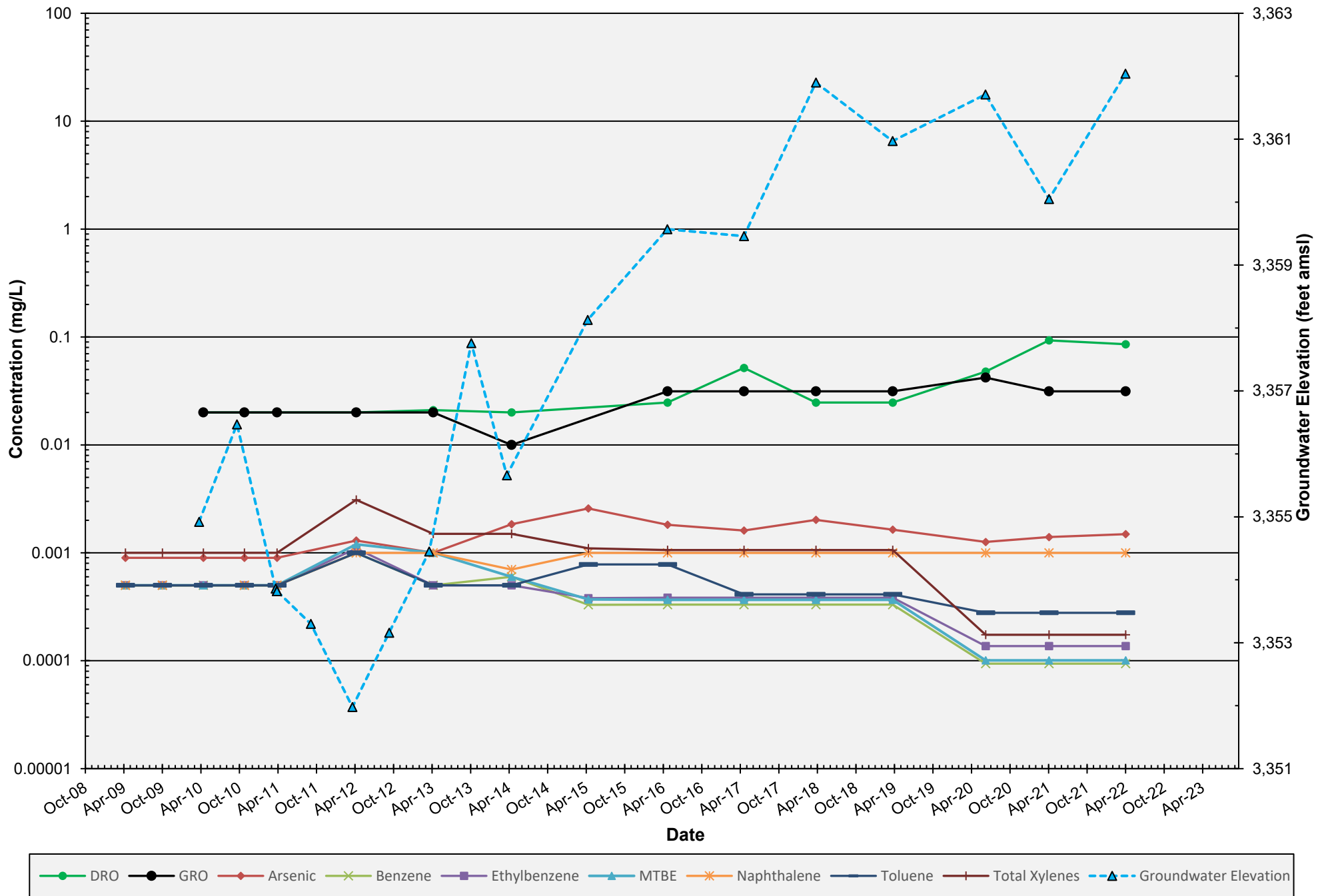
Up-Gradient of Refinery



UG-3R: COC Concentrations and Groundwater Elevations

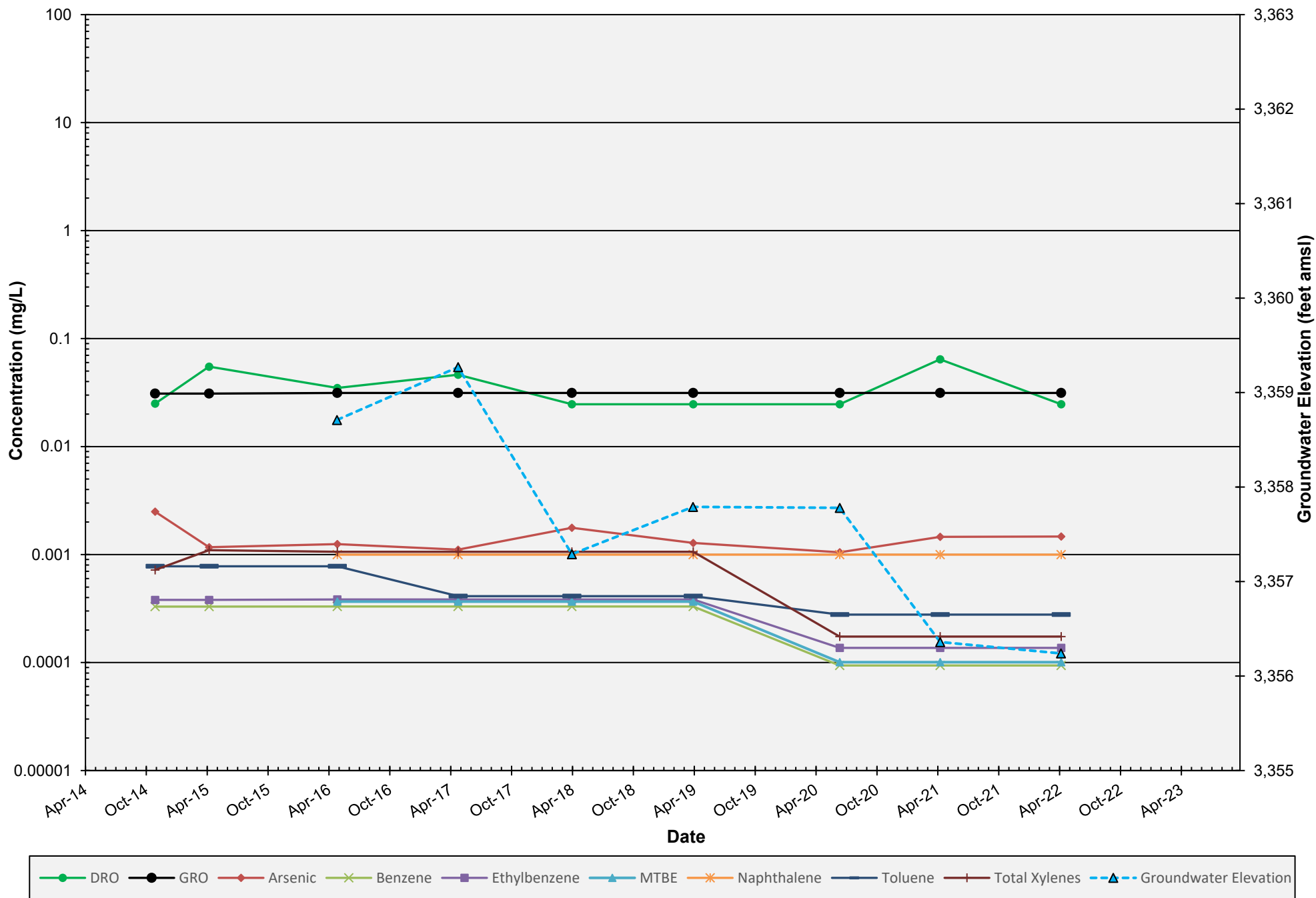
HF Sinclair Navajo Refining LLC - Artesia Refinery

Up-Gradient of Refinery



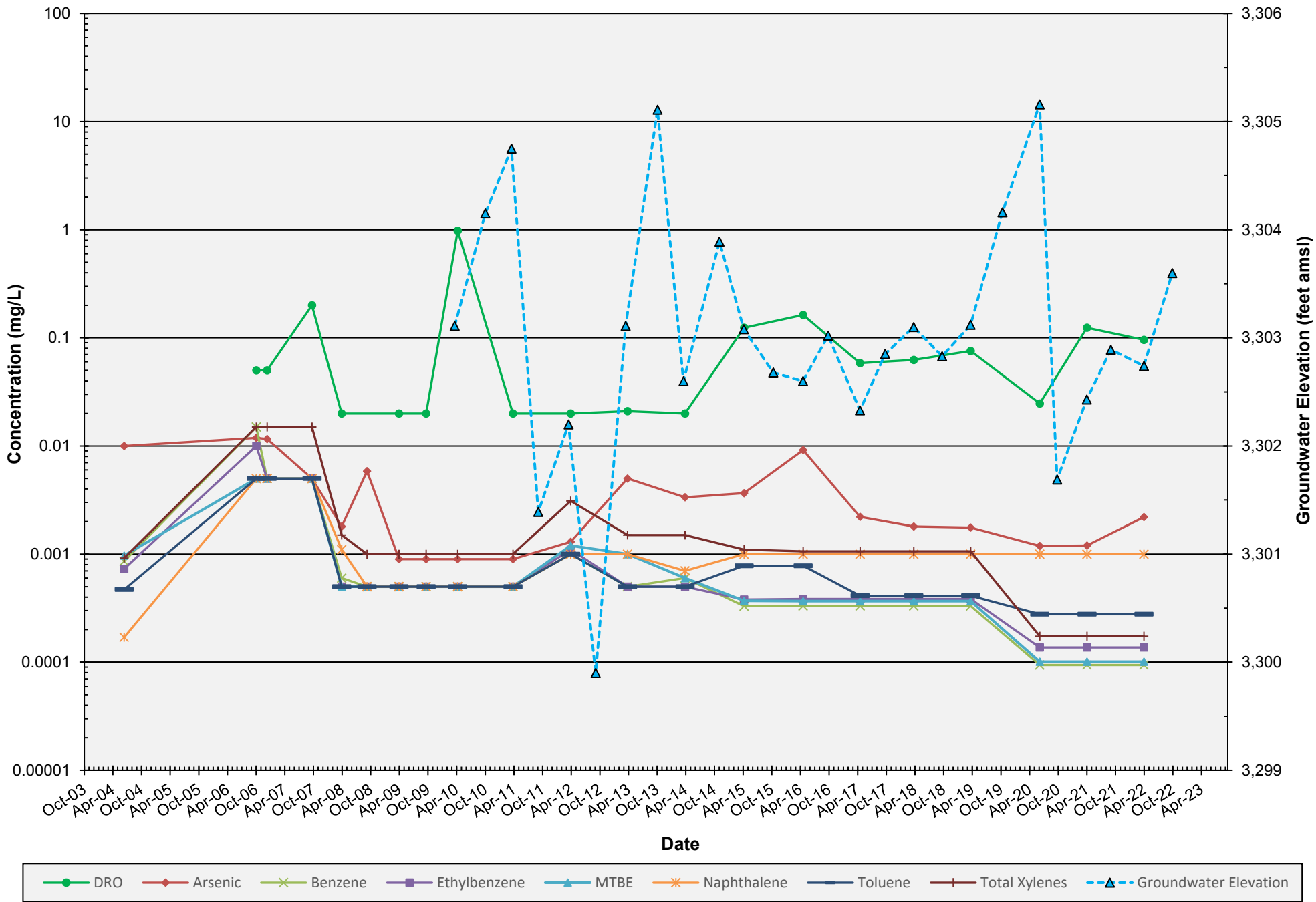
UG-4: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery
Up-Gradient of Refinery



MW-1R: COC Concentrations and Groundwater Elevations

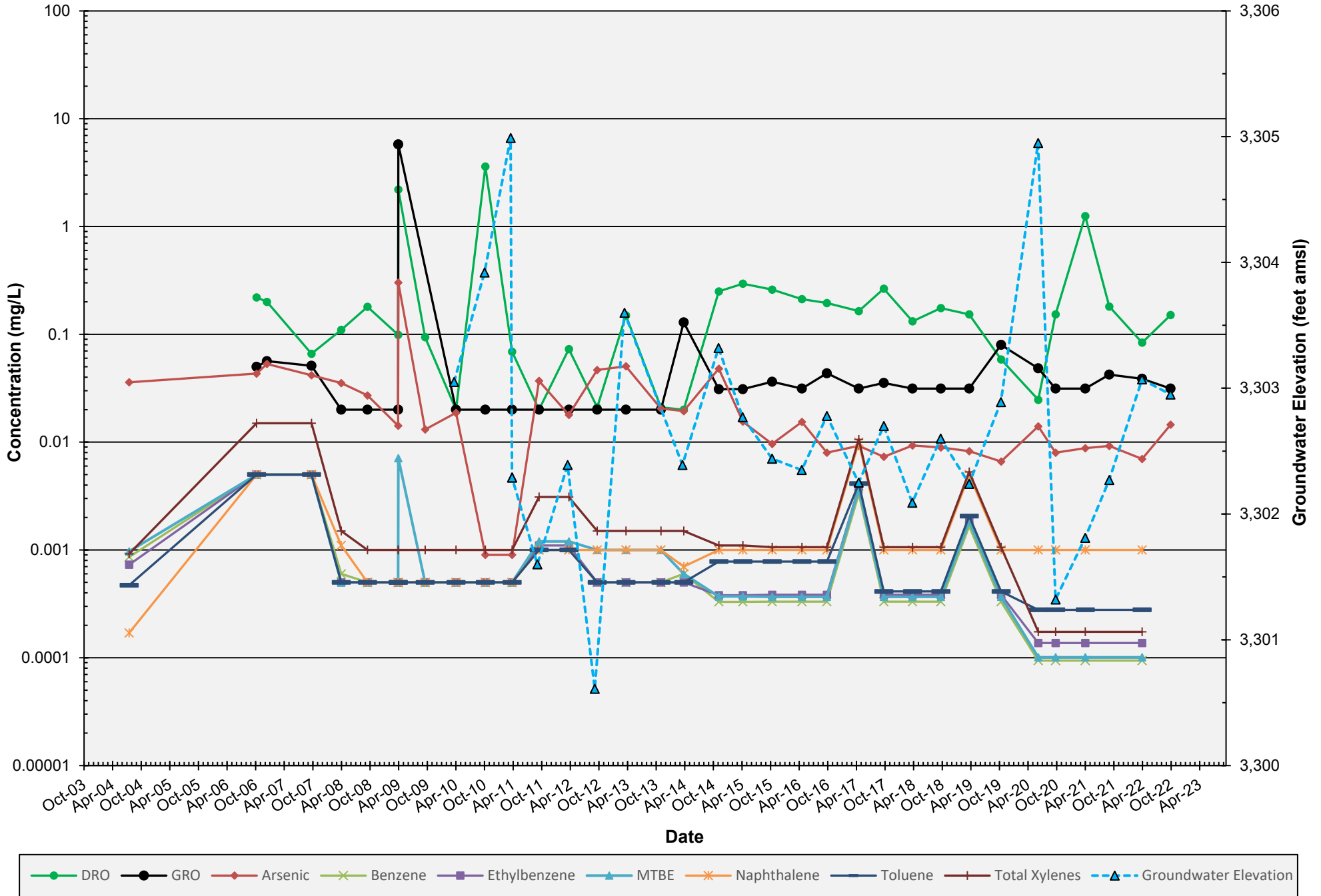
HF Sinclair Navajo Refining LLC - Artesia Refinery
Evaporation Ponds



MW-2A: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery

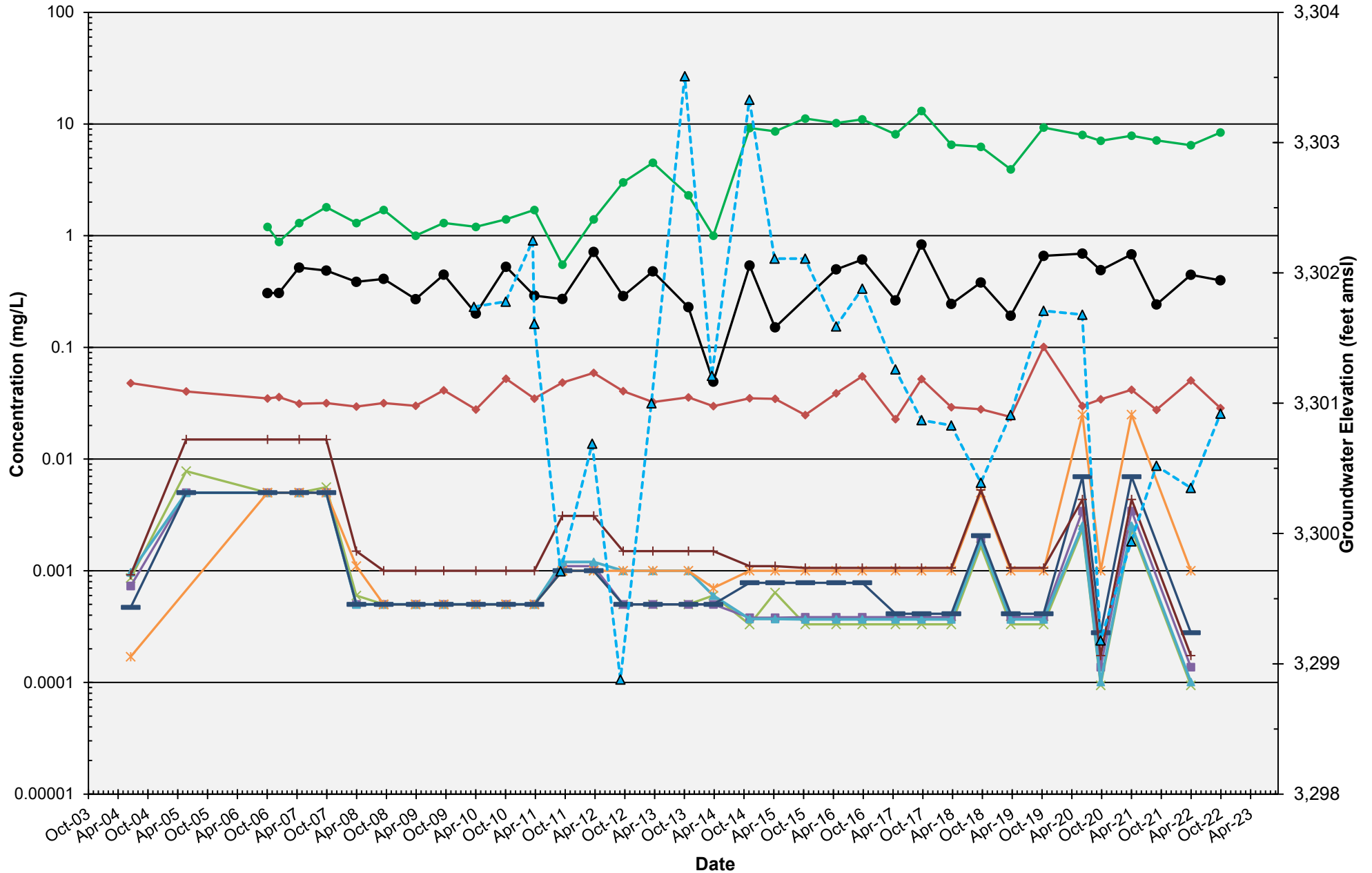
Evaporation Ponds



MW-3: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery

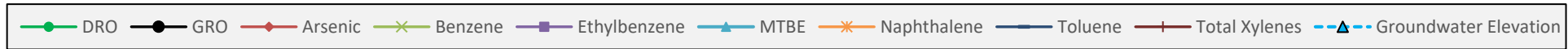
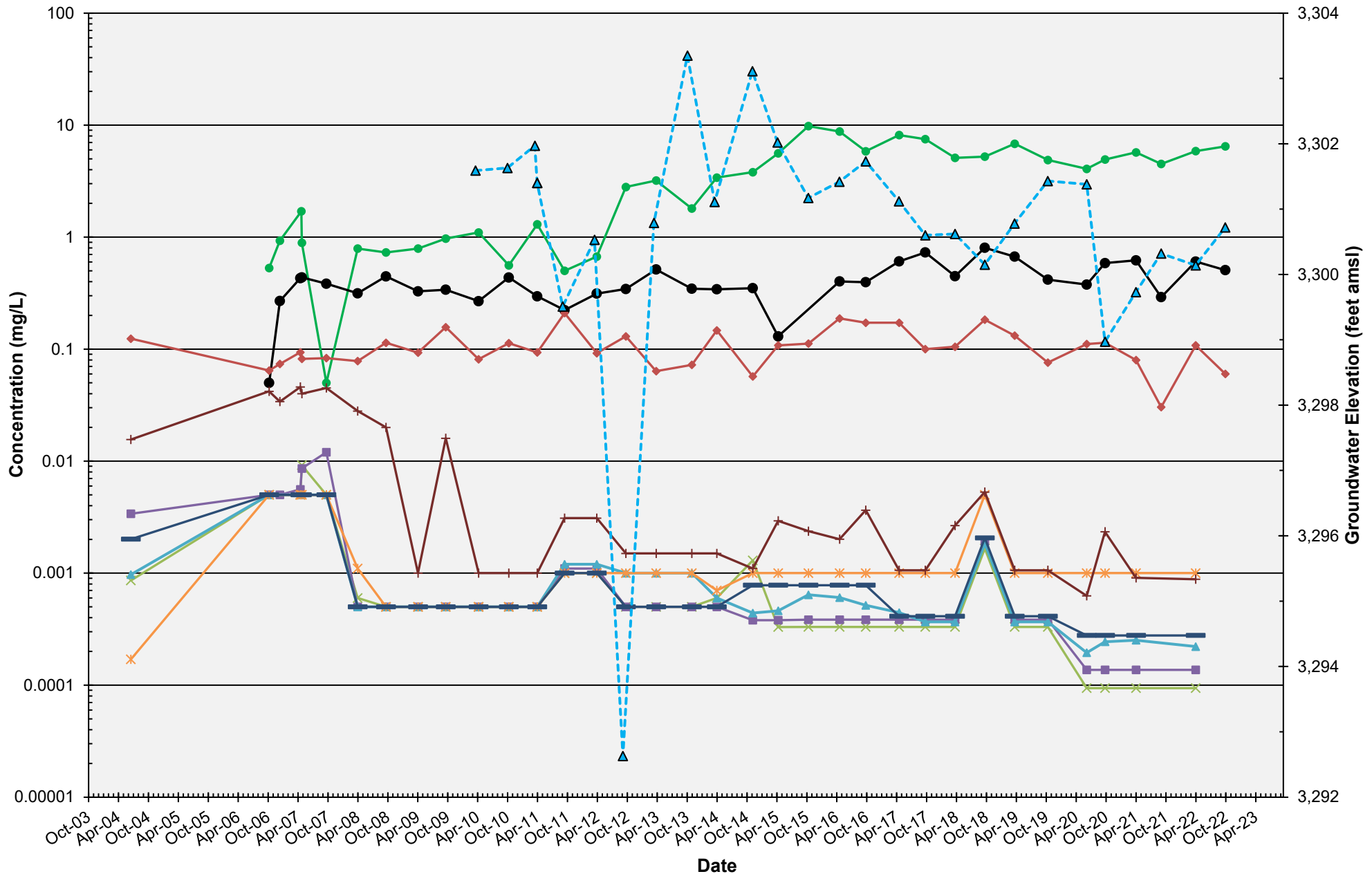
Evaporation Ponds



MW-4A: COC Concentrations and Groundwater Elevations

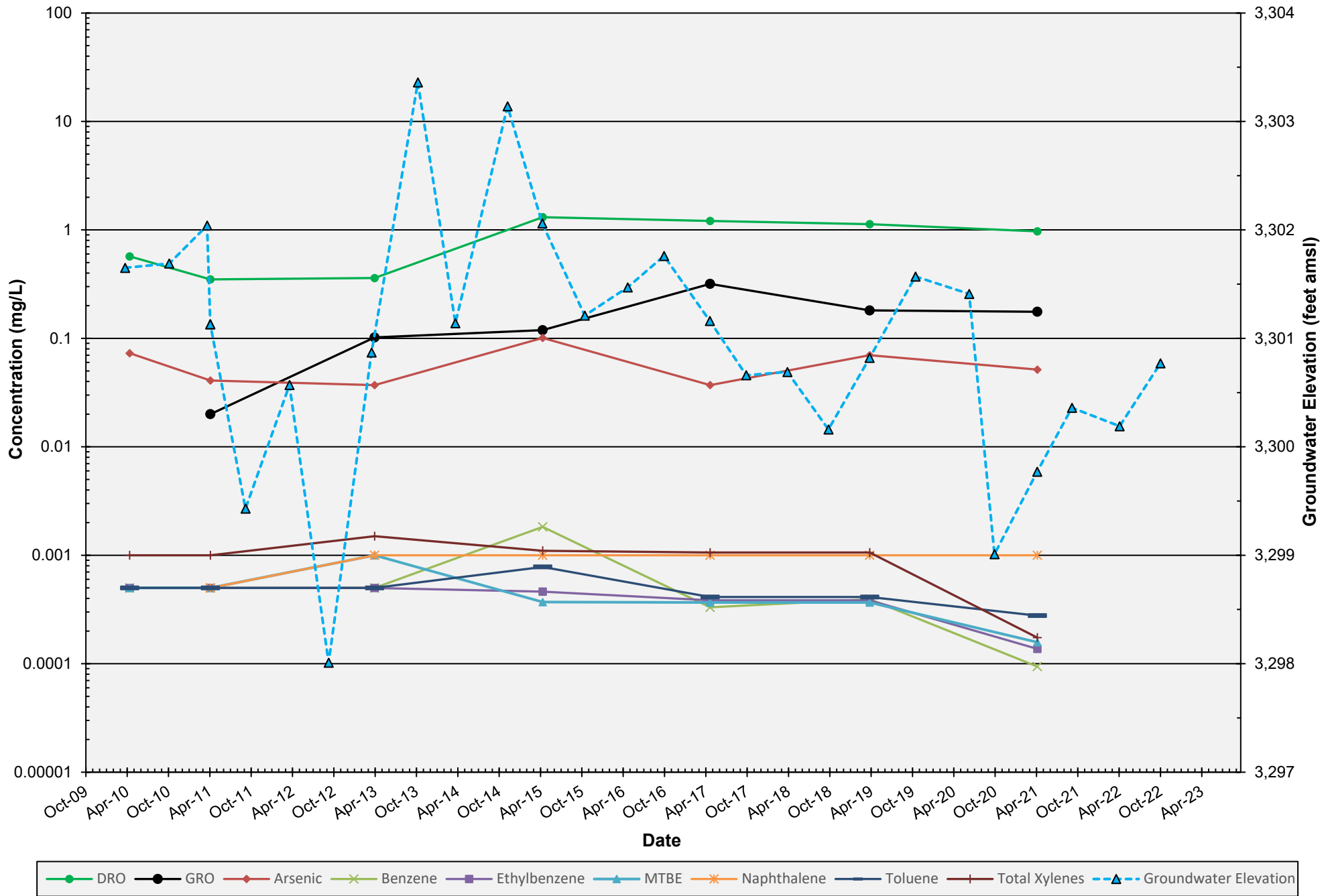
HF Sinclair Navajo Refining LLC - Artesia Refinery

Evaporation Ponds



MW-4B: COC Concentrations and Groundwater Elevations

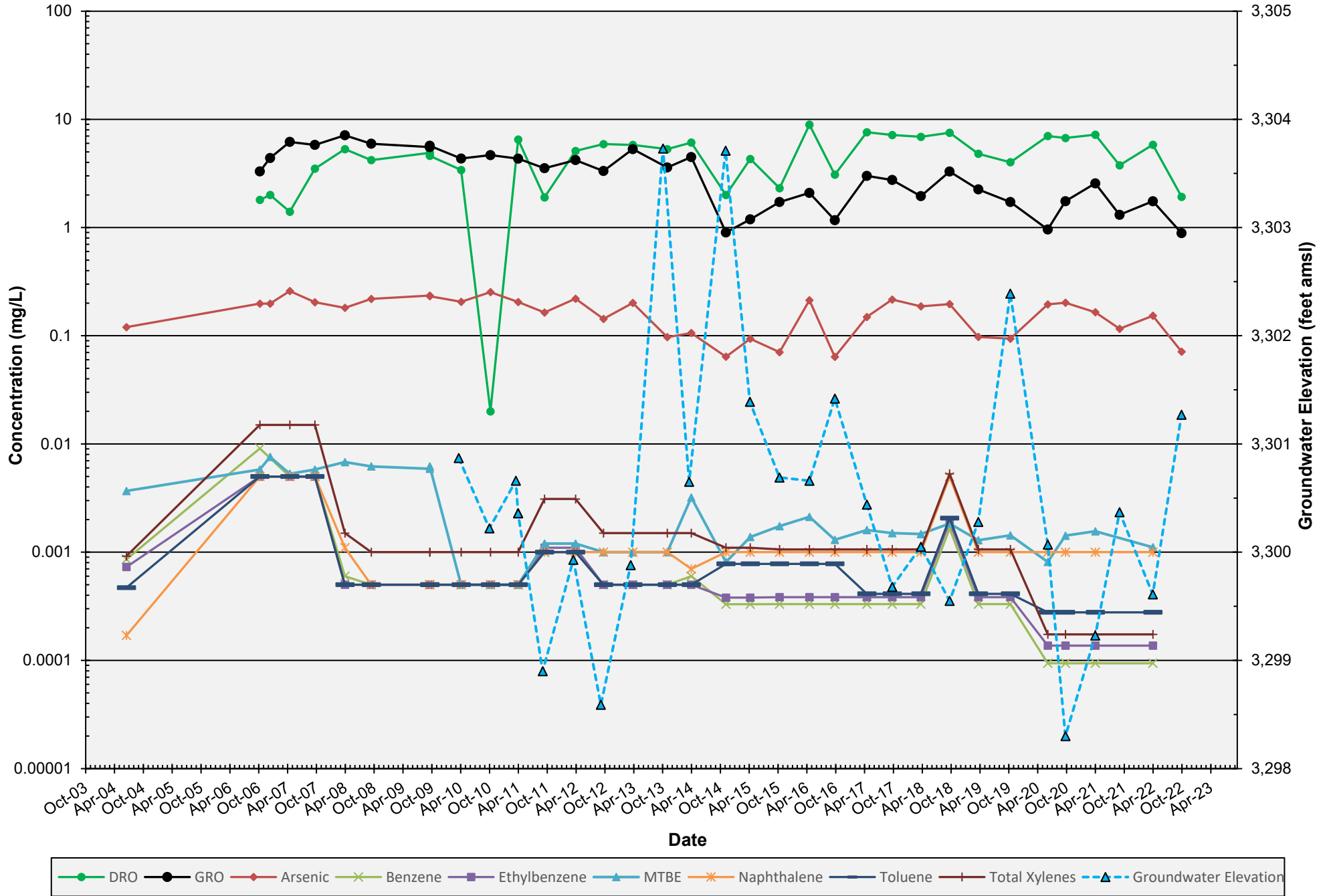
HF Sinclair Navajo Refining LLC - Artesia Refinery
Evaporation Ponds



MW-5A: COC Concentrations and Groundwater Elevations

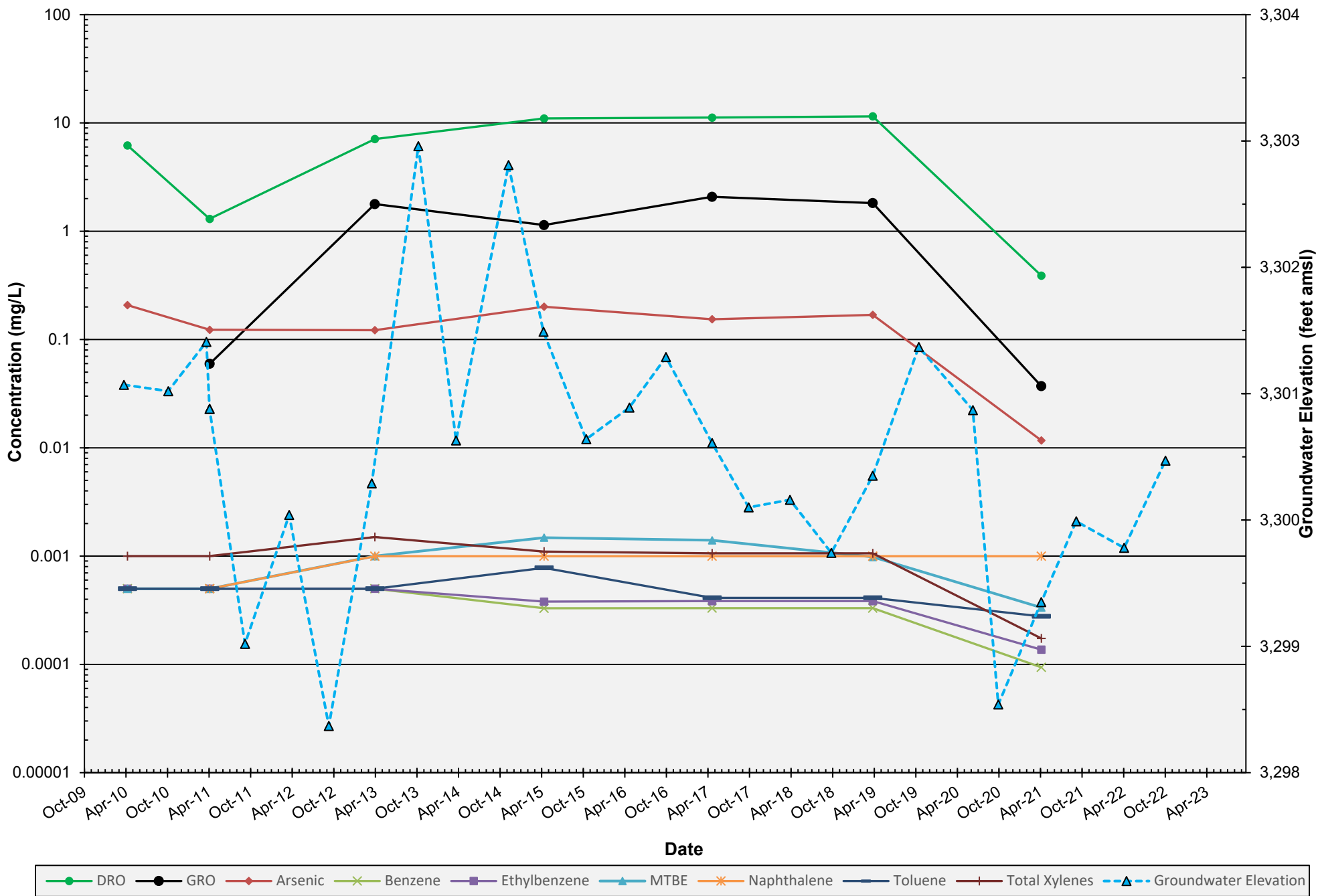
HF Sinclair Navajo Refining LLC - Artesia Refinery

Evaporation Ponds



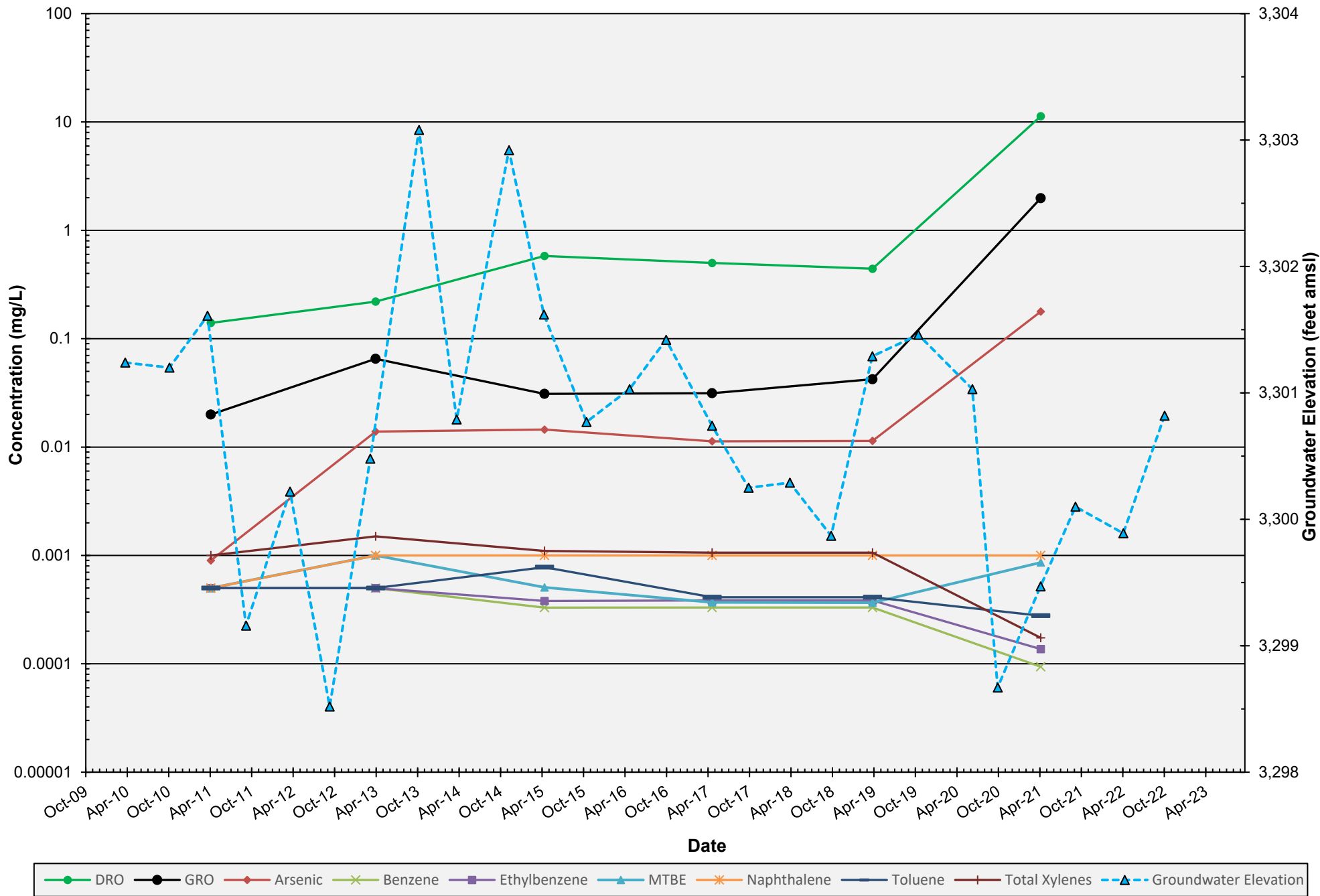
MW-5B: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery
Evaporation Ponds



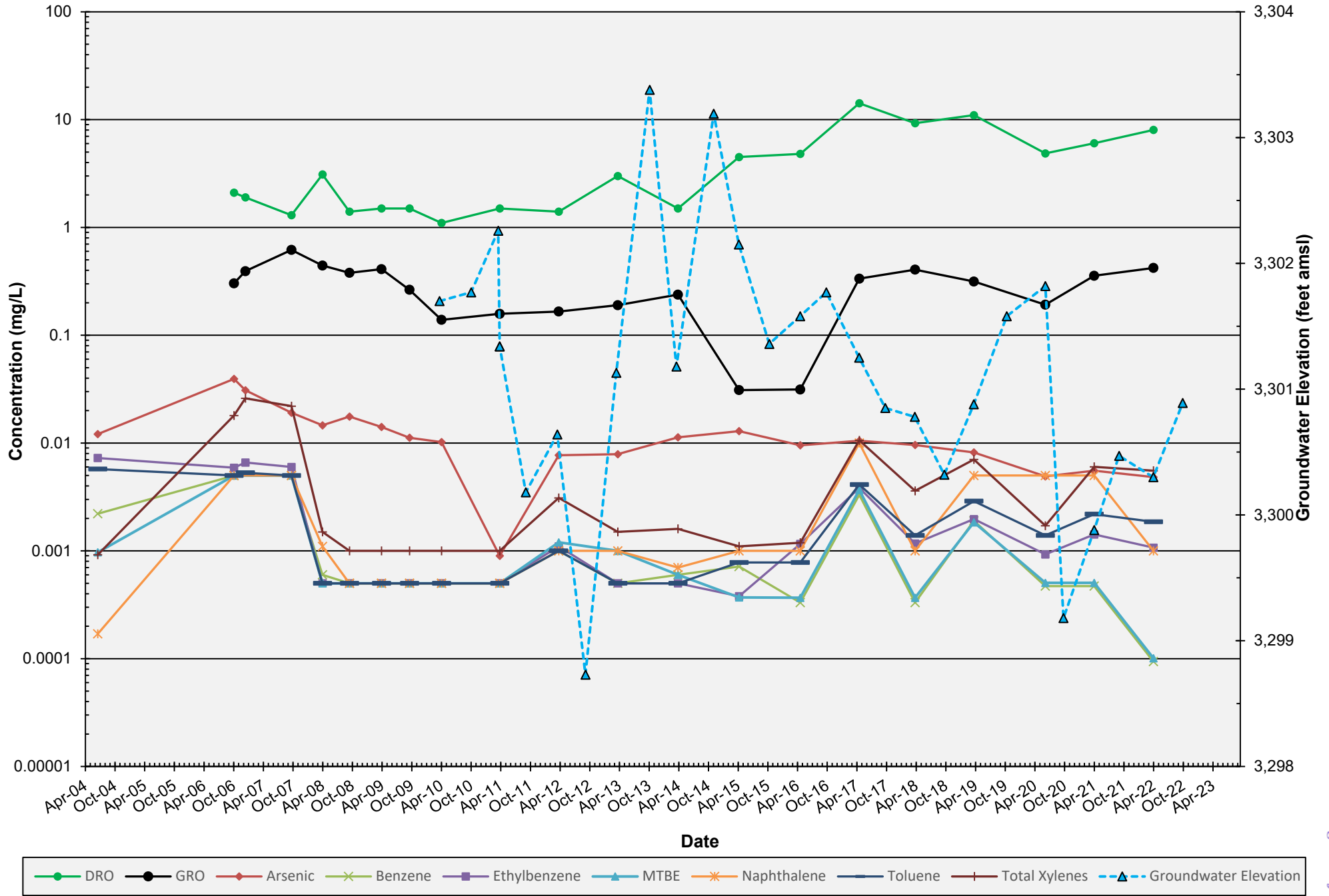
MW-5C: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery
Evaporation Ponds



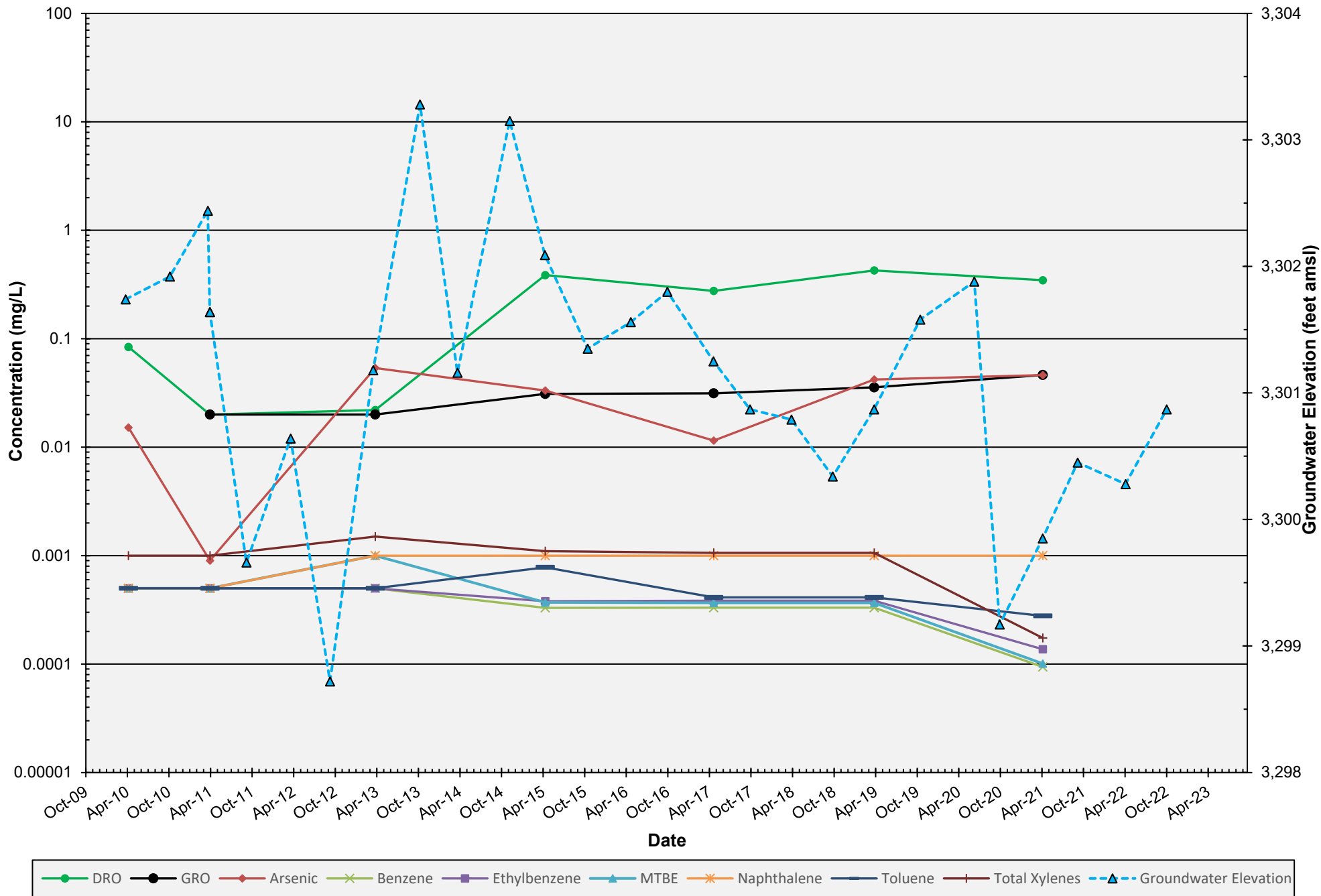
MW-6A: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery
Evaporation Ponds



MW-6B: COC Concentrations and Groundwater Elevations

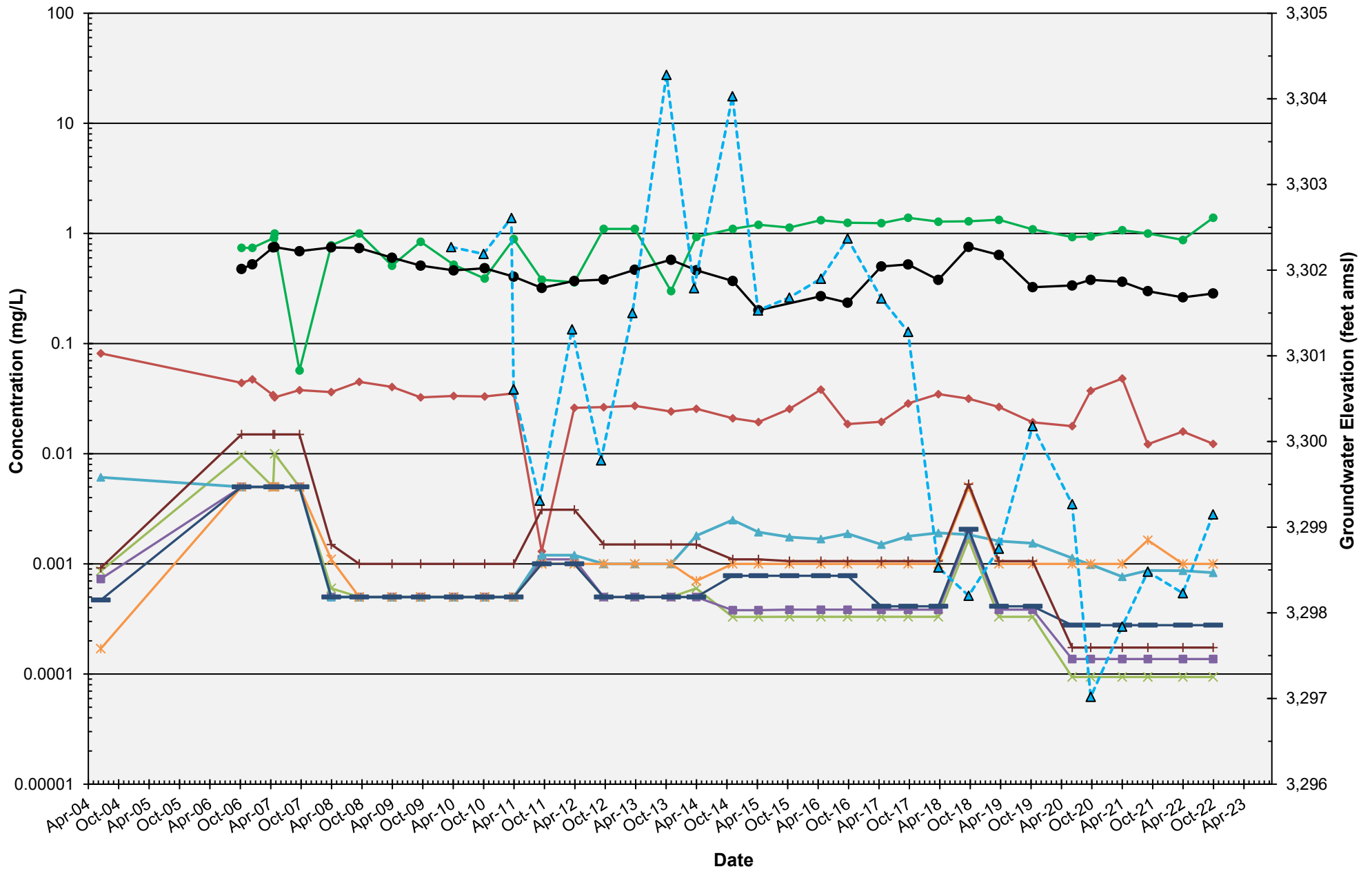
HF Sinclair Navajo Refining LLC - Artesia Refinery
Evaporation Ponds



MW-7A: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery

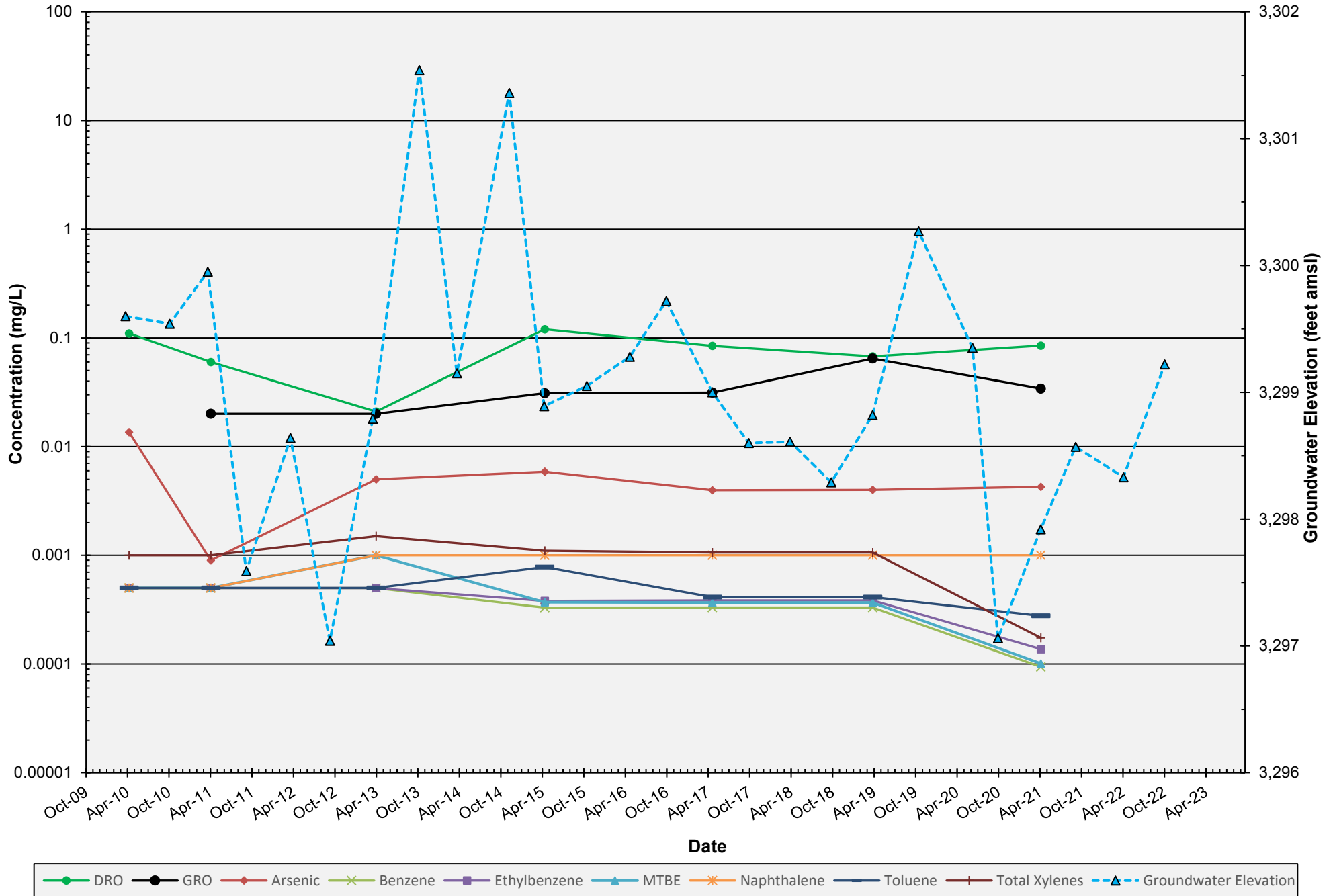
Evaporation Ponds



MW-7B: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery

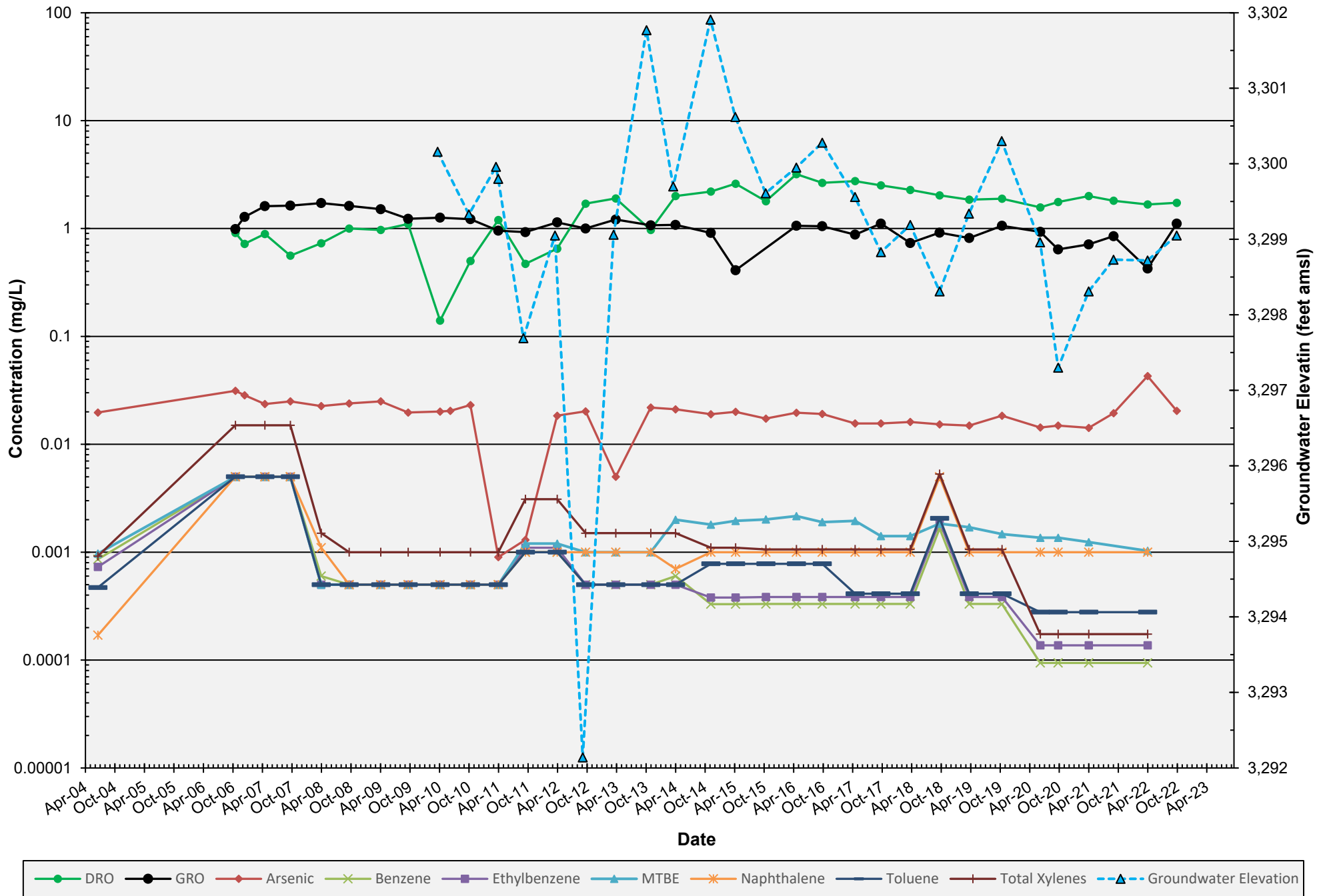
Evaporation Ponds



MW-10: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery

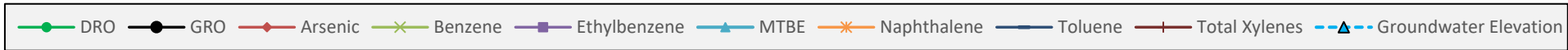
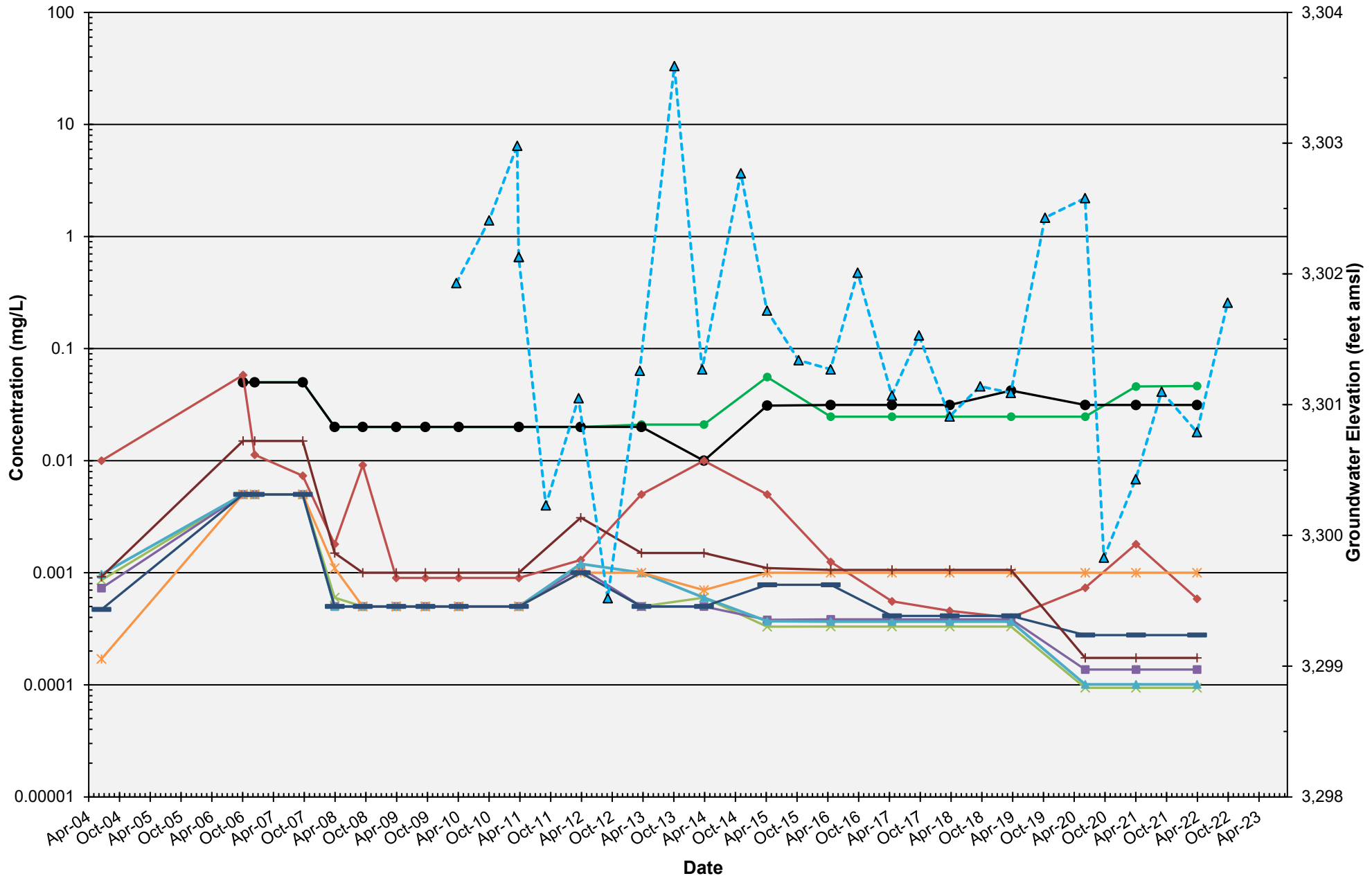
Evaporation Ponds



MW-11A: COC Concentrations and Groundwater Elevations

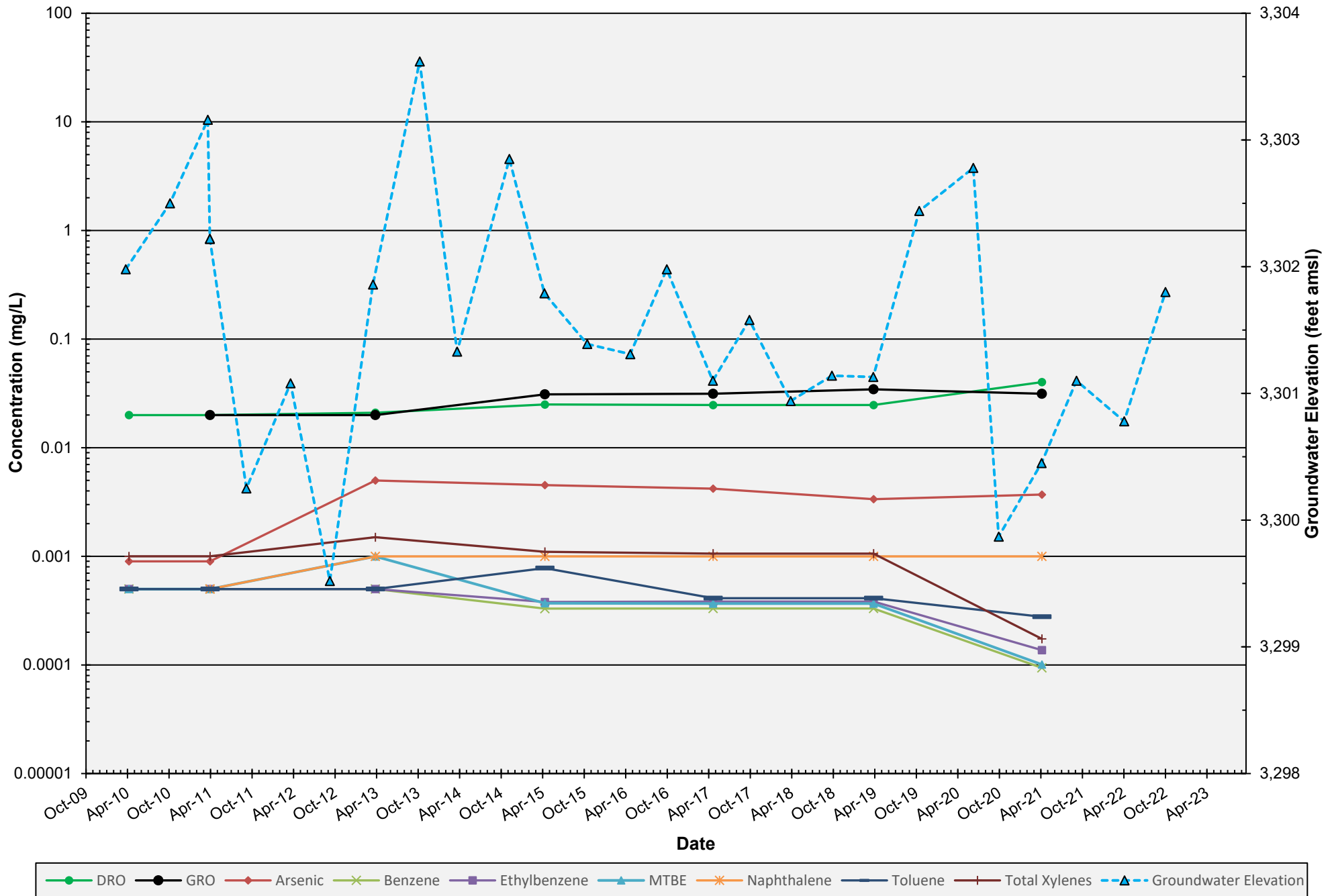
HF Sinclair Navajo Refining LLC - Artesia Refinery

Evaporation Ponds



MW-11B: COC Concentrations and Groundwater Elevations

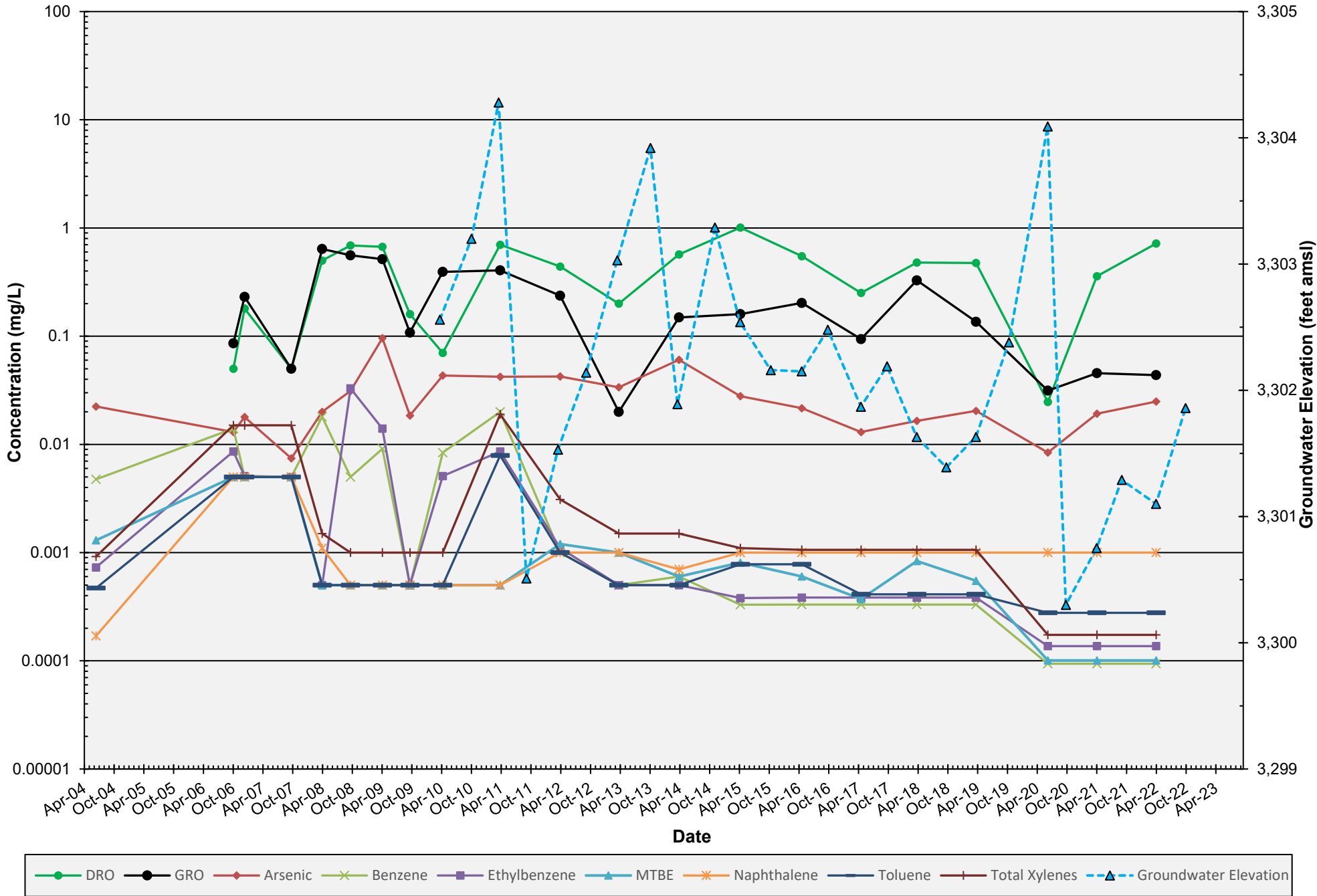
HF Sinclair Navajo Refining LLC - Artesia Refinery
Evaporation Ponds



MW-15: COC Concentrations and Groundwater Elevations

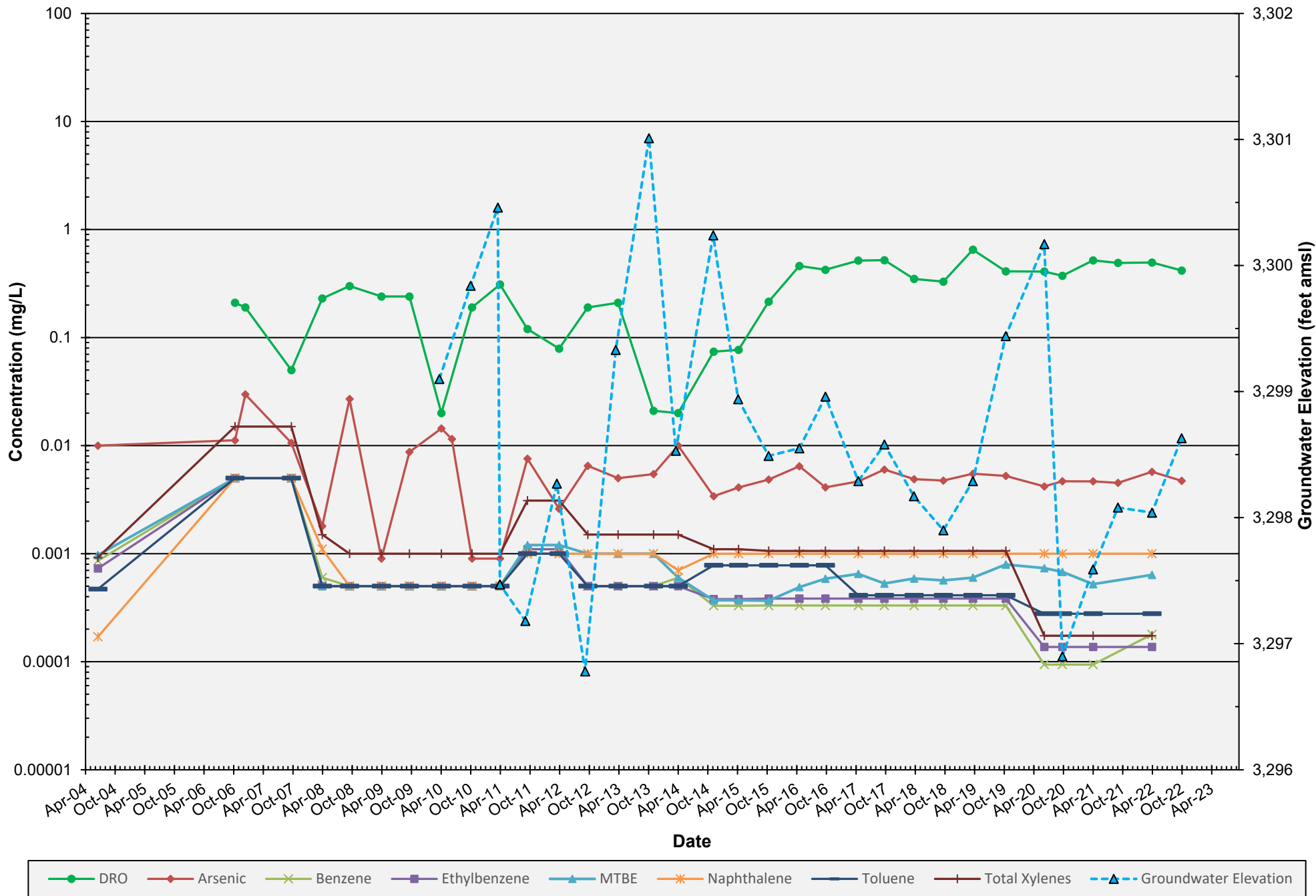
HF Sinclair Navajo Refining LLC - Artesia Refinery

Evaporation Ponds



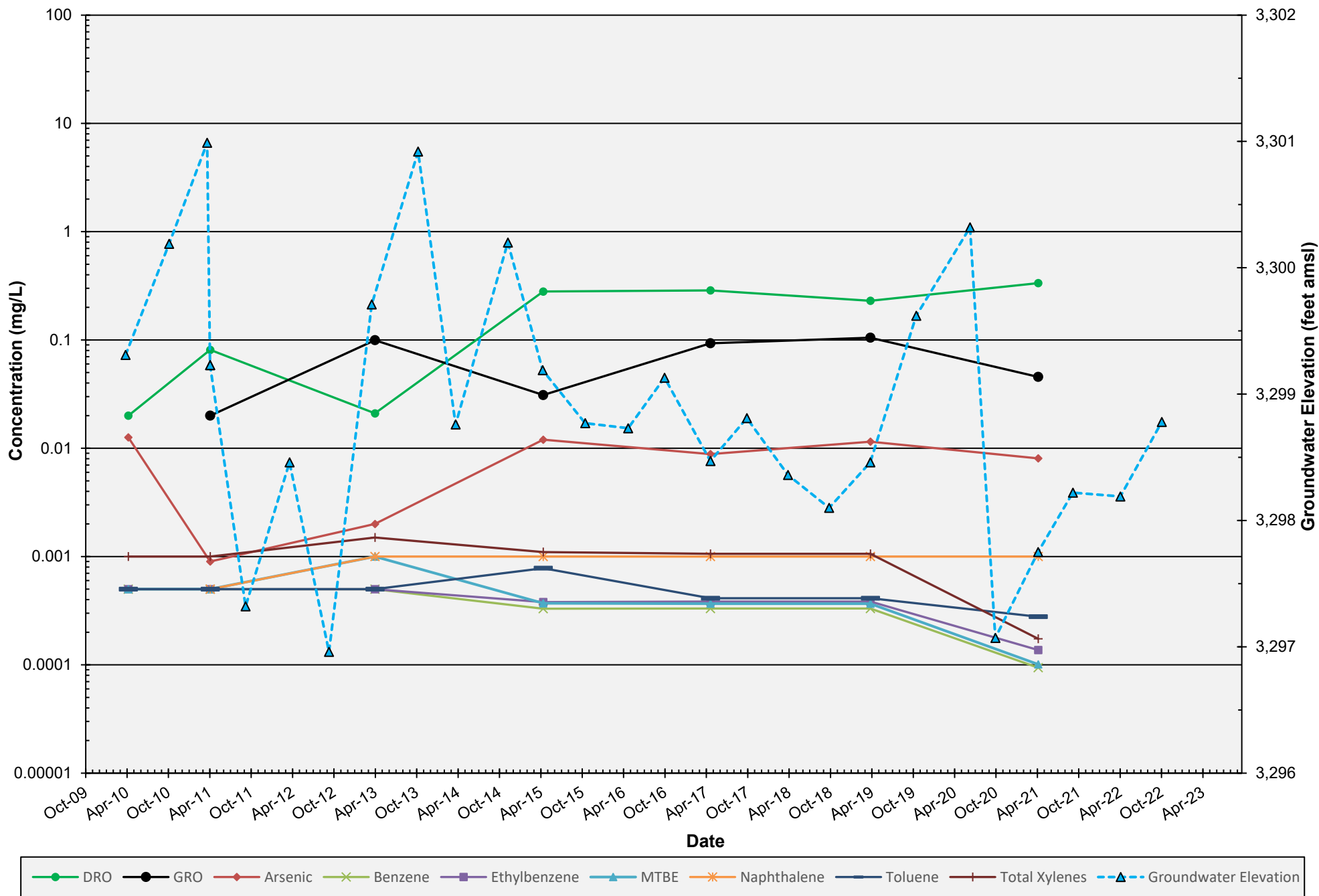
MW-18A: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery
Evaporation Ponds



MW-18B: COC Concentrations and Groundwater Elevations

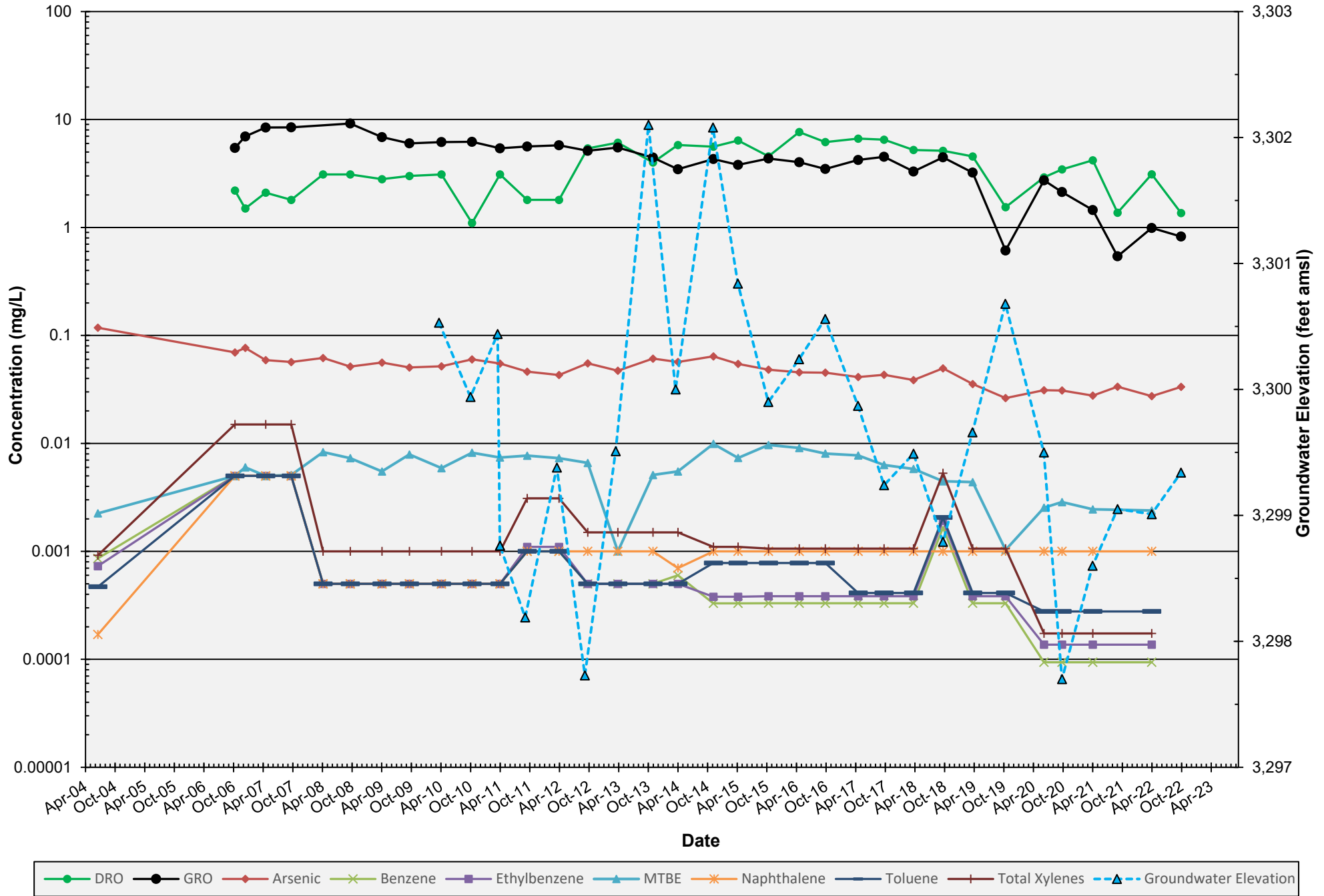
HF Sinclair Navajo Refining LLC - Artesia Refinery
Evaporation Ponds



MW-22A: COC Concentrations and Groundwater Elevations

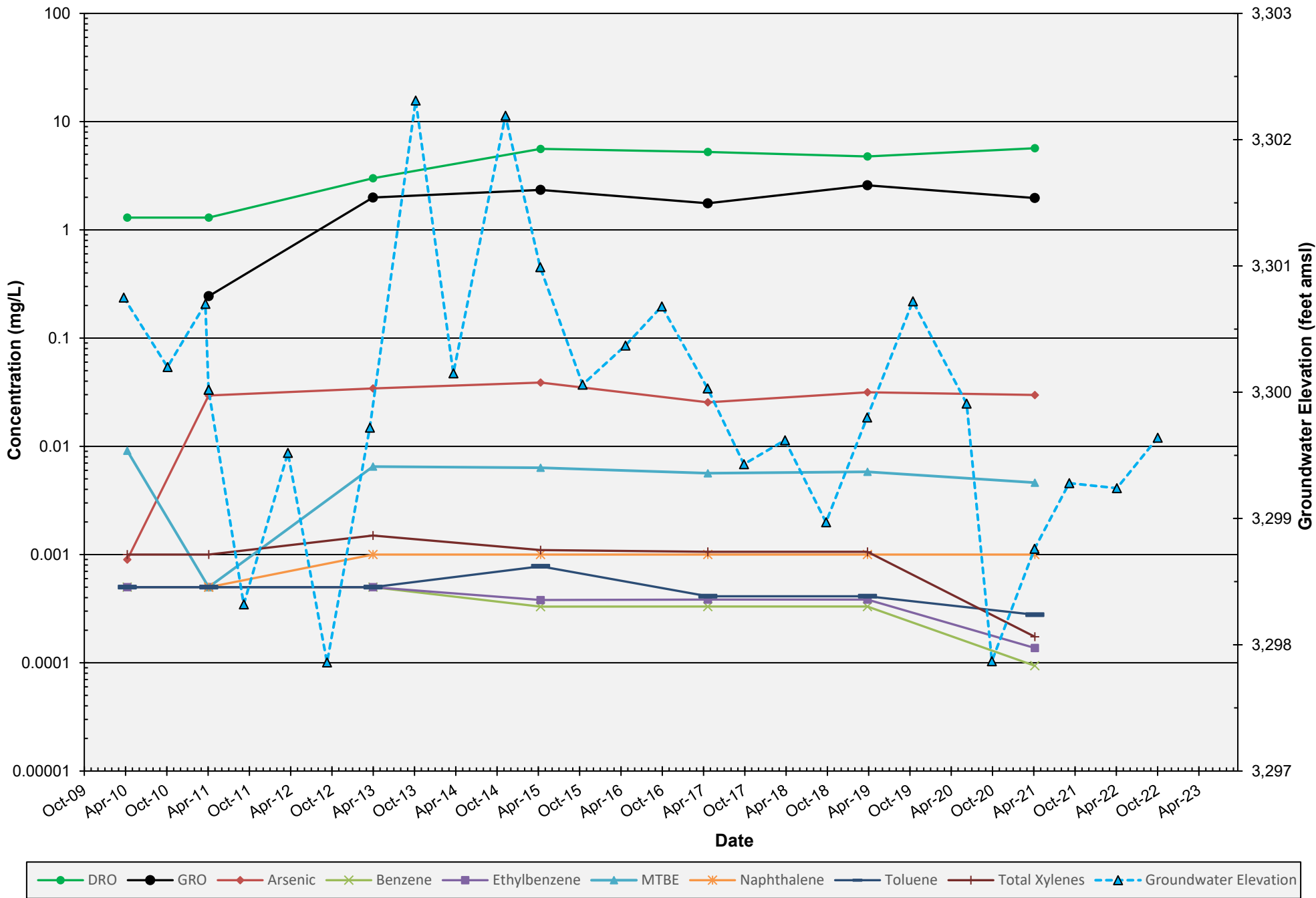
HF Sinclair Navajo Refining LLC - Artesia Refinery

Evaporation Ponds



MW-22B: COC Concentrations and Groundwater Elevations

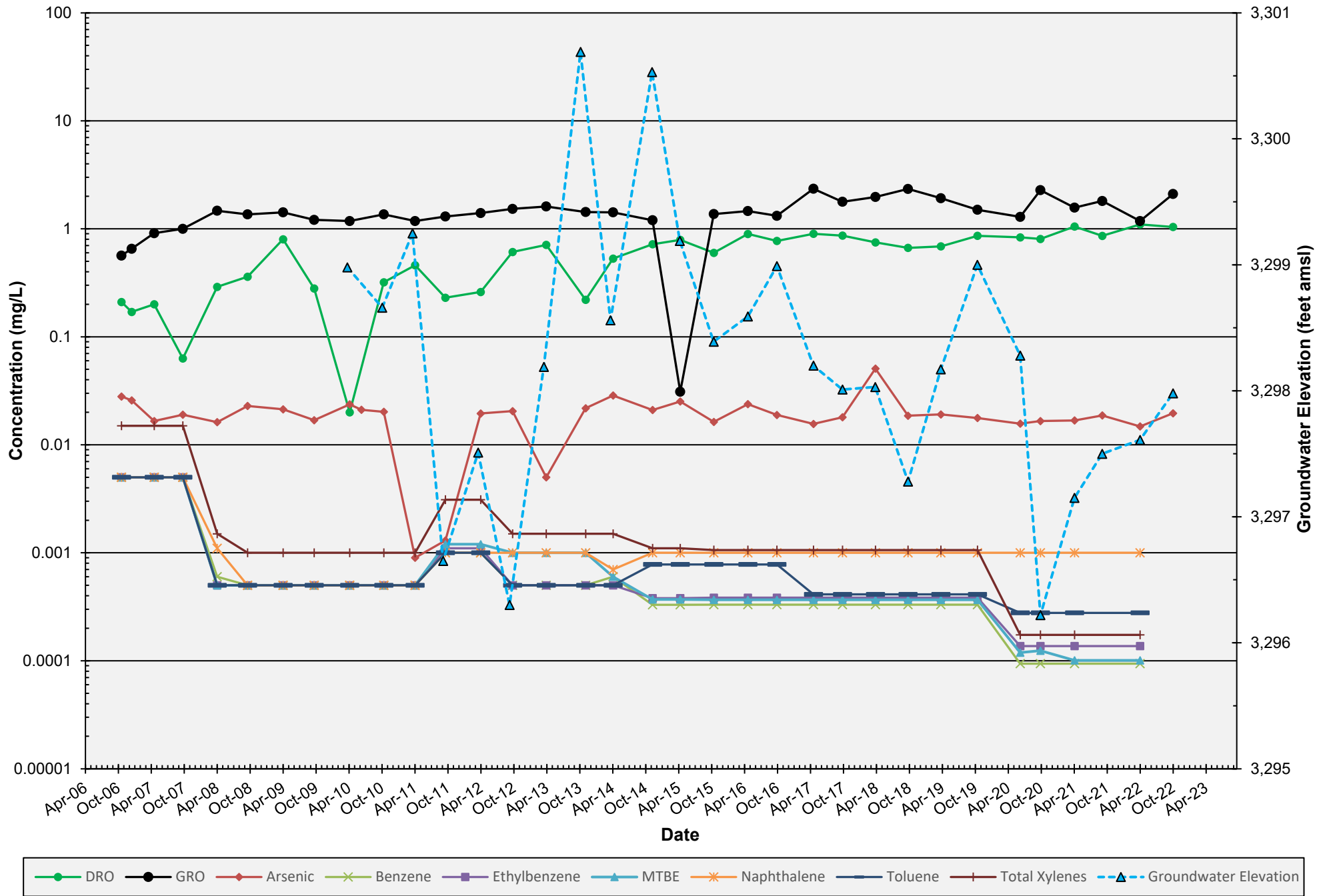
HF Sinclair Navajo Refining LLC - Artesia Refinery
Evaporation Ponds



MW-70: COC Concentrations and Groundwater Elevations

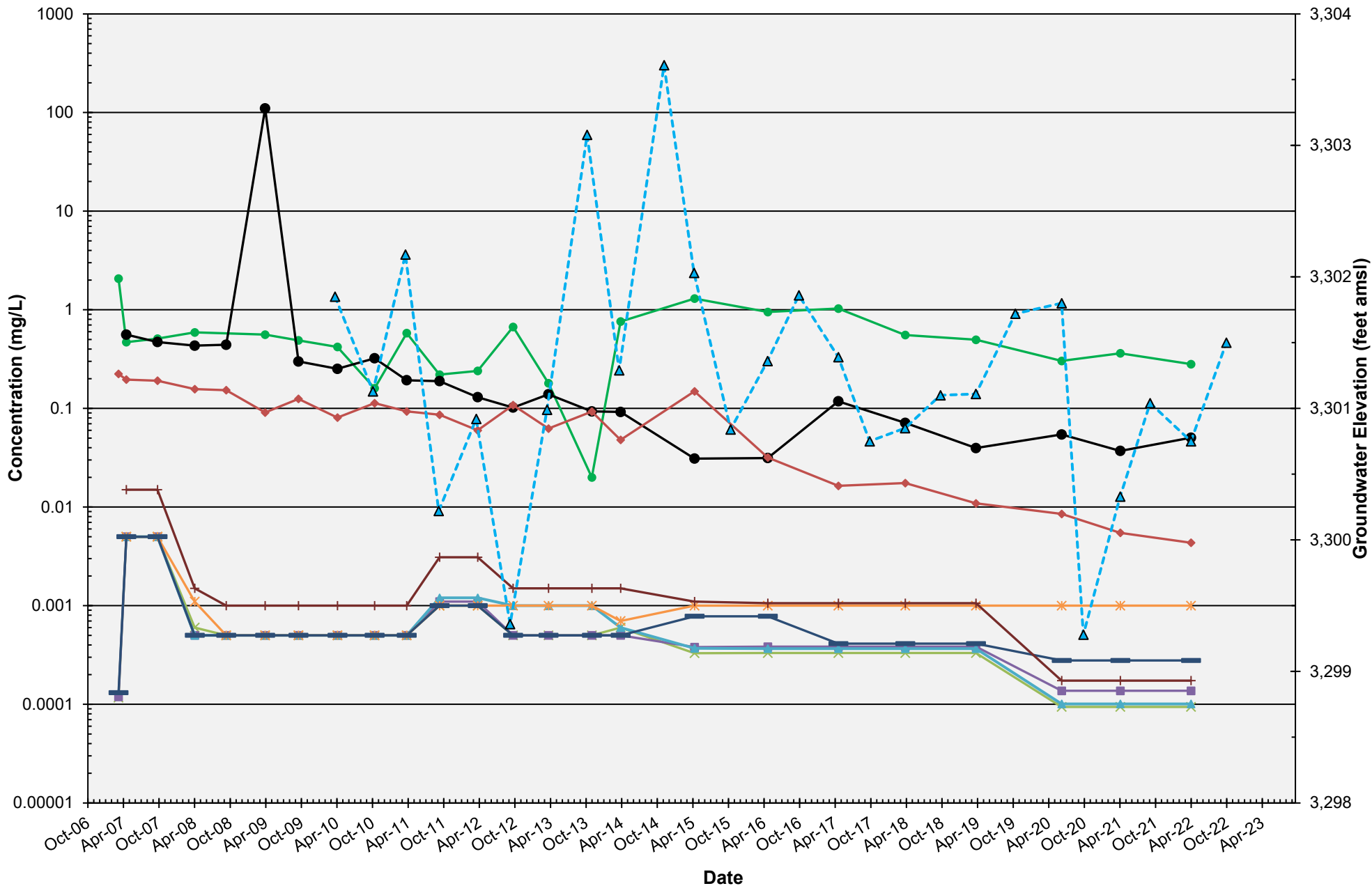
HF Sinclair Navajo Refining LLC - Artesia Refinery

Evaporation Ponds



MW-72: COC Concentrations and Groundwater Elevations

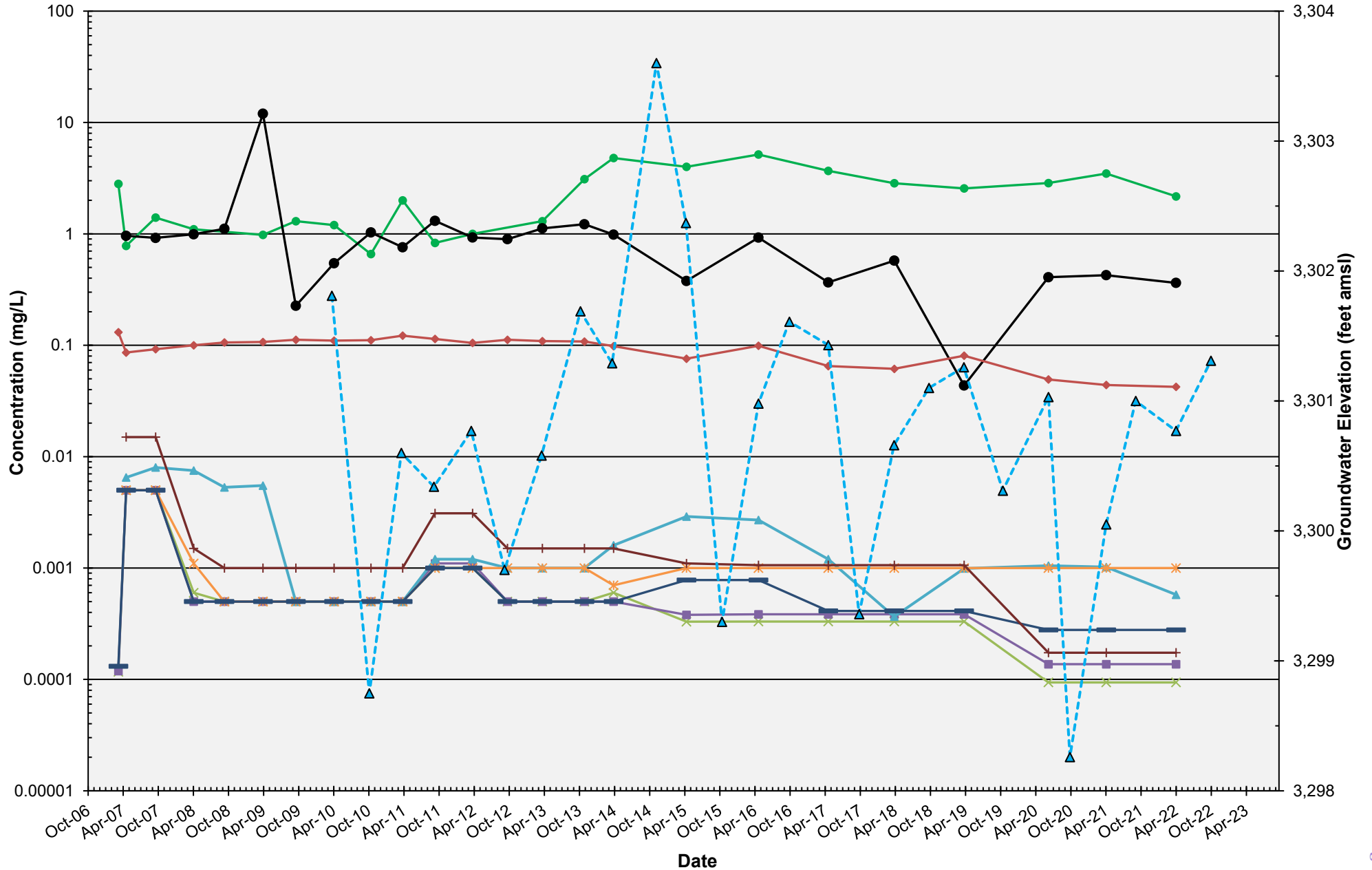
HF Sinclair Navajo Refining LLC - Artesia Refinery
Evaporation Ponds



MW-73: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery

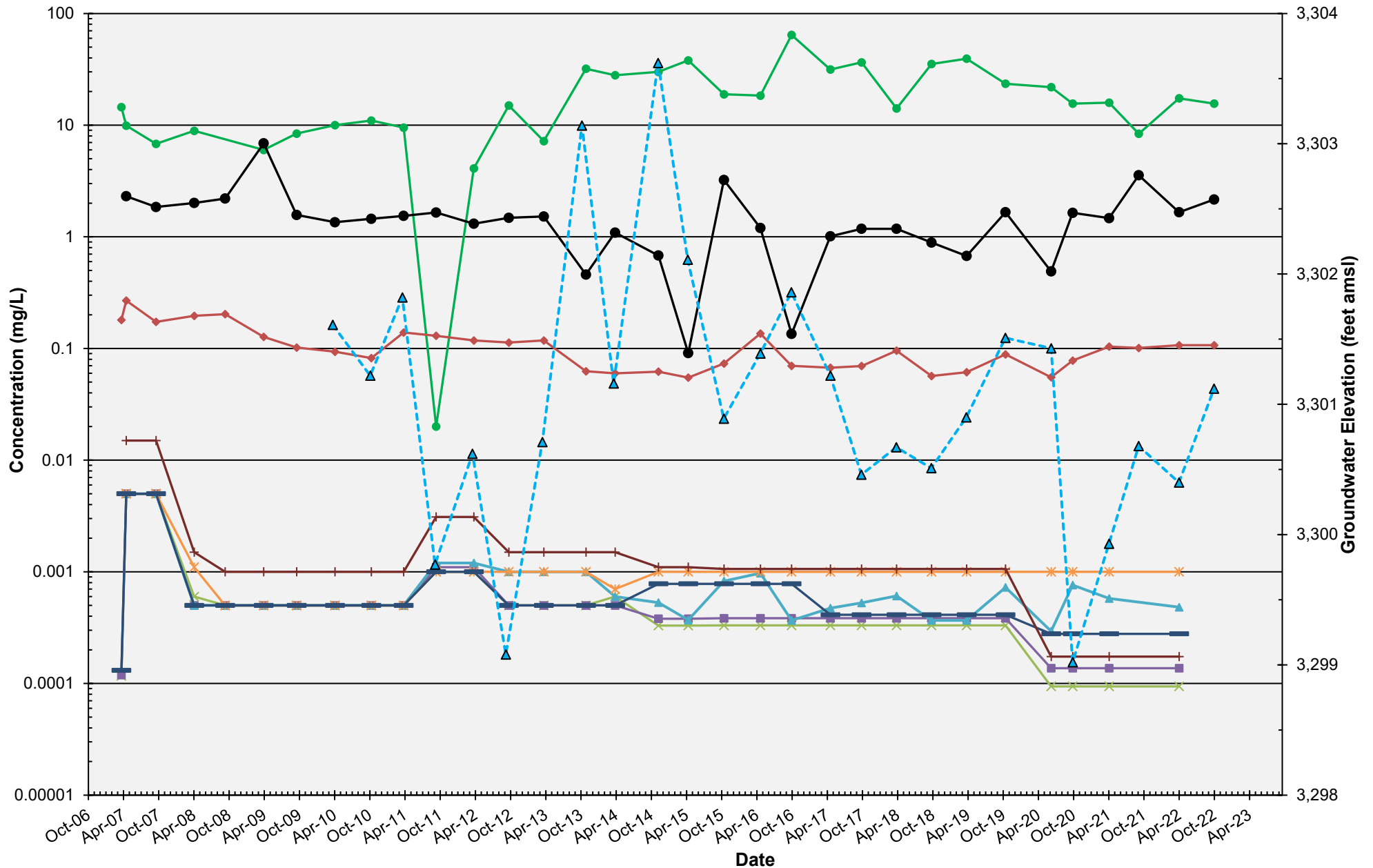
Evaporation Ponds



MW-74: COC Concentrations and Groundwater Elevations

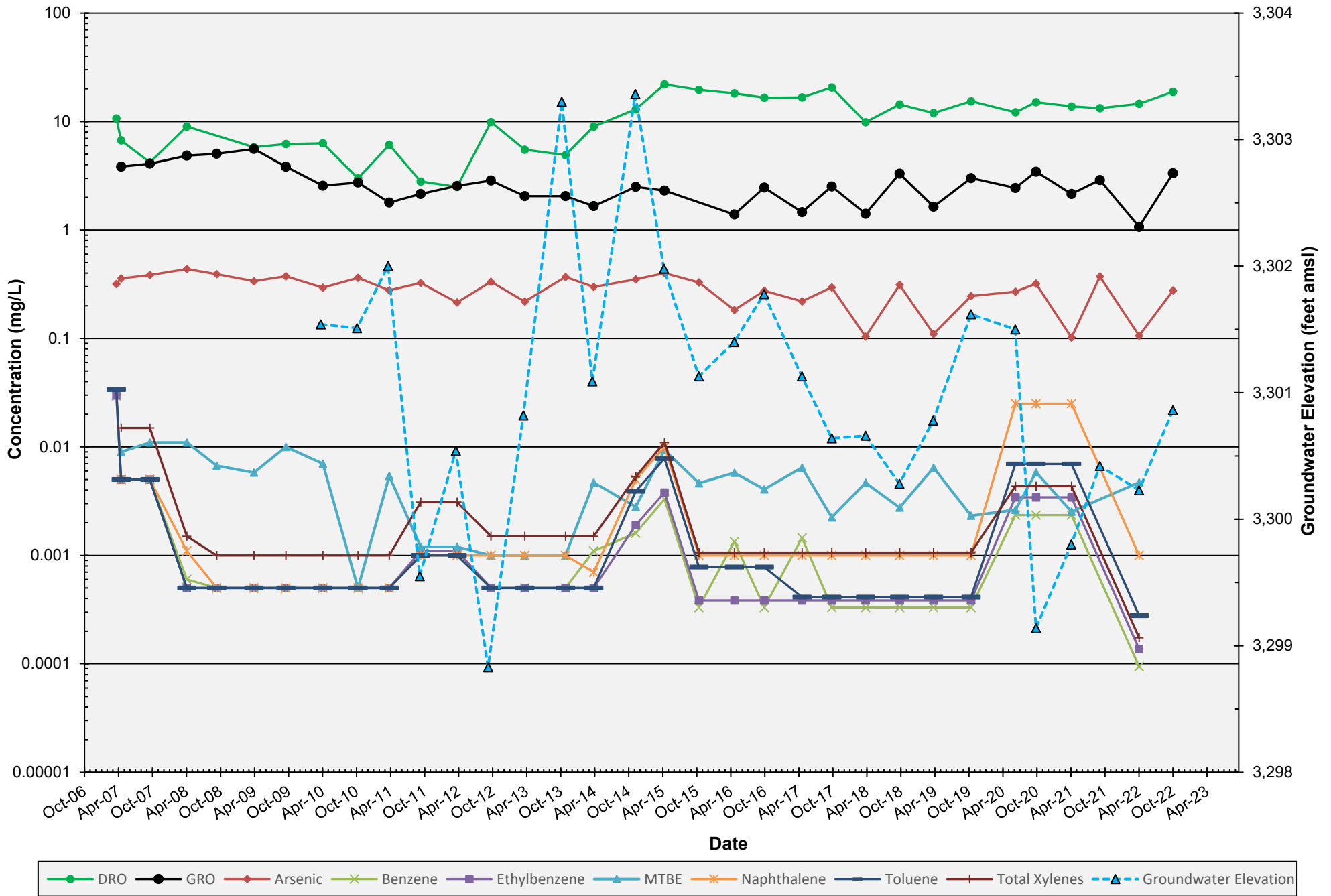
HF Sinclair Navajo Refining LLC - Artesia Refinery

Evaporation Ponds



MW-75: COC Concentrations and Groundwater Elevations

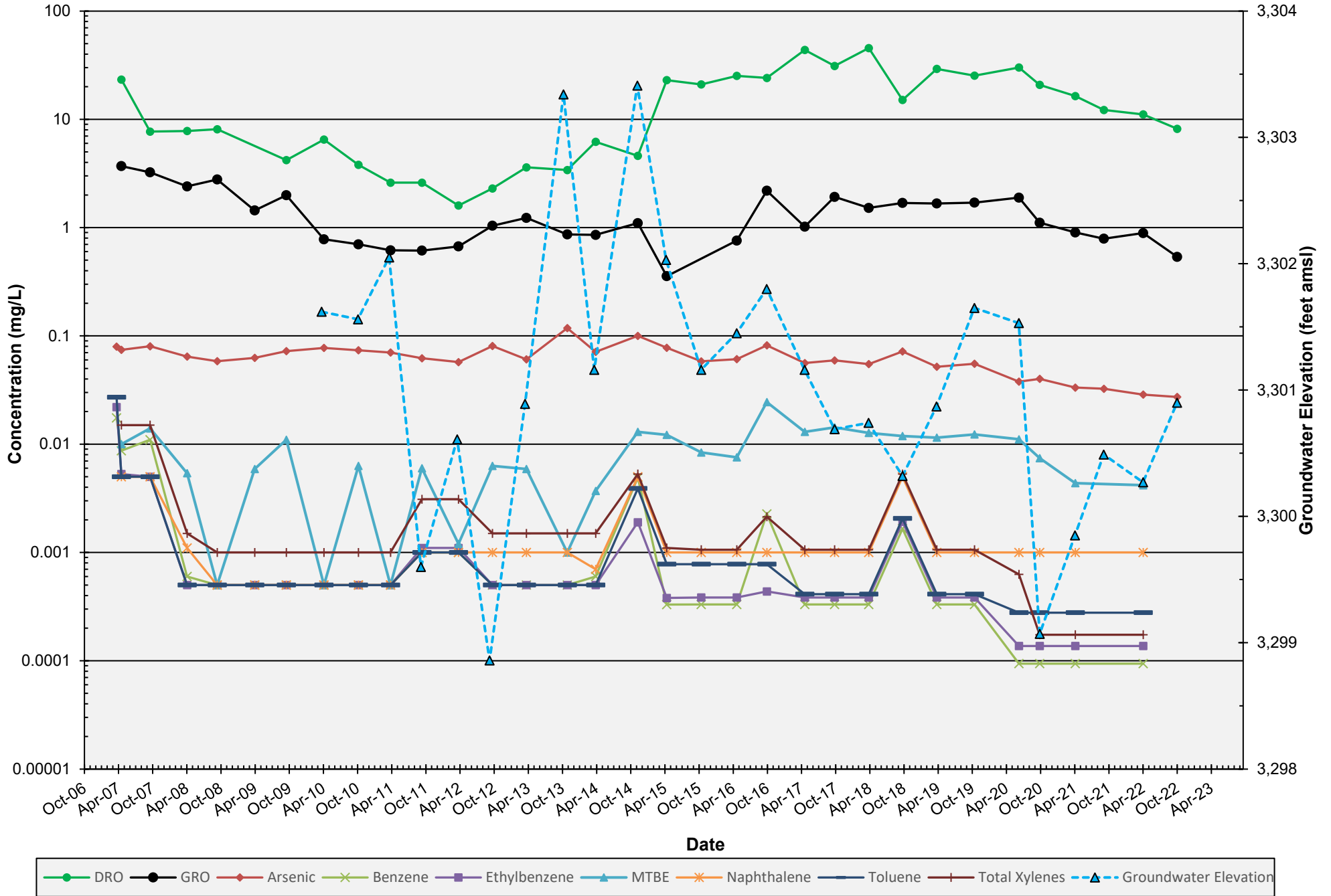
HF Sinclair Navajo Refining LLC - Artesia Refinery
Evaporation Ponds



MW-76: COC Concentrations and Groundwater Elevations

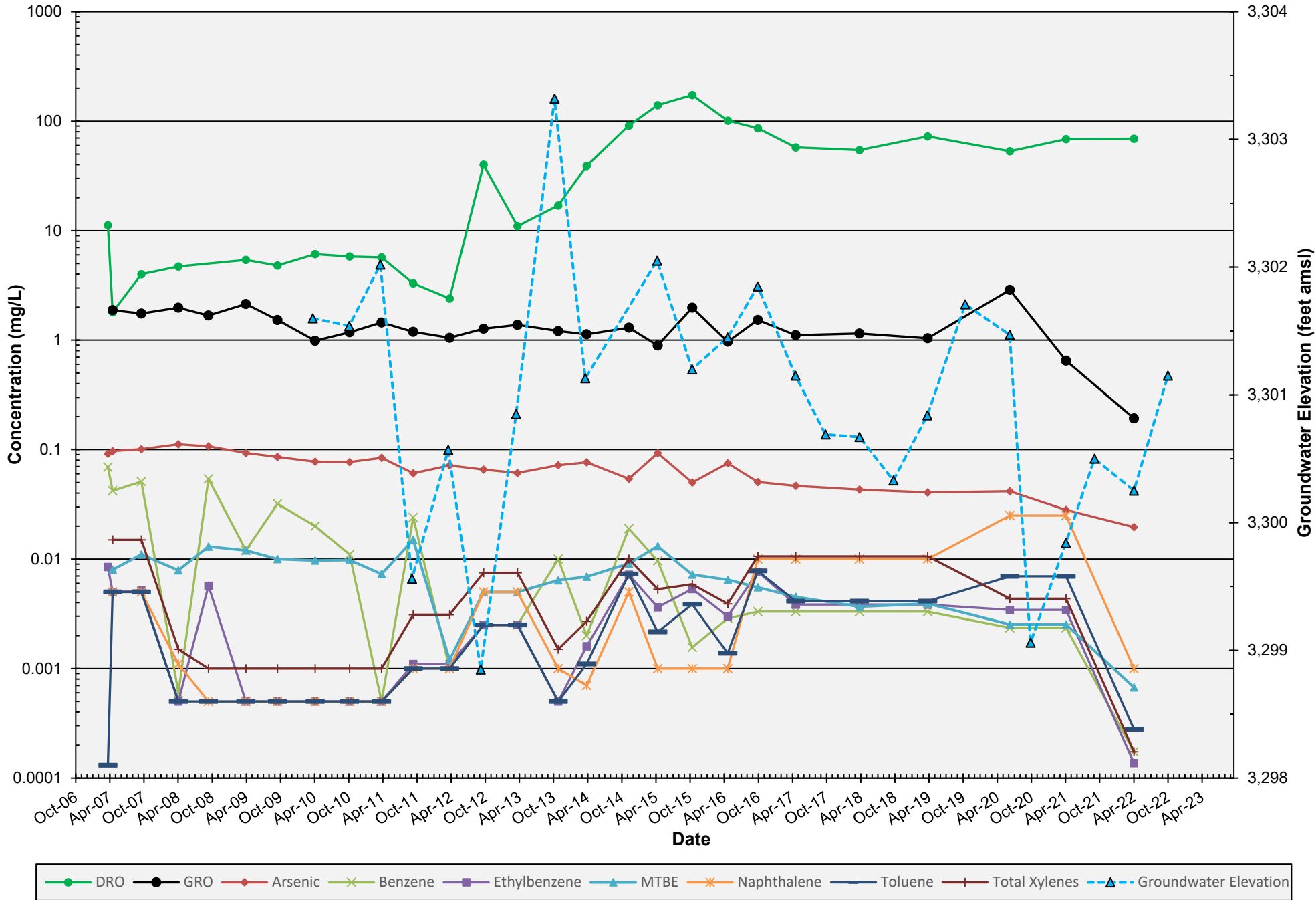
HF Sinclair Navajo Refining LLC - Artesia Refinery

Evaporation Ponds



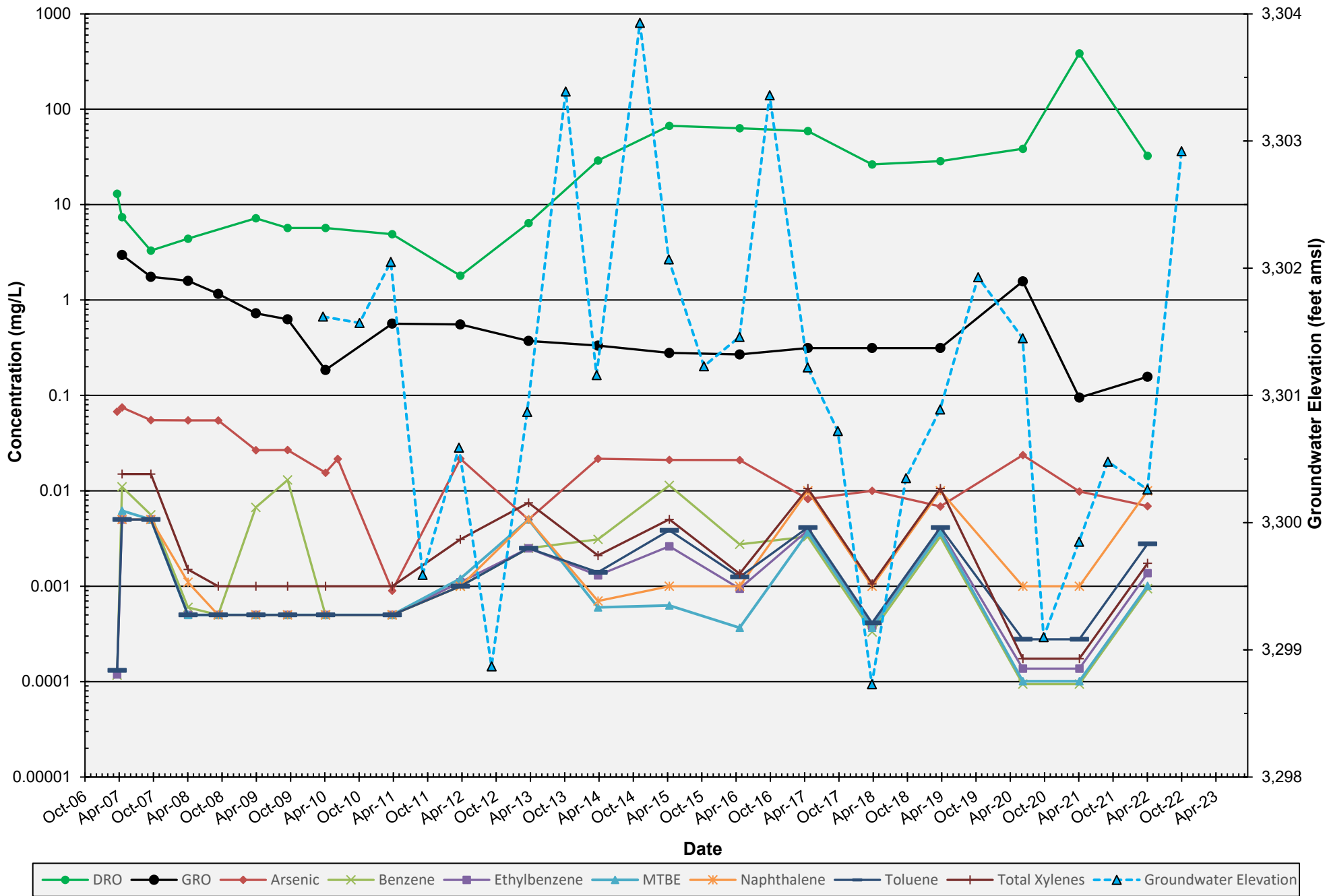
MW-77: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery
Evaporation Ponds



MW-78: COC Concentrations and Groundwater Elevations

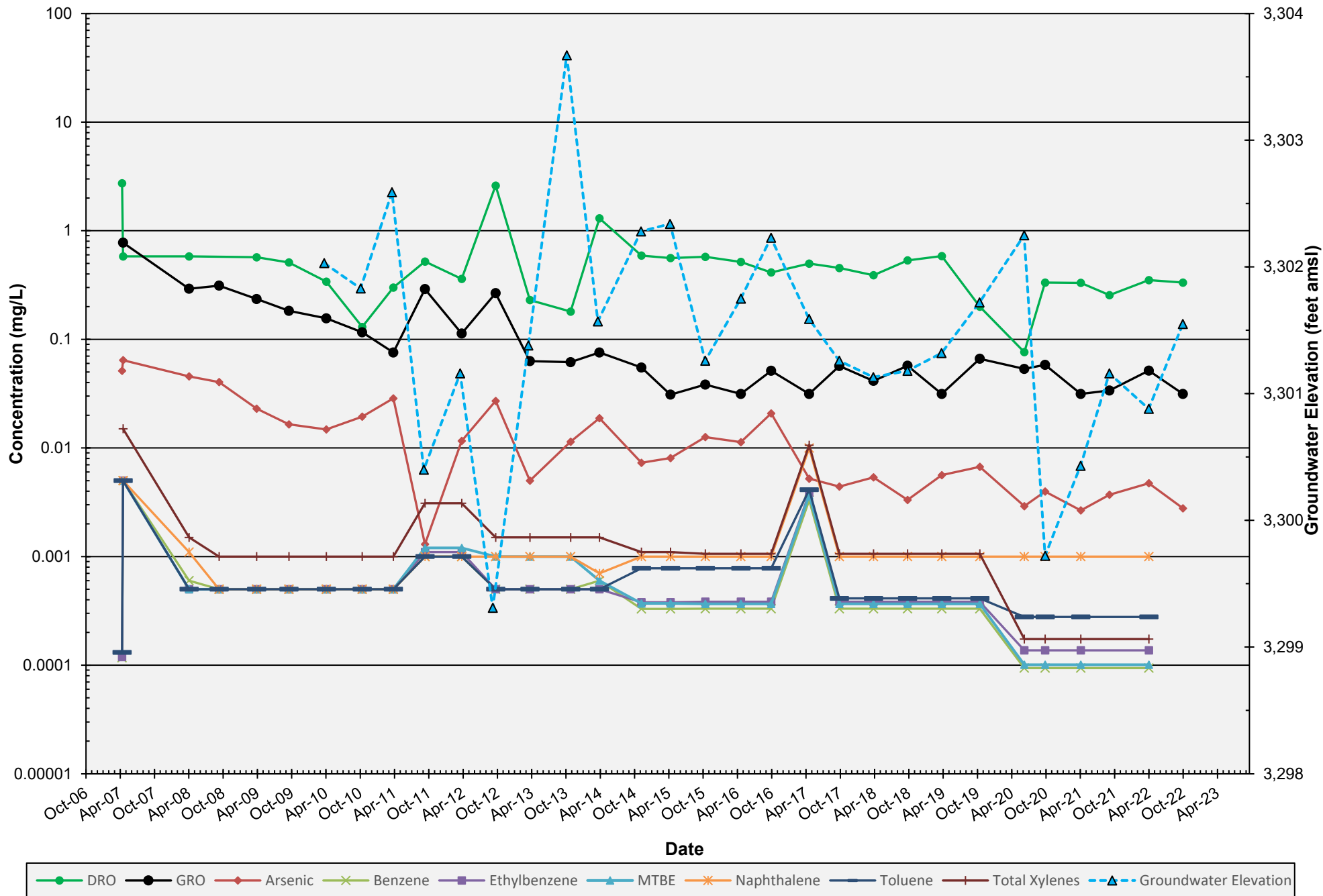
HF Sinclair Navajo Refining LLC - Artesia Refinery
Evaporation Ponds



MW-79: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery

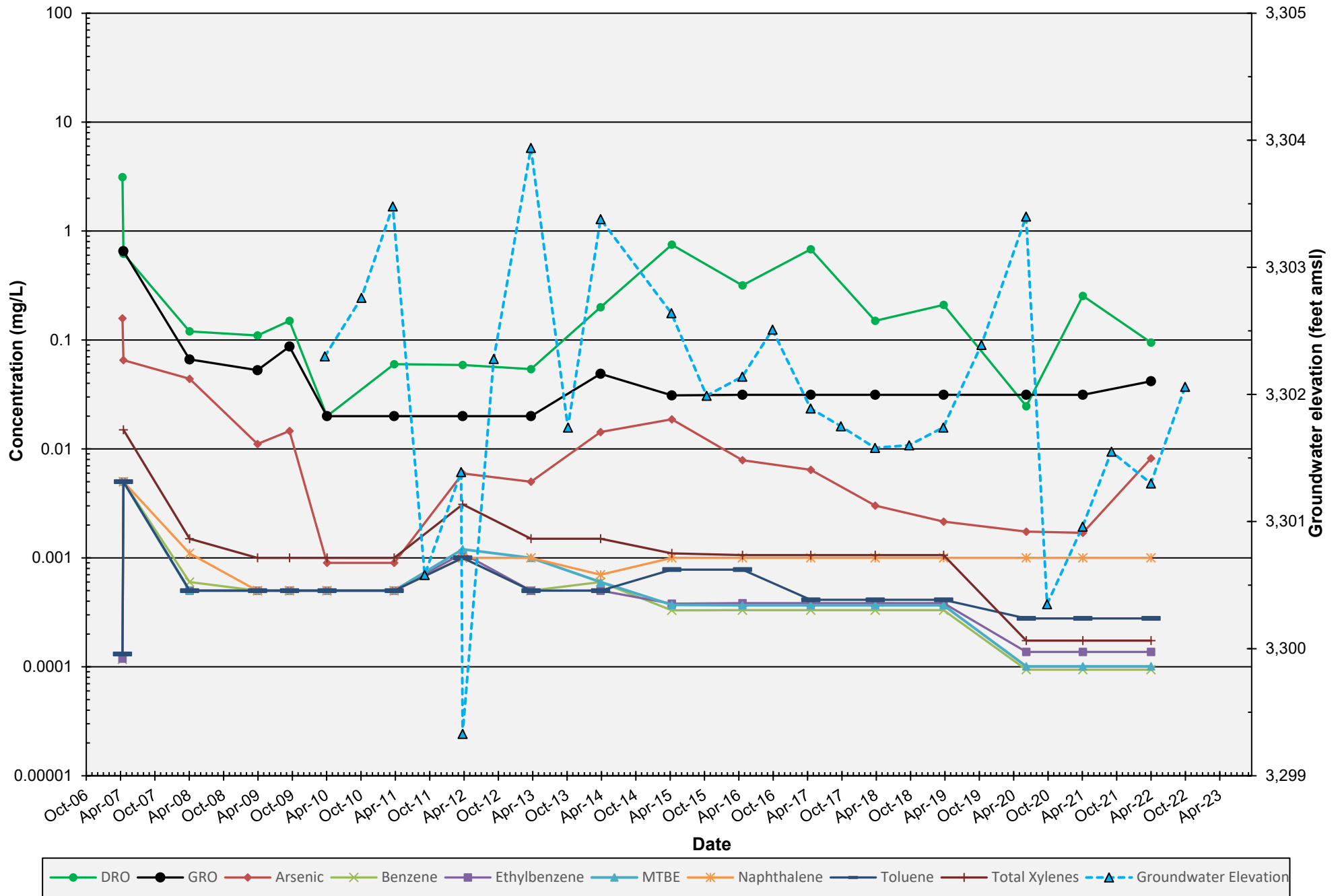
Evaporation Ponds



MW-80: COC Concentrations and Groundwater Elevations

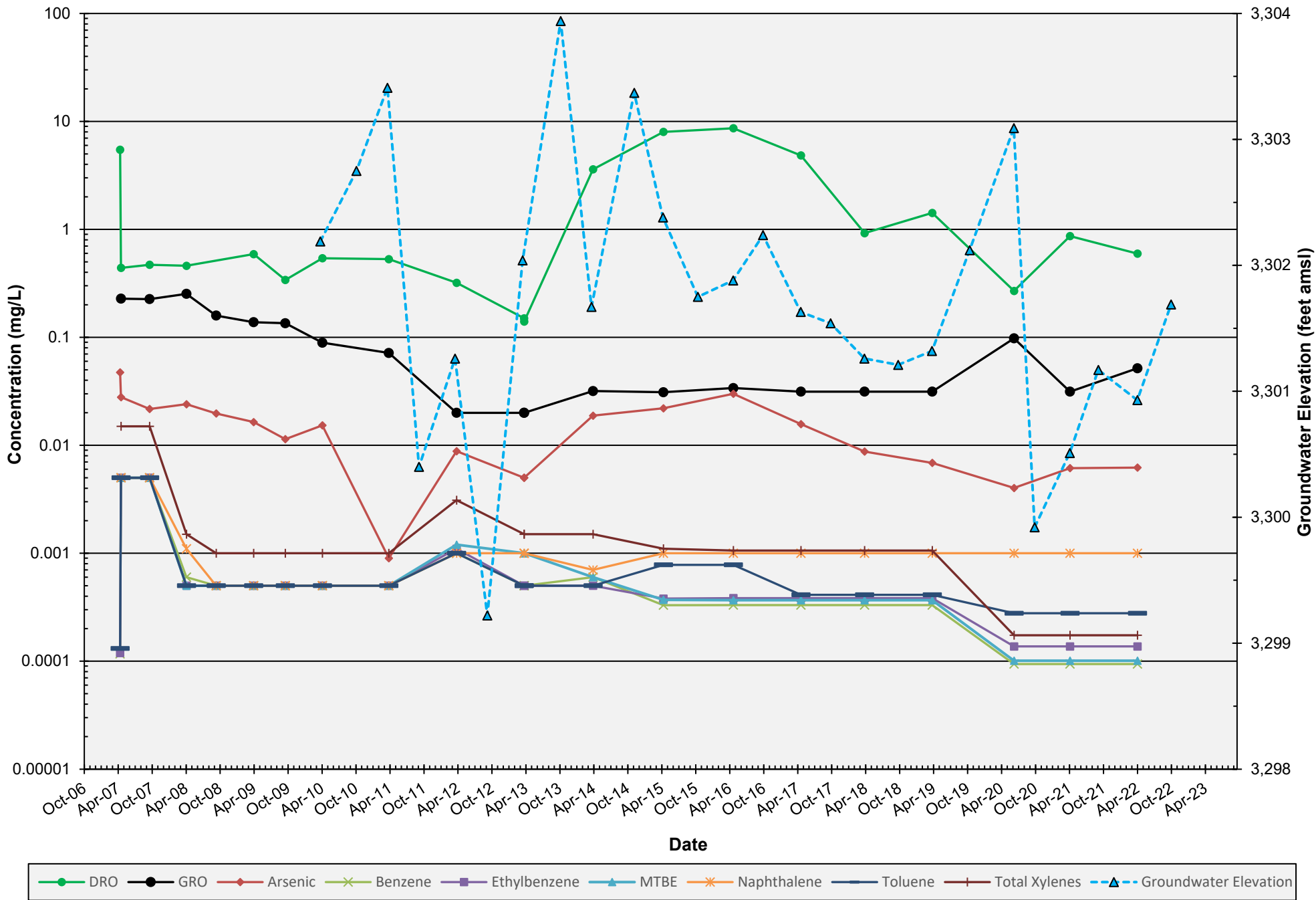
HF Sinclair Navajo Refining LLC - Artesia Refinery

Evaporation Ponds



MW-81: COC Concentrations and Groundwater Elevations

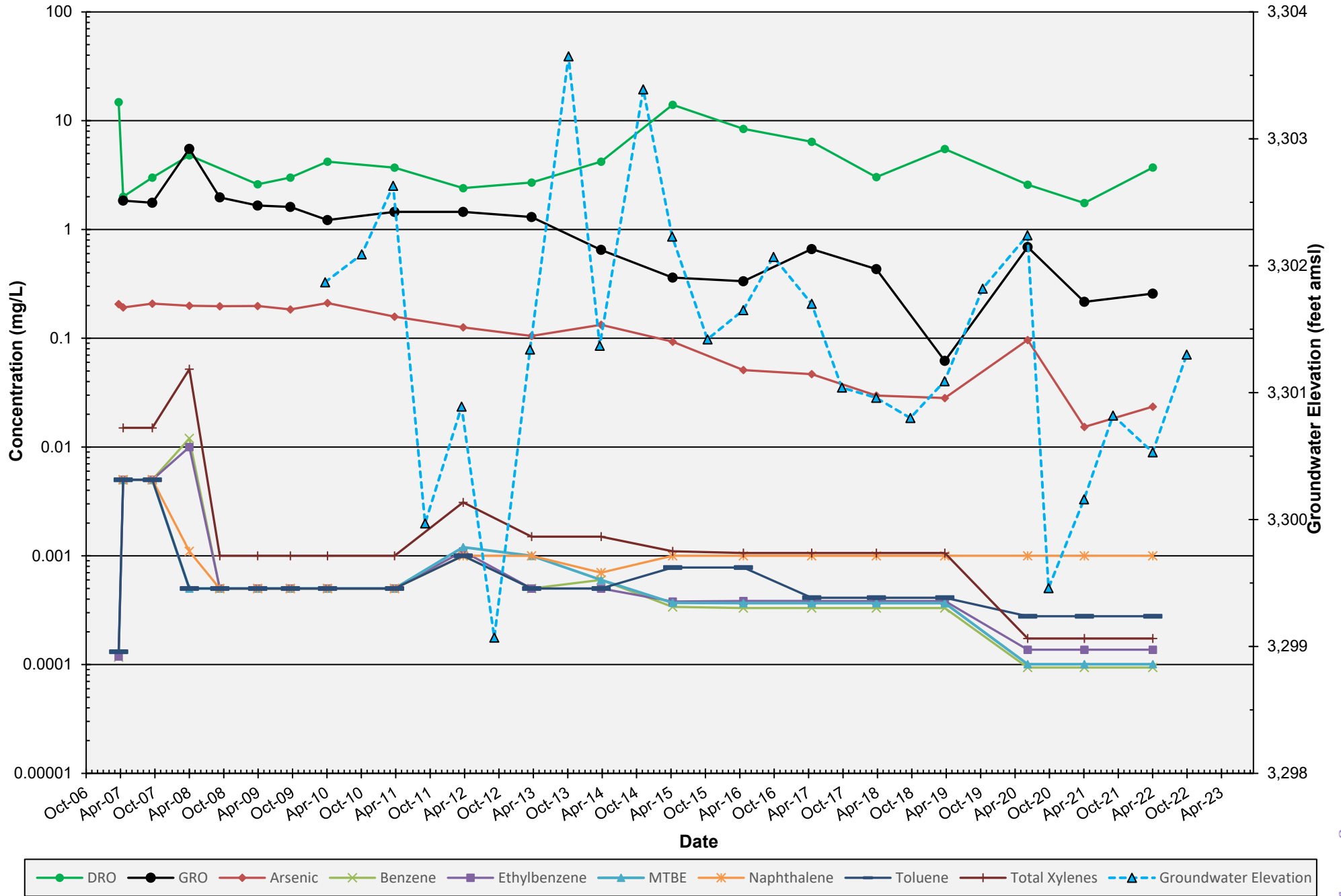
HF Sinclair Navajo Refining LLC - Artesia Refinery
Evaporation Ponds



MW-82: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery

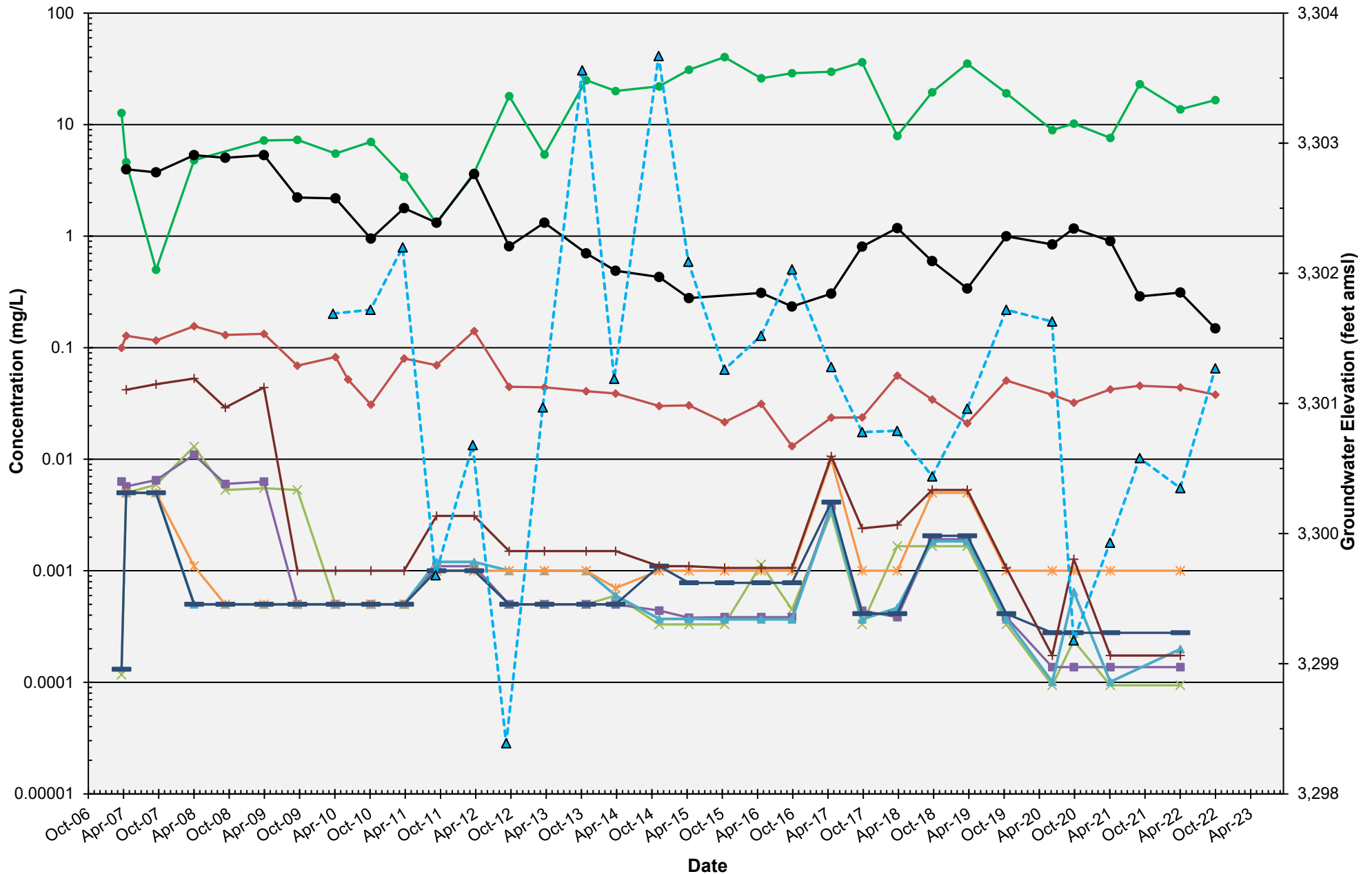
Evaporation Ponds



MW-83: COC Concentrations and Groundwater Elevations

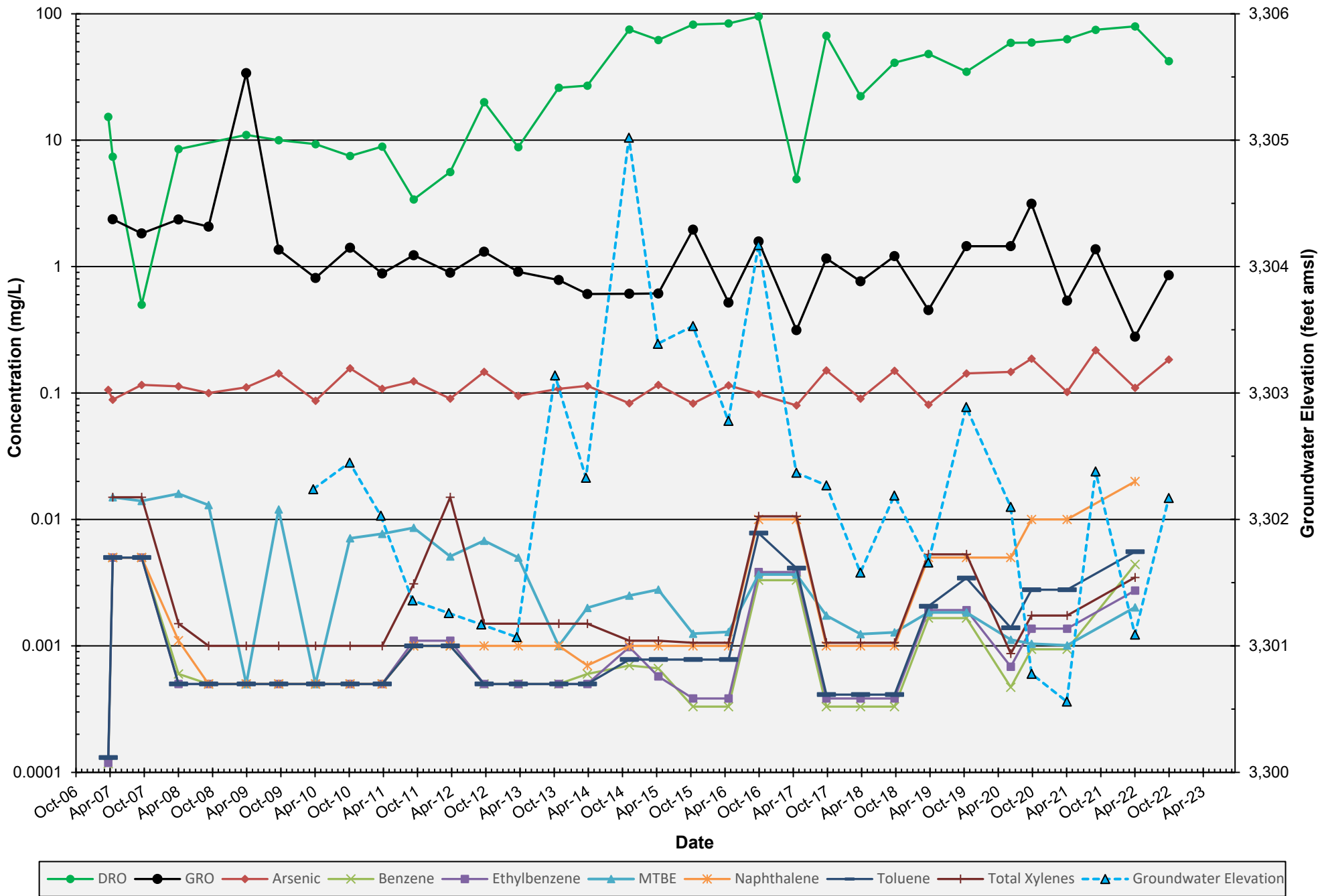
HF Sinclair Navajo Refining LLC - Artesia Refinery

Evaporation Ponds



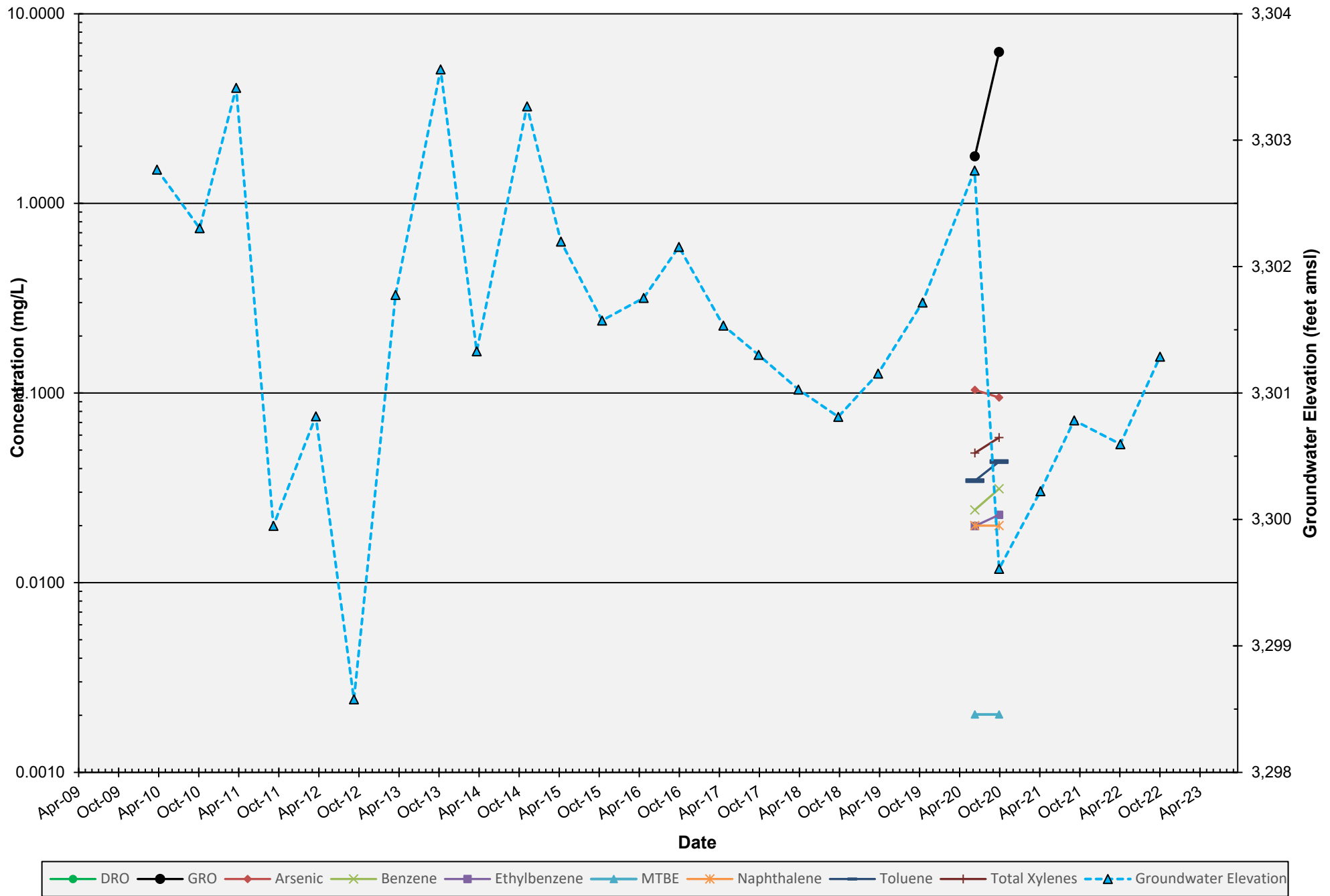
MW-84: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery
Evaporation Ponds



MW-86: COC Concentrations and Groundwater Elevations

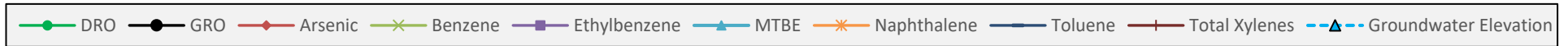
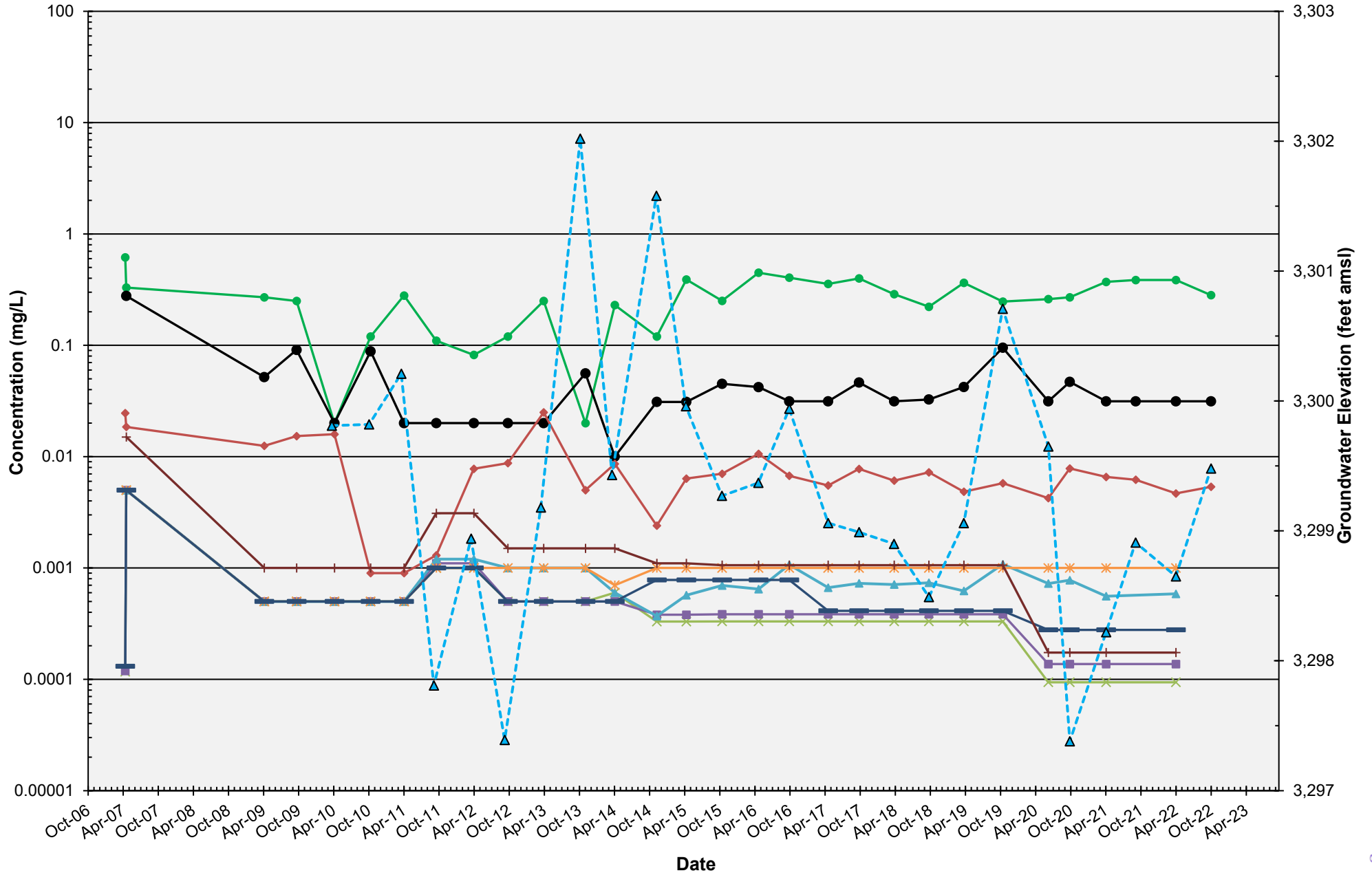
HF Sinclair Navajo Refining LLC - Artesia Refinery
Evaporation Ponds



MW-87: COC Concentrations and Groundwater Elevations

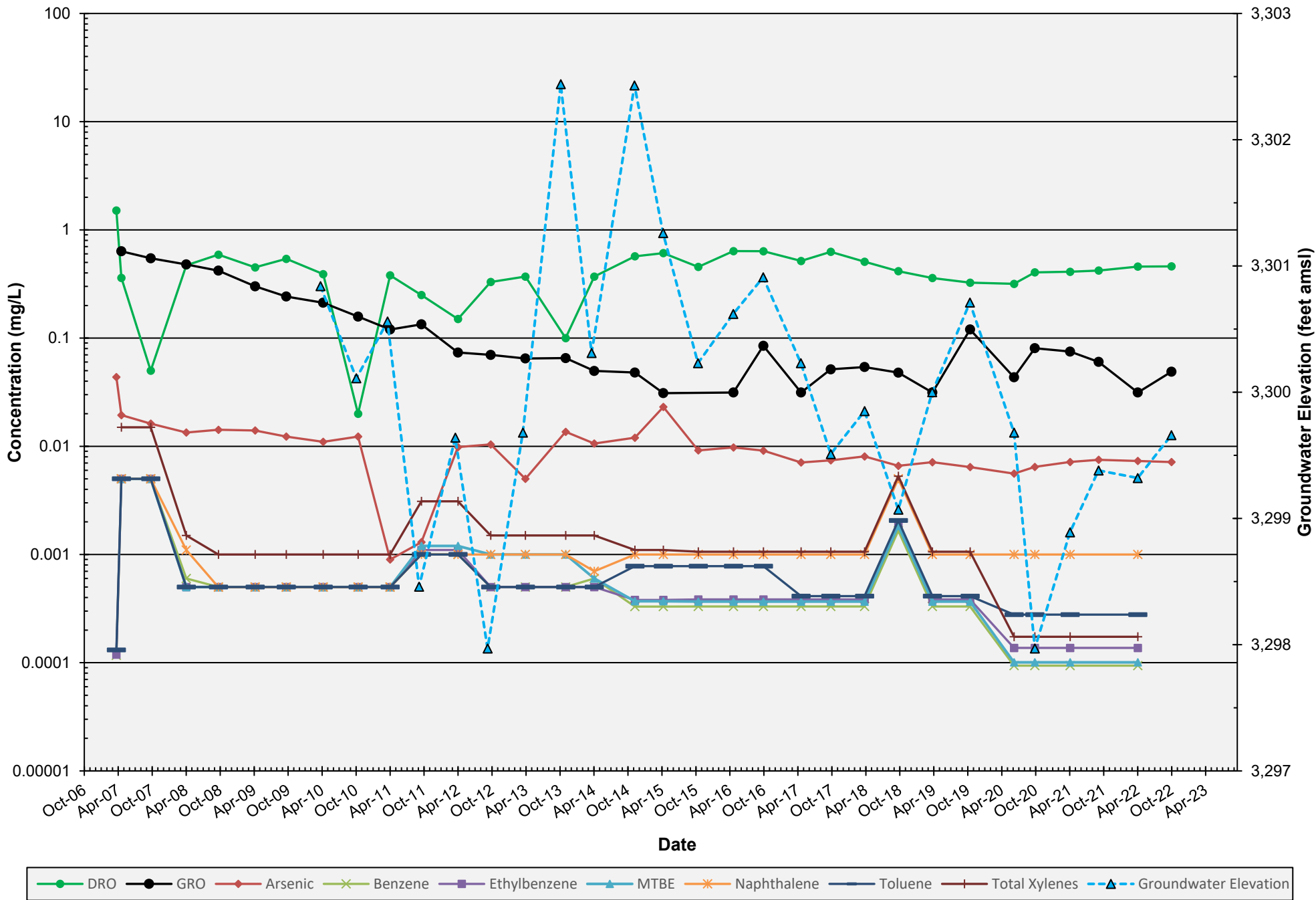
HF Sinclair Navajo Refining LLC - Artesia Refinery

Evaporation Ponds



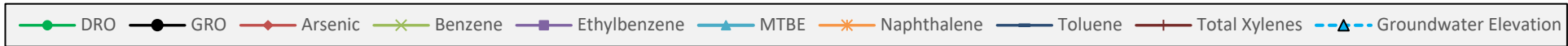
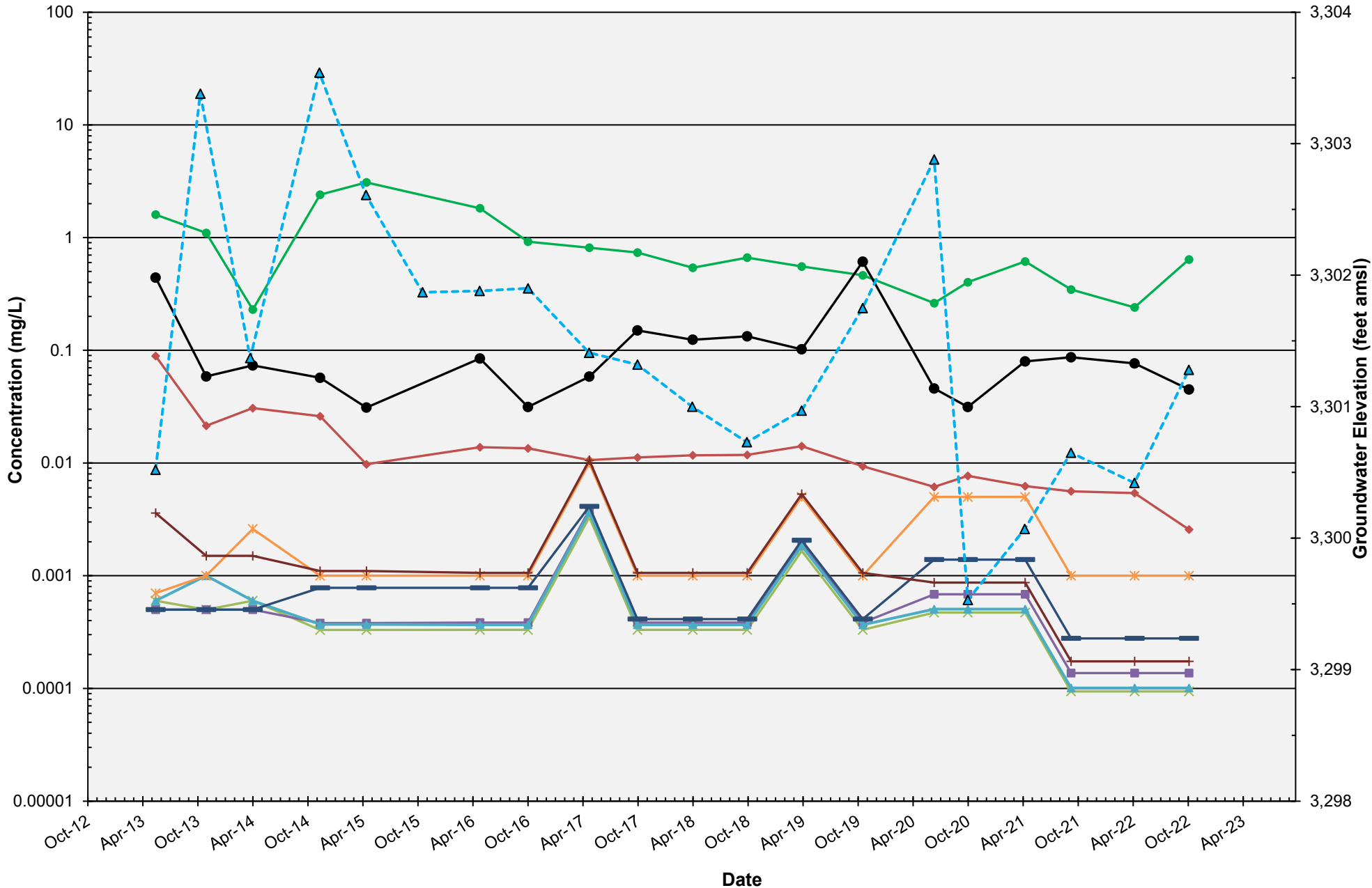
MW-88: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery
Evaporation Ponds



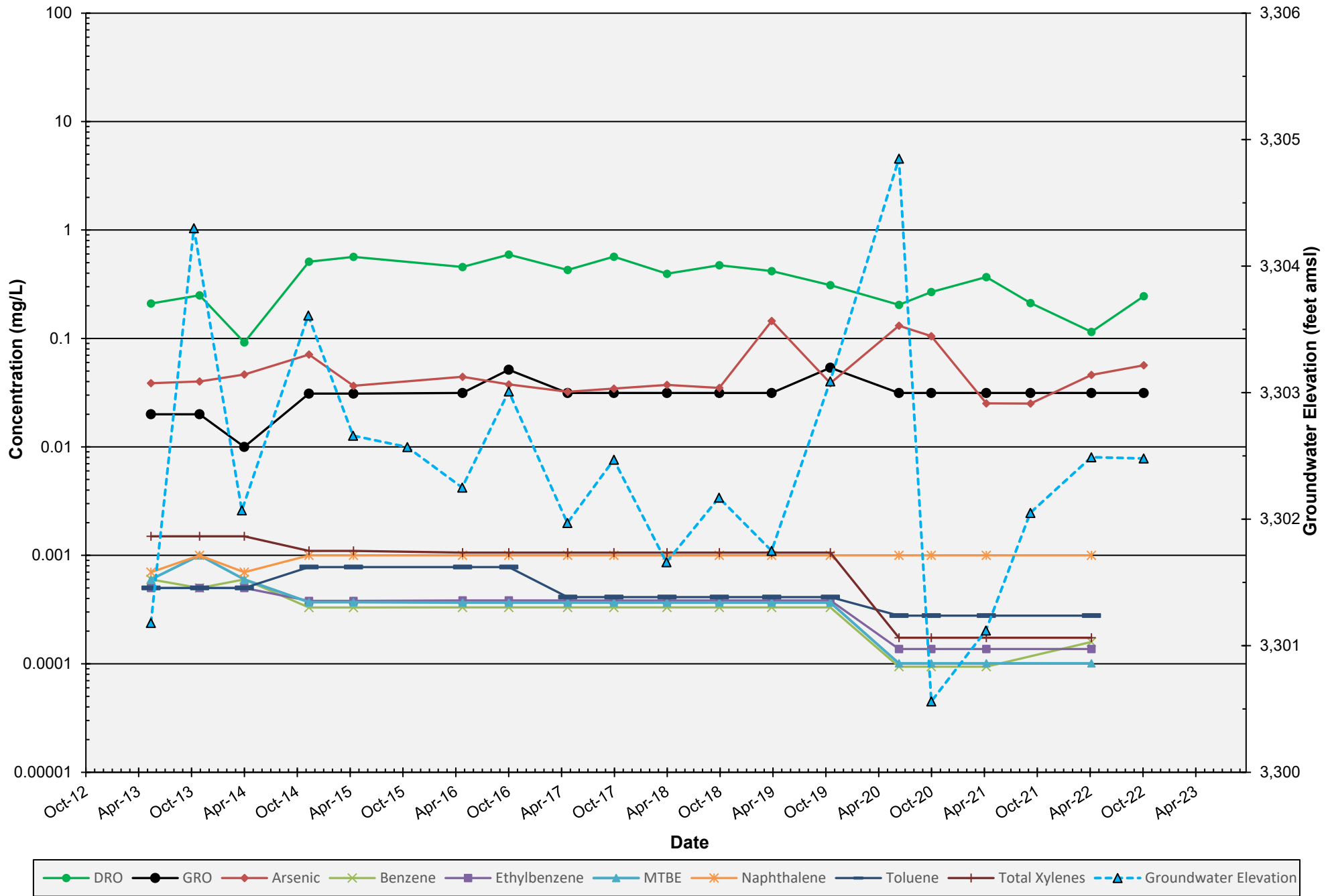
MW-120: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery
Evaporation Ponds



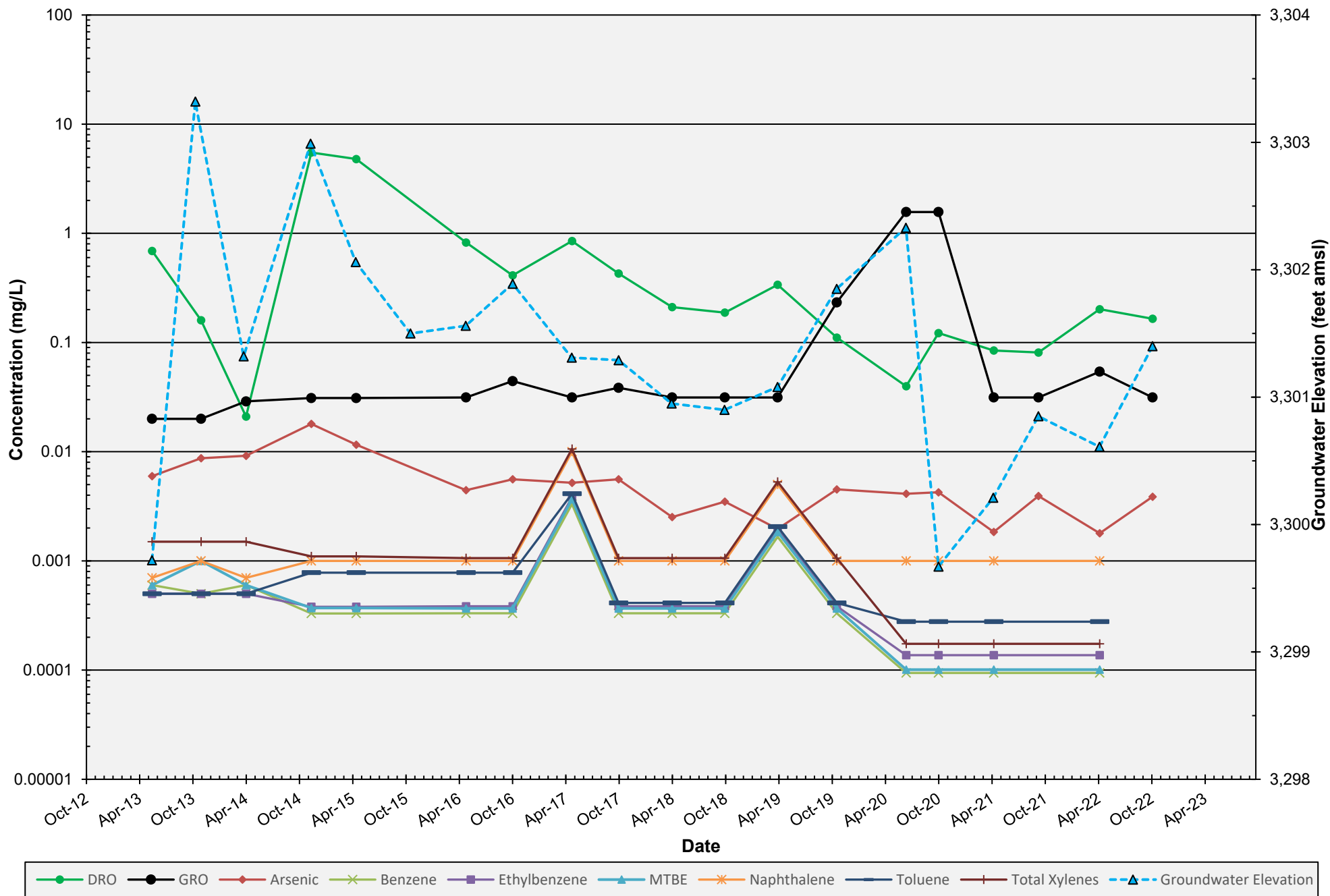
MW-121: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery
Evaporation Ponds



MW-122: COC Concentrations and Groundwater Elevations

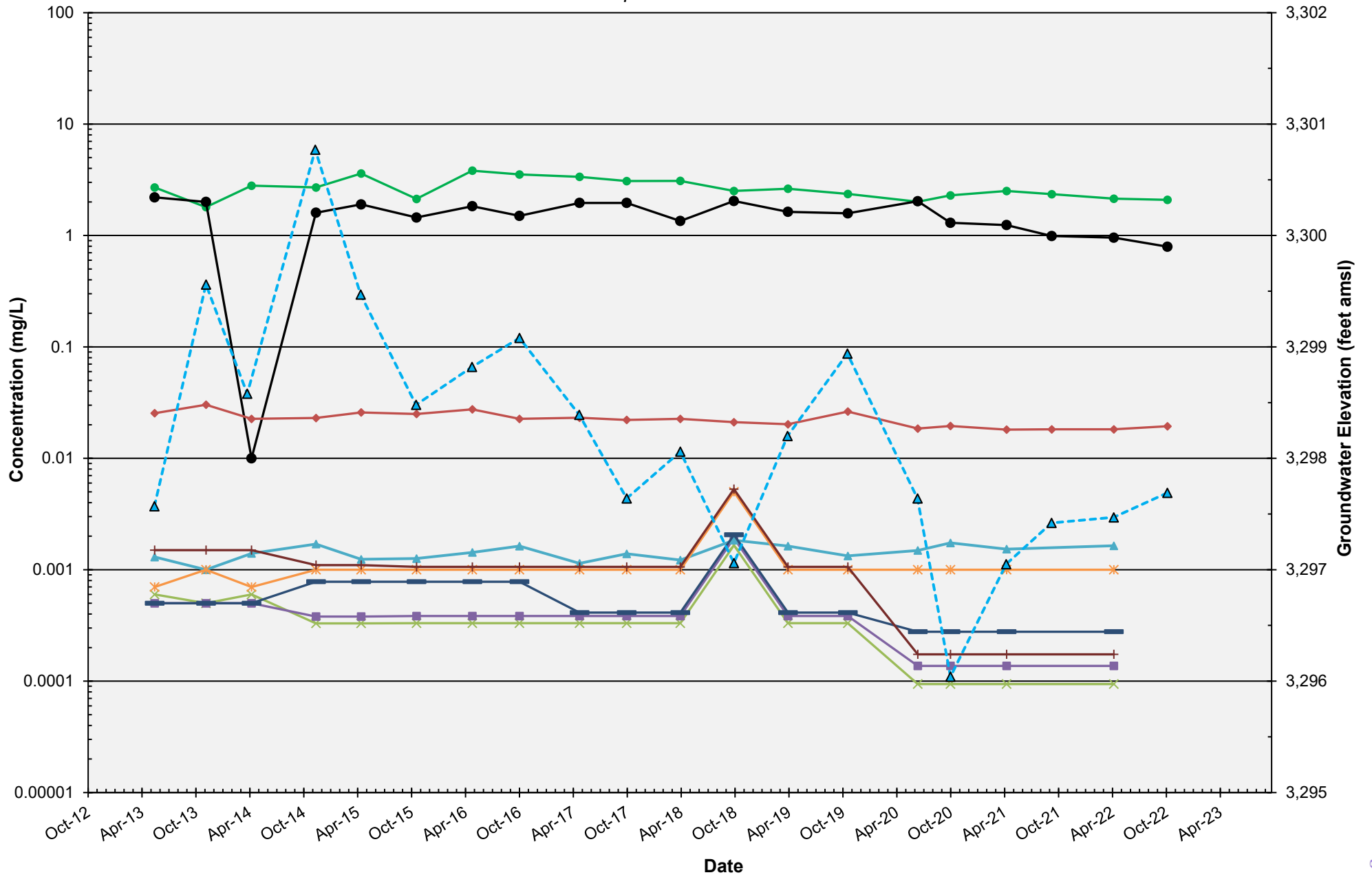
HF Sinclair Navajo Refining LLC - Artesia Refinery
Evaporation Ponds



MW-123: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery

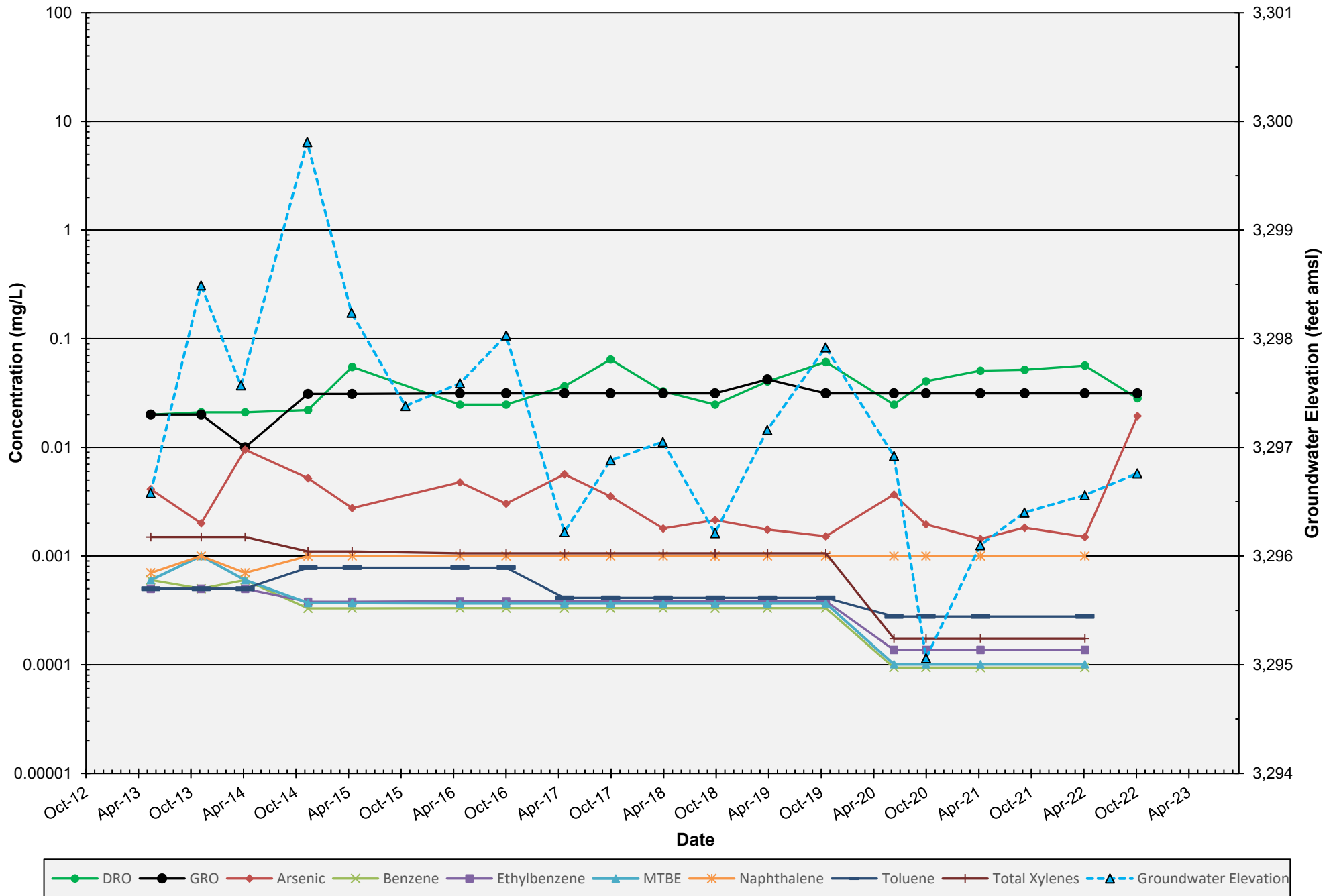
Evaporation Ponds



MW-124: COC Concentrations and Groundwater Elevations

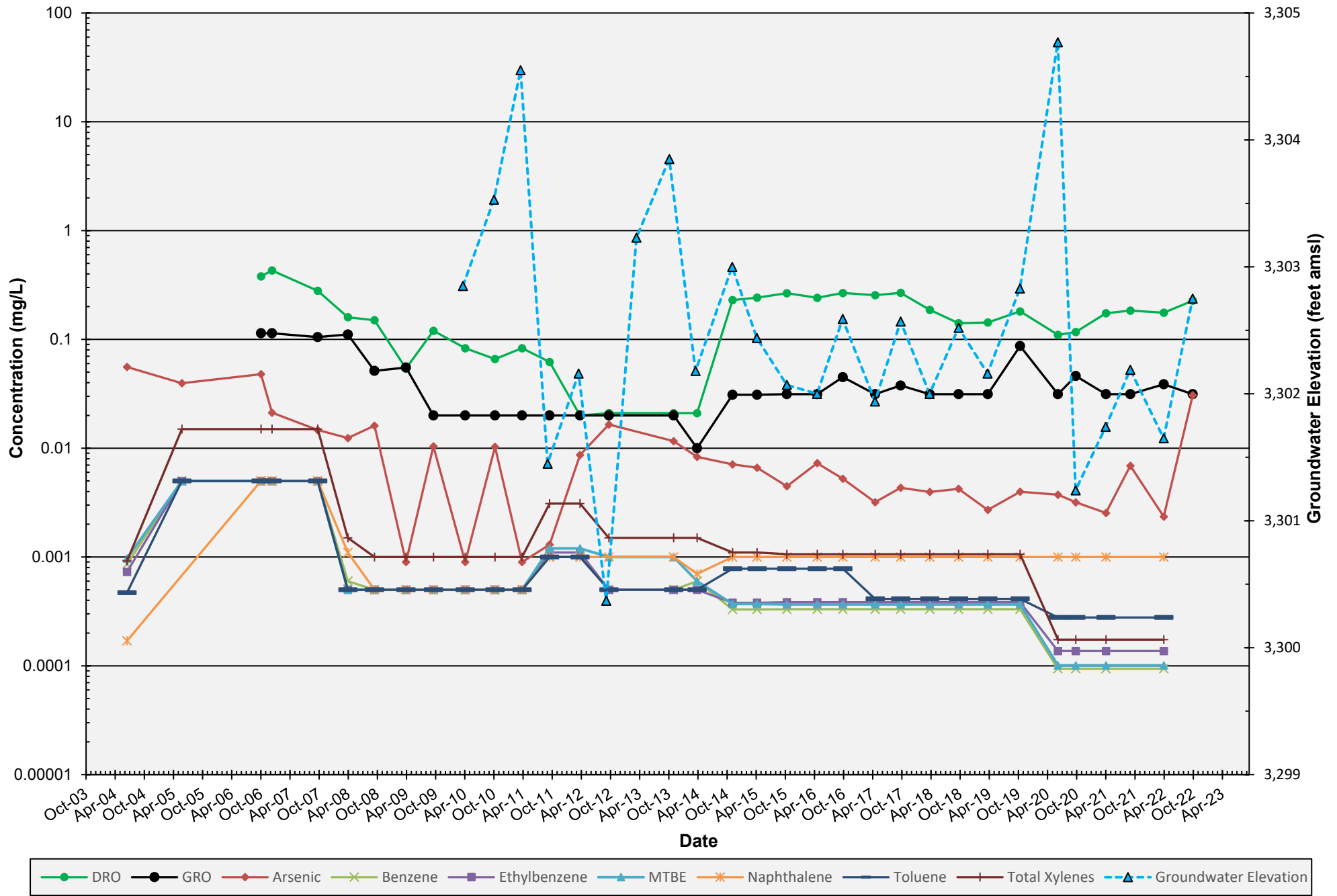
HF Sinclair Navajo Refining LLC - Artesia Refinery

Evaporation Ponds



OCD-1 & OCD-1R: COC Concentrations and Groundwater Elevations

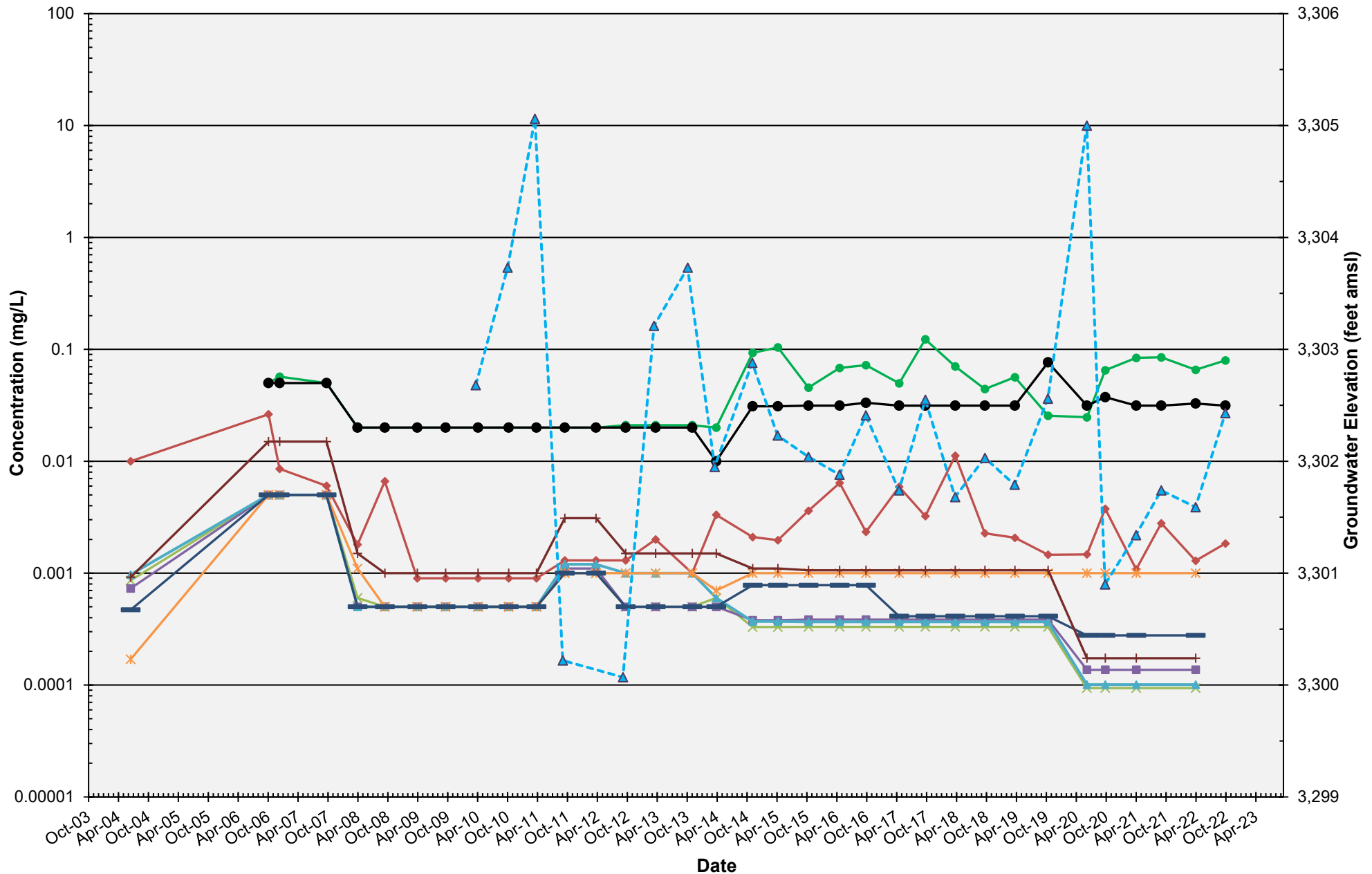
HF Sinclair Navajo Refining LLC - Artesia Refinery
Evaporation Ponds



OCD-2A: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery

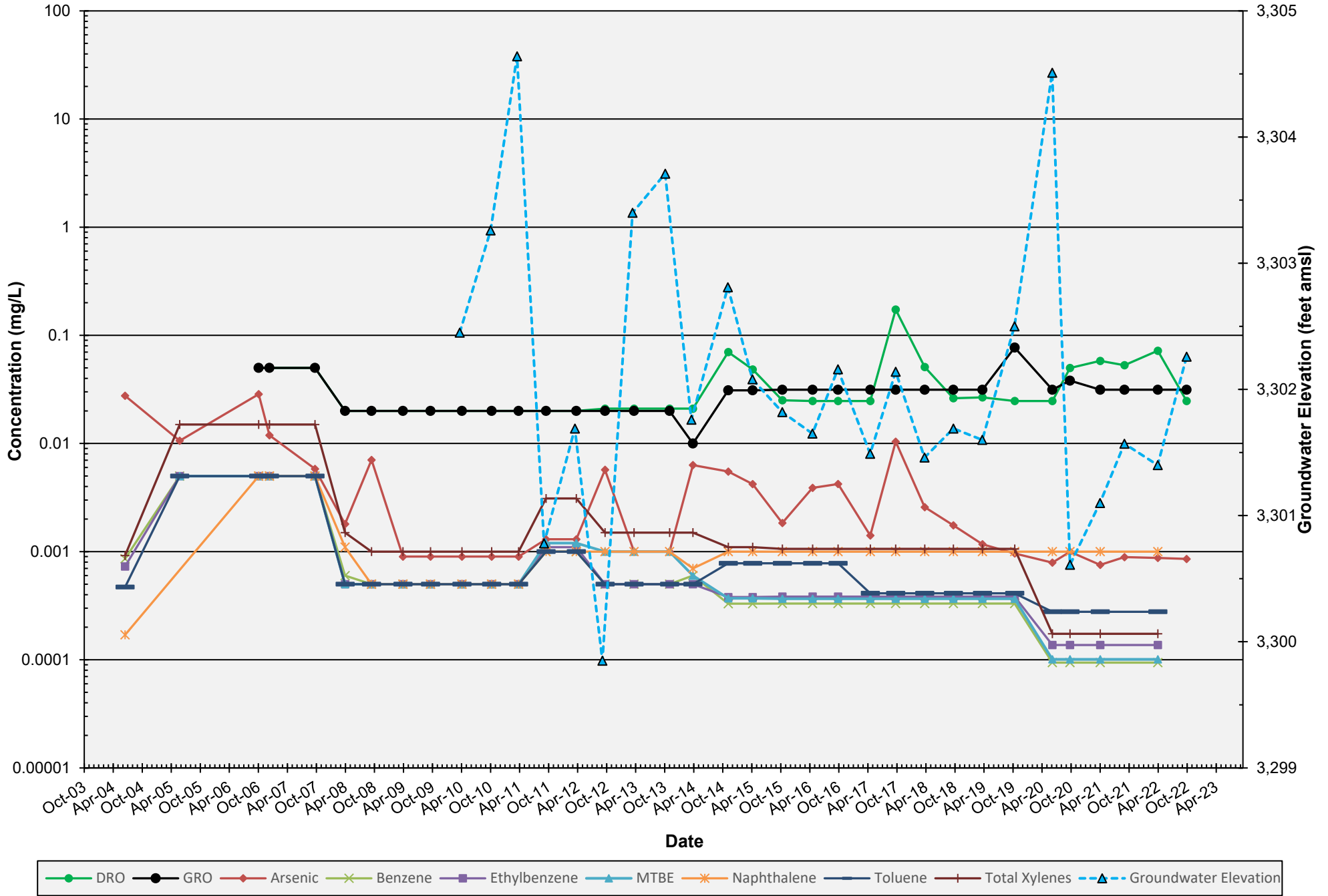
Evaporation Ponds



OCD-3: COC Concentrations and Groundwater Elevations

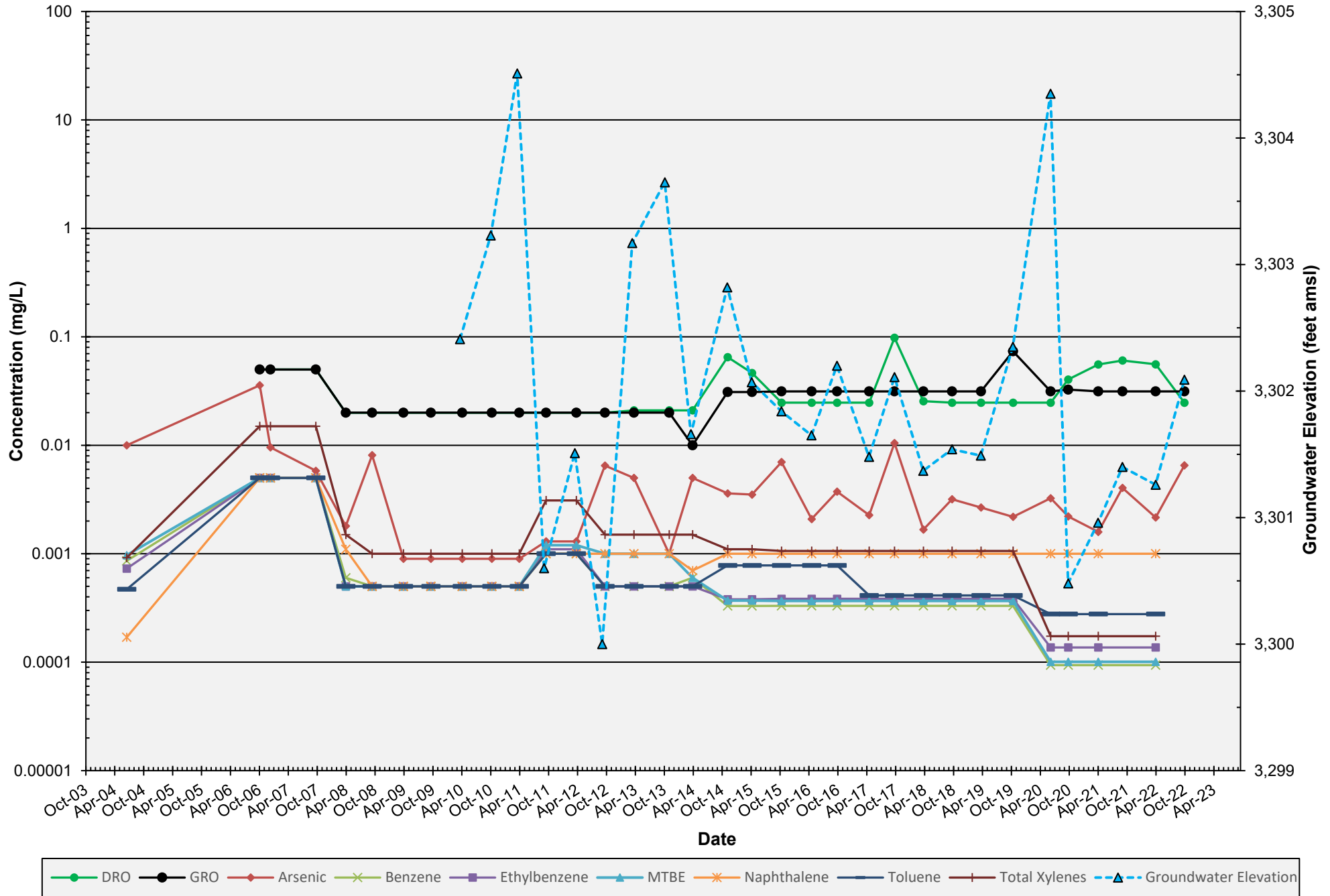
HF Sinclair Navajo Refining LLC - Artesia Refinery

Evaporation Ponds



OCD-4: COC Concentrations and Groundwater Elevations

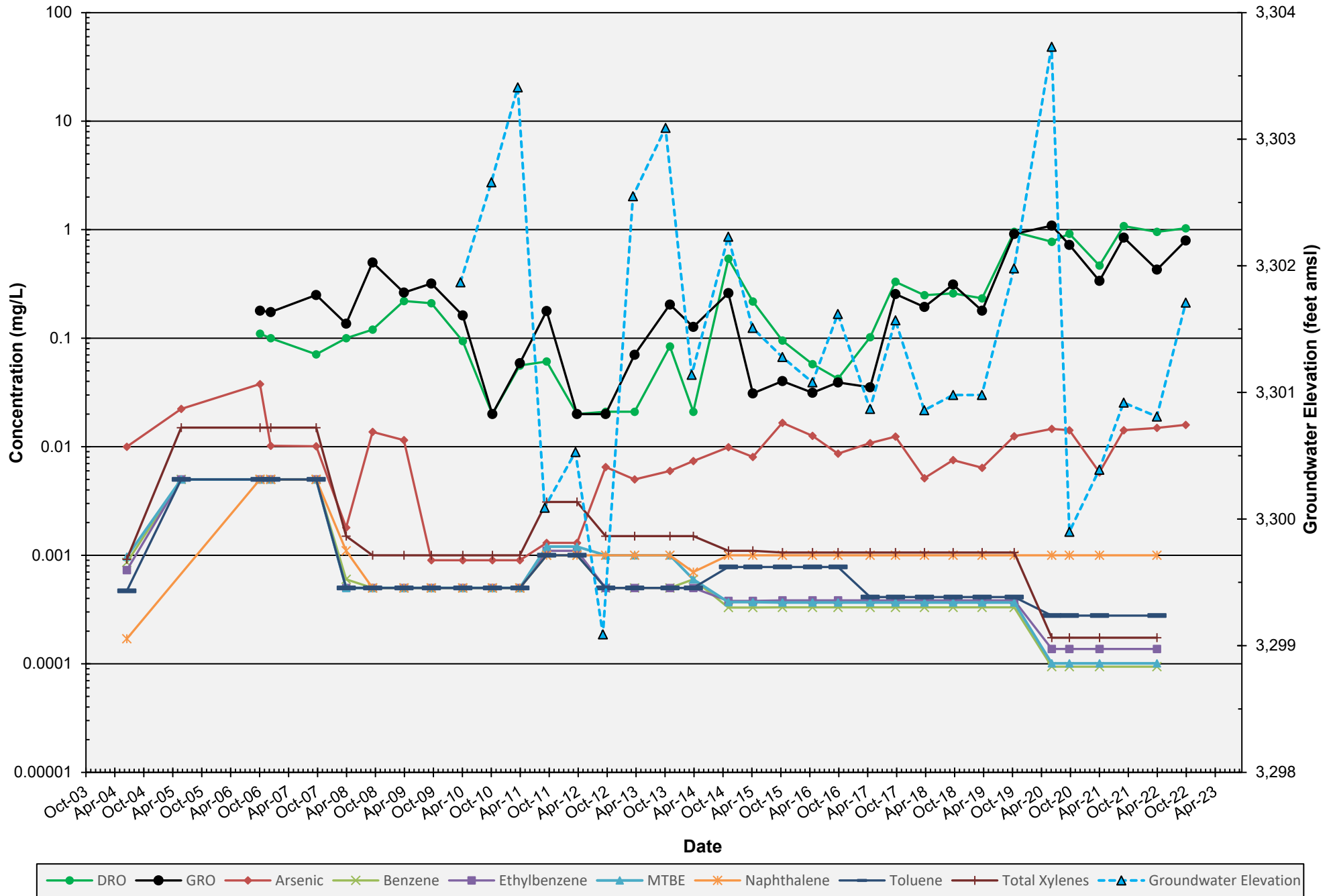
HF Sinclair Navajo Refining LLC - Artesia Refinery
Evaporation Ponds



OCD-5: COC Concentrations and Groundwater Elevations

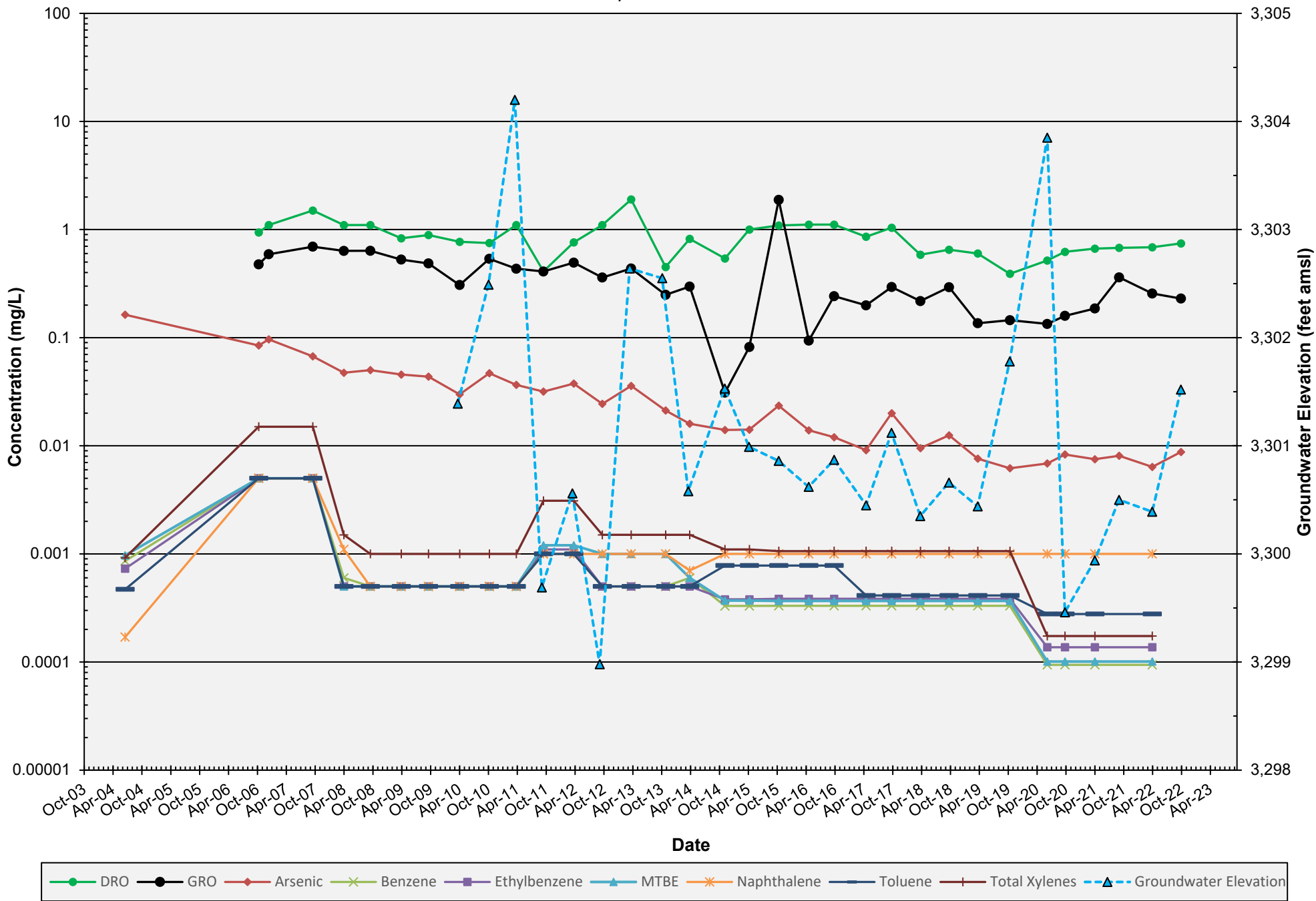
HF Sinclair Navajo Refining LLC - Artesia Refinery

Evaporation Ponds



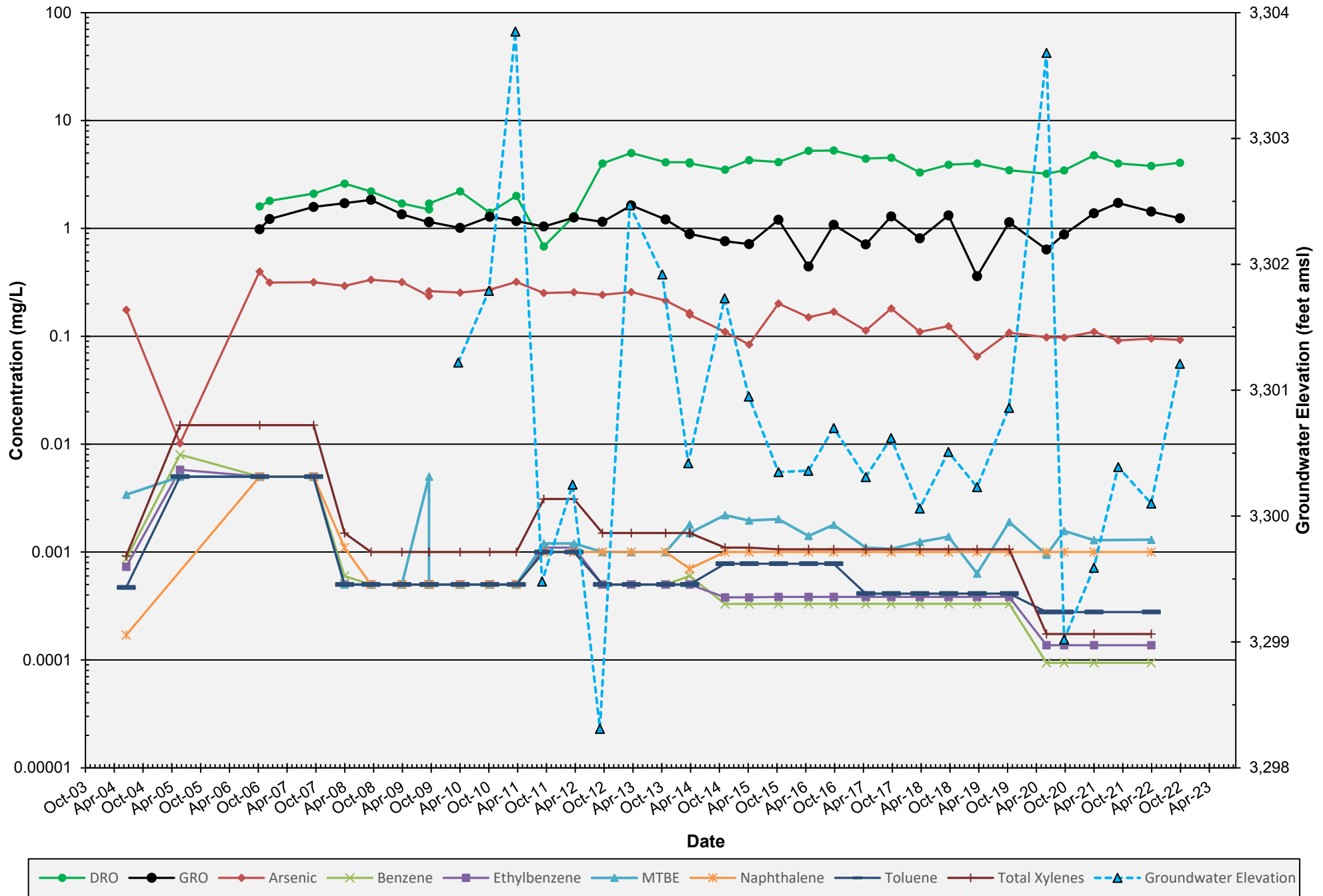
OCD-6: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery
Evaporation Ponds



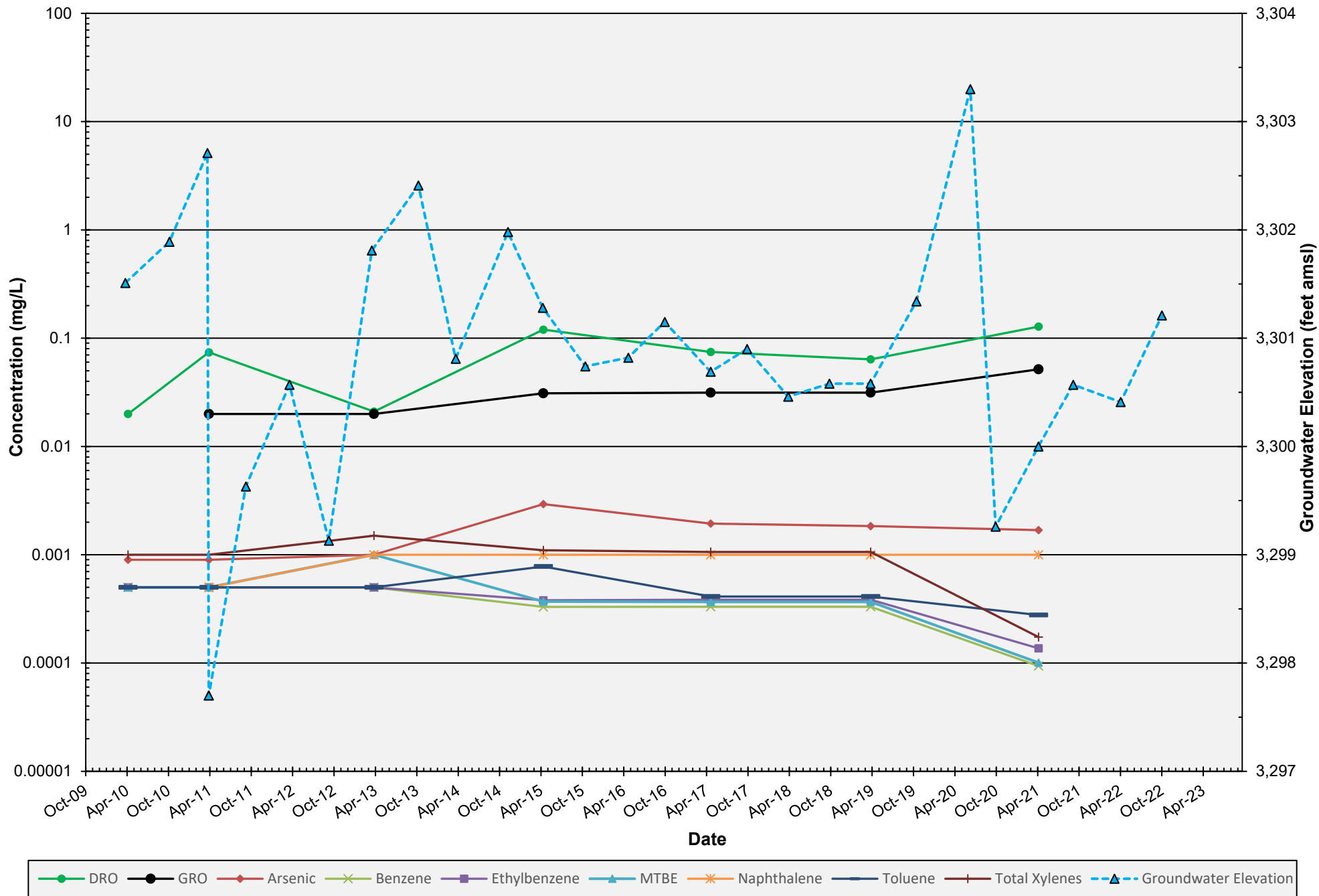
OCD-7A & OCD-7AR: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery
Evaporation Ponds



OCD-7B: COC Concentrations and Groundwater Elevations

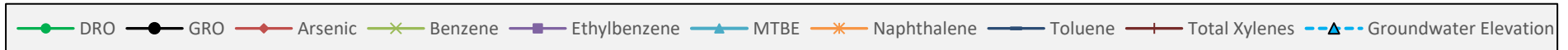
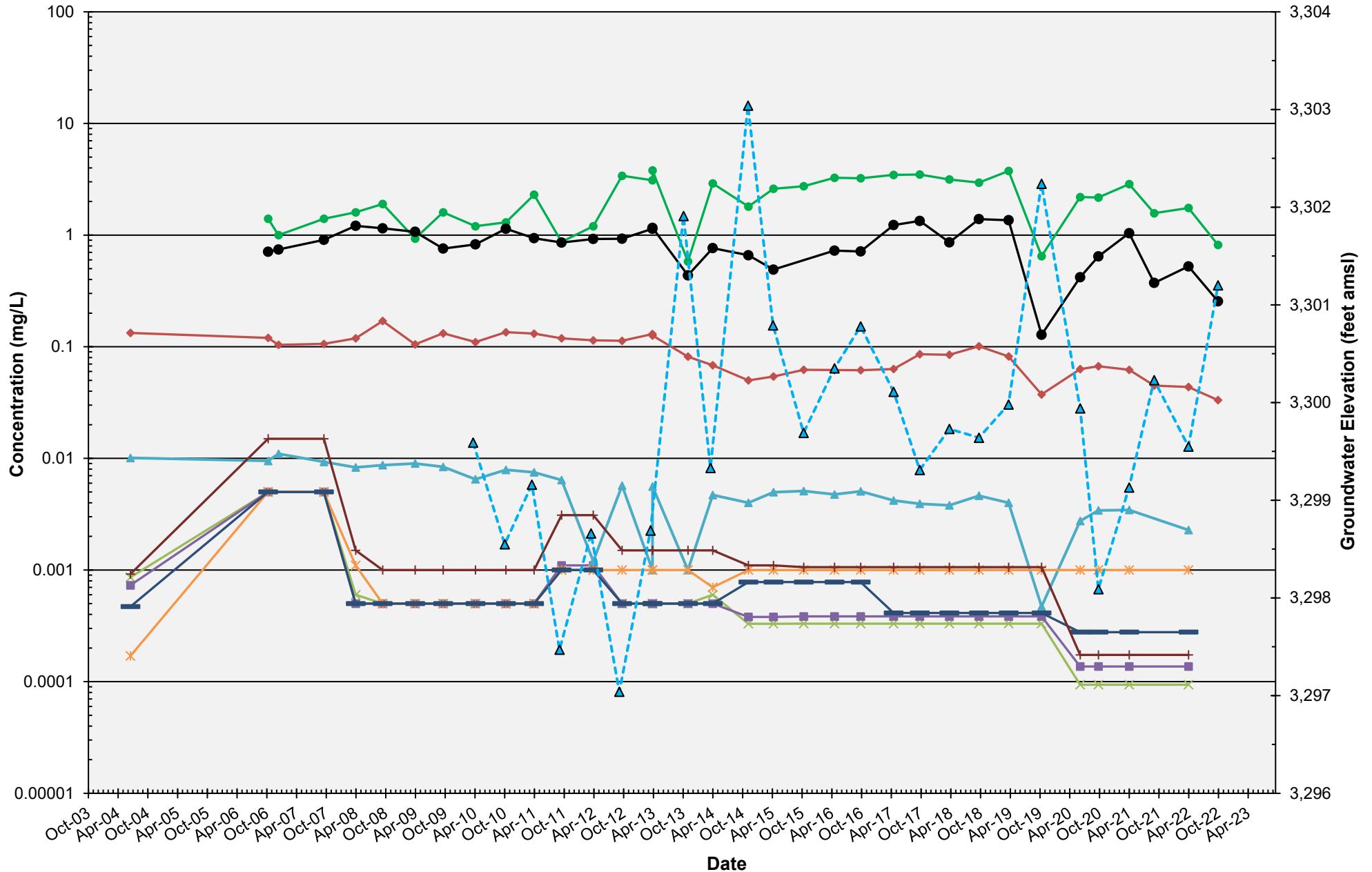
HF Sinclair Navajo Refining LLC - Artesia Refinery
Evaporation Ponds



OCD-8A: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery

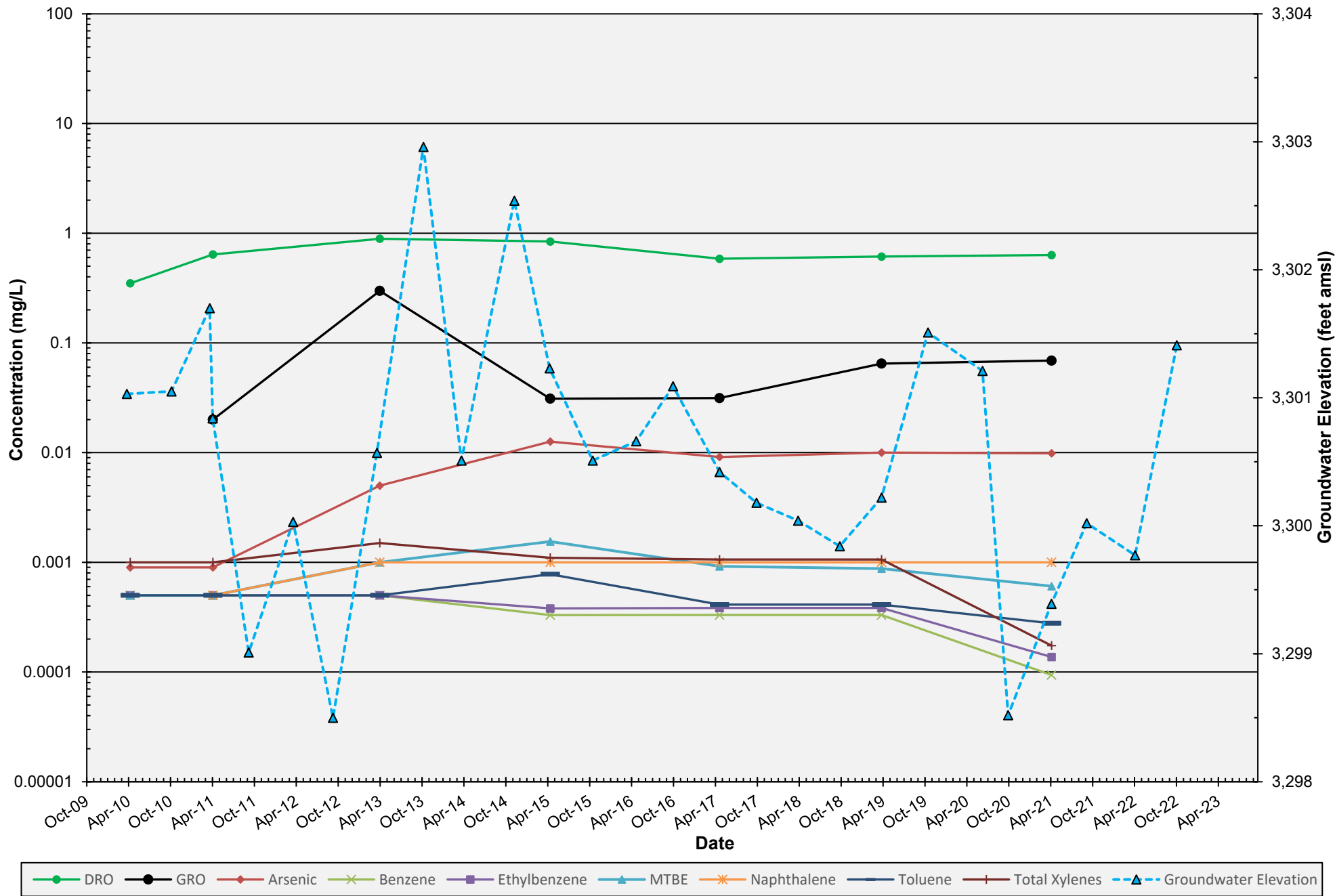
Evaporation Ponds



OCD-8B: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery

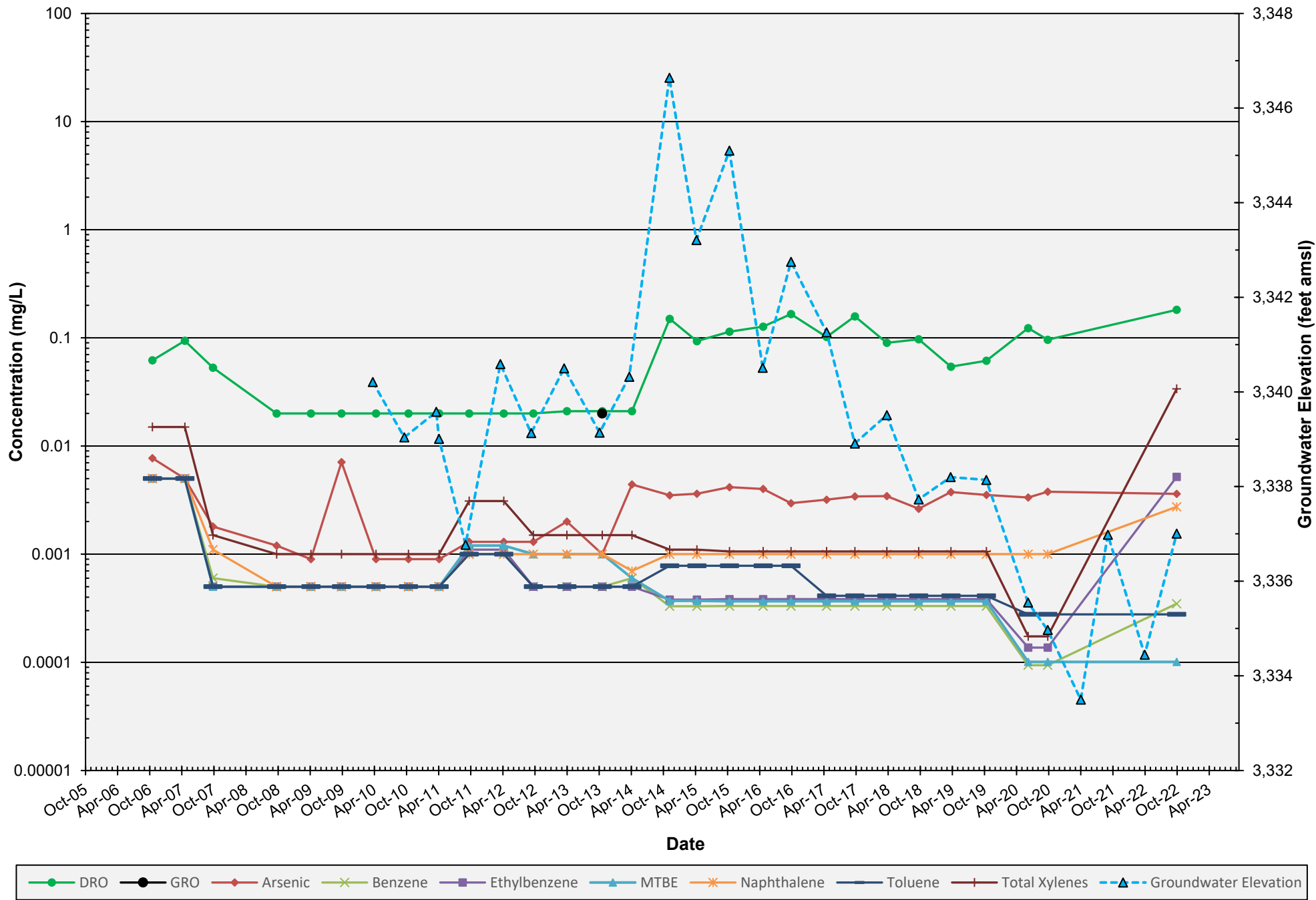
Evaporation Ponds



KWB-1A: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery

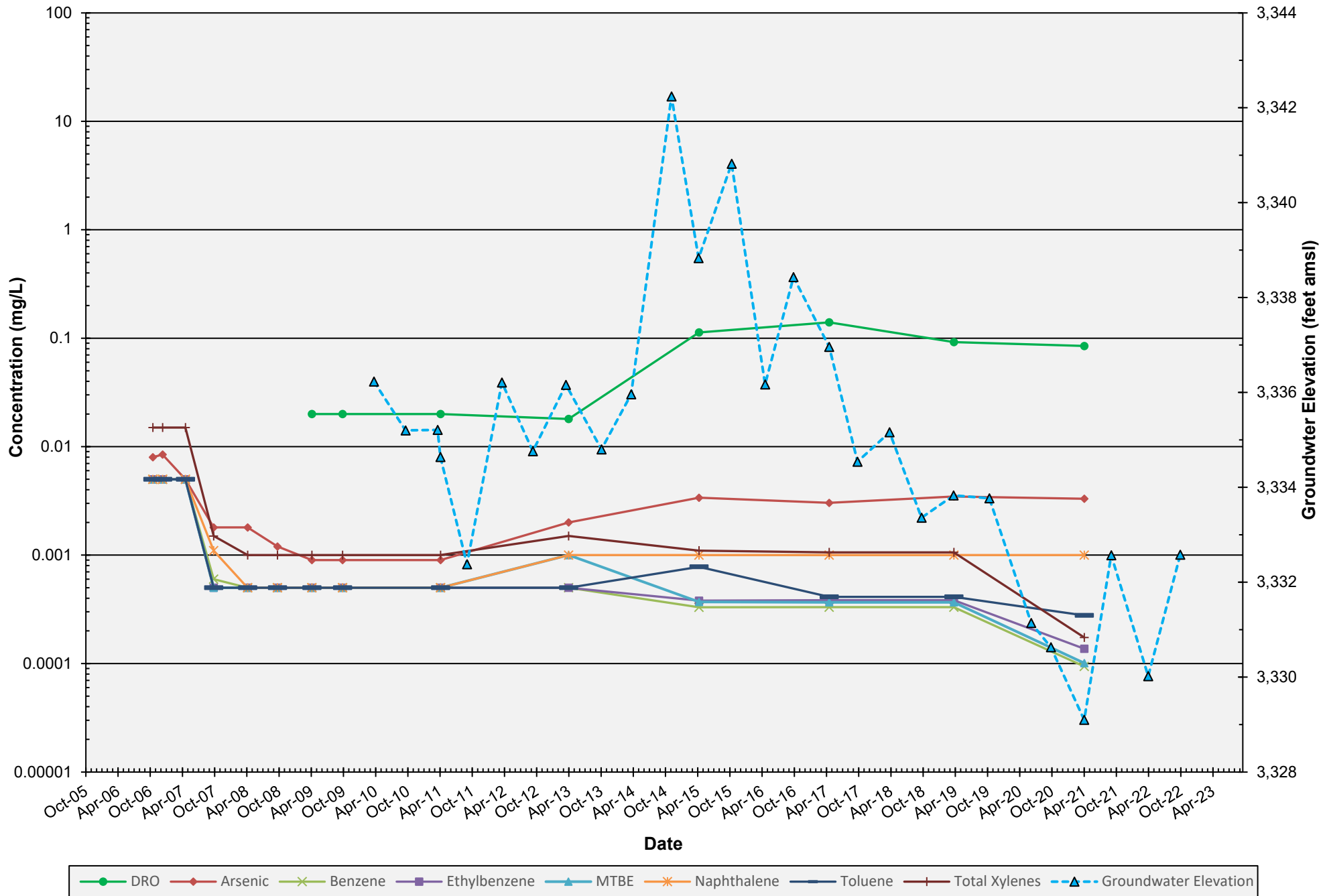
Field East of Refinery



KWB-1C: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery

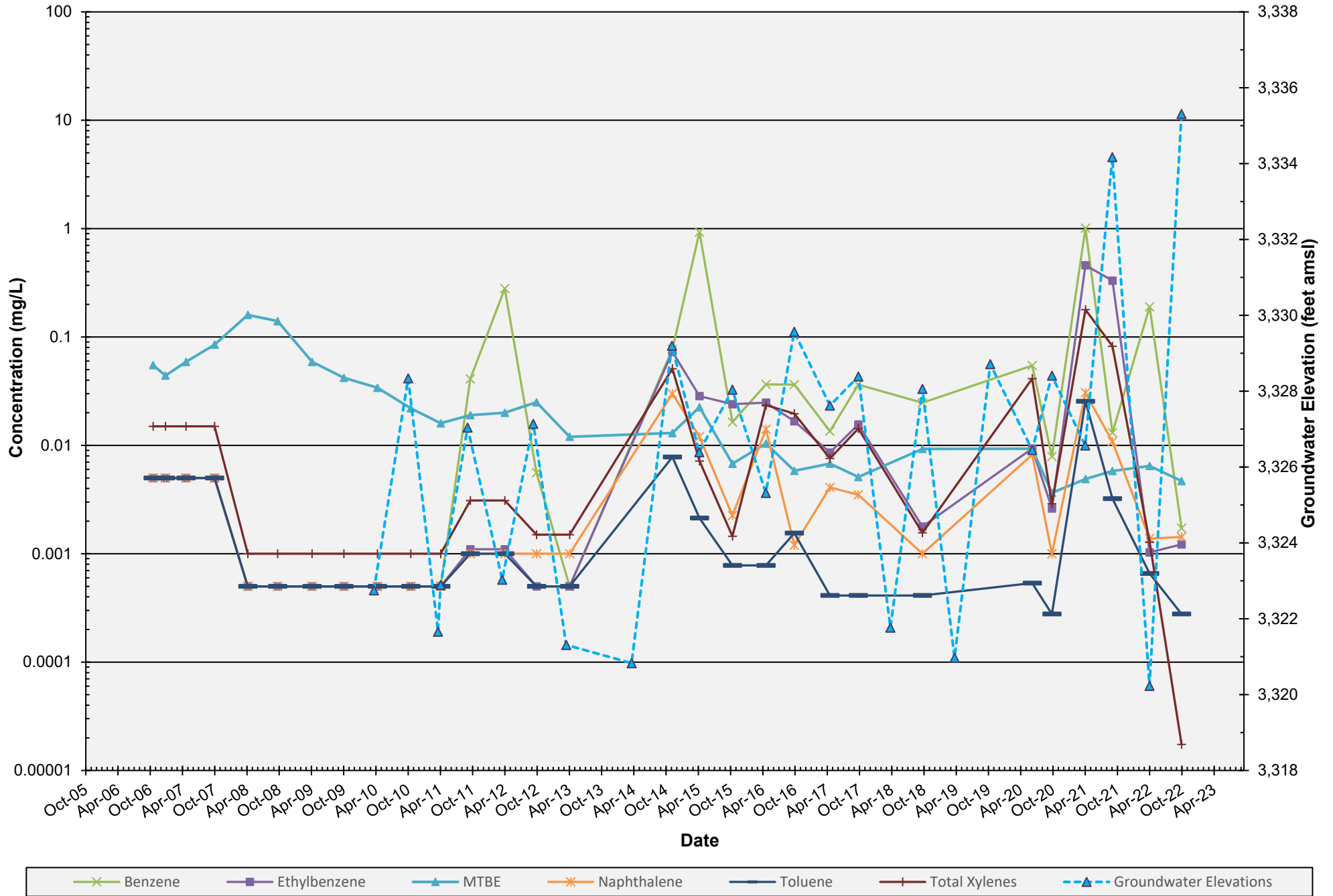
Field East of Refinery



KWB-7: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery

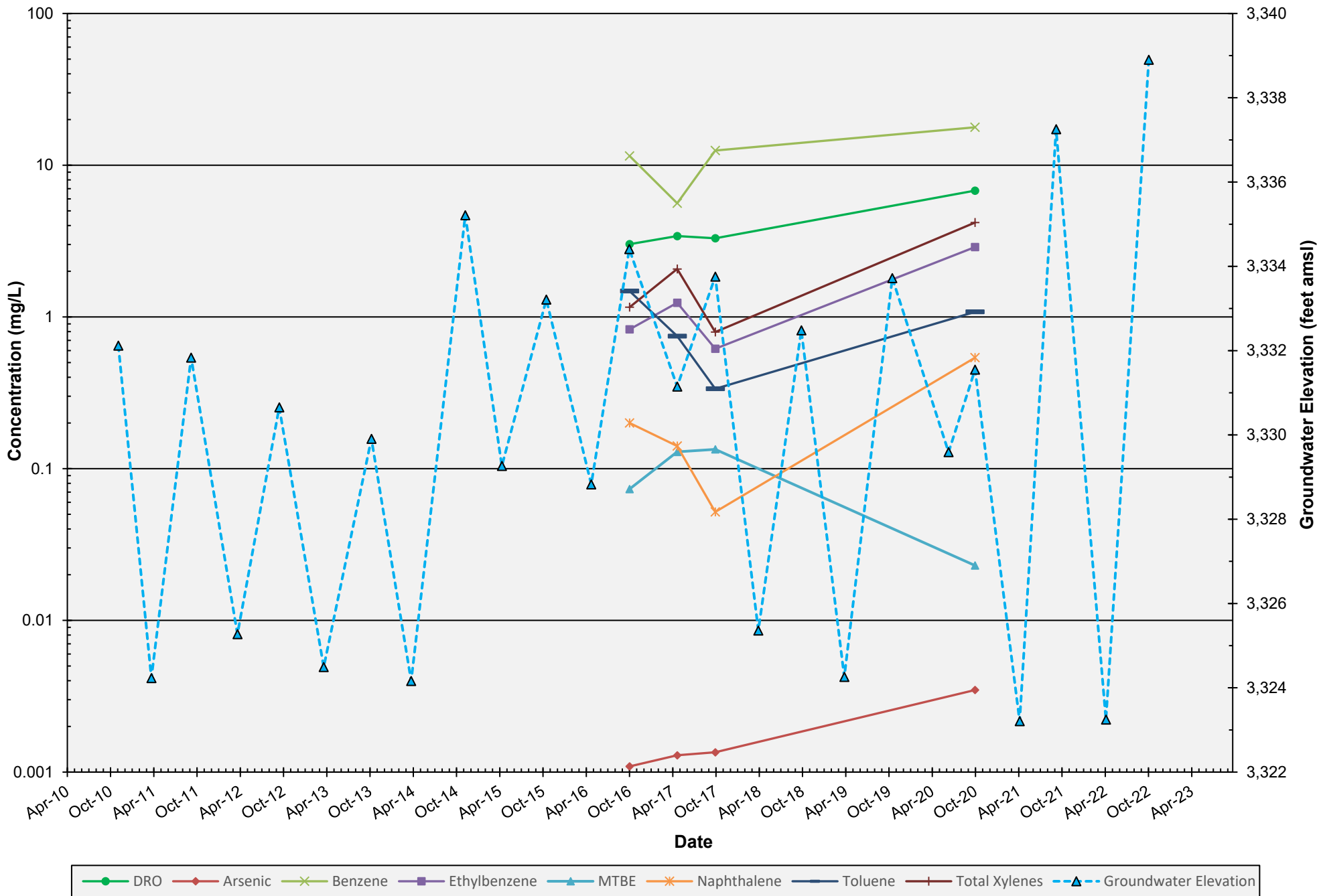
Field East of Refinery



KWB-8: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery

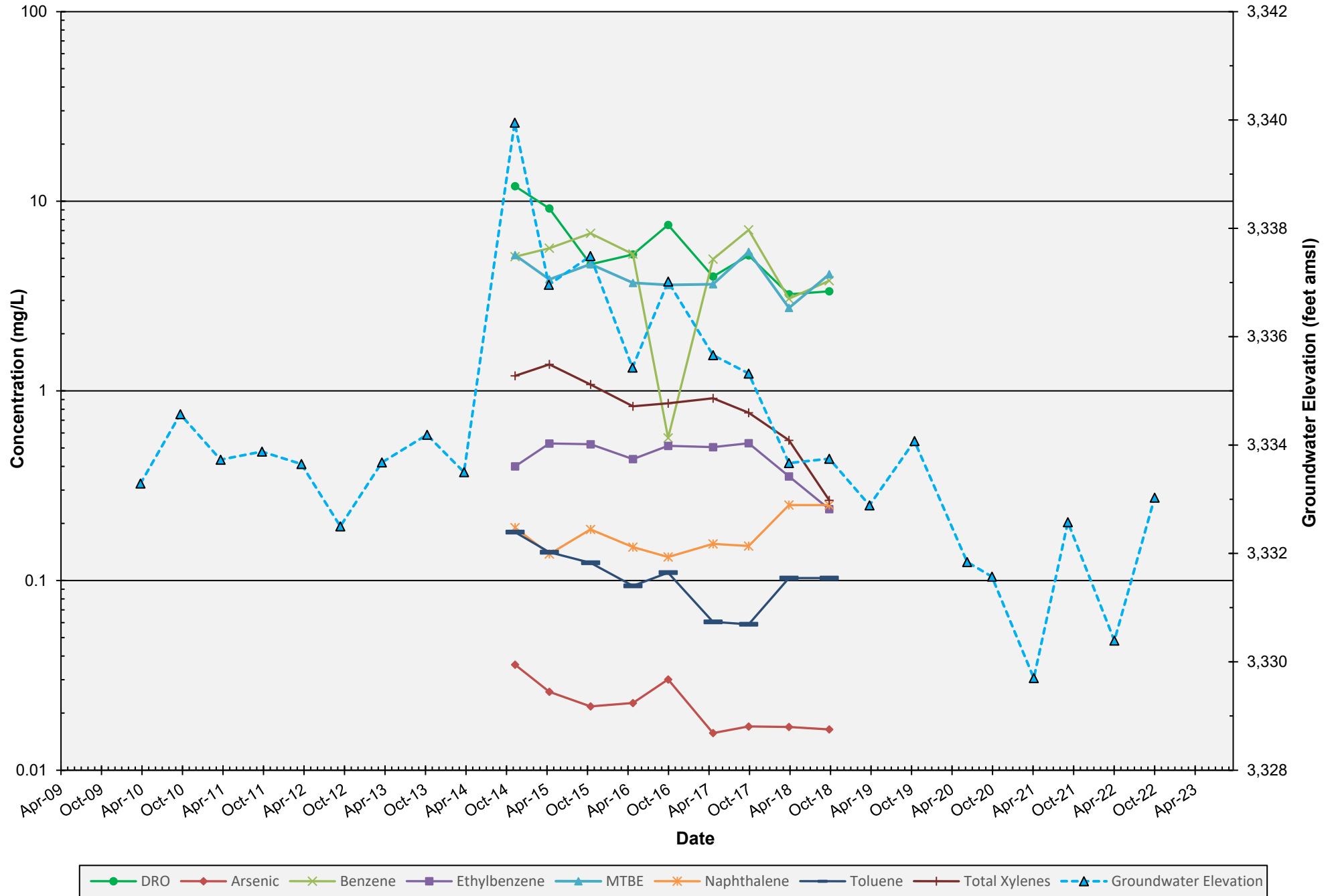
Field East of Refinery



KWB-10R: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery

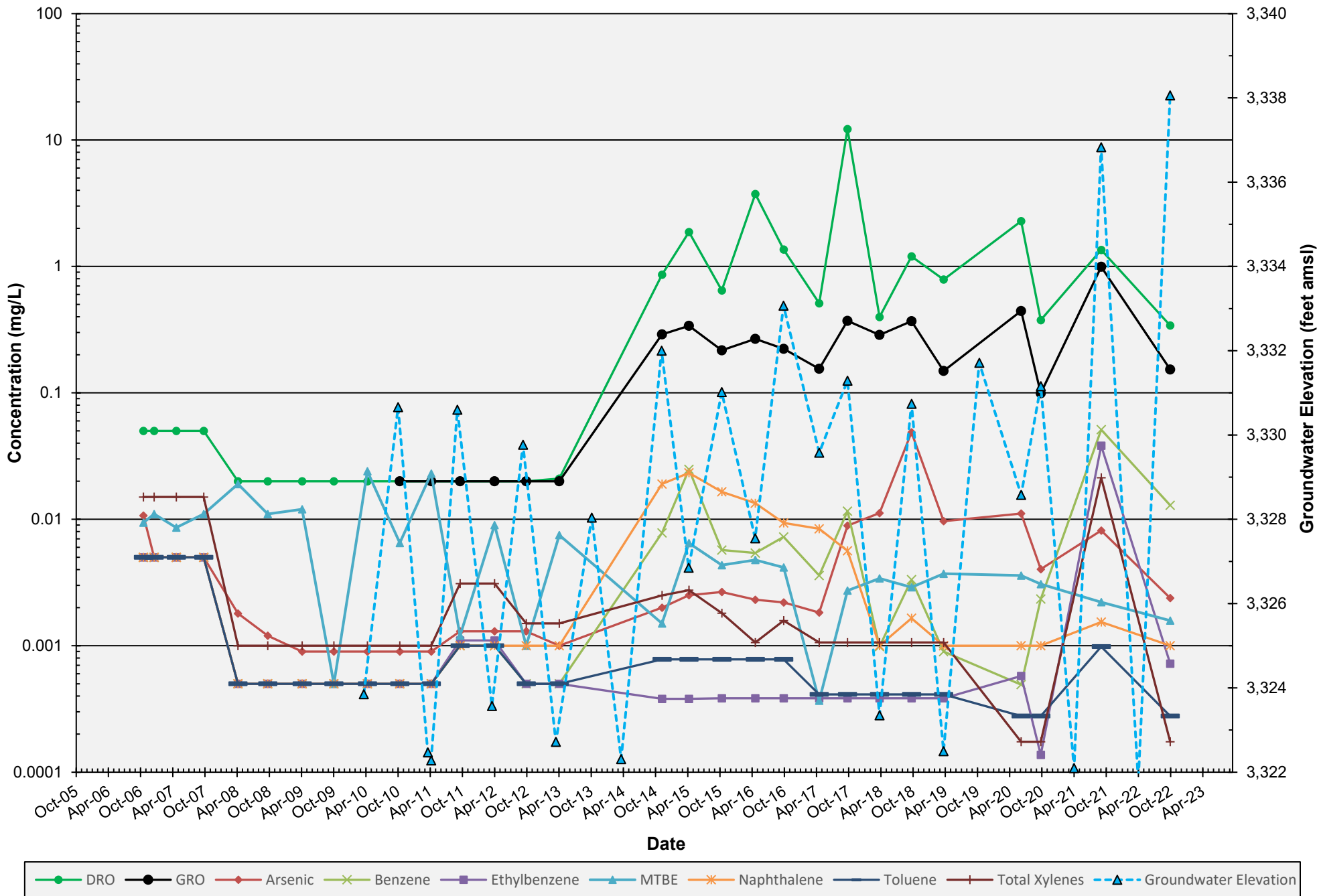
Field East of Refinery



KWB-11A: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery

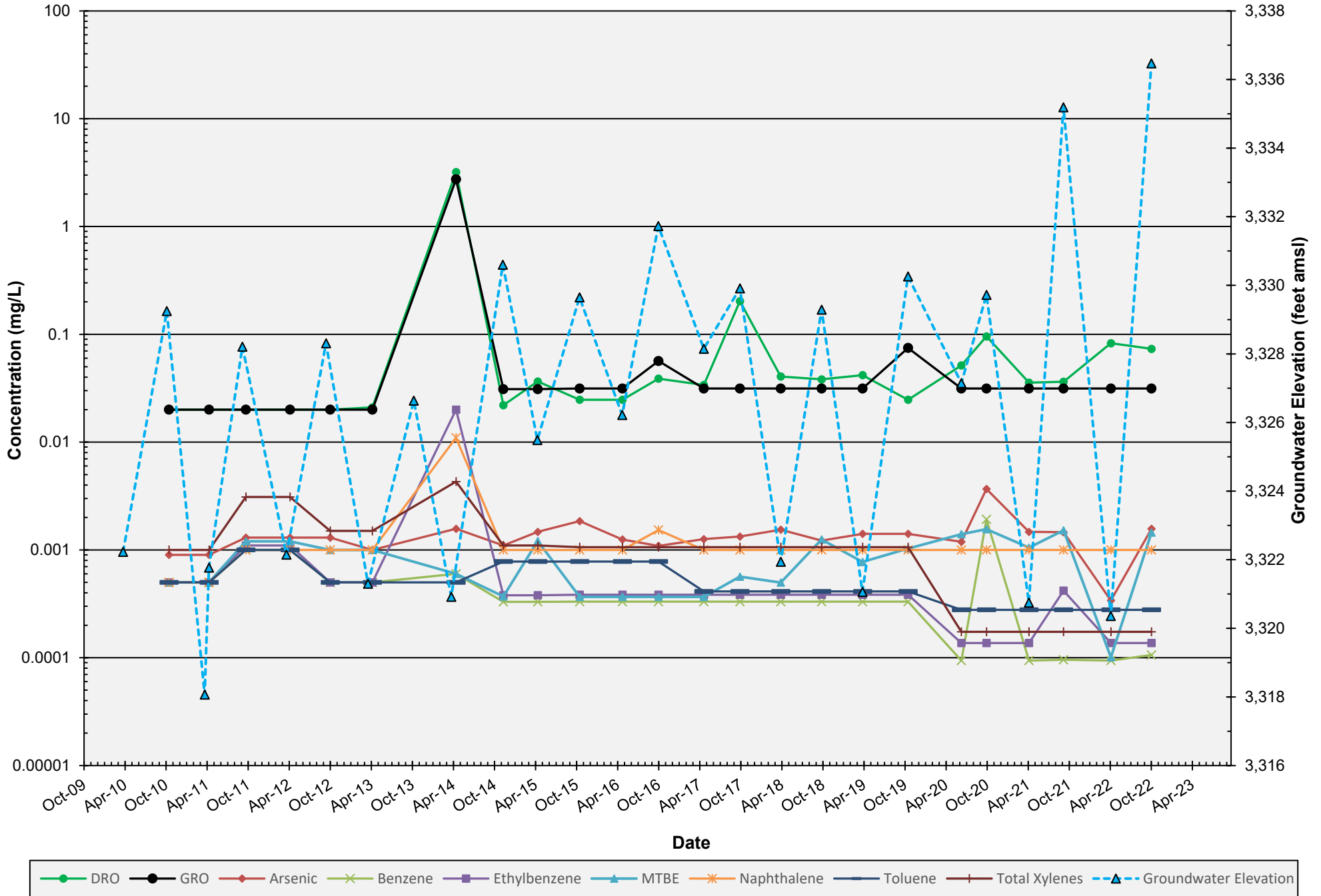
Field East of Refinery



KWB-11B: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery

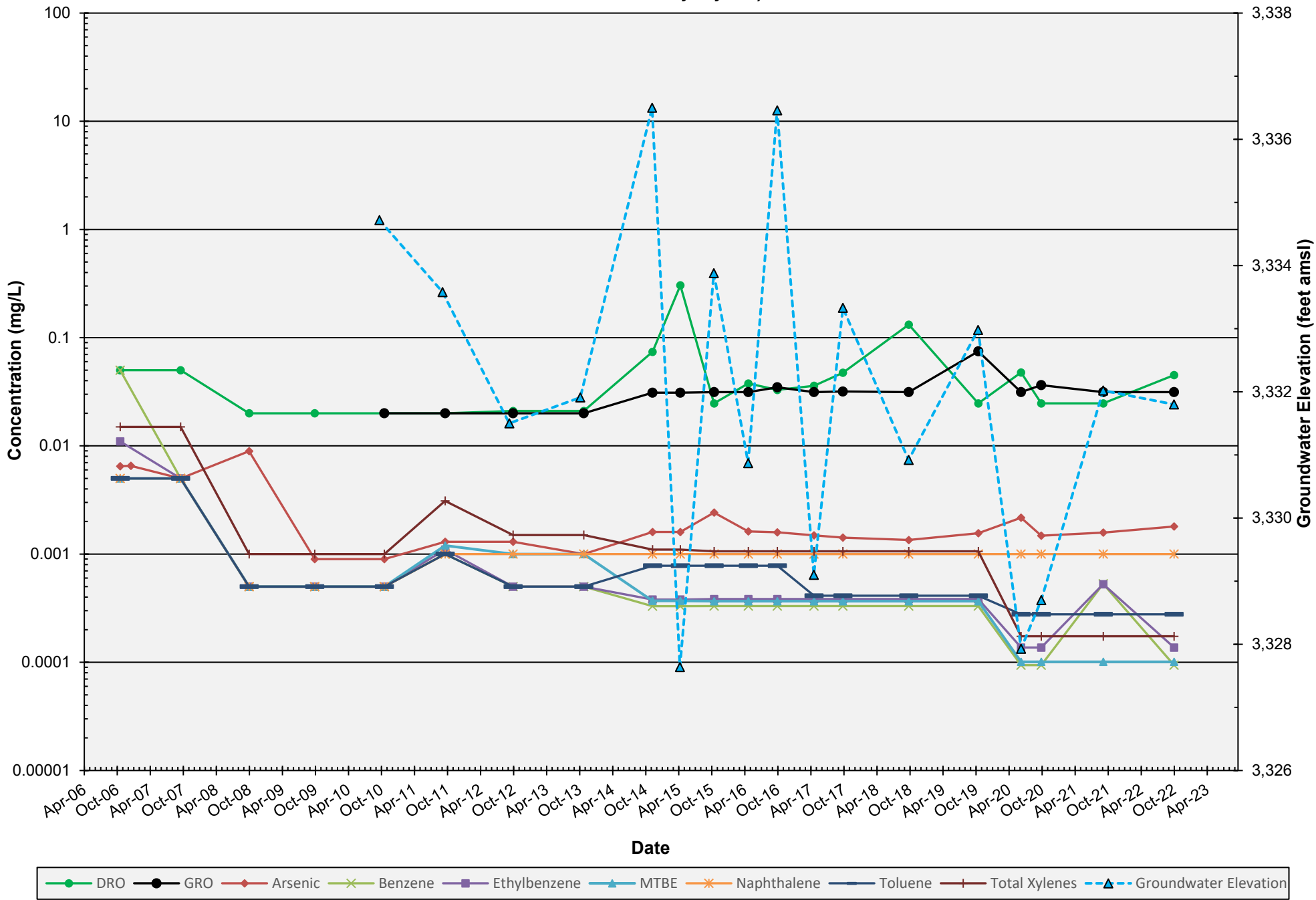
Field East of Refinery



KWB-12A: COC Concentrations and Groundwater Elevations

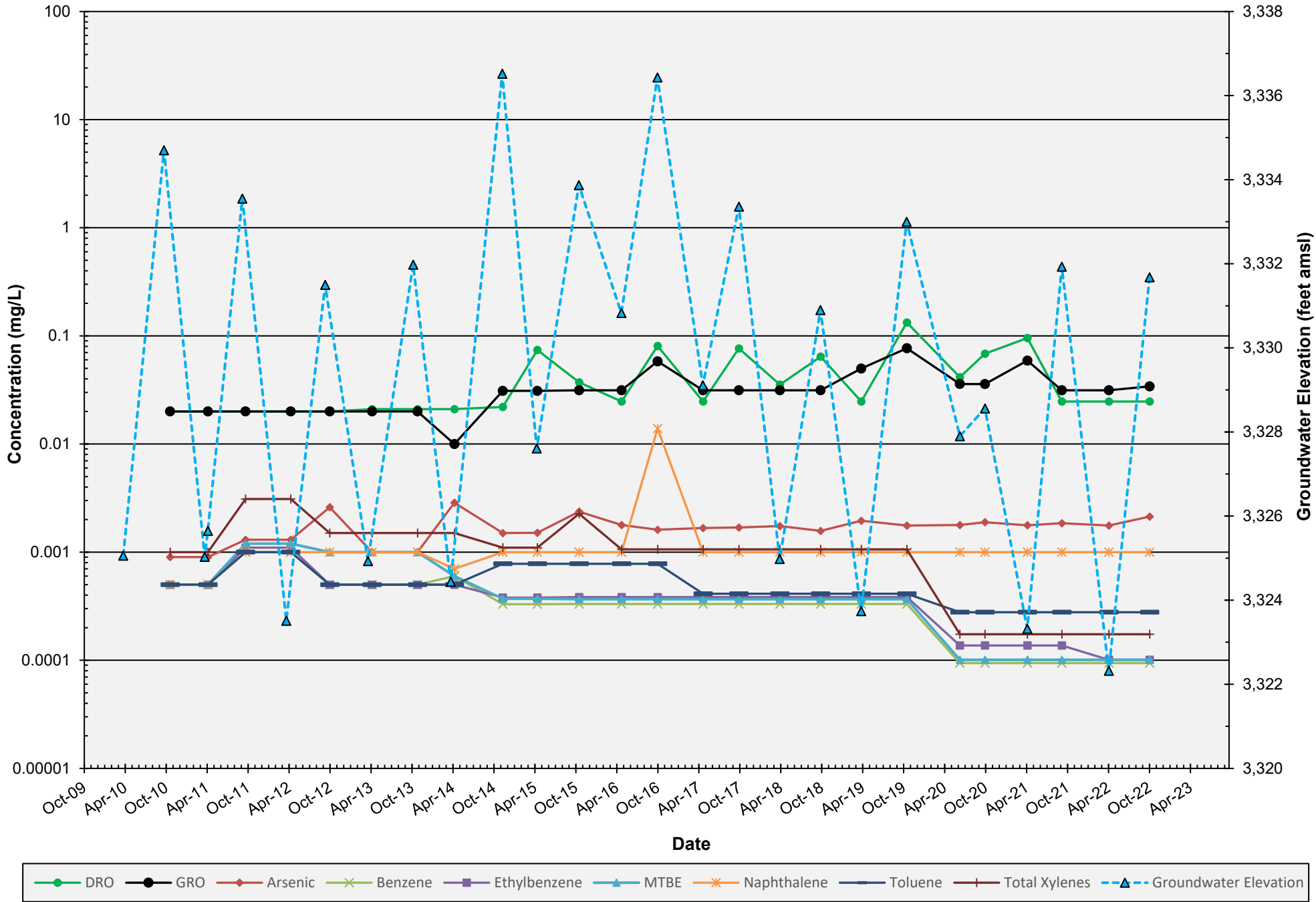
HF Sinclair Navajo Refining LLC - Artesia Refinery

Field East of Refinery



KWB-12B: COC Concentrations and Groundwater Elevations

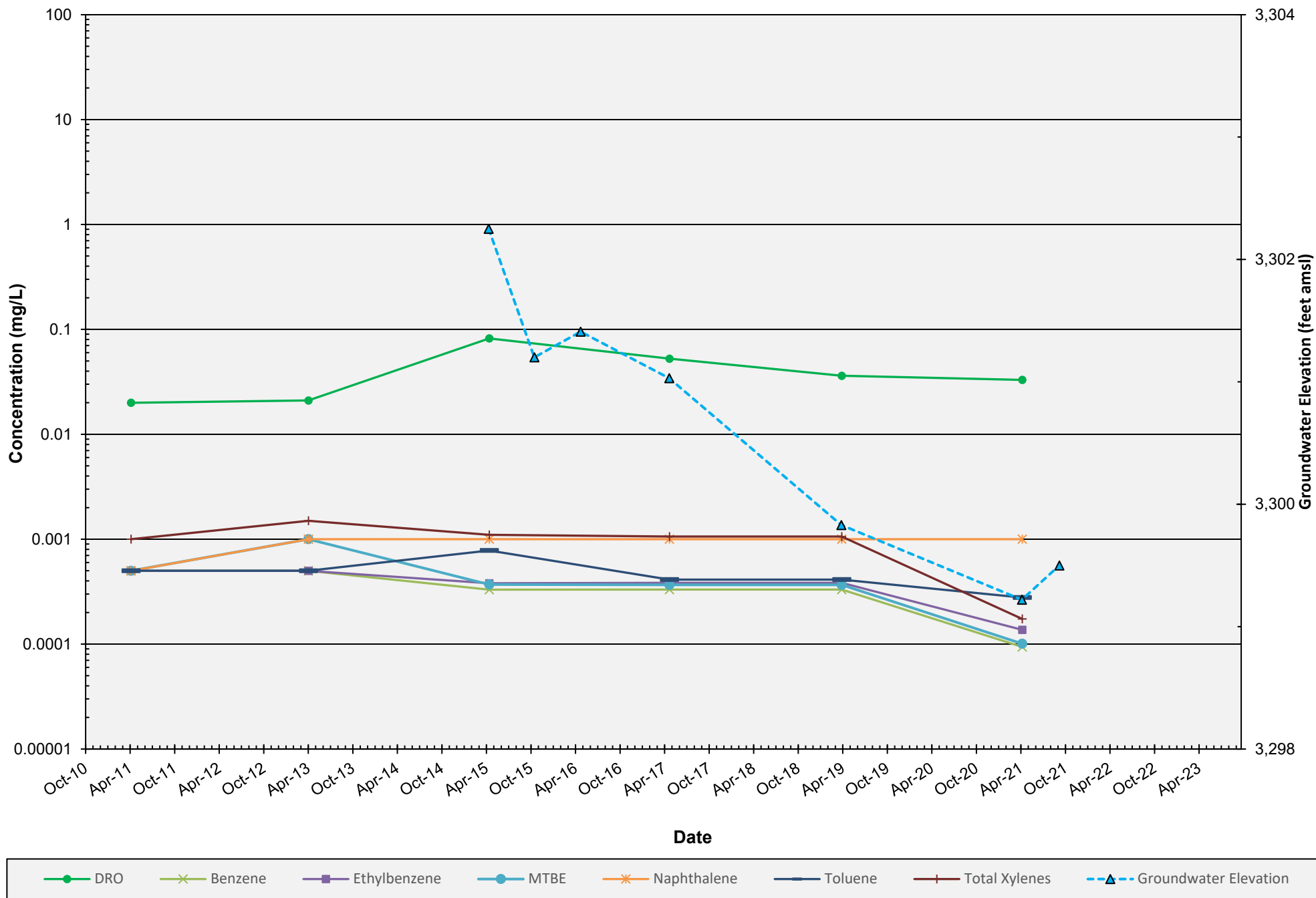
HF Sinclair Navajo Refining LLC - Artesia Refinery
Field East of Refinery



KWB-P4: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery

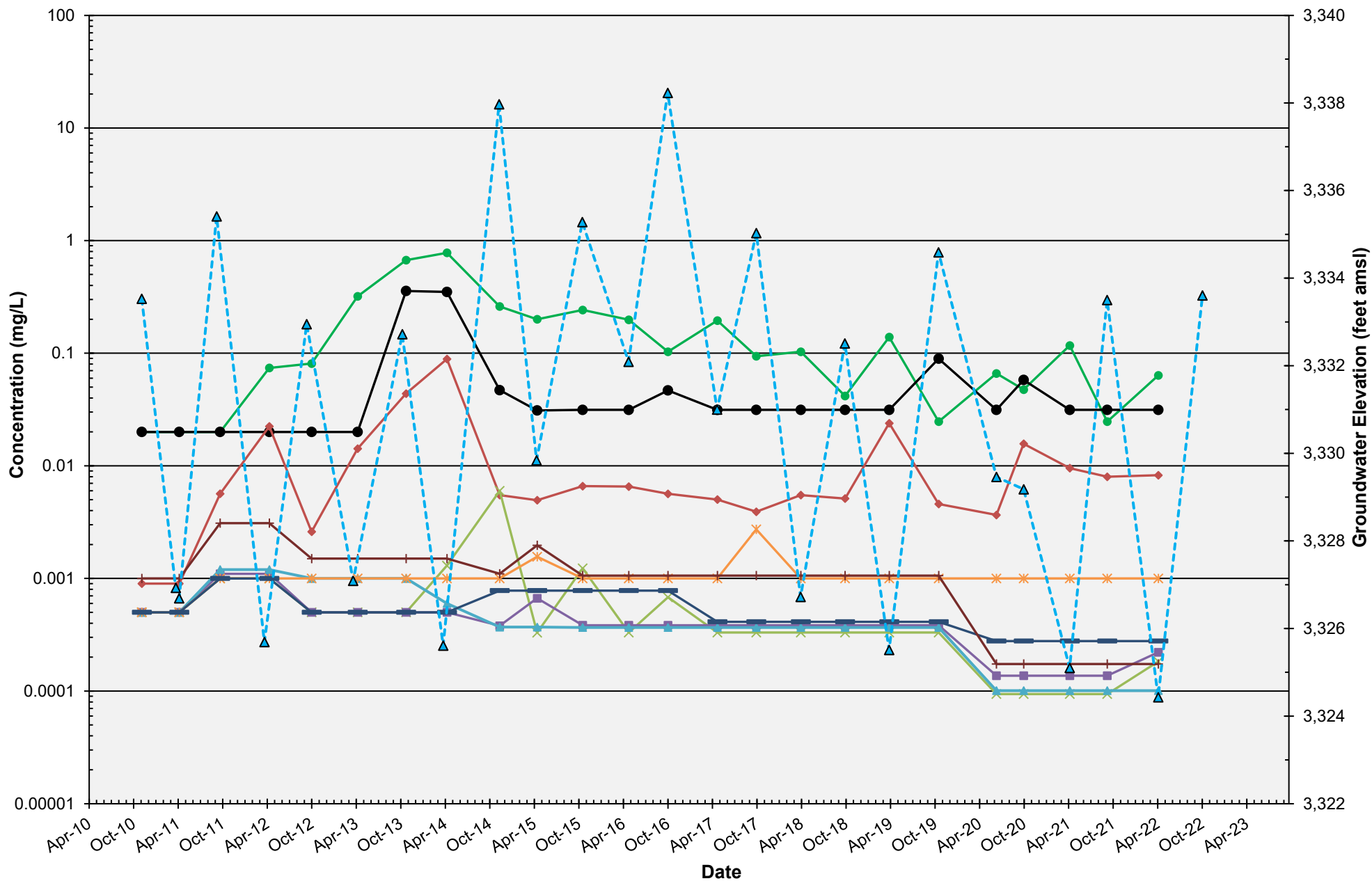
Field East of Refinery



MW-57: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery

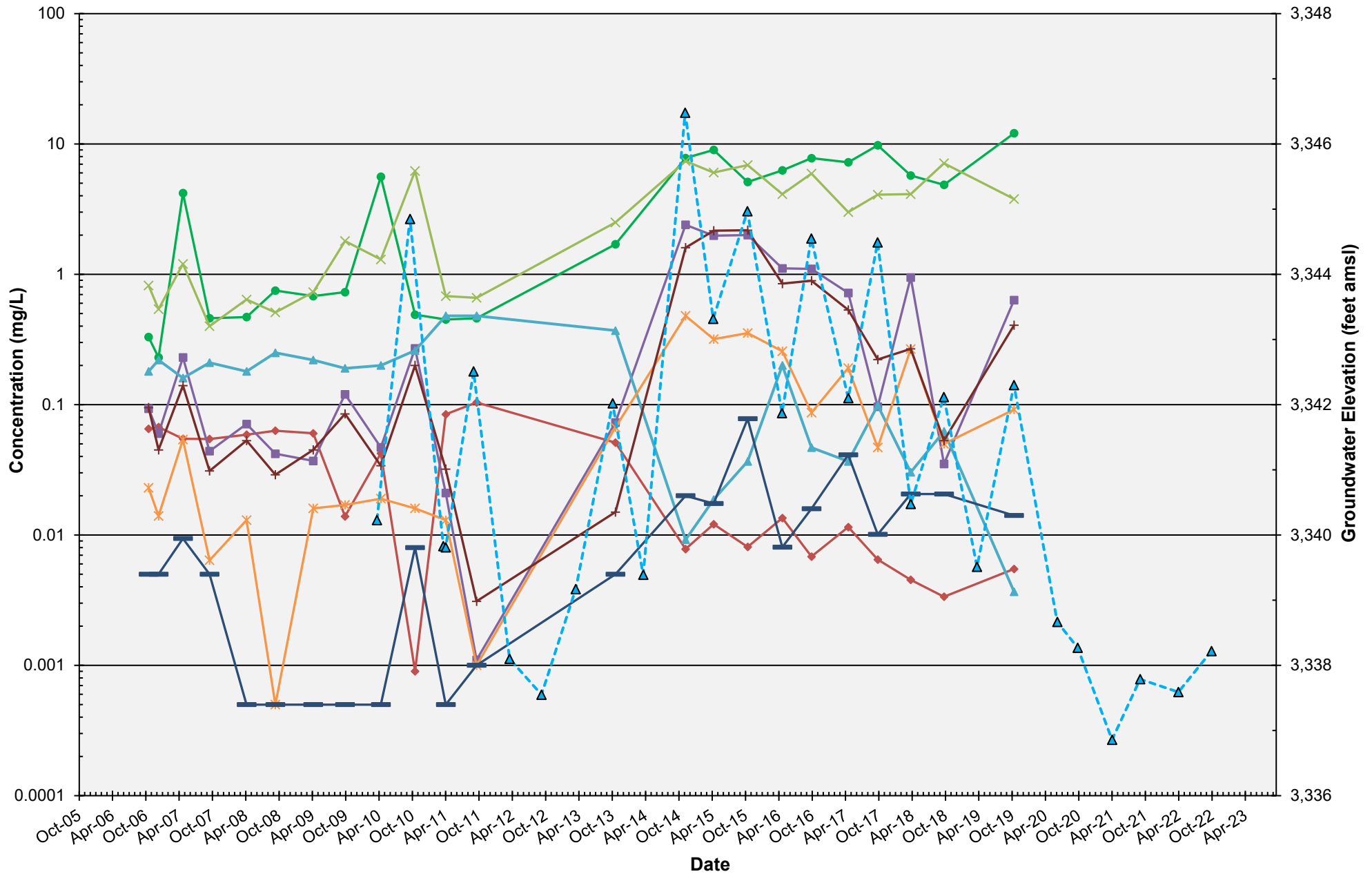
Field East of Refinery



MW-58: COC Concentrations and Groundwater Elevations

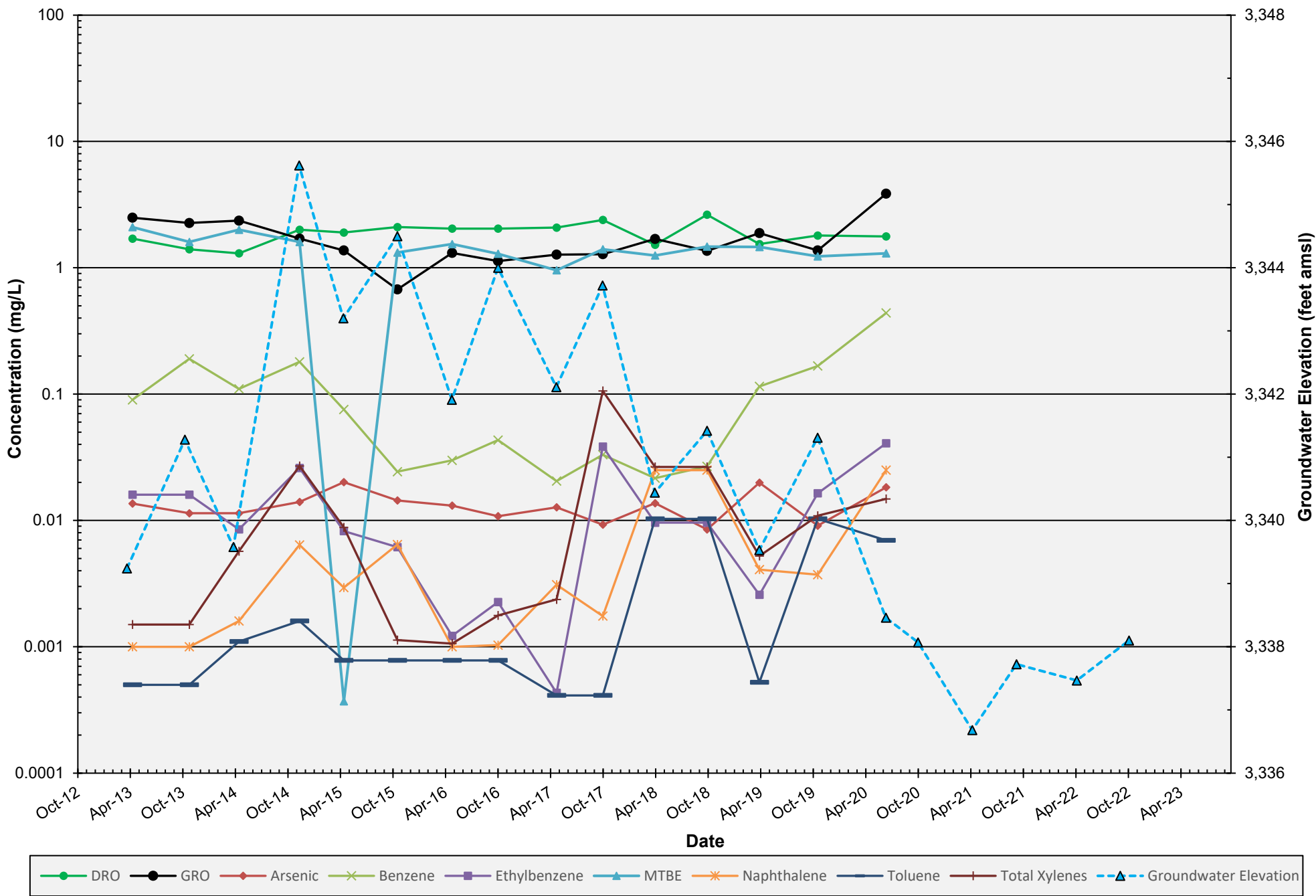
HF Sinclair Navajo Refining LLC - Artesia Refinery

Field East of Refinery



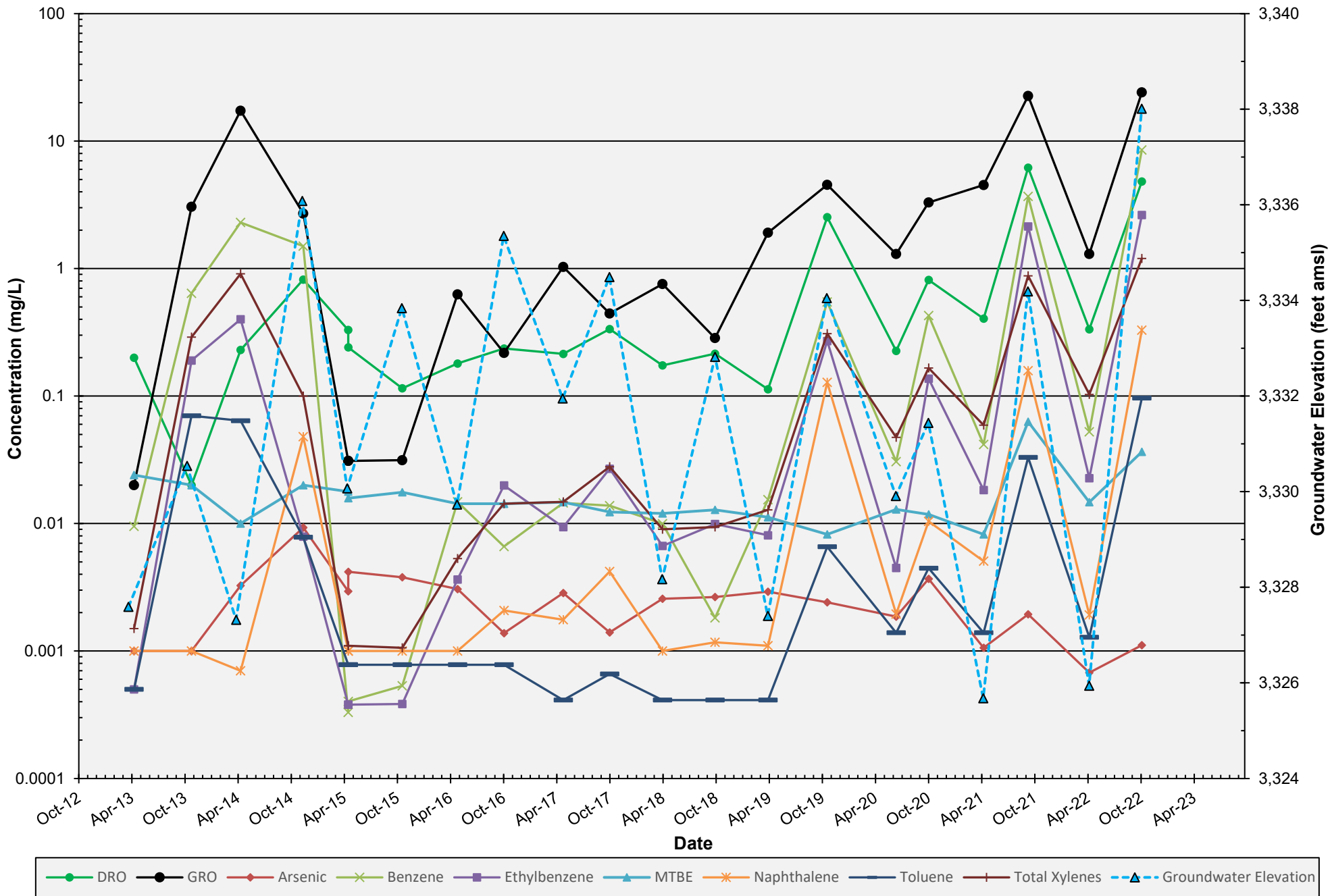
MW-111: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery
Field East of Refinery



MW-113: COC Concentrations and Groundwater Elevations

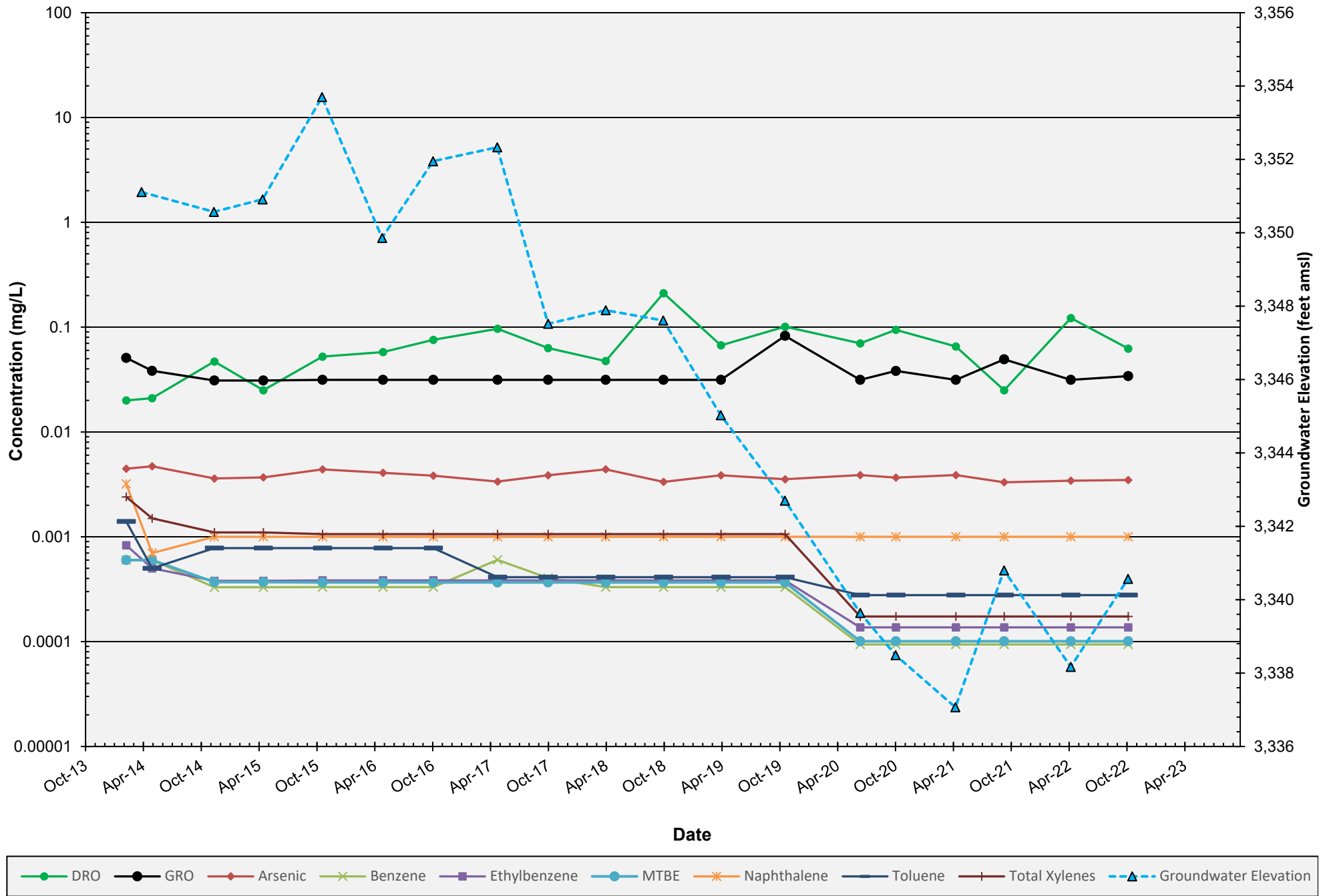
HF Sinclair Navajo Refining LLC - Artesia Refinery
Field East of Refinery



MW-125: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery

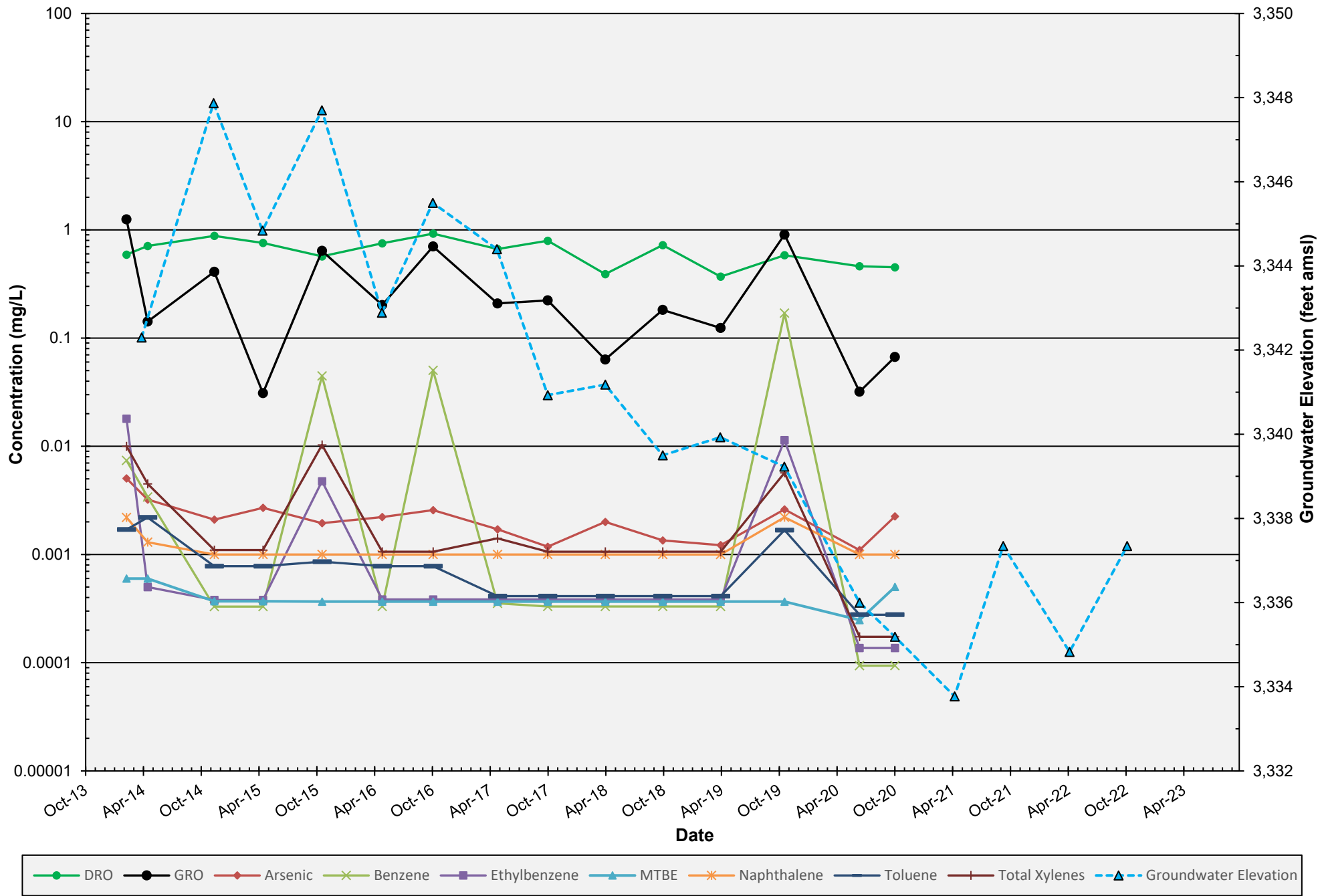
Field East of Refinery



MW-126A: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery

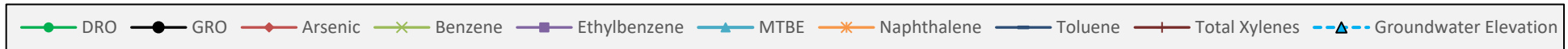
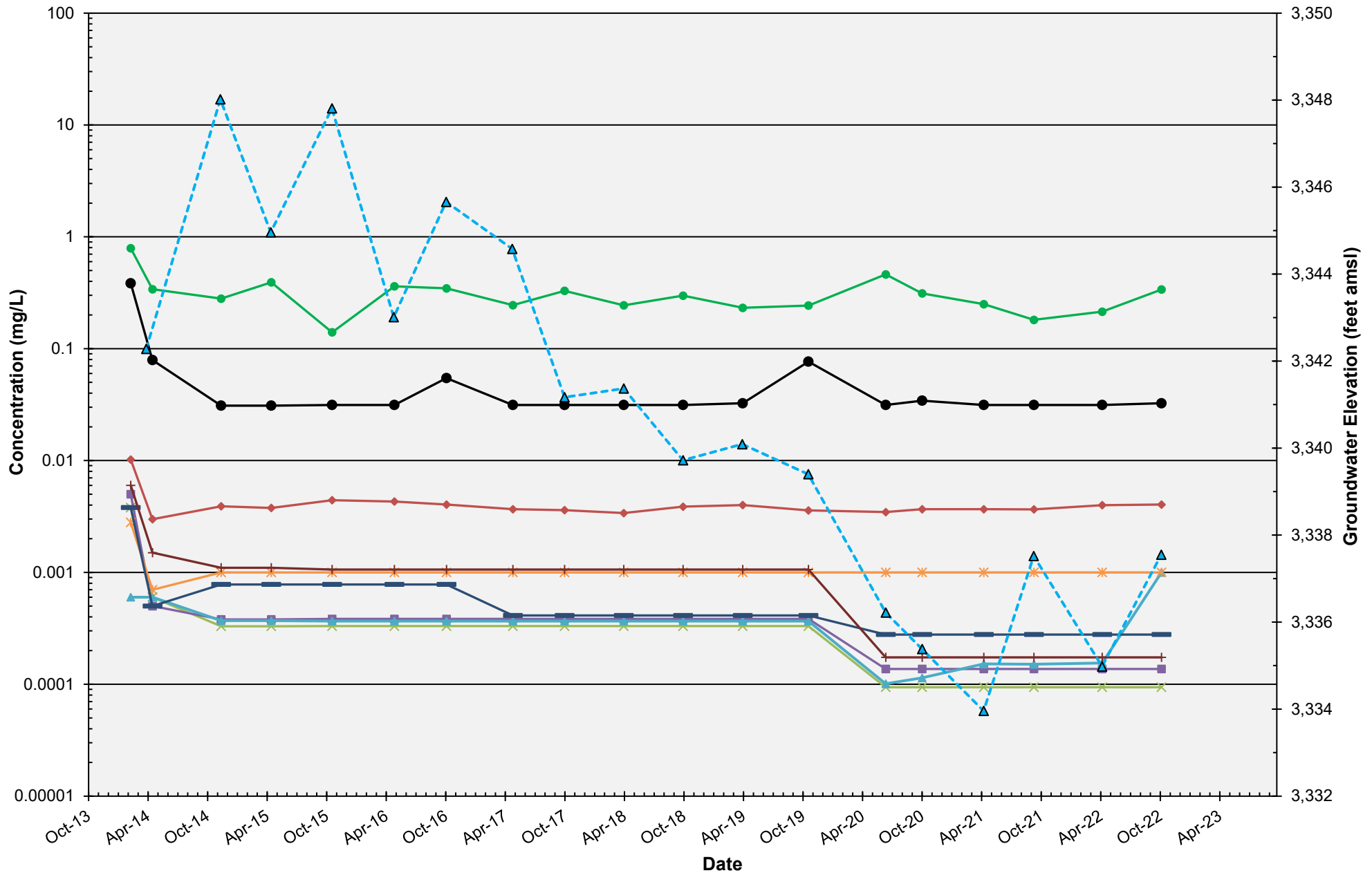
Field East of Refinery



MW-126B: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery

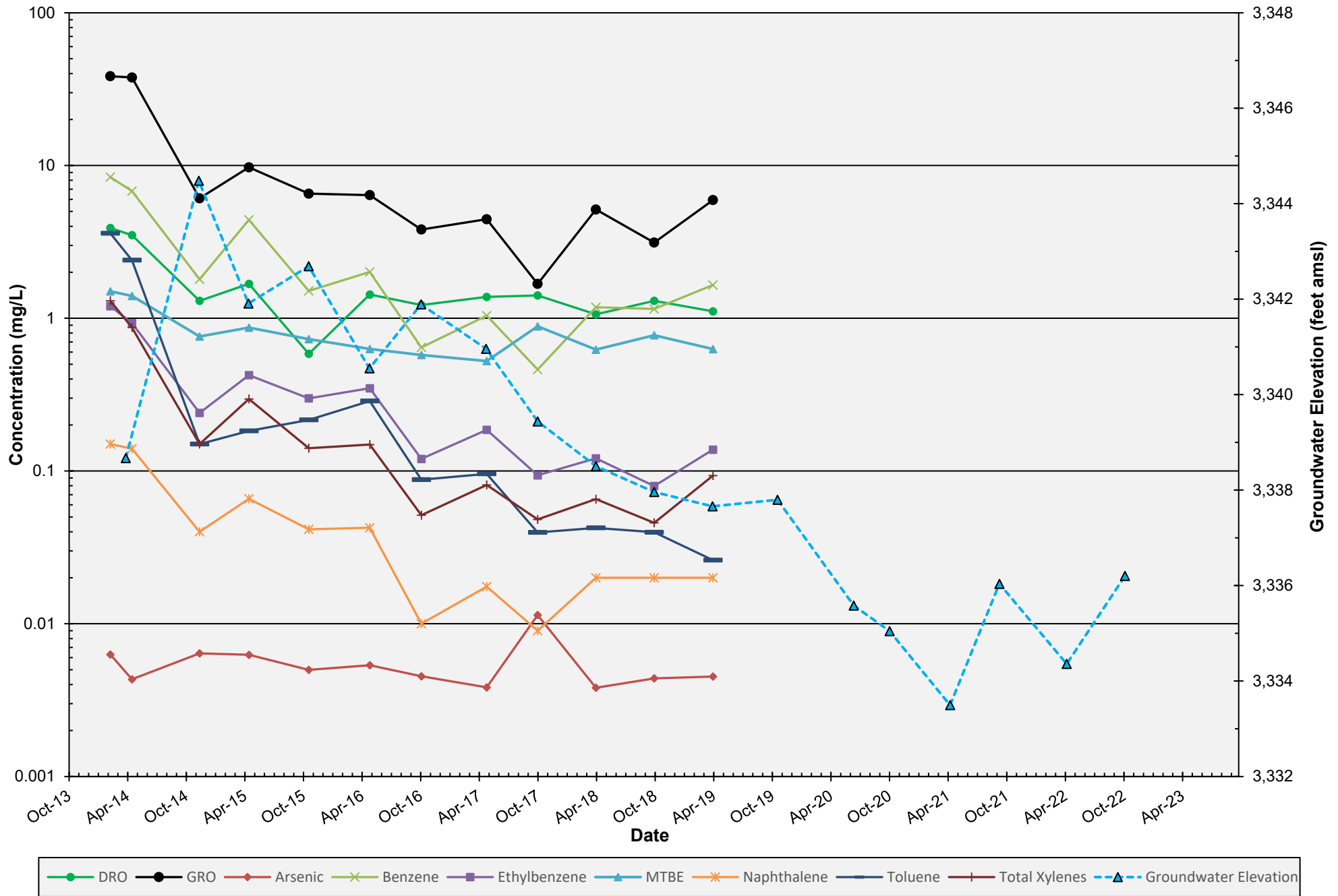
Field East of Refinery



MW-127: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery

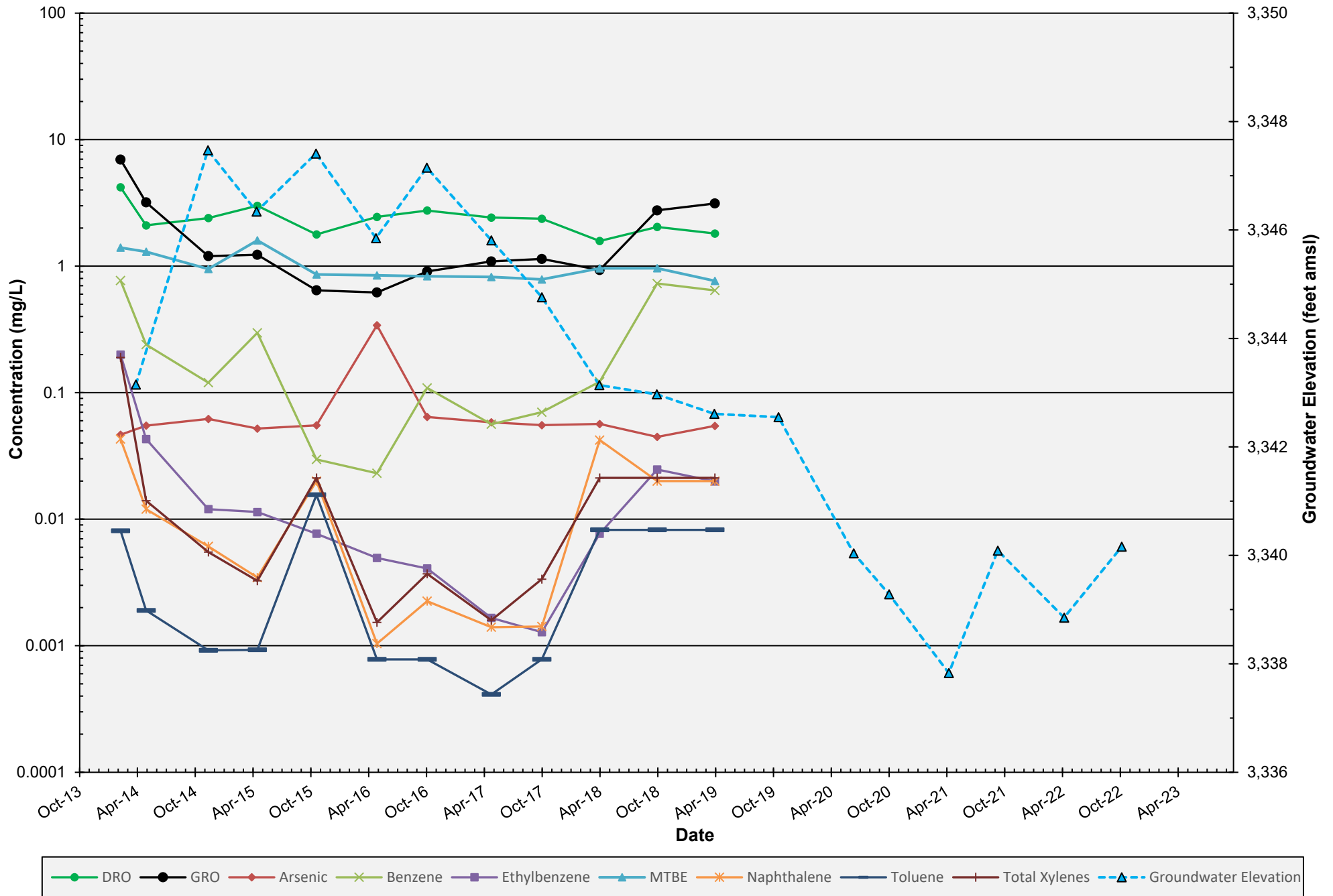
Field East of Refinery



MW-128: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery

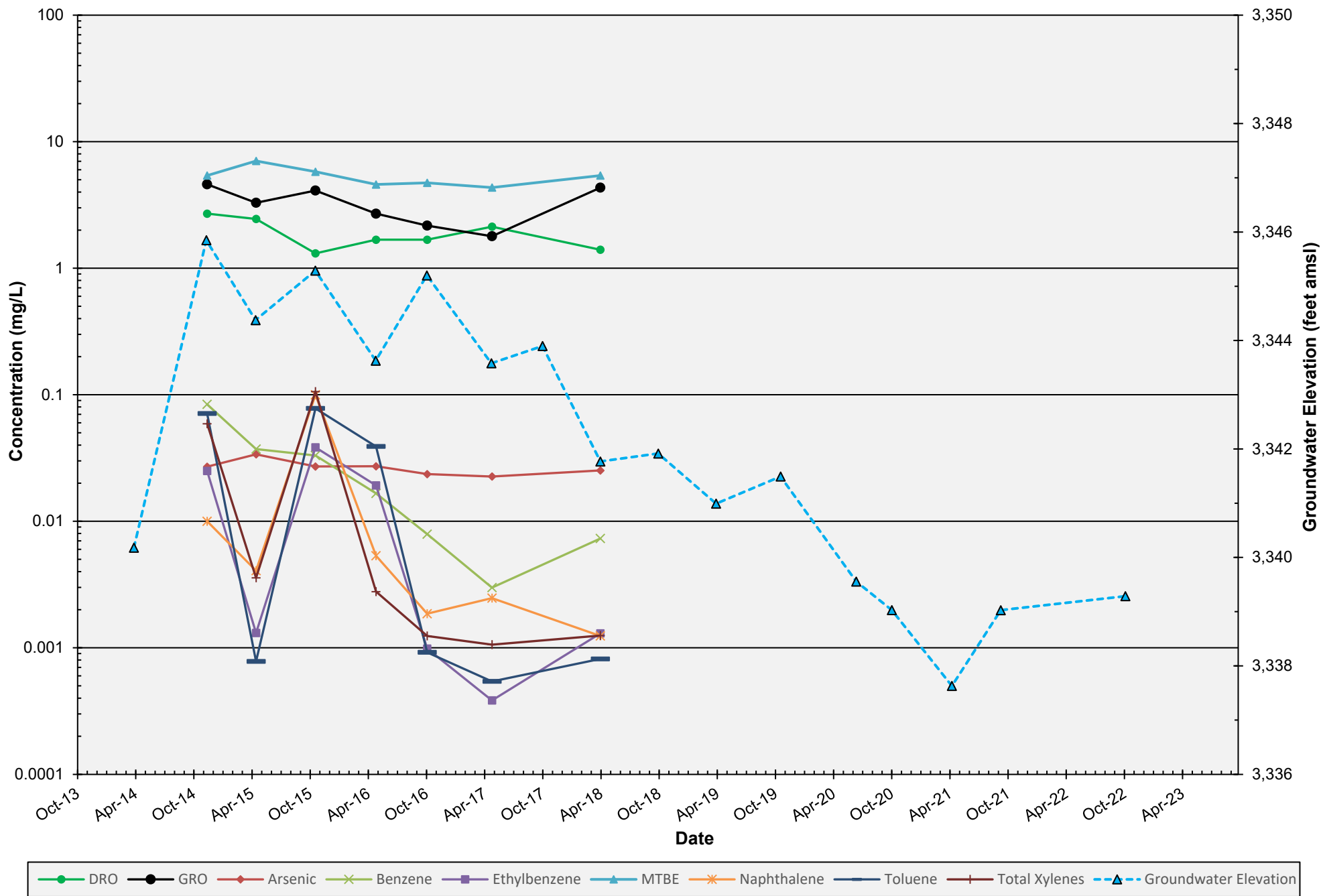
Field East of Refinery



MW-129: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery

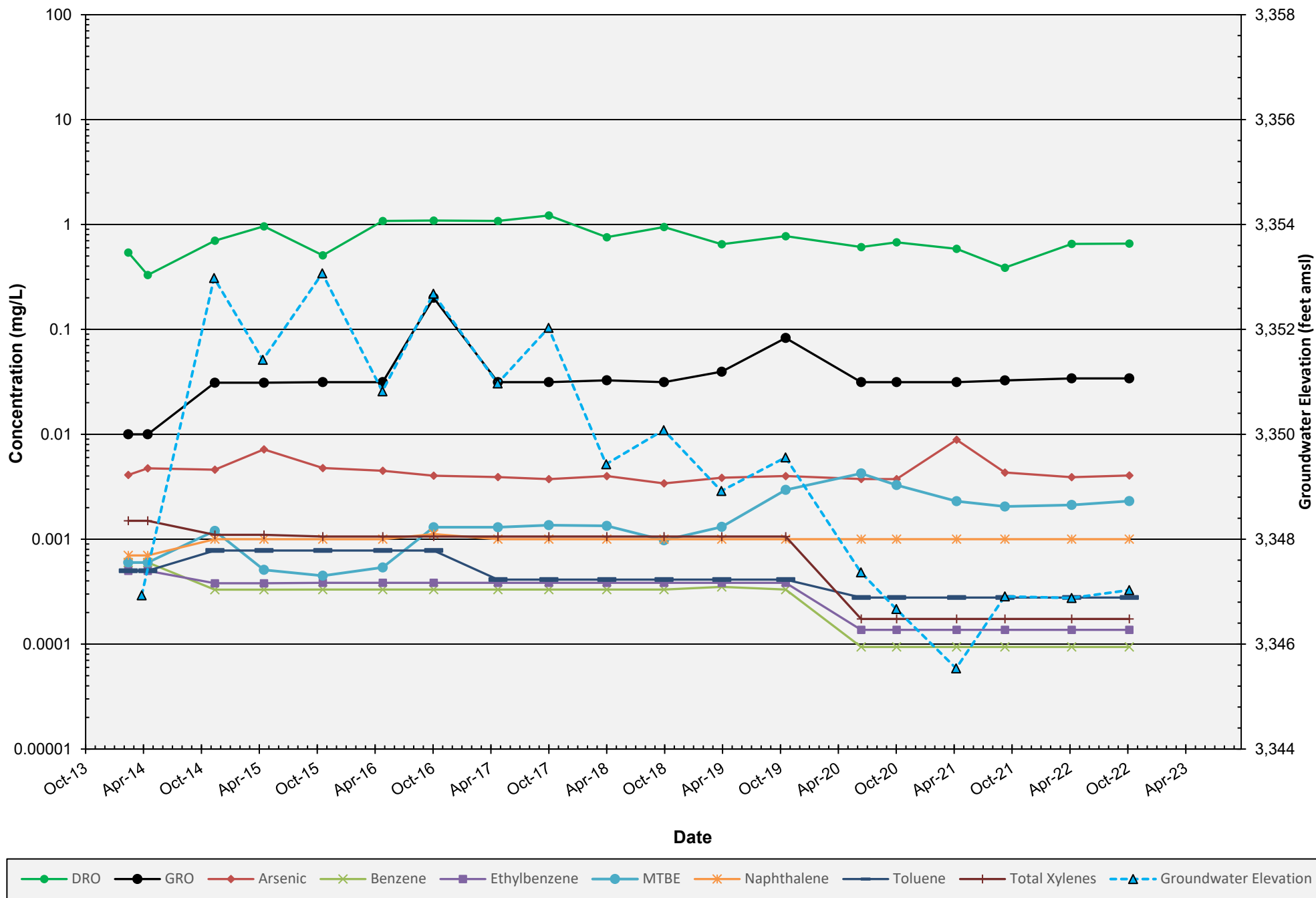
Field East of Refinery



MW-130: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery

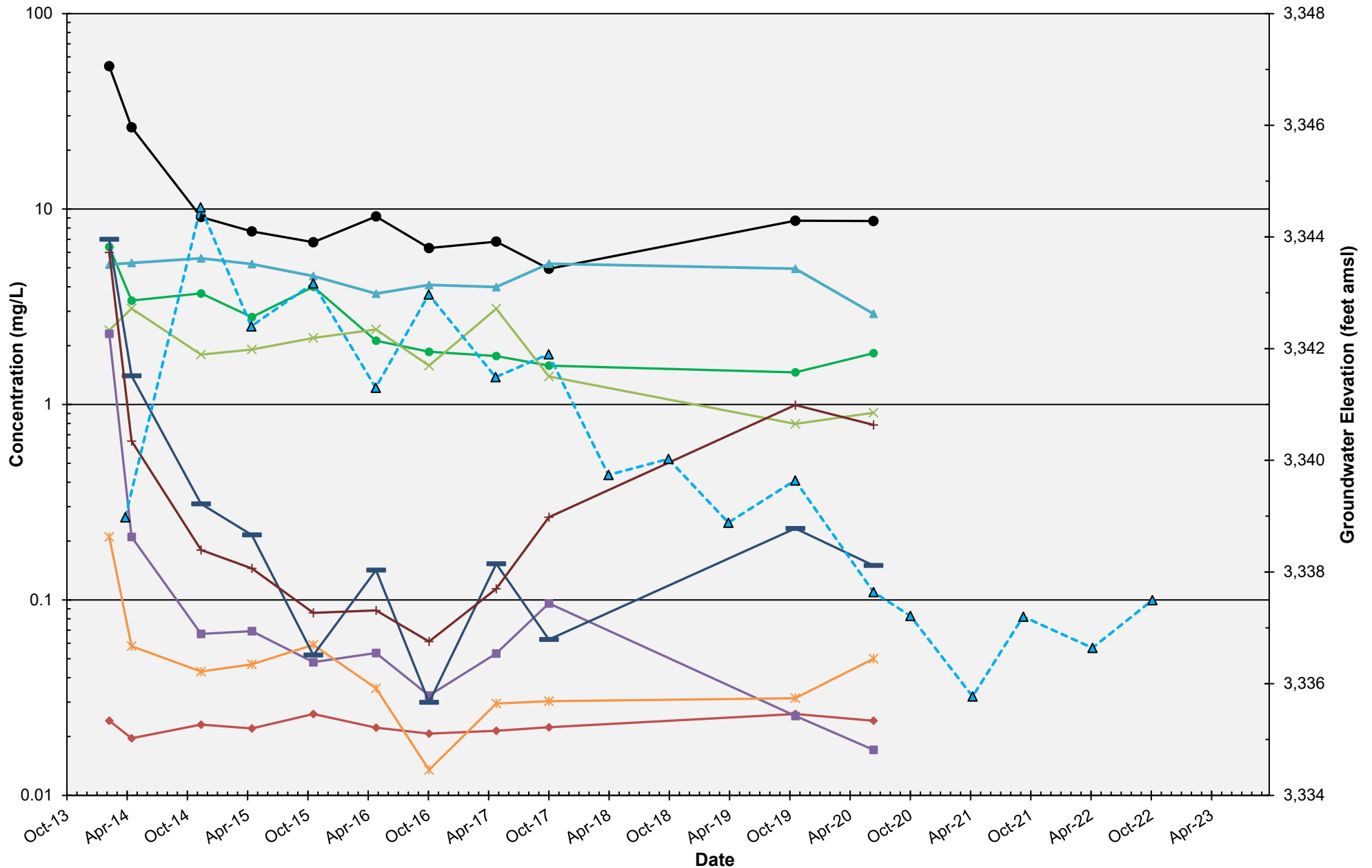
Field East of Refinery



MW-131: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery

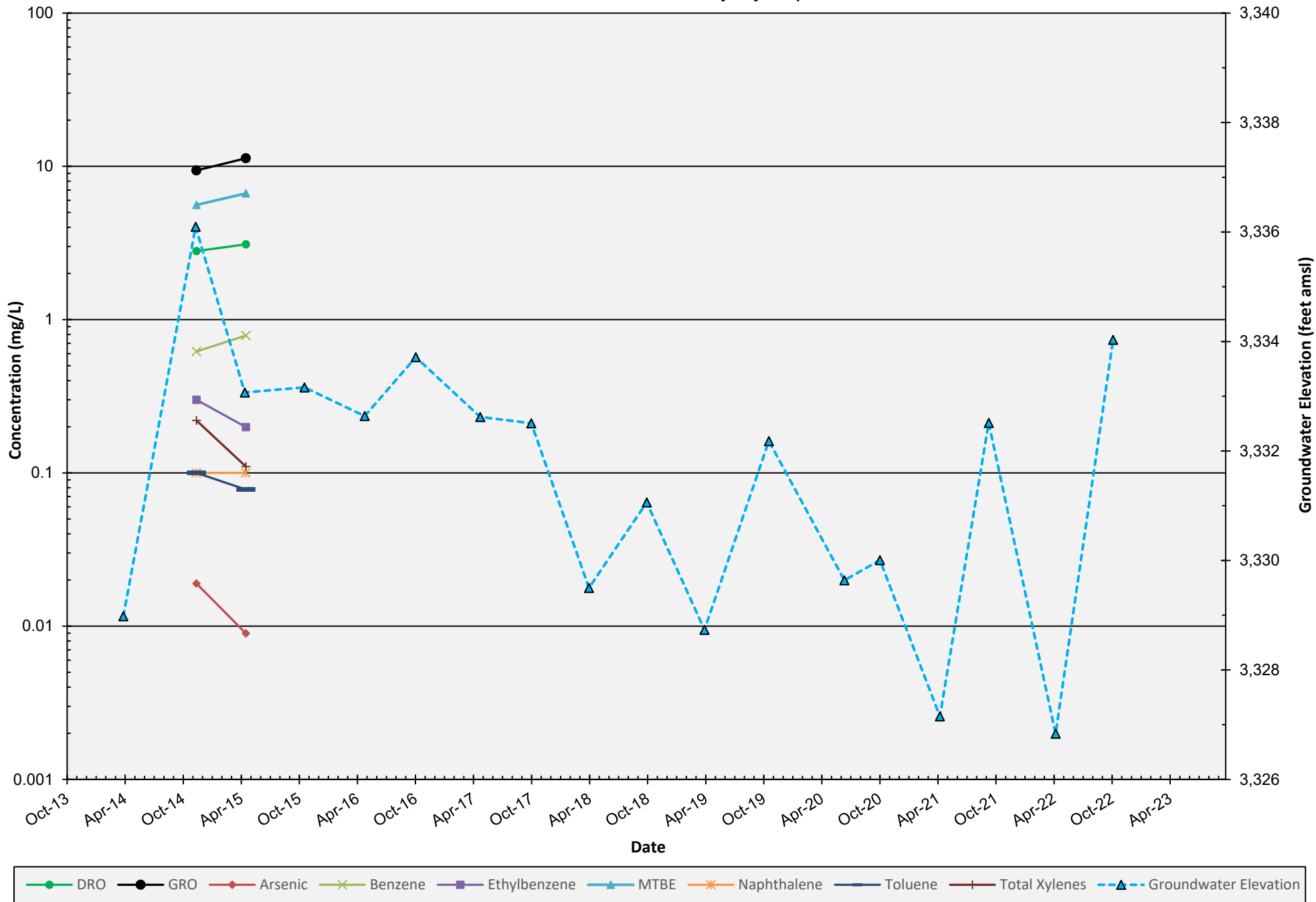
Field East of Refinery



MW-133: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery

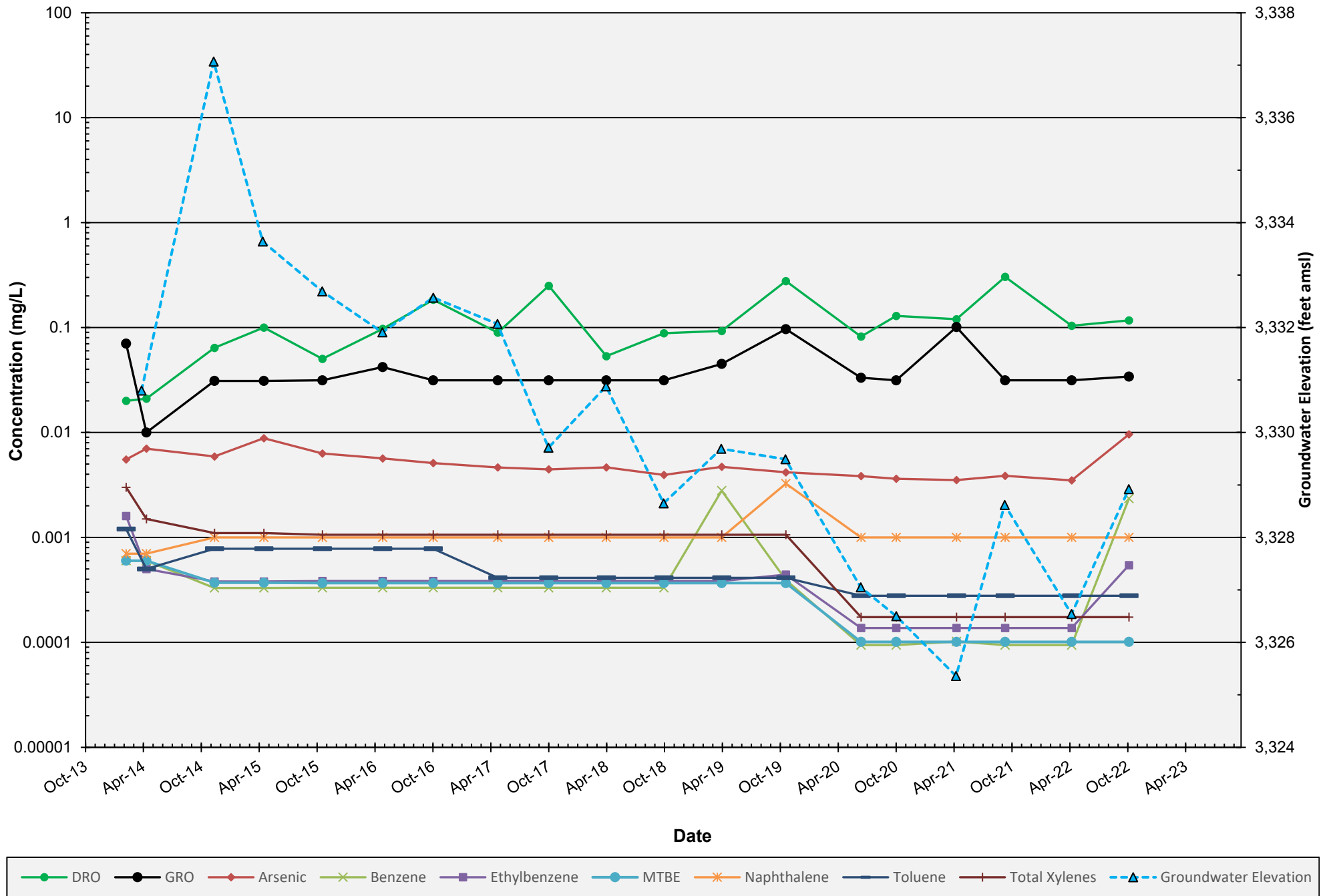
Field East of Refinery



MW-134: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery

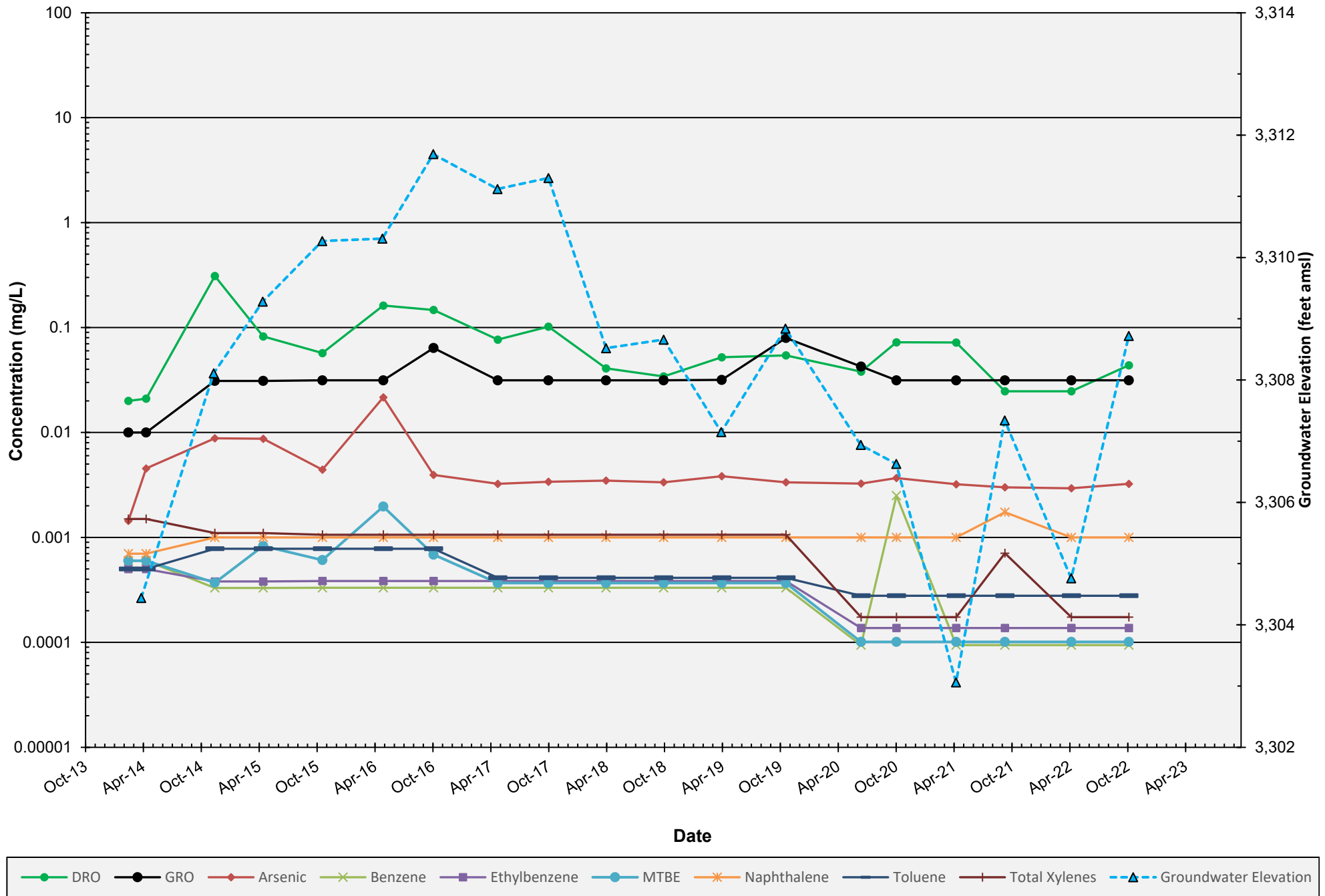
Field East of Refinery



MW-135: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery

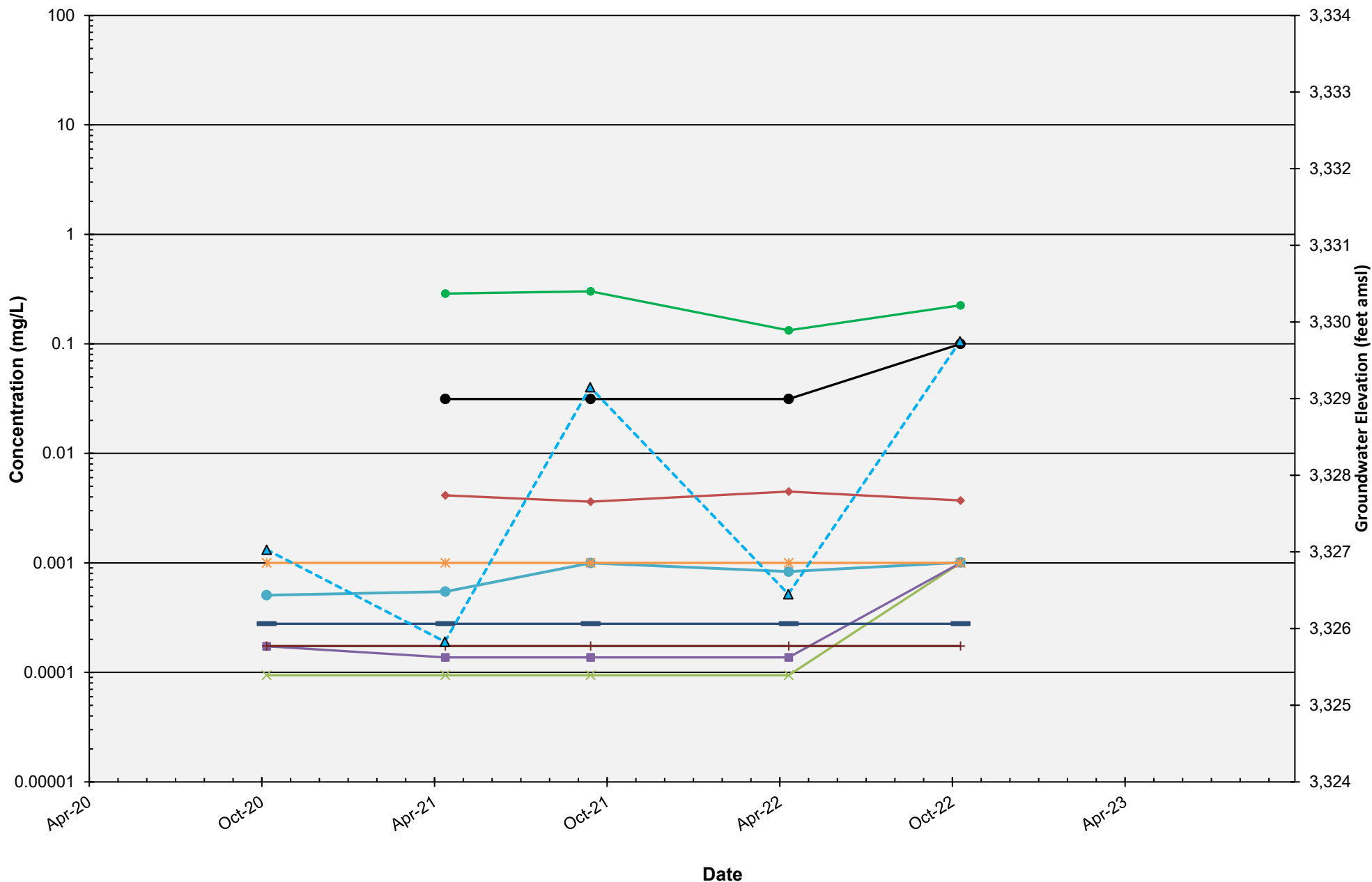
Field East of Refinery



MW-145: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery

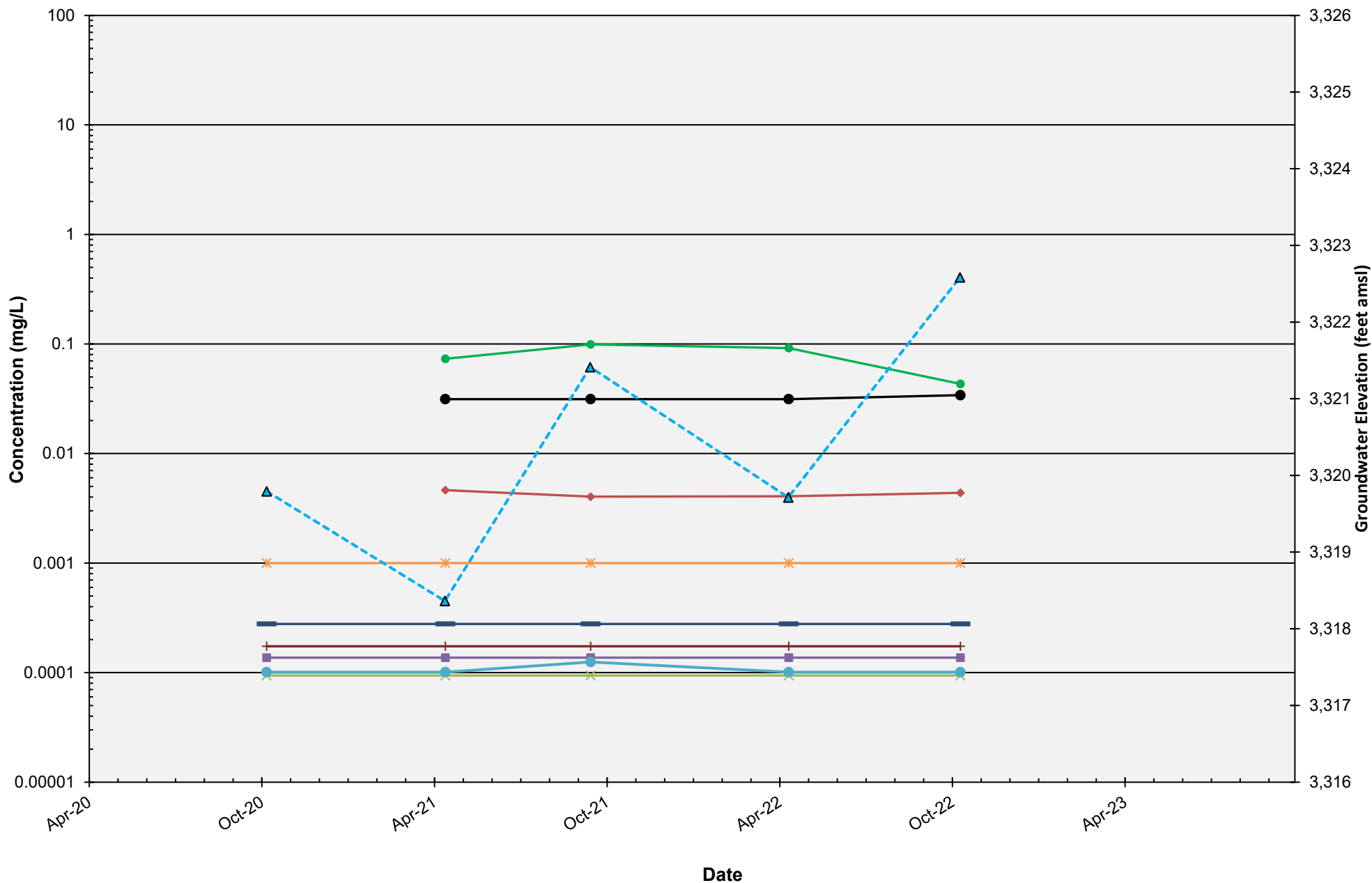
Field East of Refinery



MW-146: COC Concentrations and Groundwater Elevations

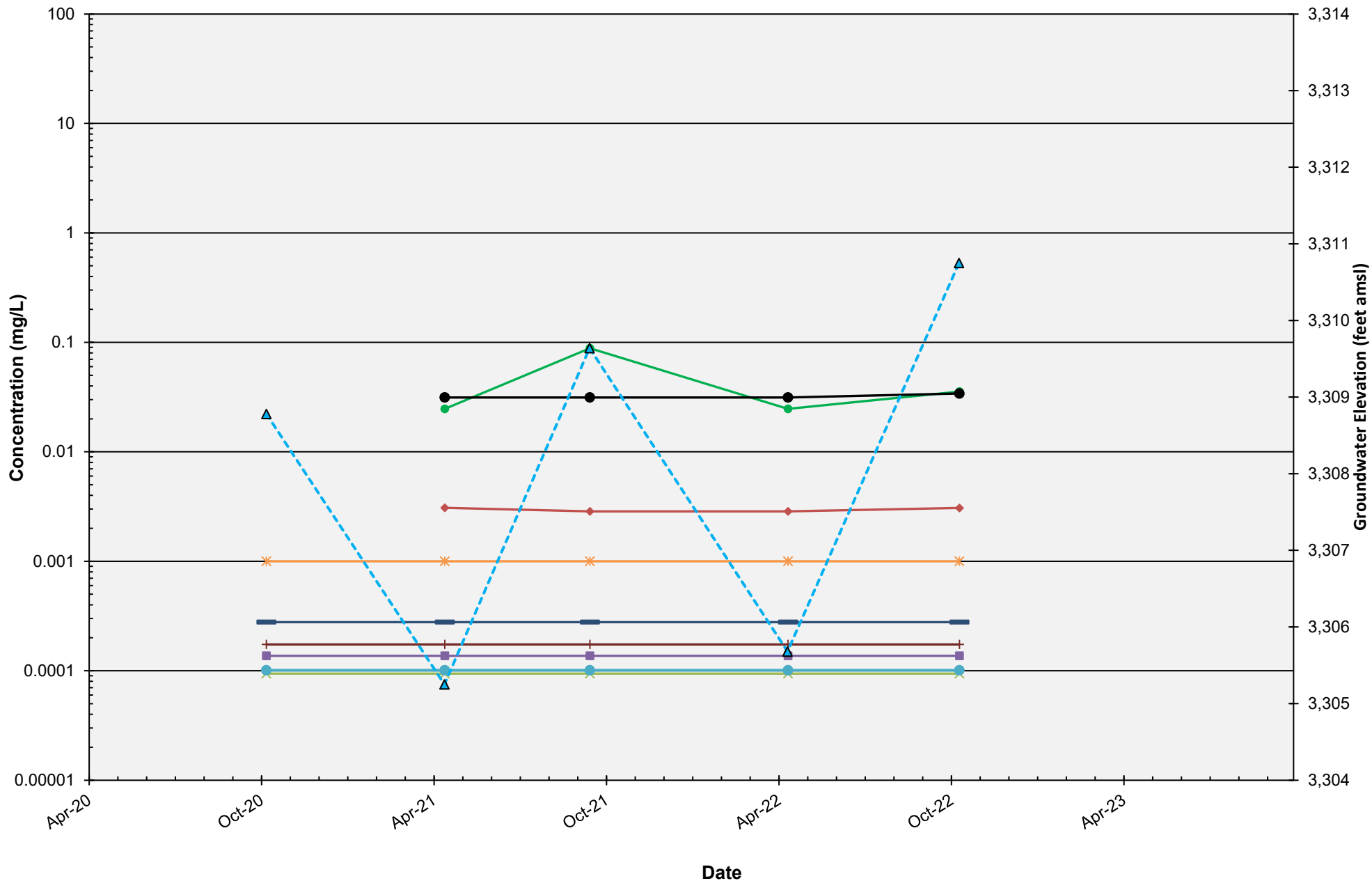
HF Sinclair Navajo Refining LLC - Artesia Refinery

Field East of Refinery



MW-147: COC Concentrations and Groundwater Elevations

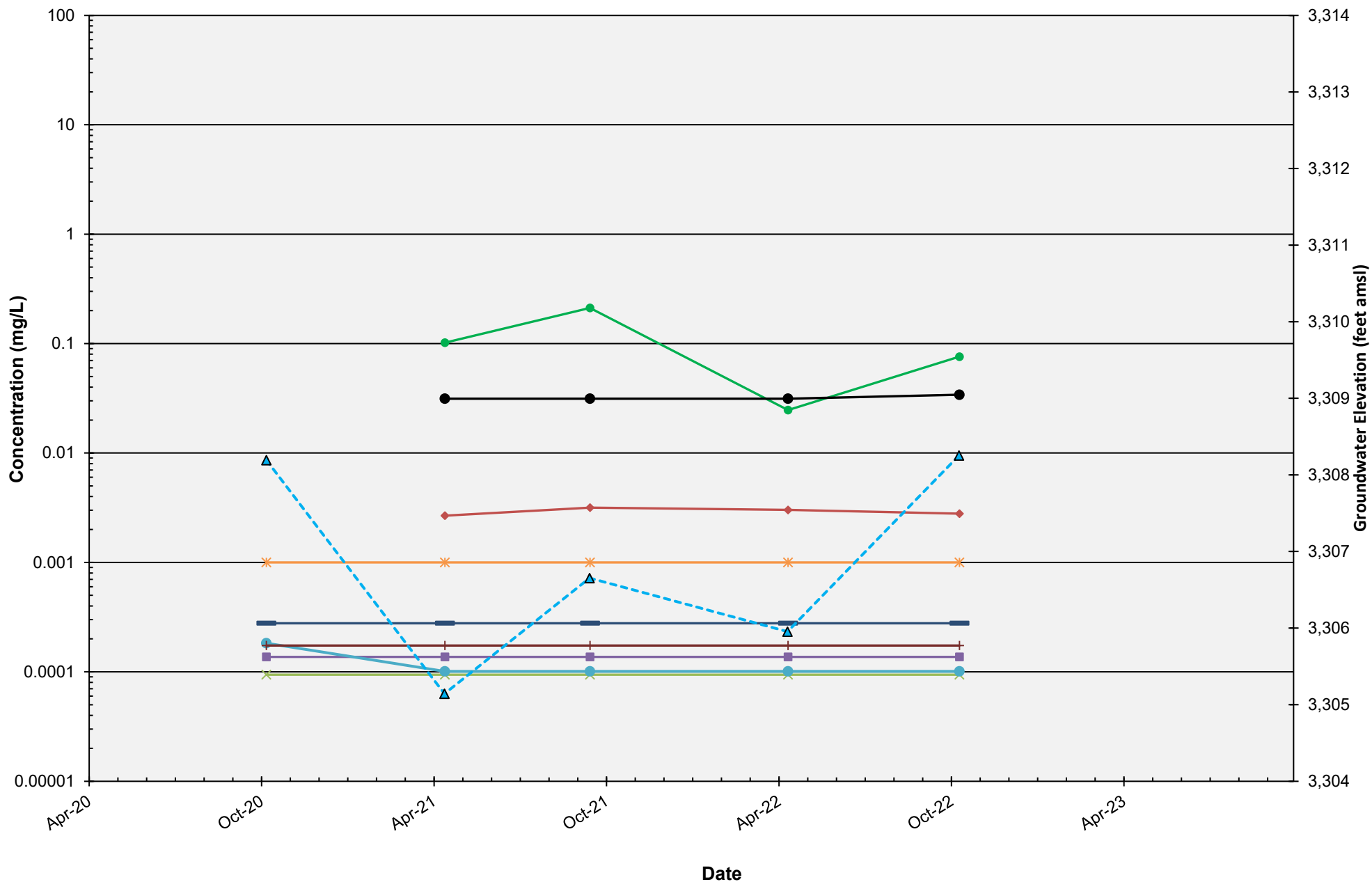
HF Sinclair Navajo Refining LLC - Artesia Refinery
Field East of Refinery



MW-148: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery

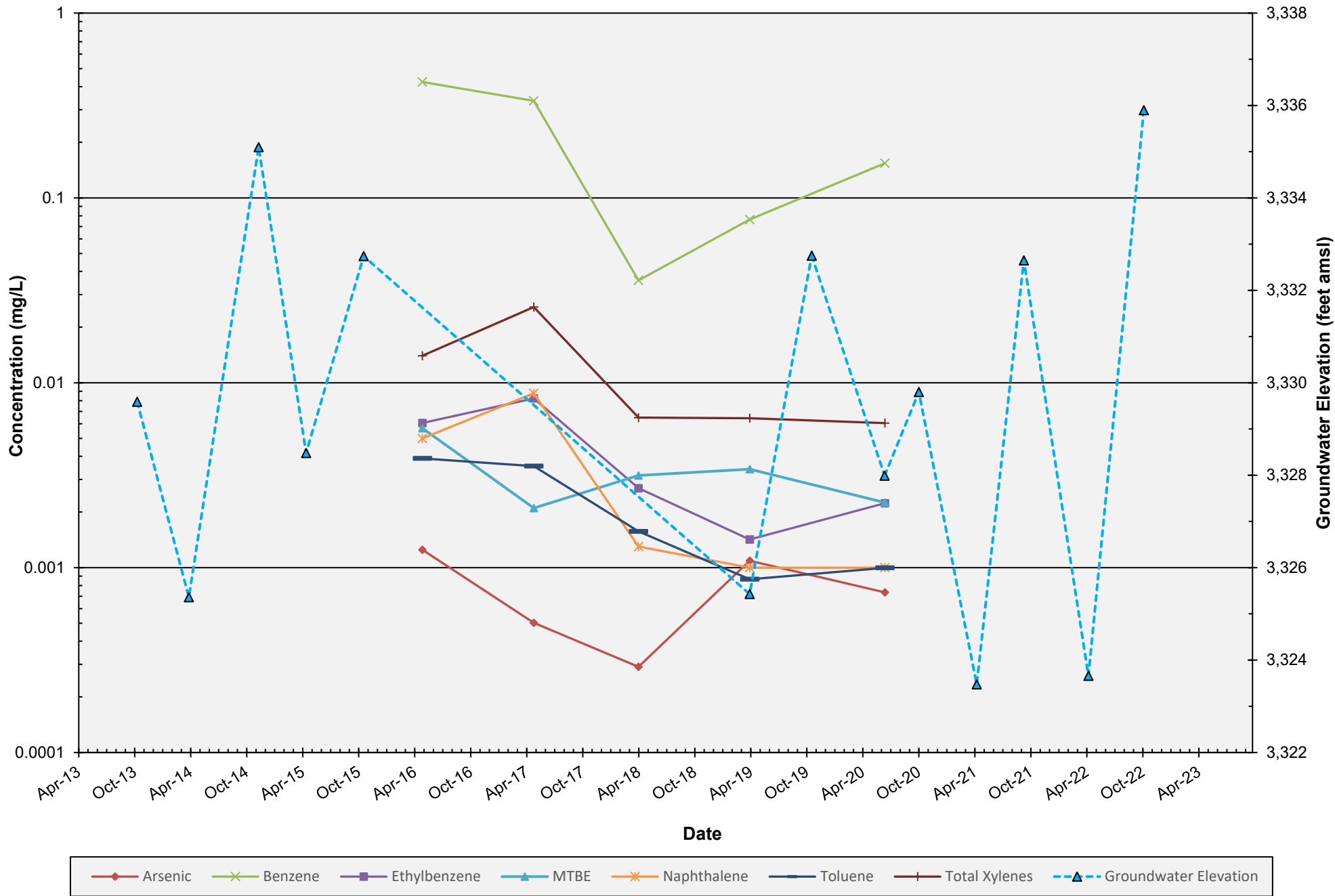
Field East of Refinery



RW-12R: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery

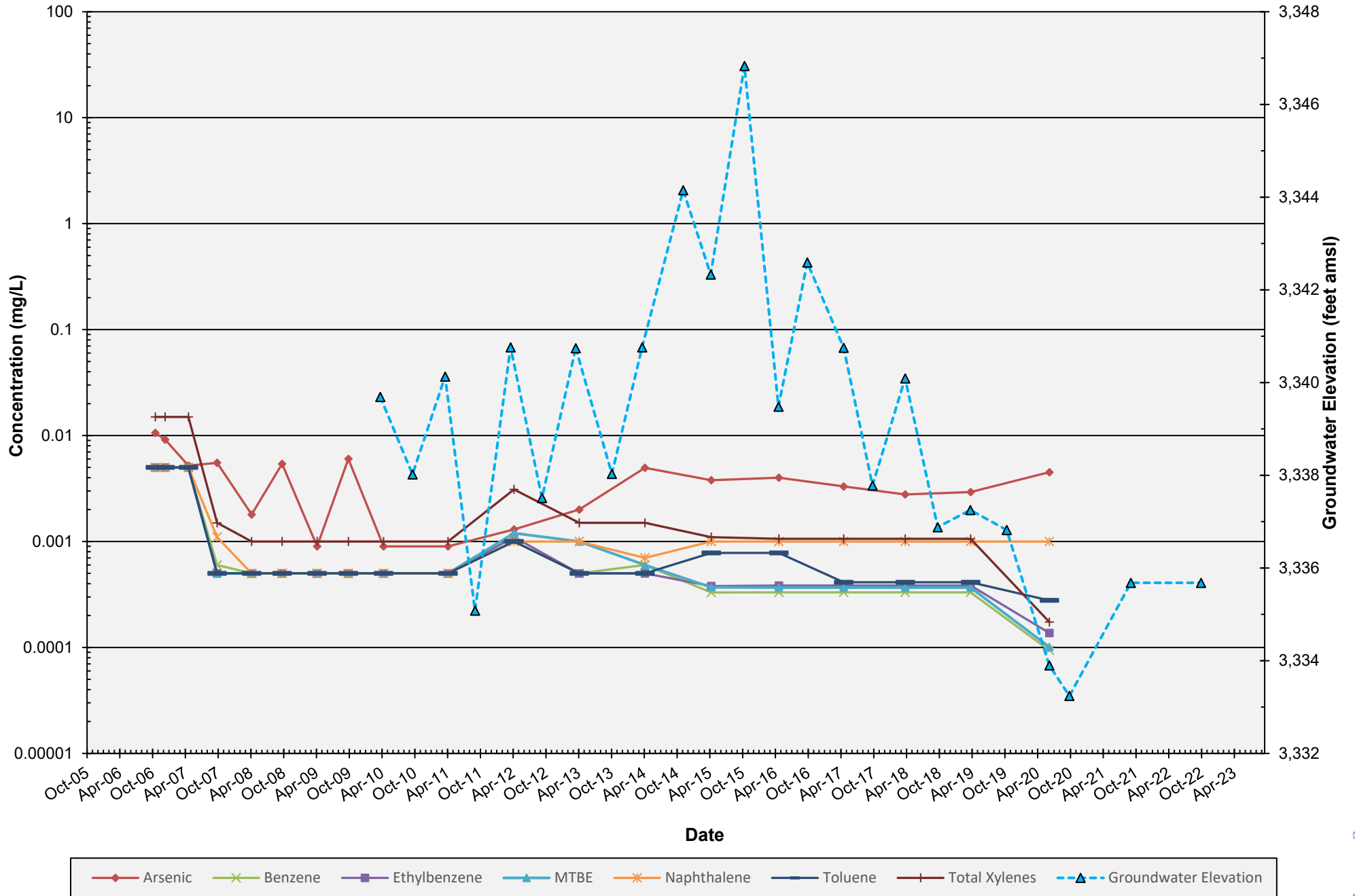
Field East of Refinery



RW-18A: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery

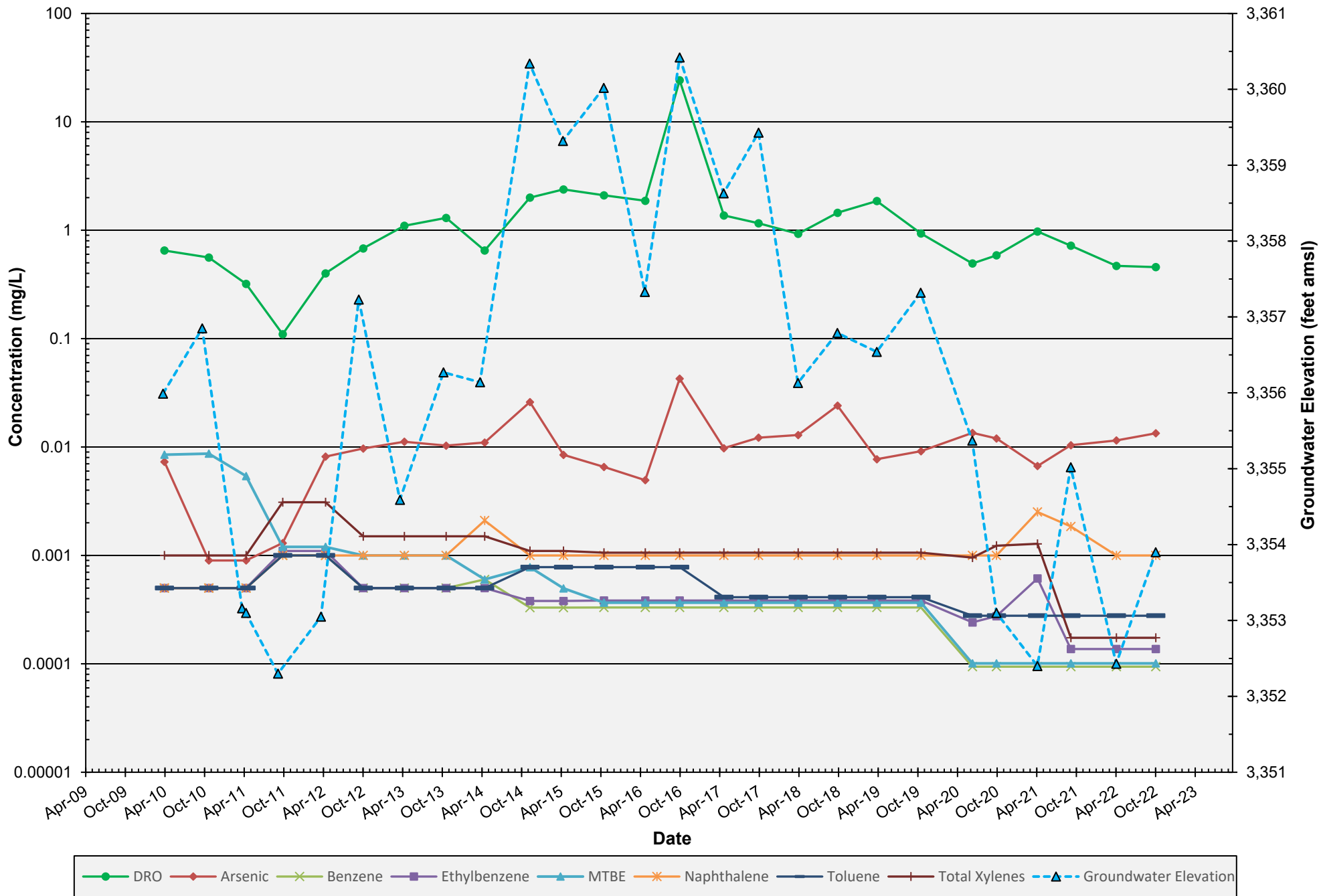
Field East of Refinery



NCL-31: COC Concentrations and Groundwater Elevations

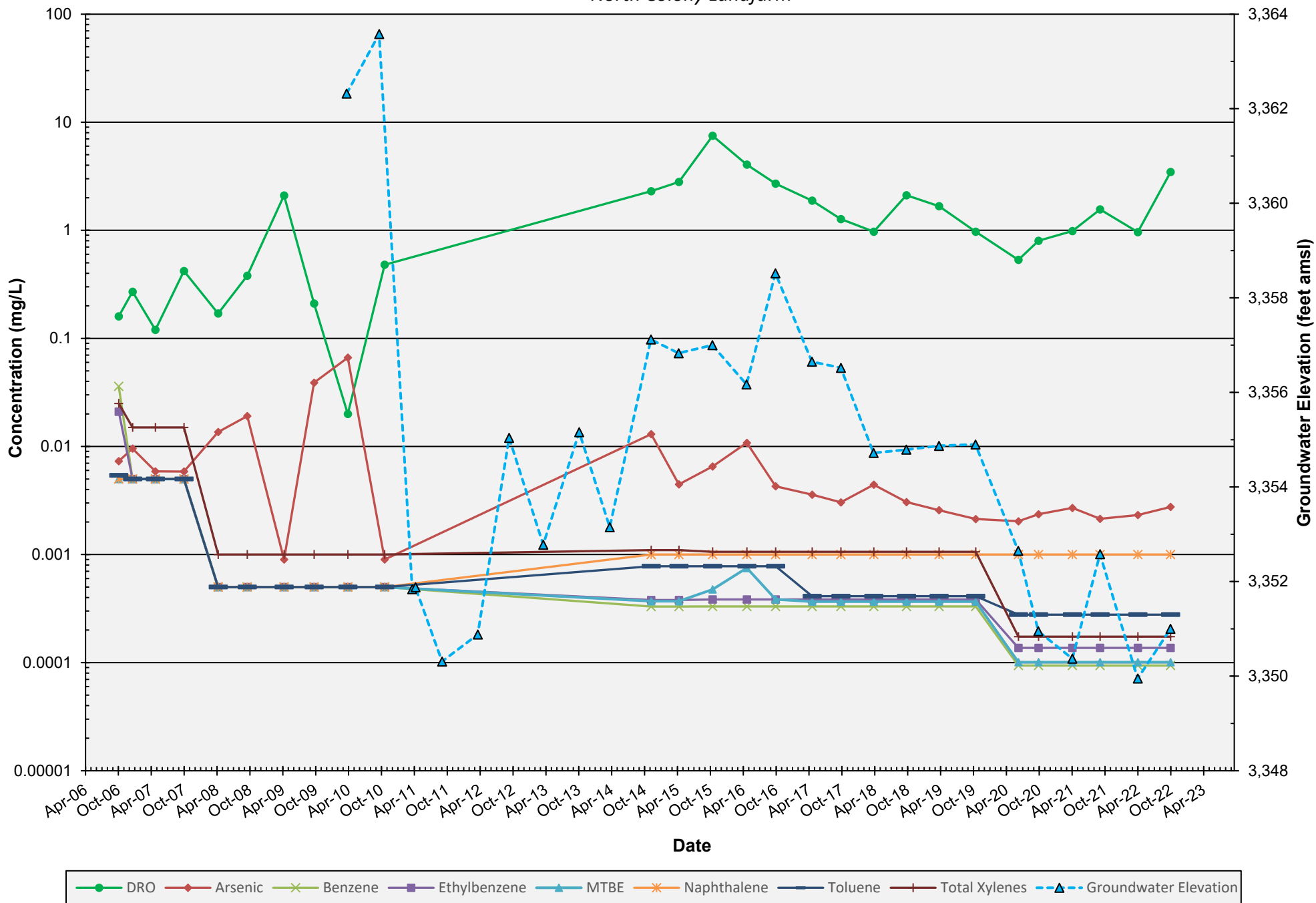
HF Sinclair Navajo Refining LLC - Artesia Refinery

North Colony Landfarm



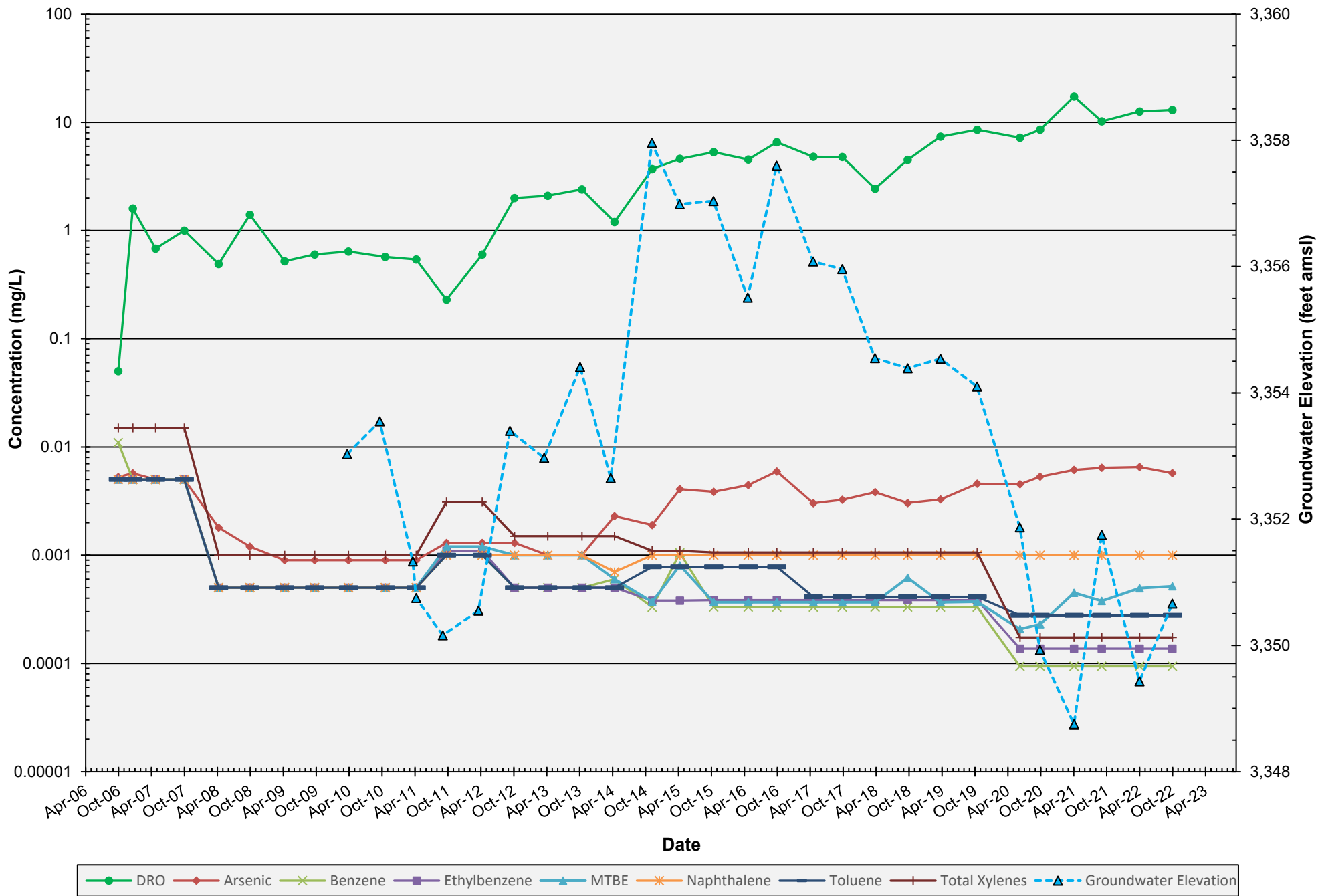
NCL-32: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery
North Colony Landfarm



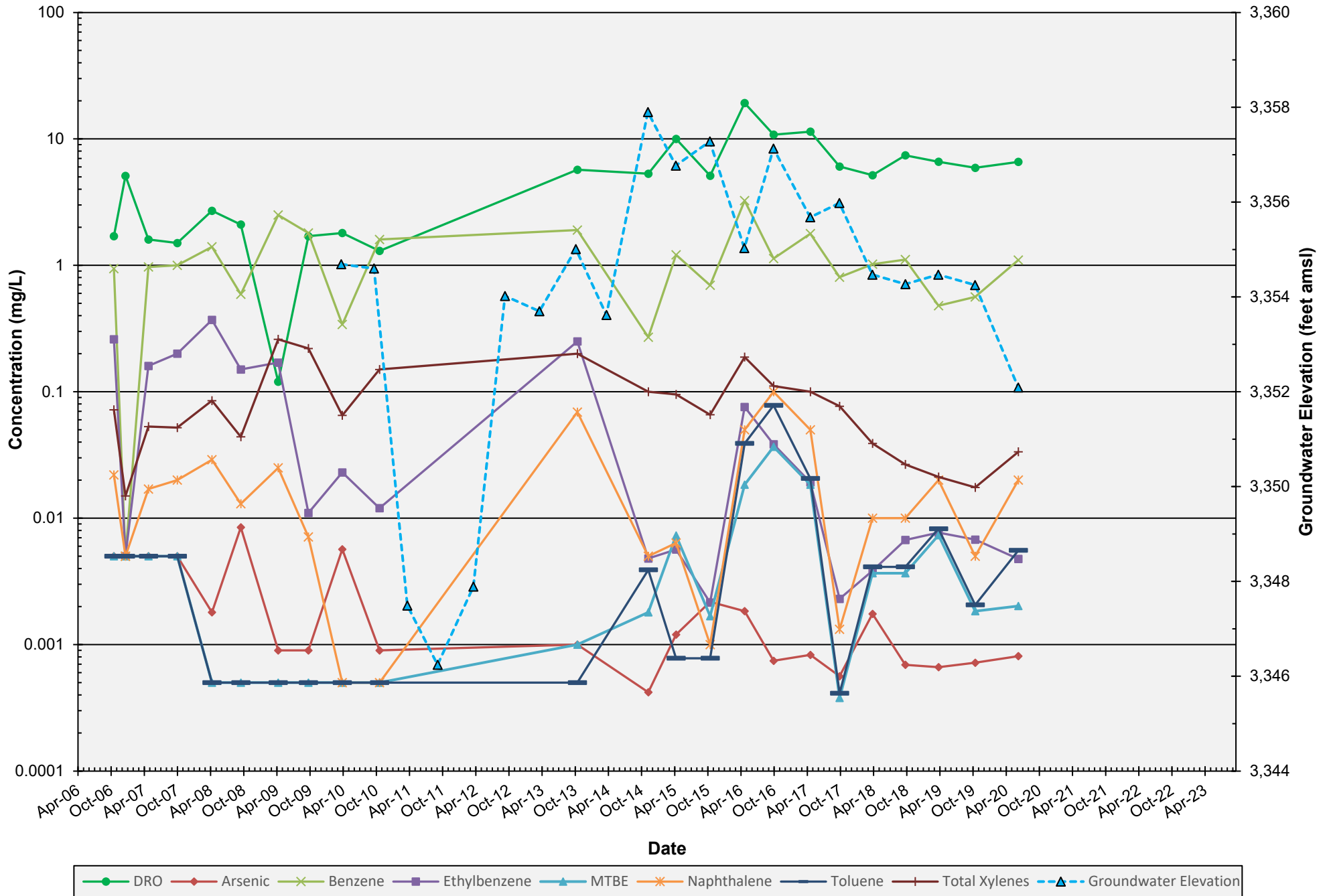
NCL-33: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery
North Colony Landfarm



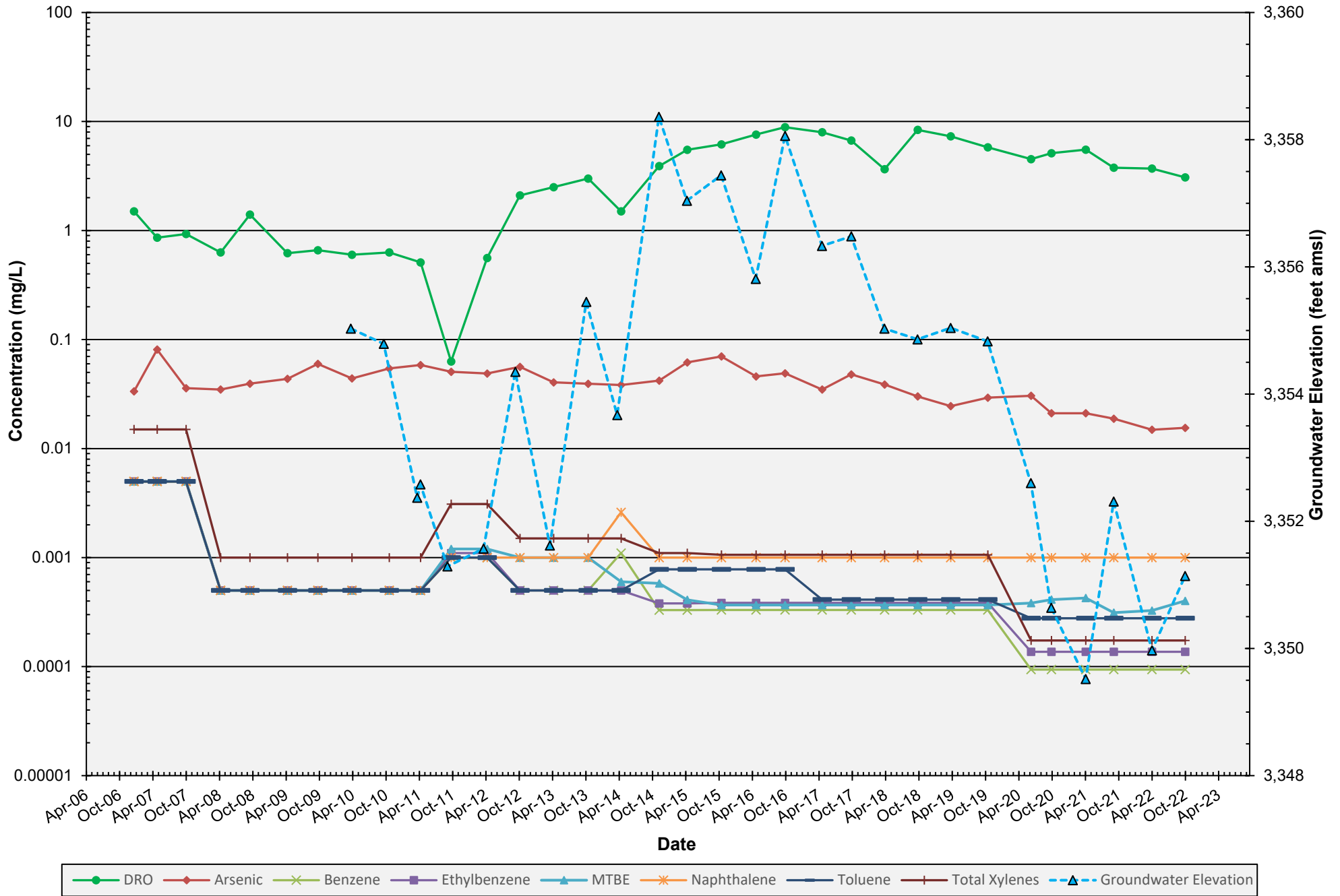
NCL-34A: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery
North Colony Landfarm



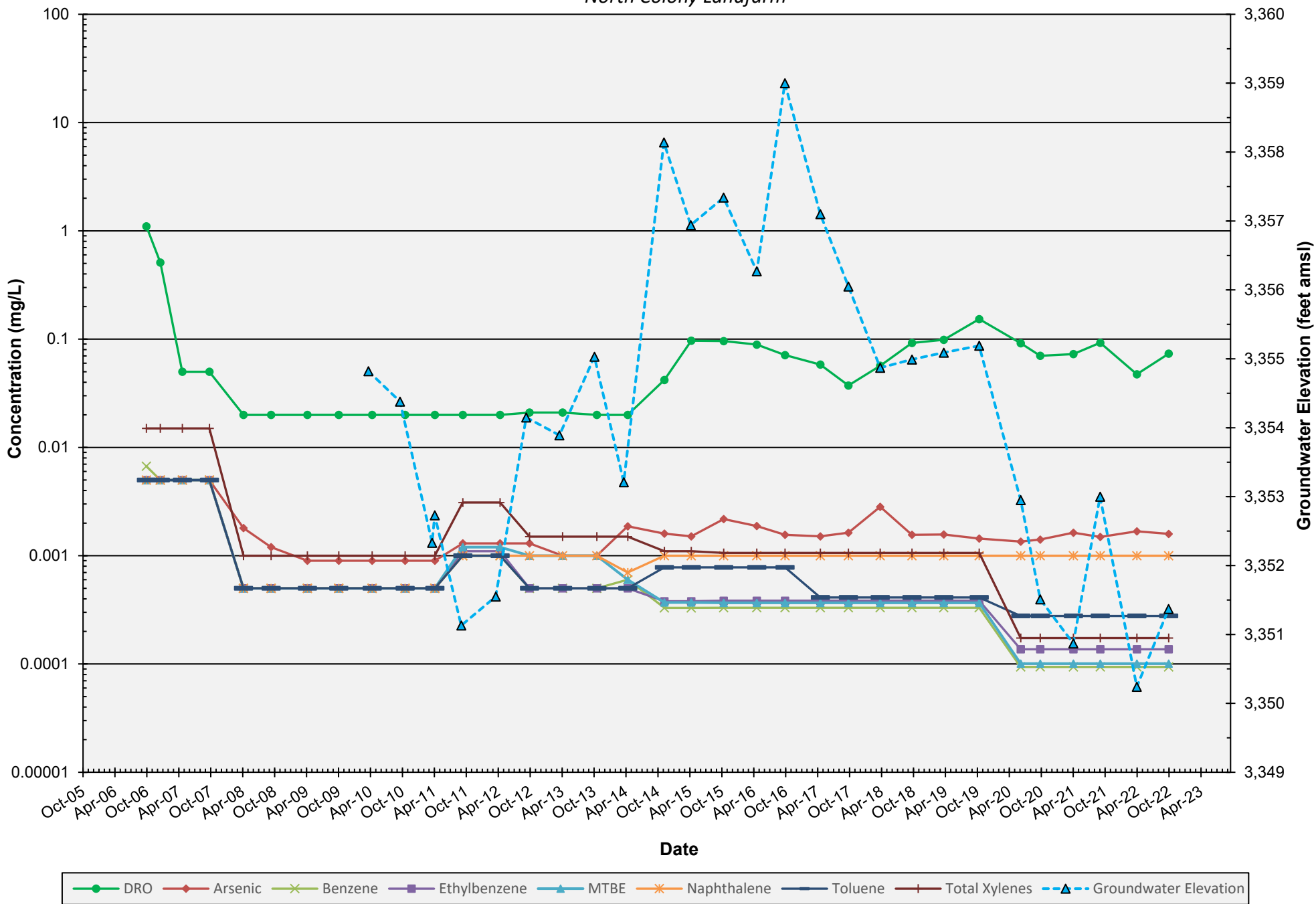
NCL-44: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery
North Colony Landfarm



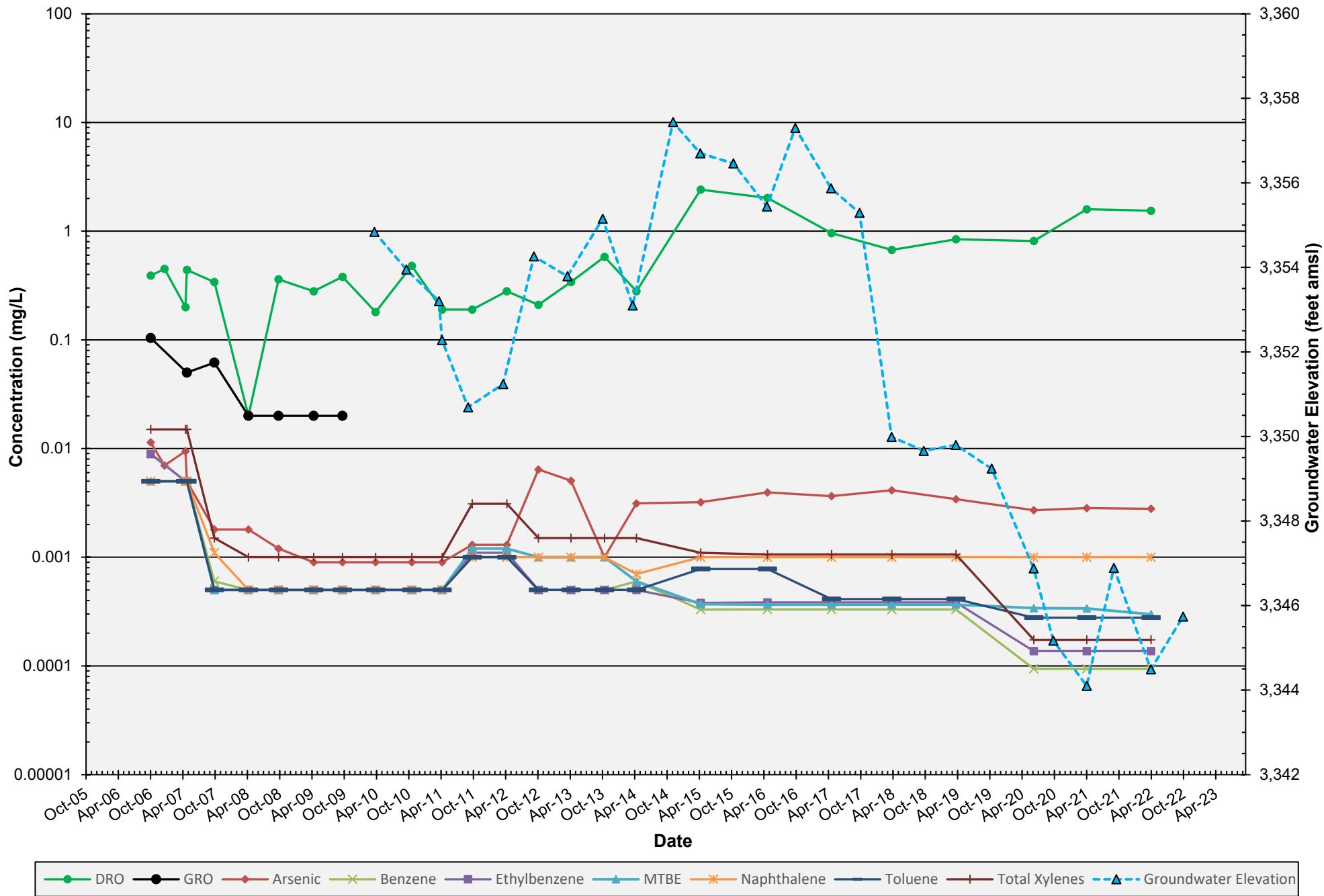
NCL-49: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery
North Colony Landfarm



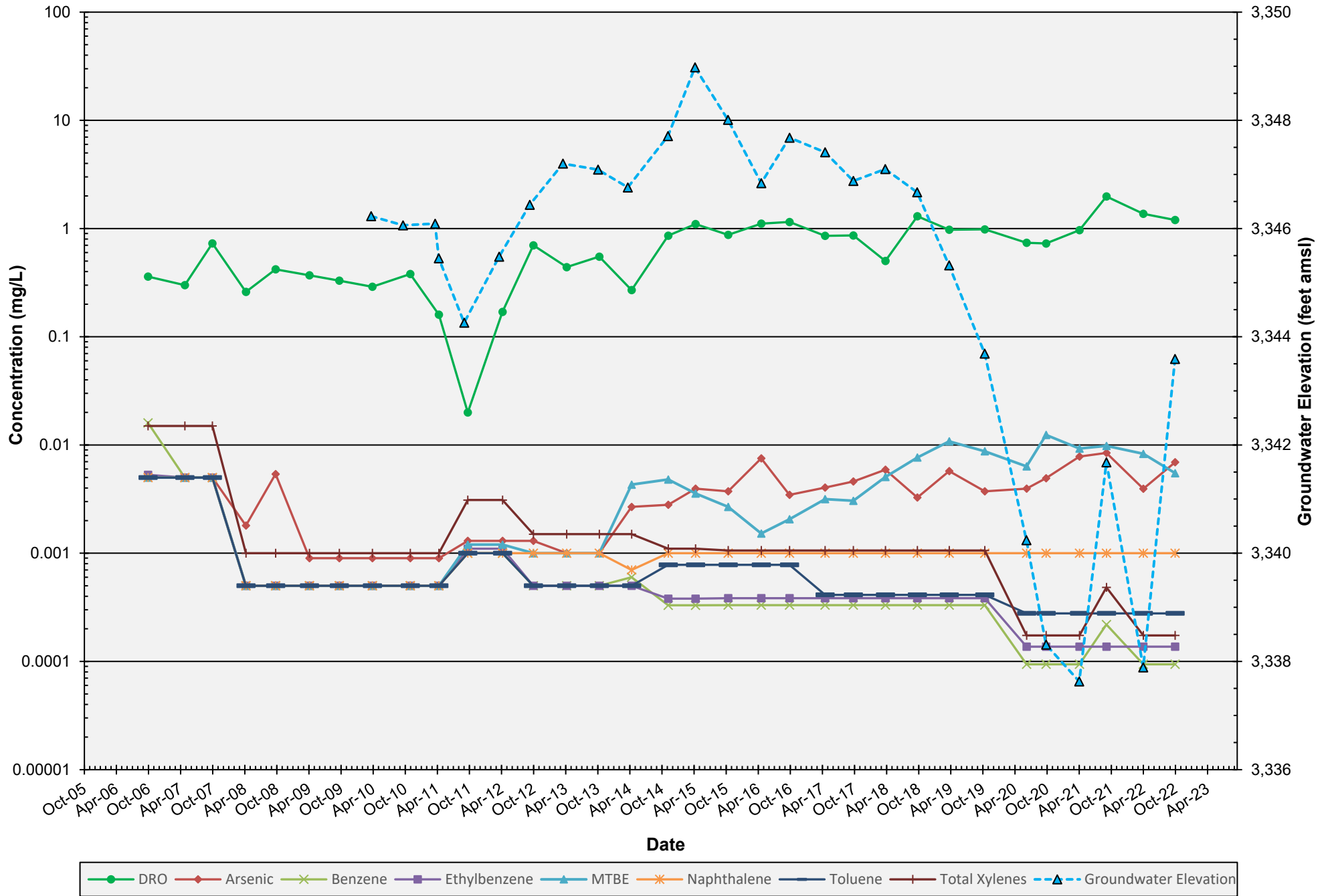
MW-18: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery
North Colony Landfarm



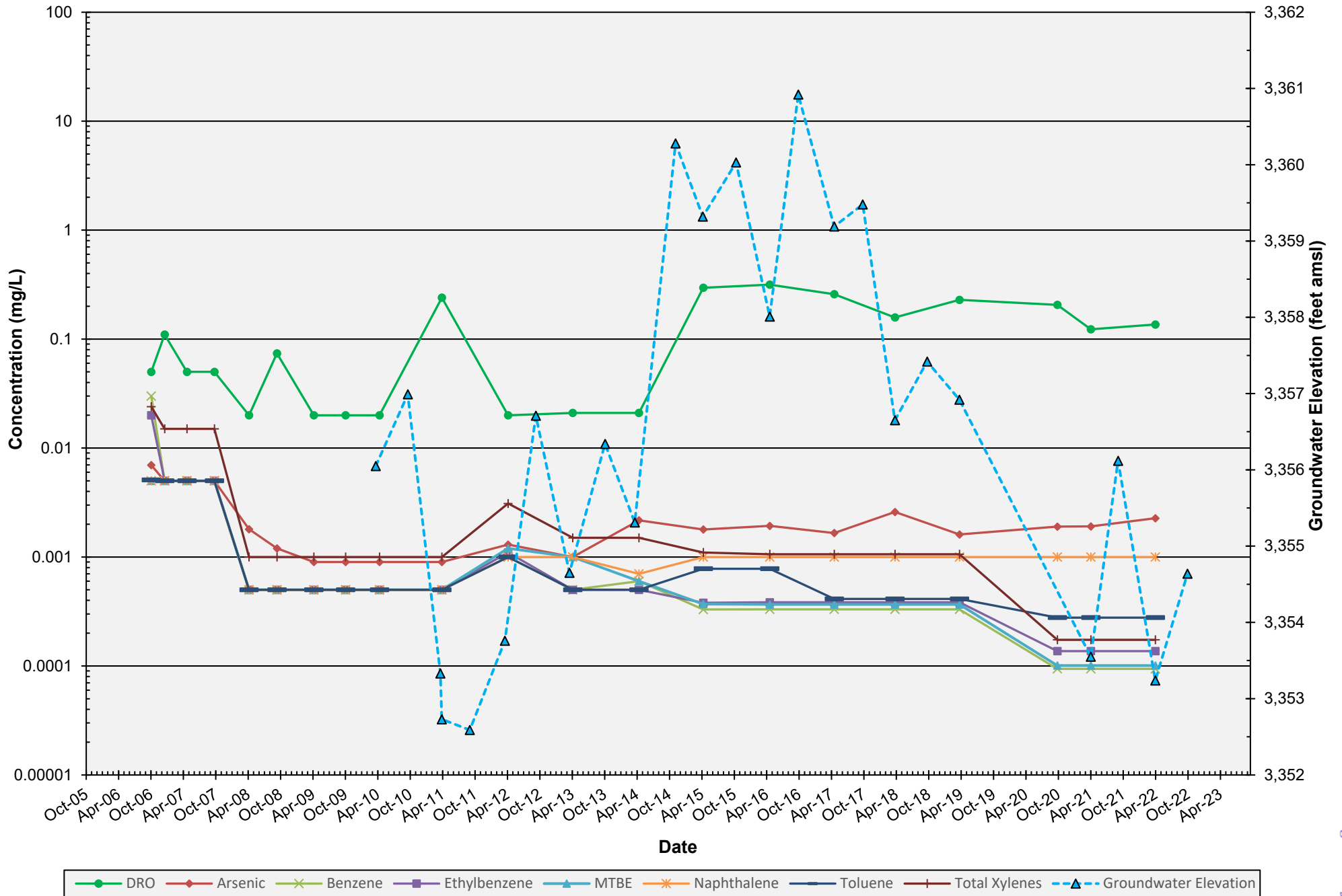
MW-45: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery
North Colony Landfarm



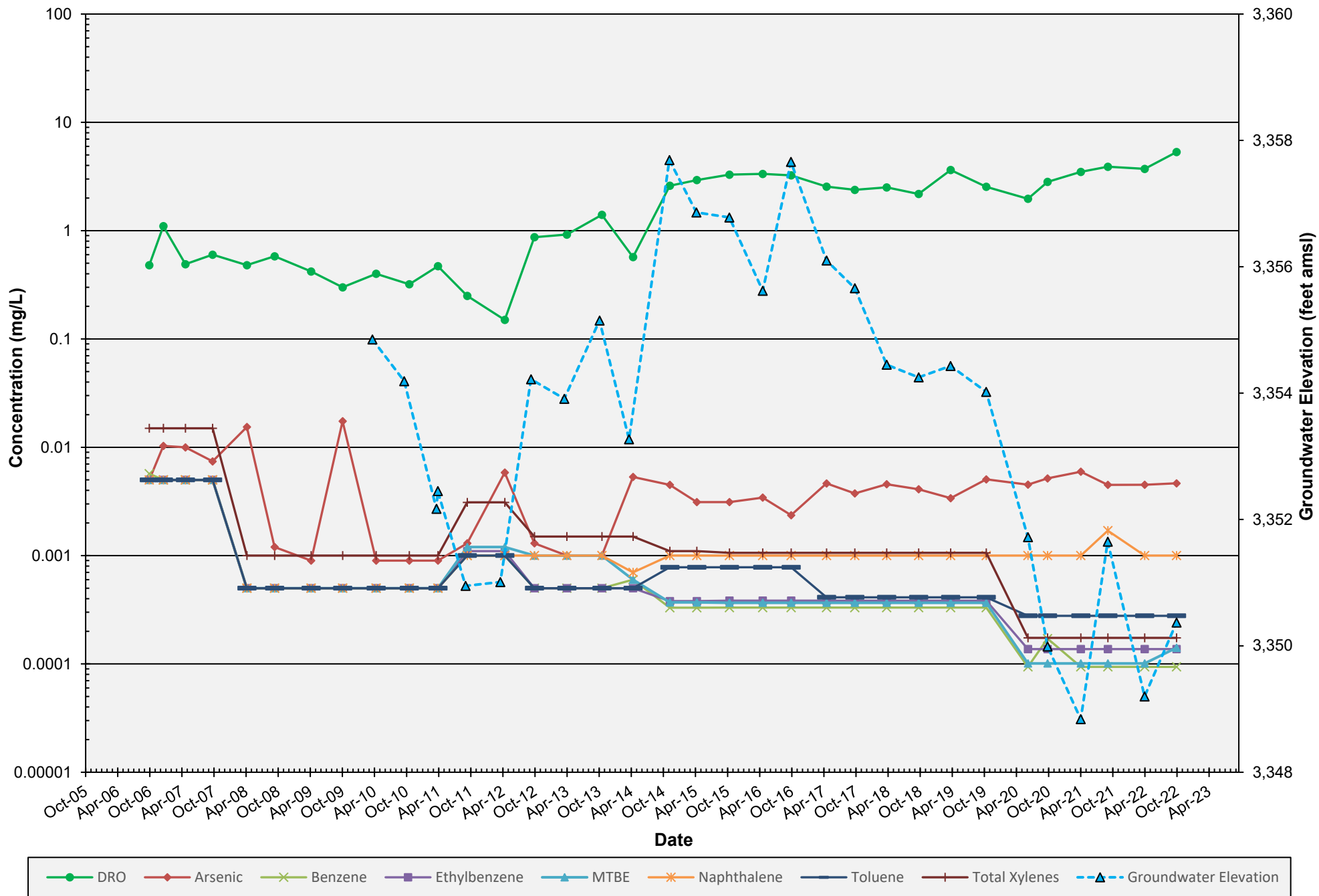
MW-53/MW-53R: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery
North Colony Landfarm



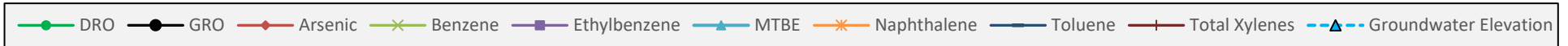
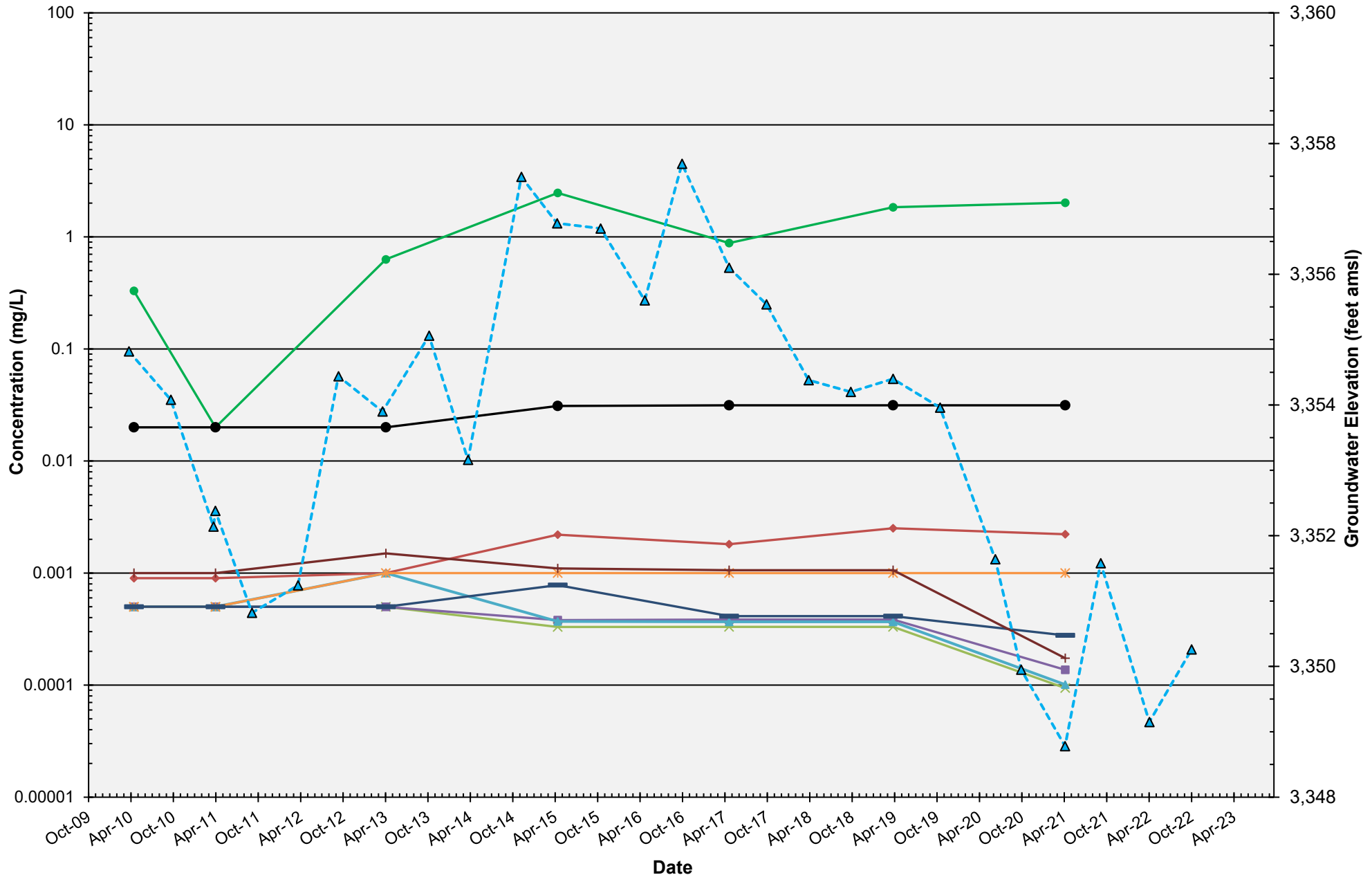
MW-54A: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery
North Colony Landfarm



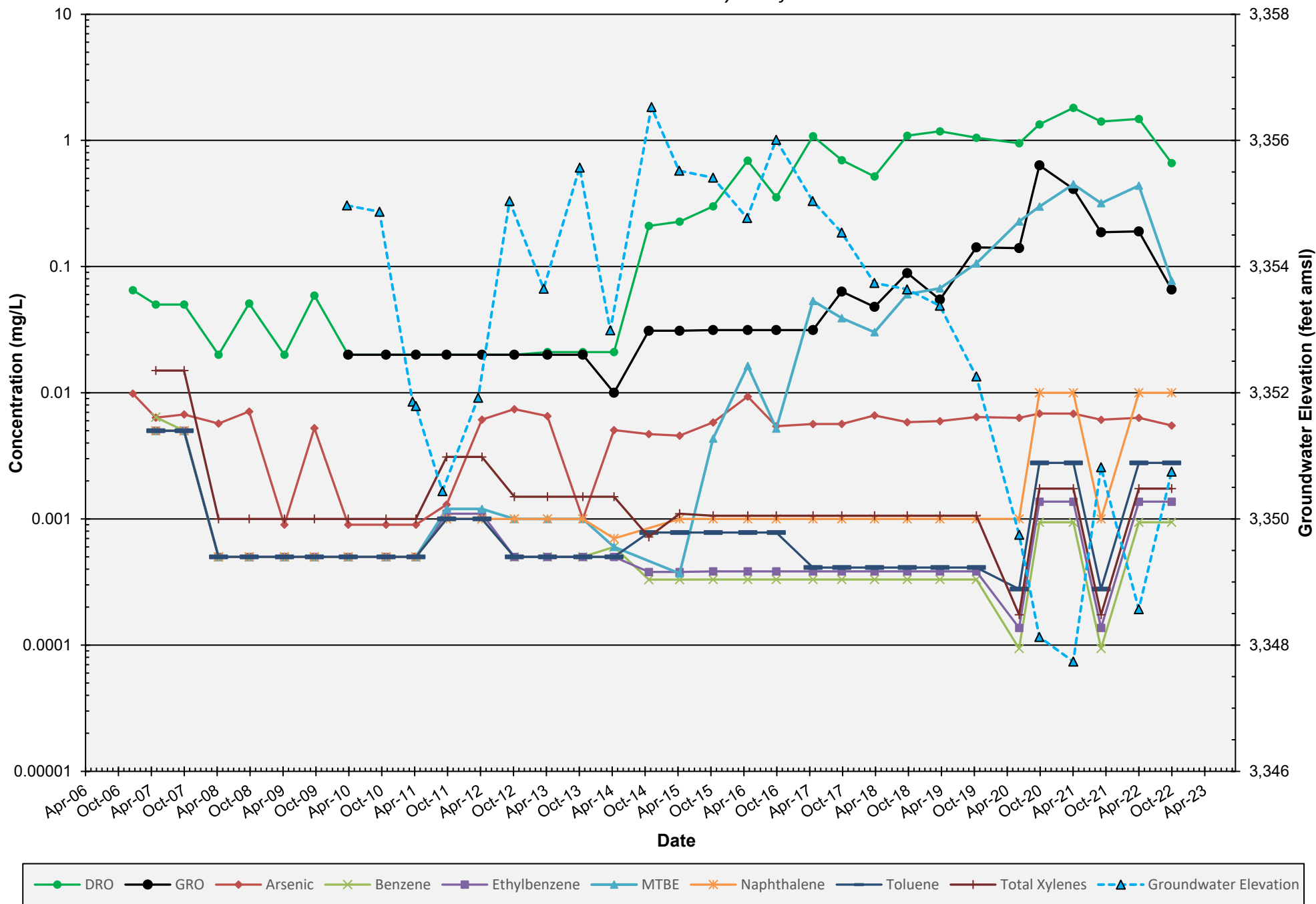
MW-54B: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery
North Colony Landfarm



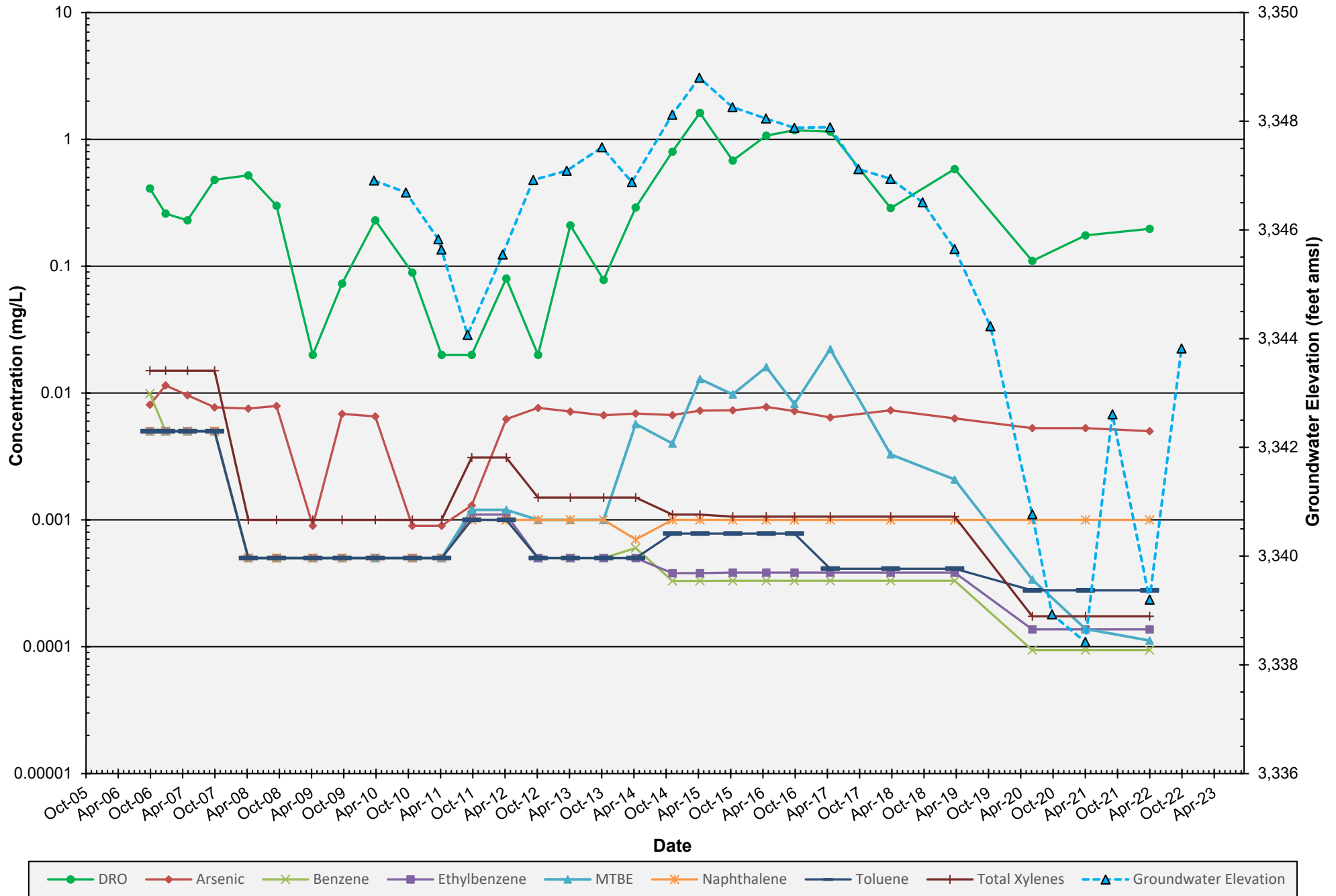
MW-55: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery
North Colony Landfarm



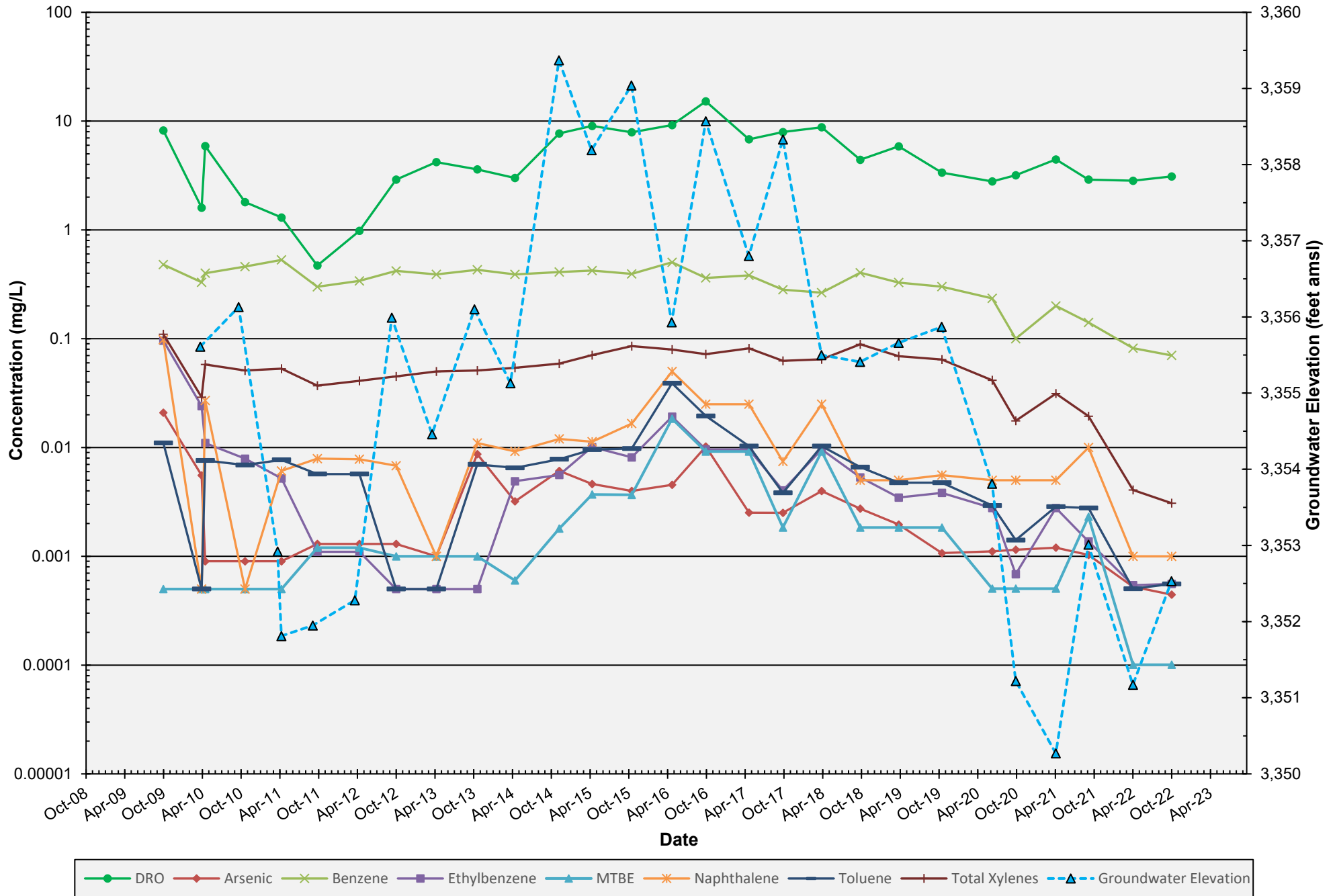
MW-56: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery
North Colony Landfarm



MW-108: COC Concentrations and Groundwater Elevations

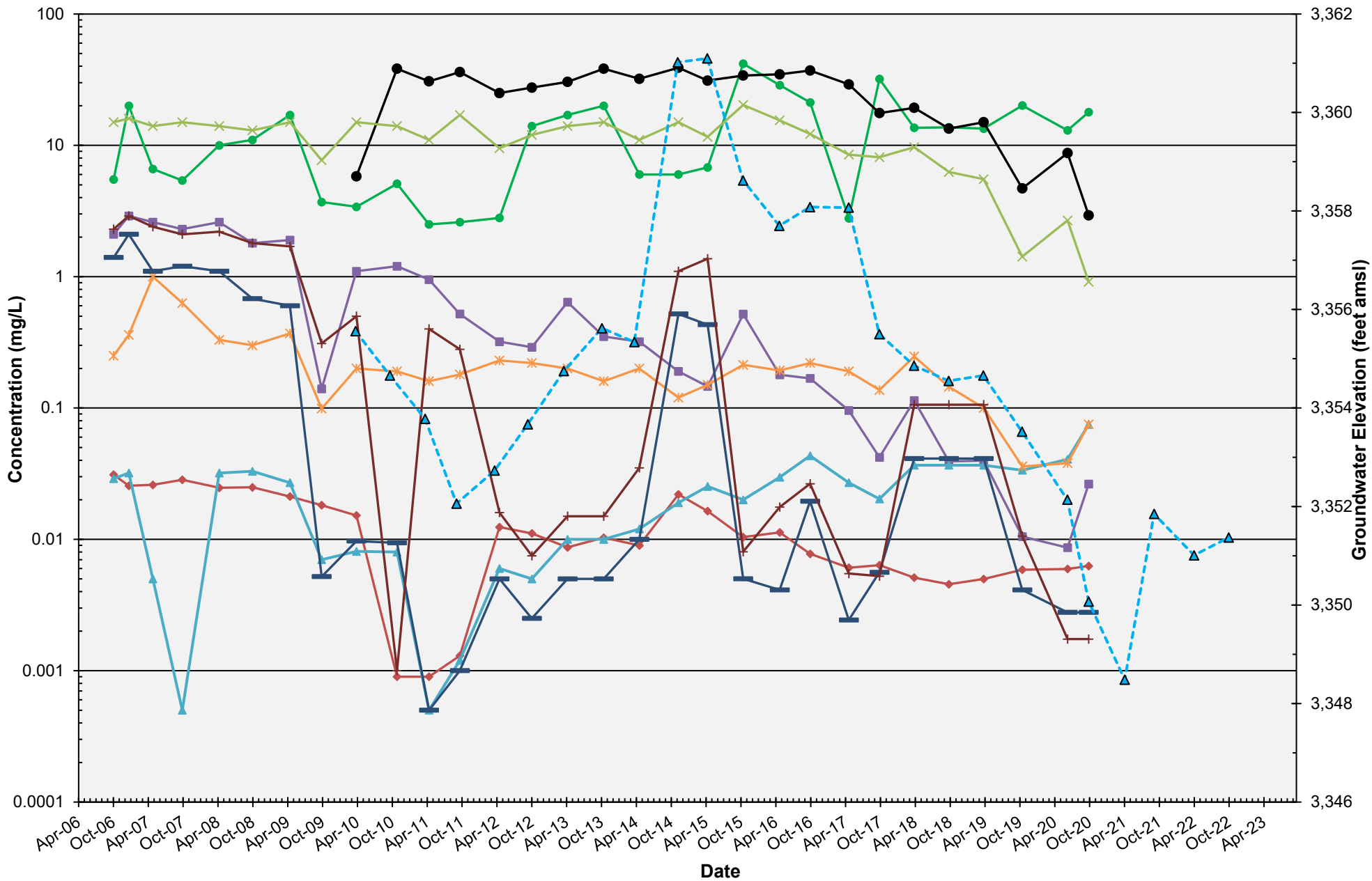
HF Sinclair Navajo Refining LLC - Artesia Refinery
North Colony Landfarm



MW-23: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery

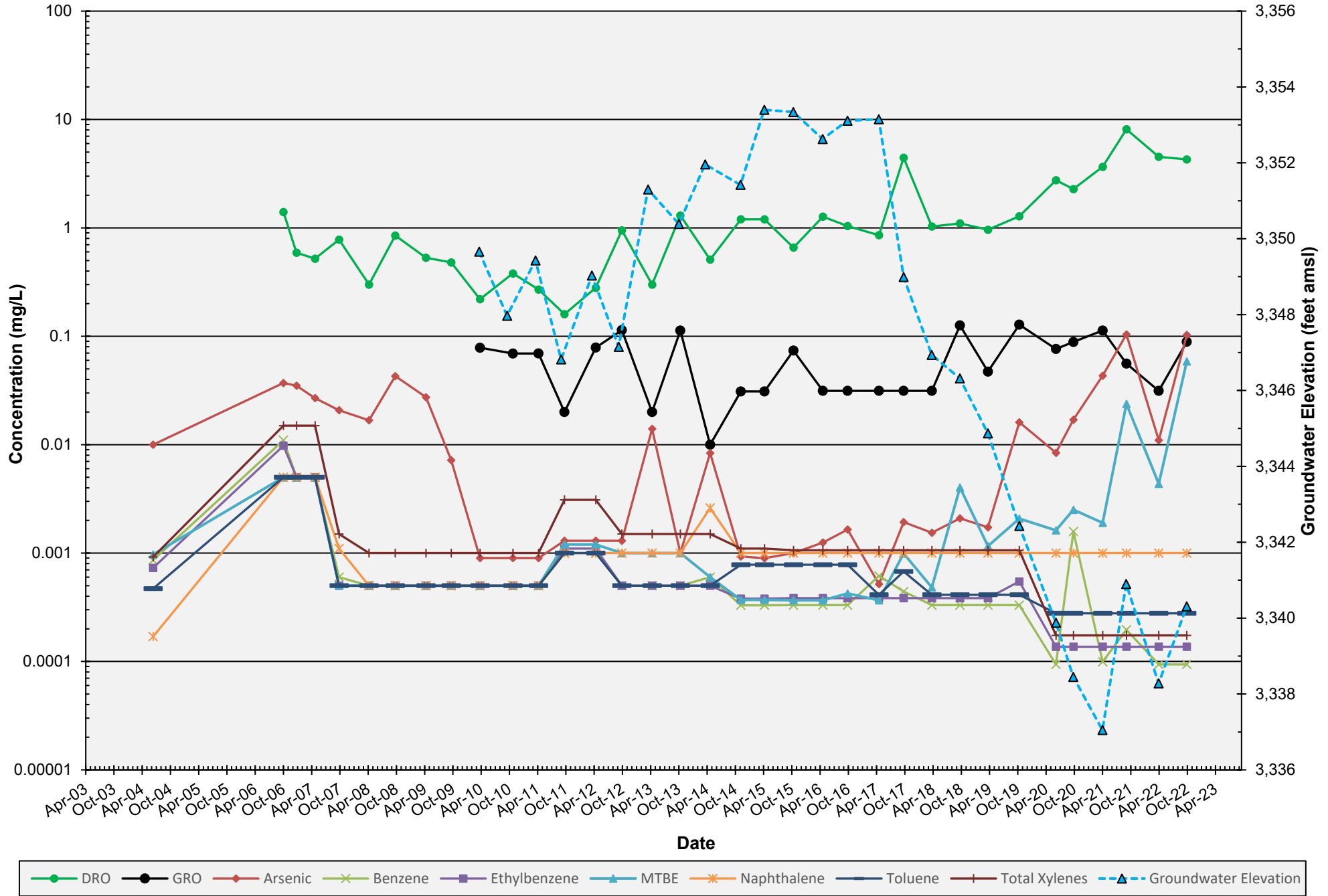
North Refinery Area



MW-29: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery

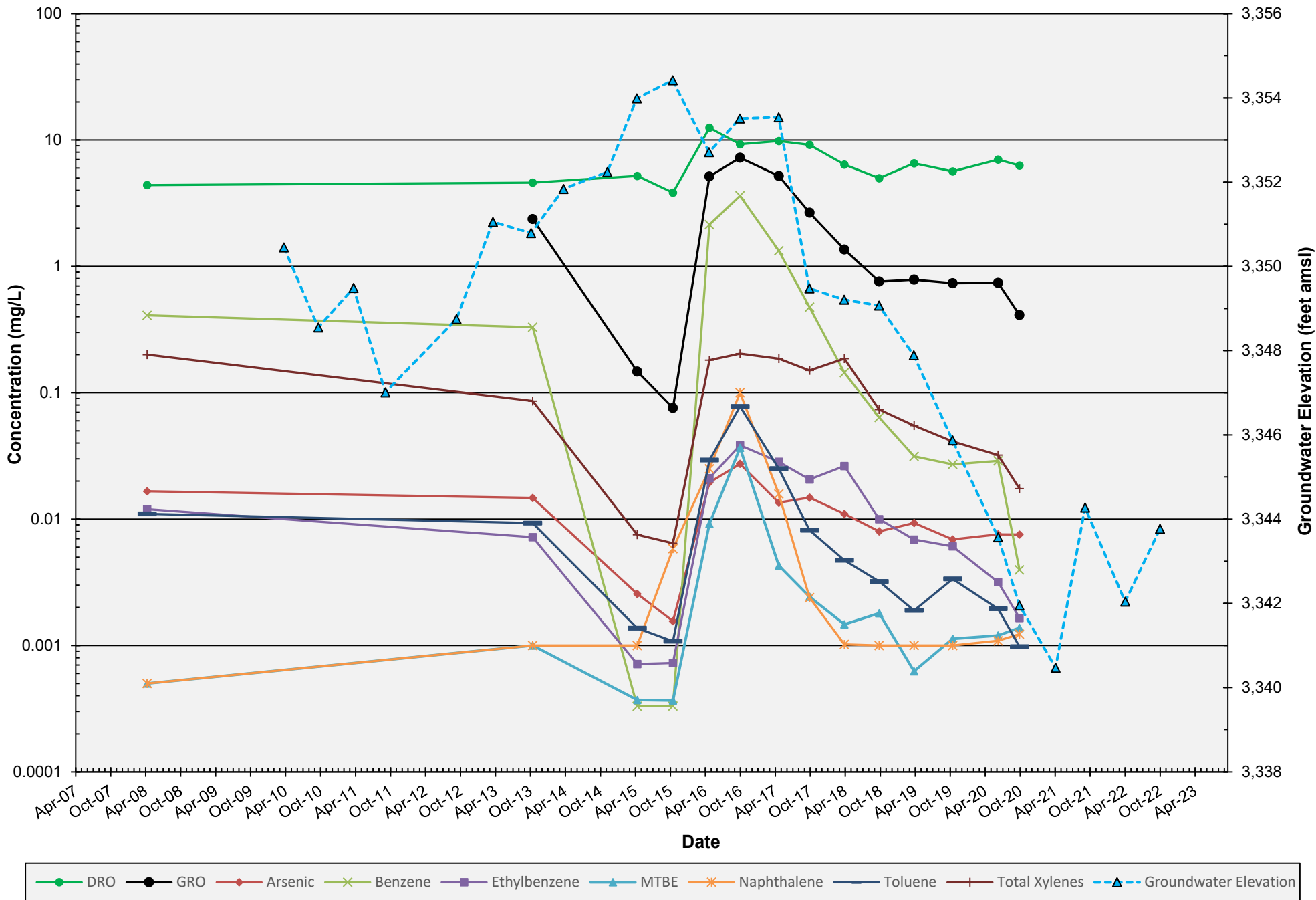
North Refinery Area



MW-39: COC Concentrations and Groundwater Elevations

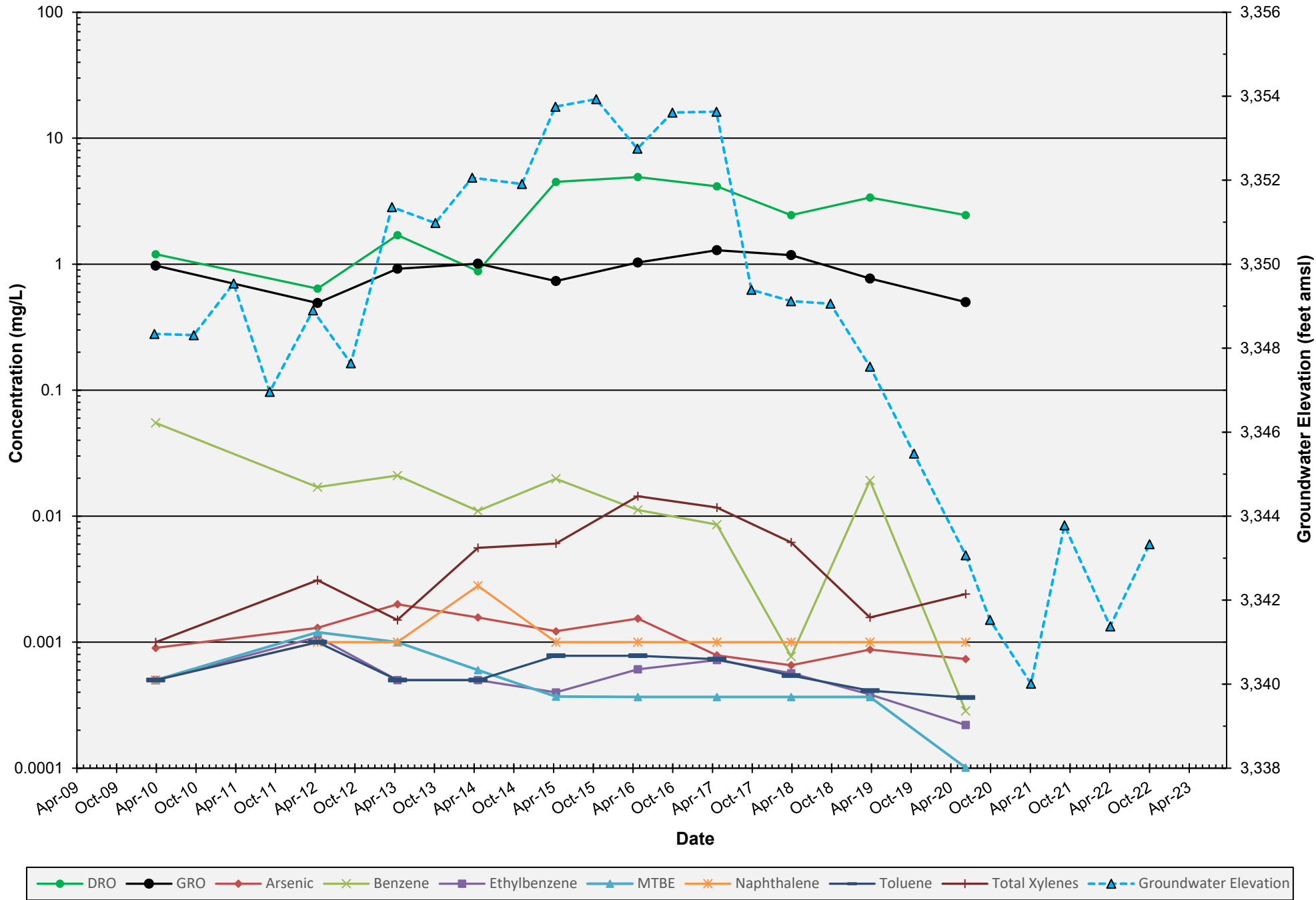
HF Sinclair Navajo Refining LLC - Artesia Refinery

North Refinery Area



MW-40: COC Concentrations and Groundwater Elevations

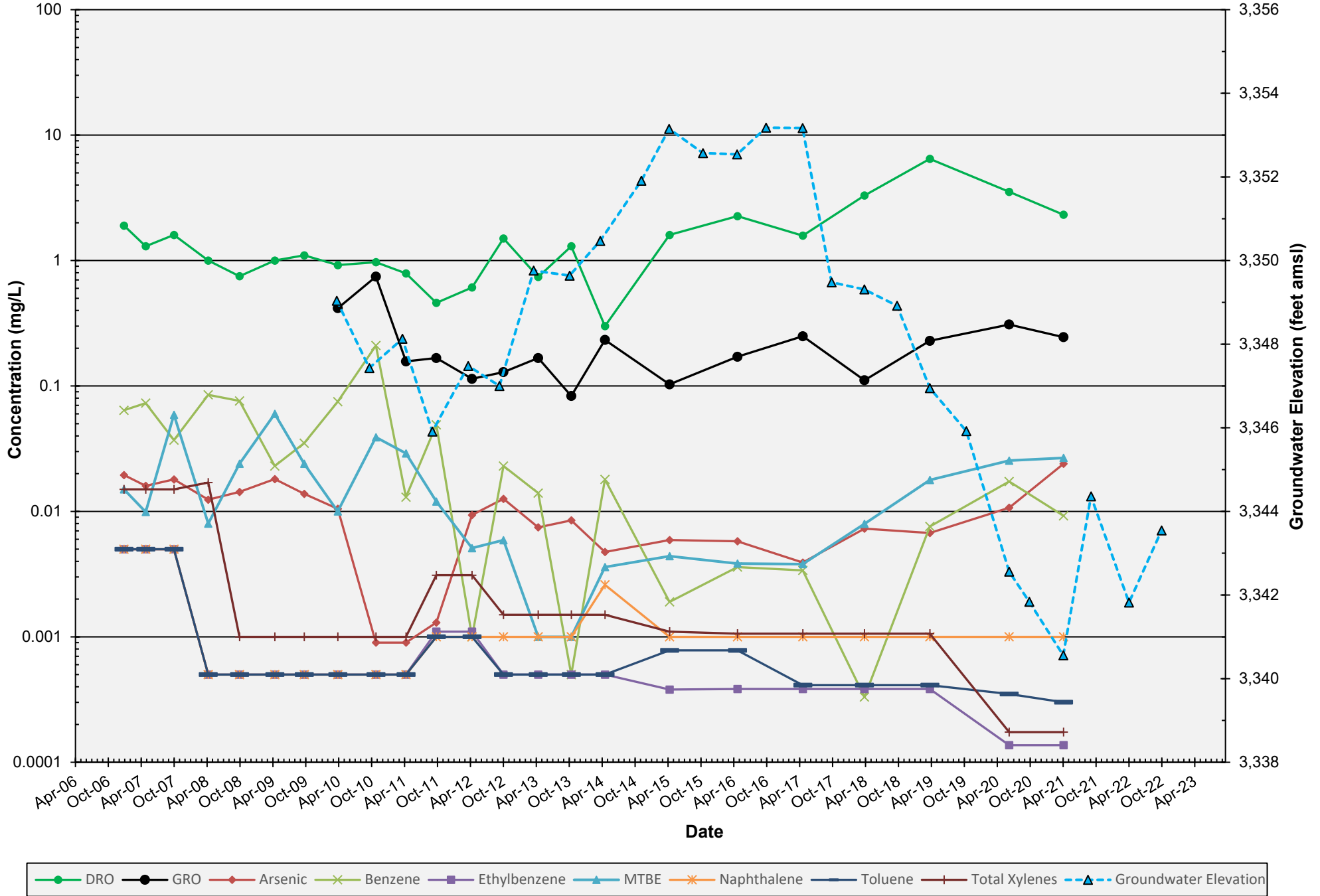
HF Sinclair Navajo Refining LLC - Artesia Refinery
North Refinery Area



MW-41: COC Concentrations and Groundwater Elevations

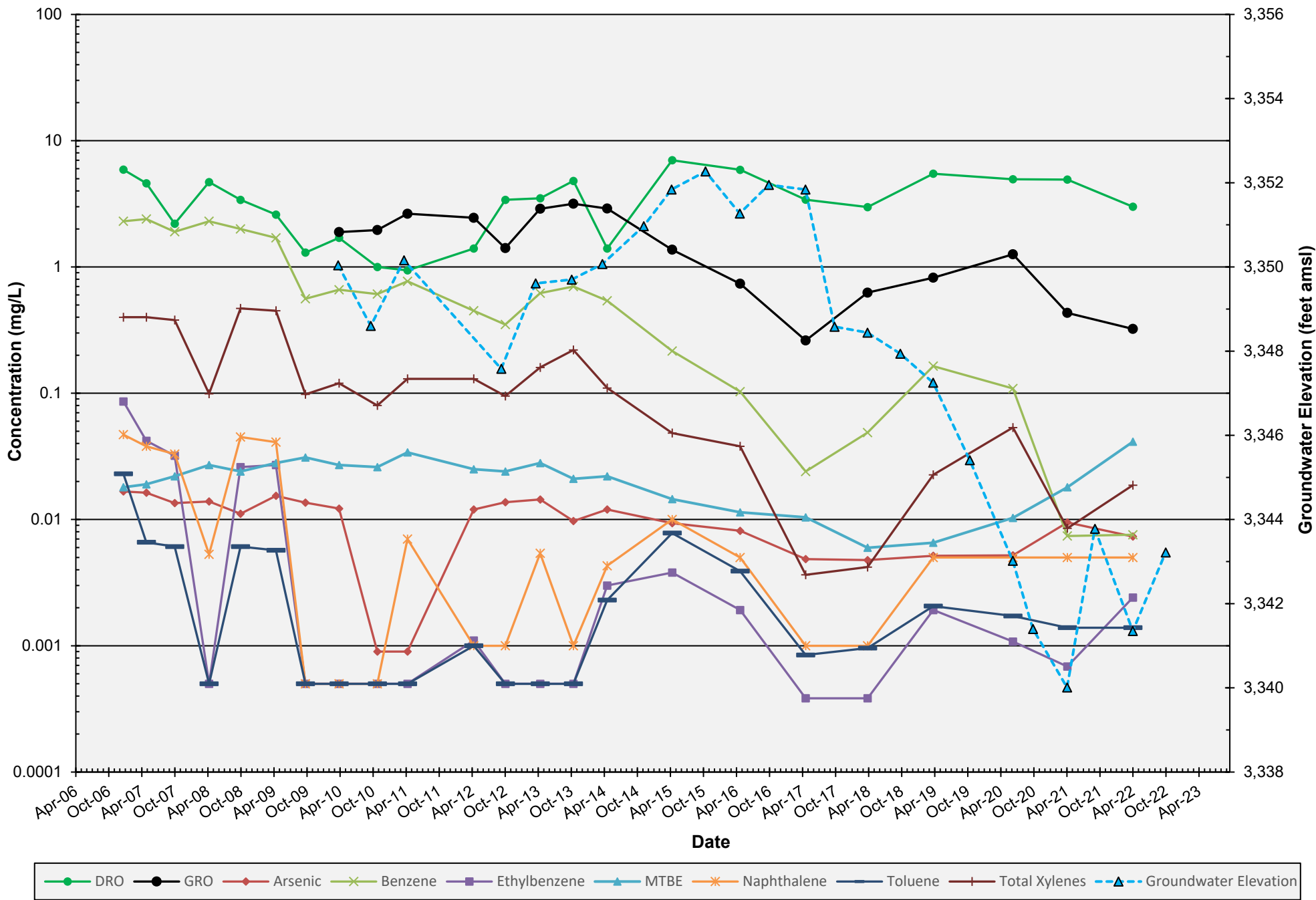
HF Sinclair Navajo Refining LLC - Artesia Refinery

North Refinery Area



MW-42: COC Concentrations and Groundwater Elevations

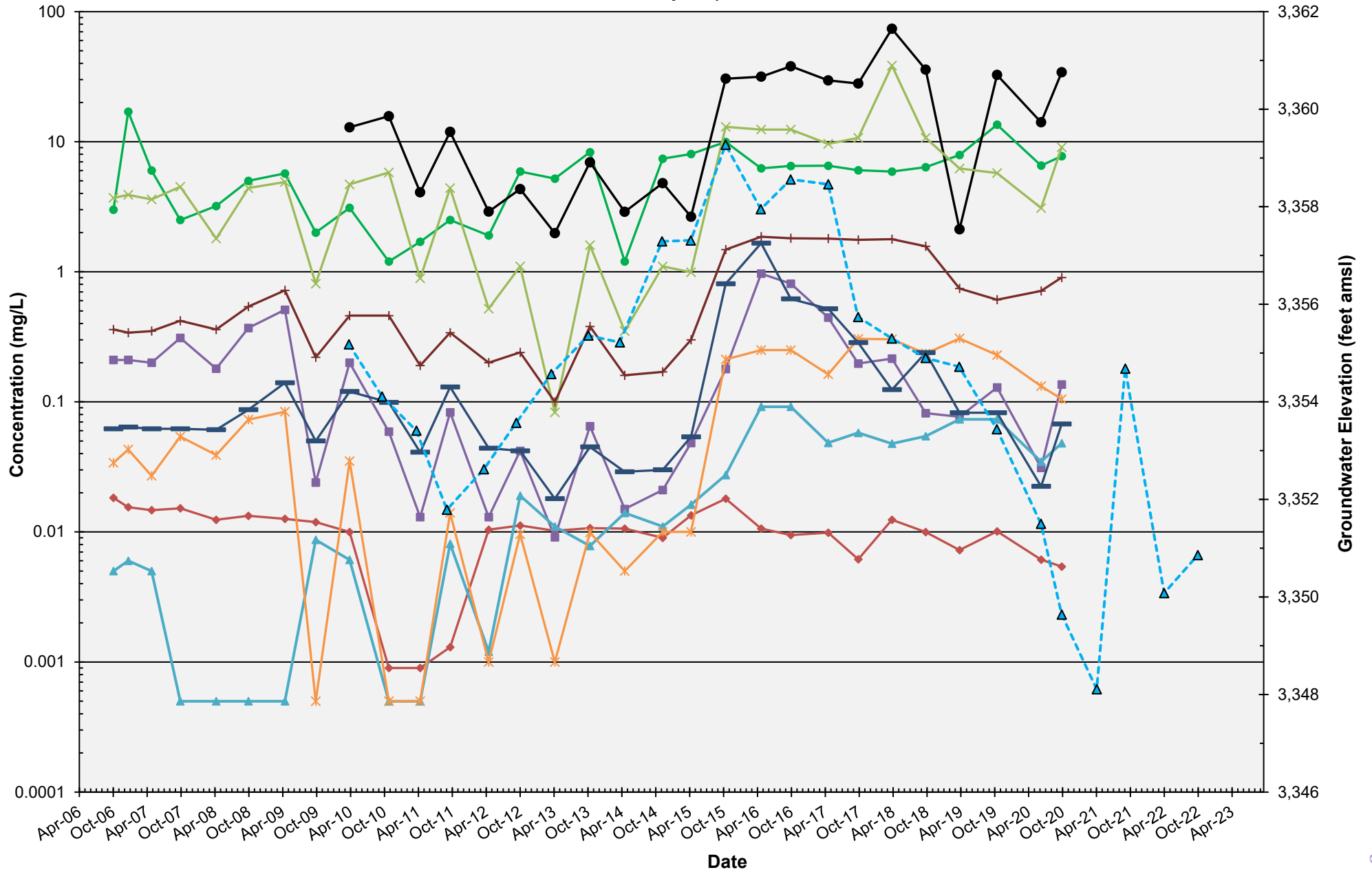
HF Sinclair Navajo Refining LLC - Artesia Refinery
North Refinery Area



MW-43: COC Concentrations and Groundwater Elevations

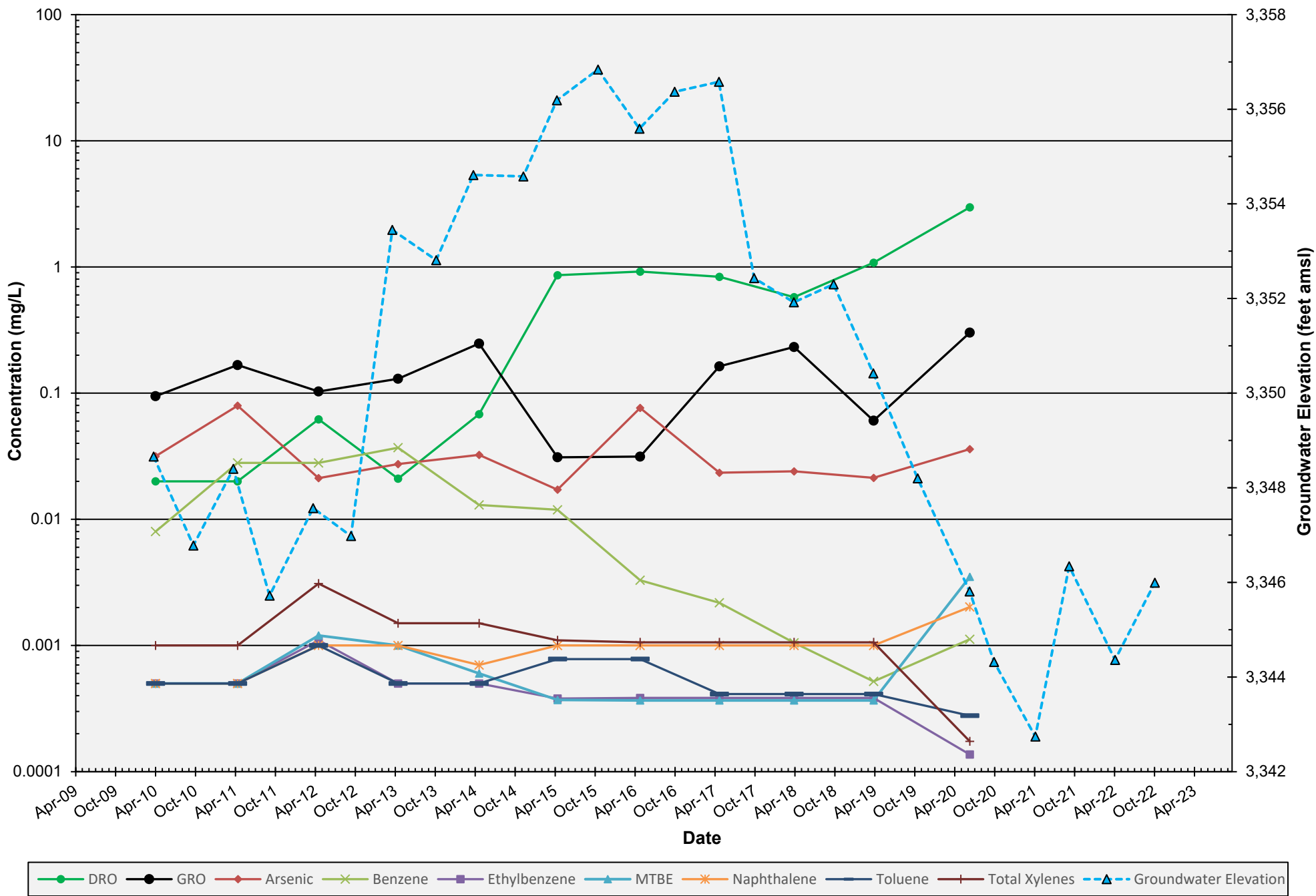
HF Sinclair Navajo Refining LLC - Artesia Refinery

North Refinery Area



MW-59: COC Concentrations and Groundwater Elevations

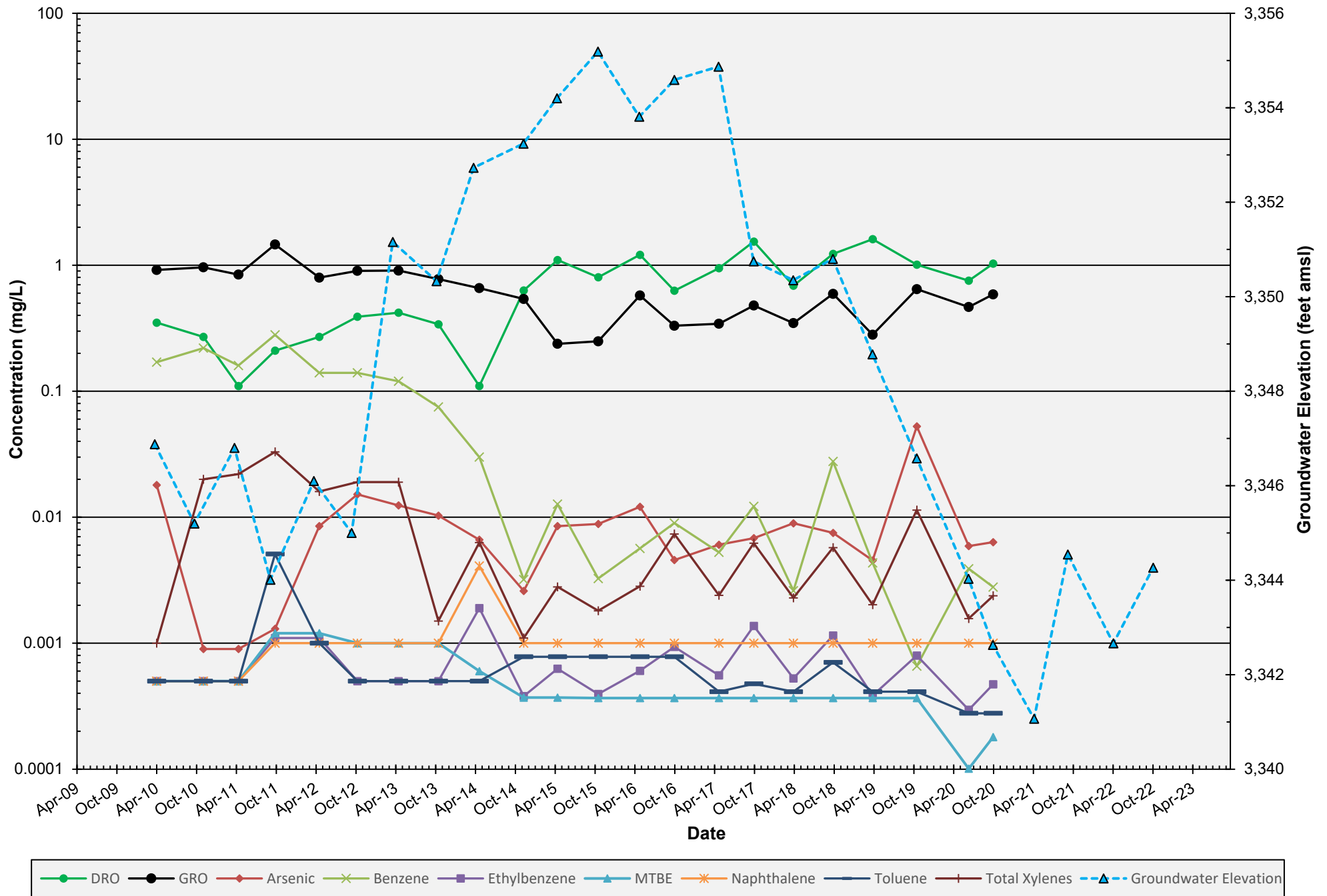
HF Sinclair Navajo Refining LLC - Artesia Refinery
North Refinery Area



MW-60: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery

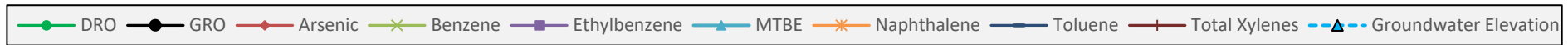
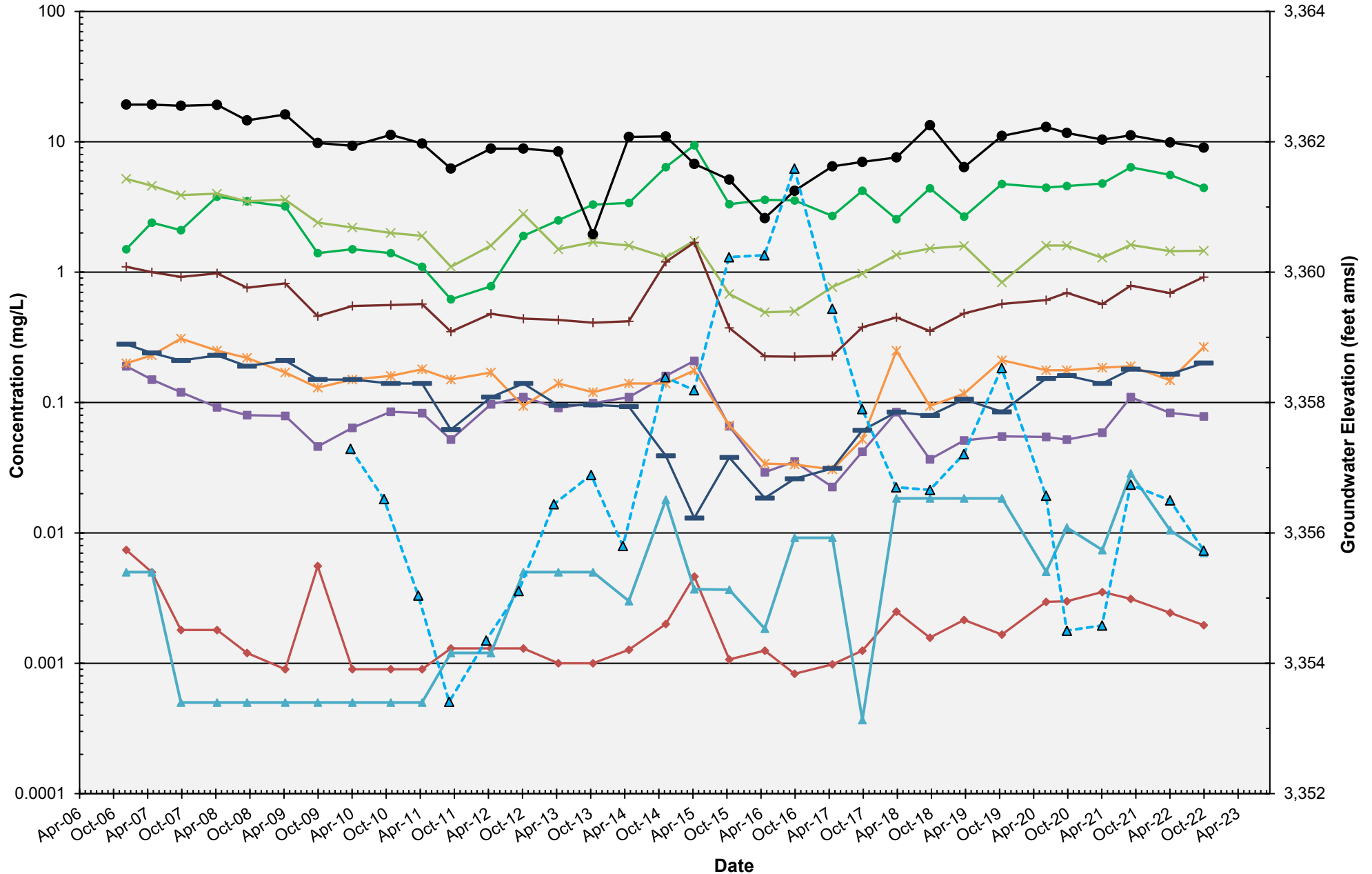
North Refinery Area



MW-61: COC Concentrations and Groundwater Elevations

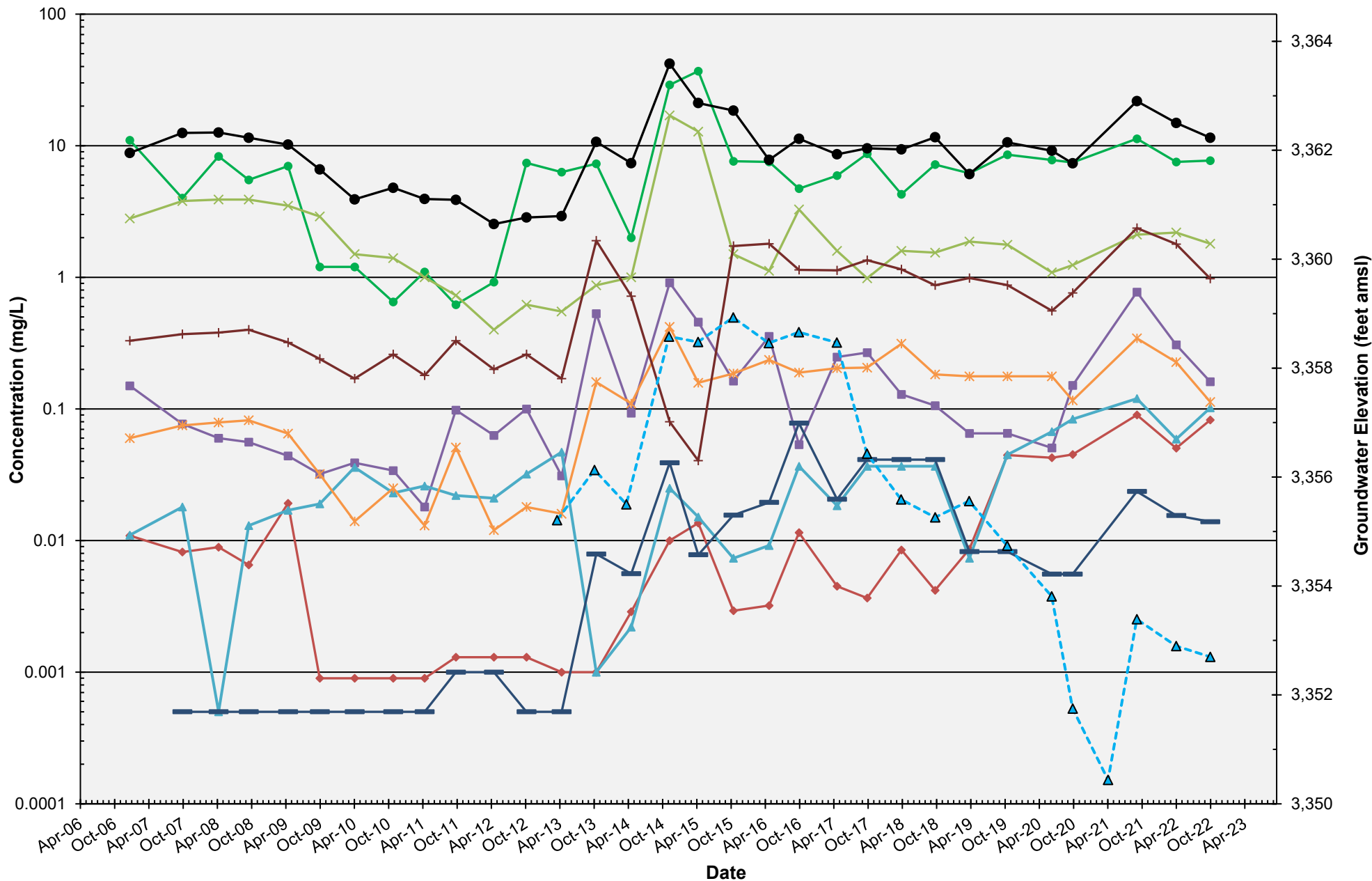
HF Sinclair Navajo Refining LLC - Artesia Refinery

North Refinery Area



MW-62: COC Concentrations and Groundwater Elevations

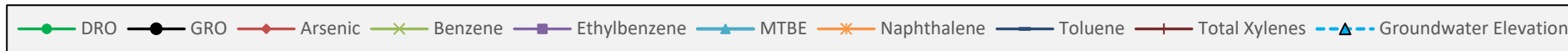
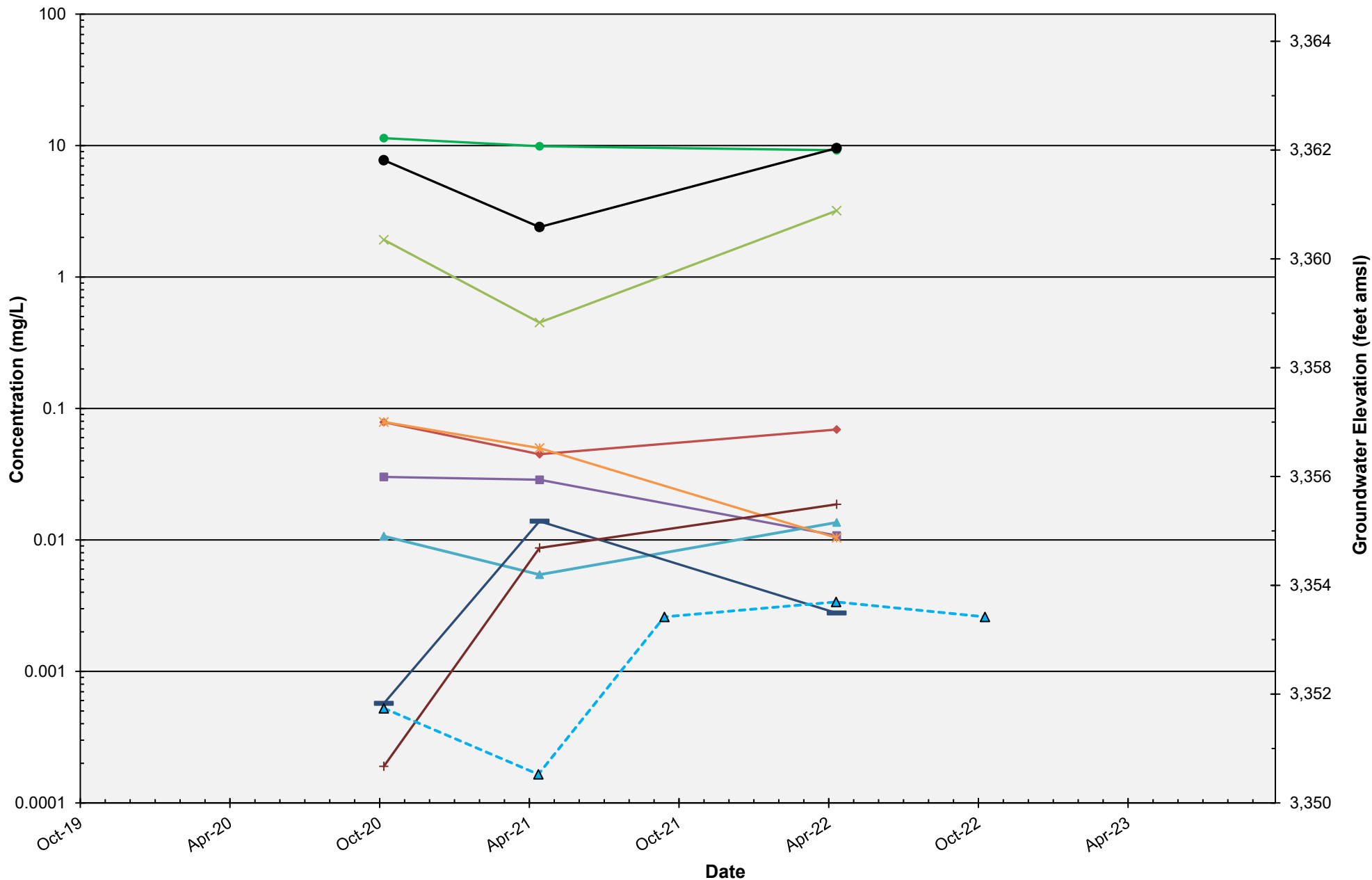
HF Sinclair Navajo Refining LLC - Artesia Refinery
North Refinery Area



MW-62R: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery

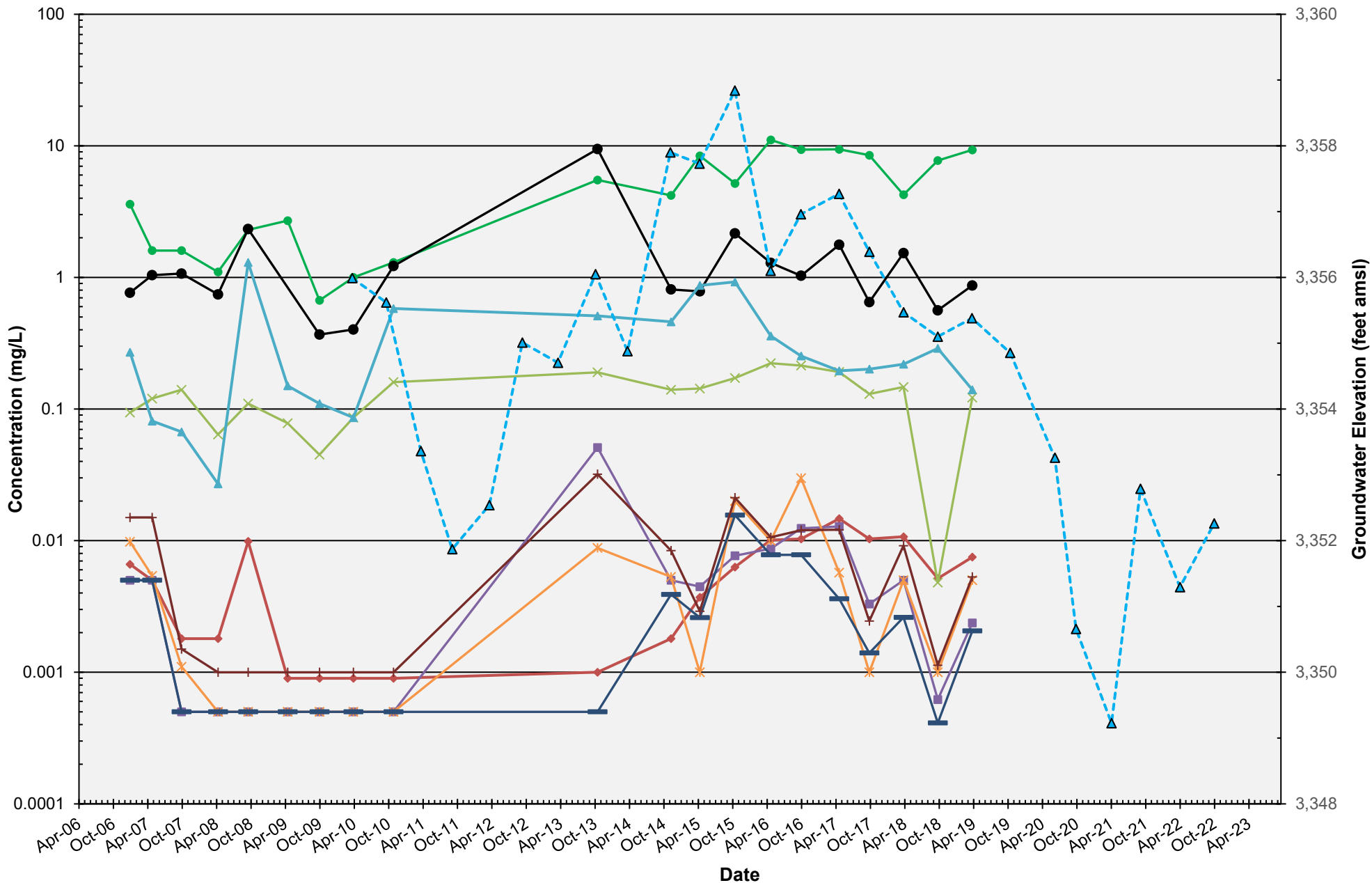
North Refinery Area



MW-67: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery

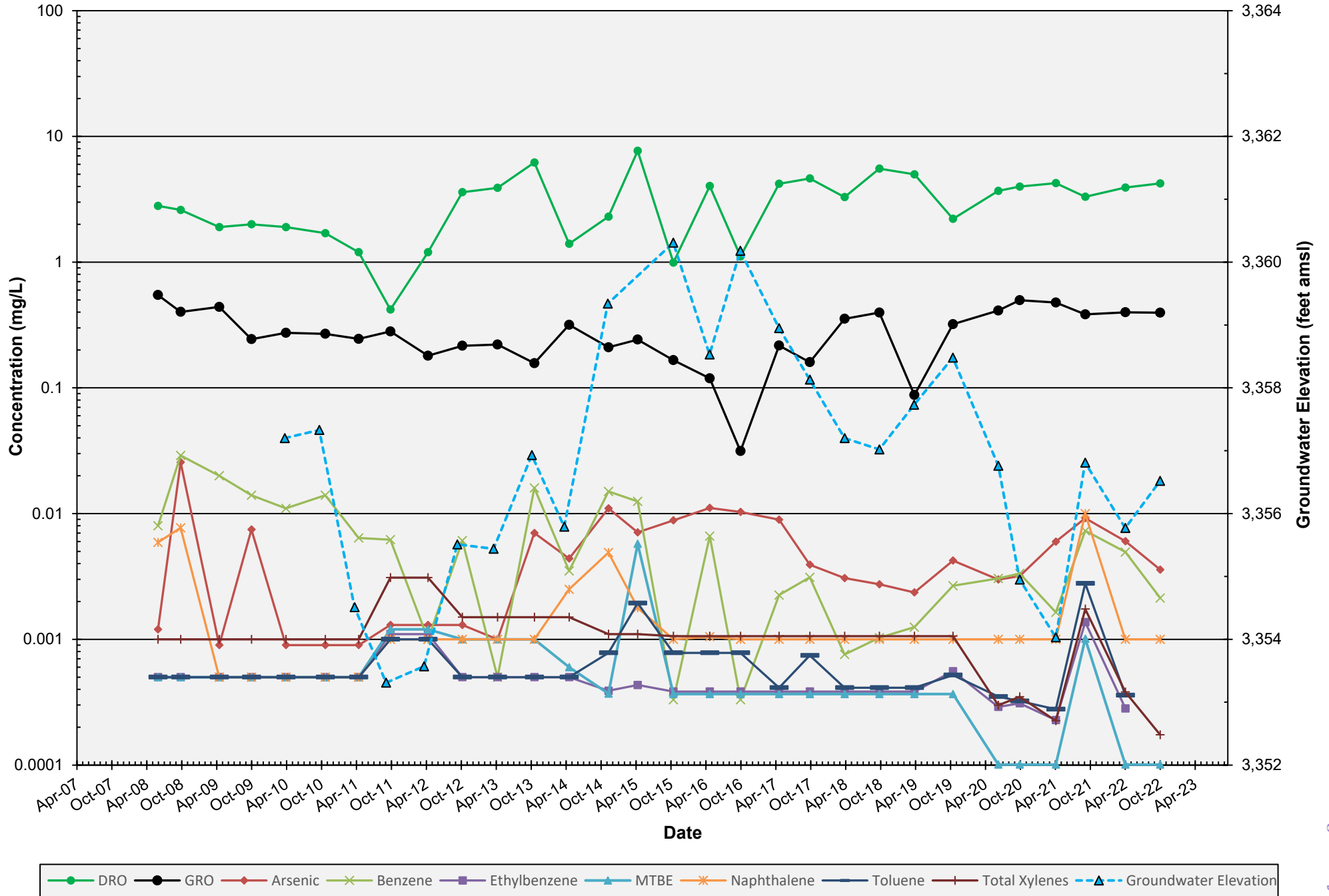
North Refinery Area



MW-90: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery

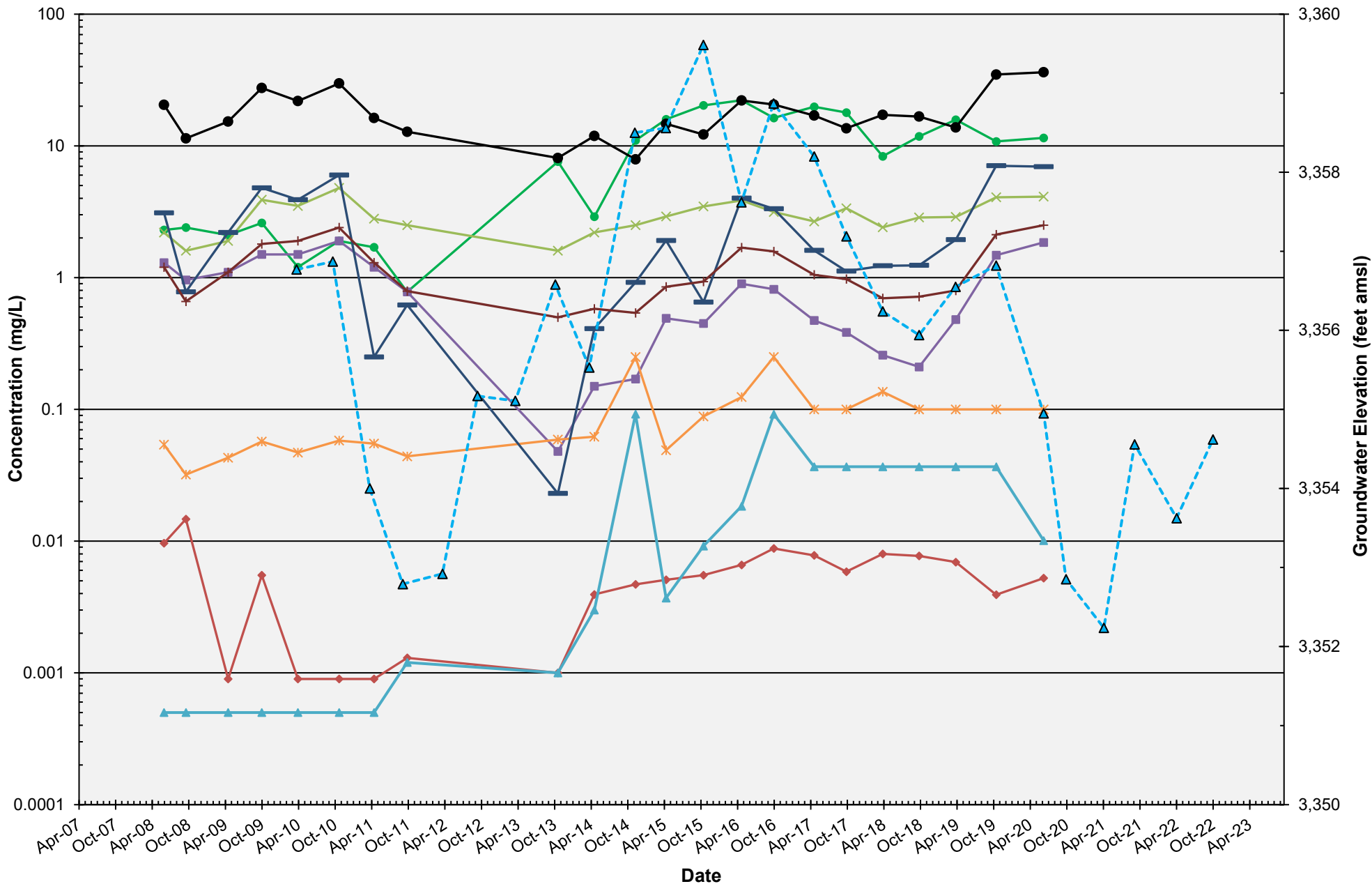
North Refinery Area



MW-91: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery

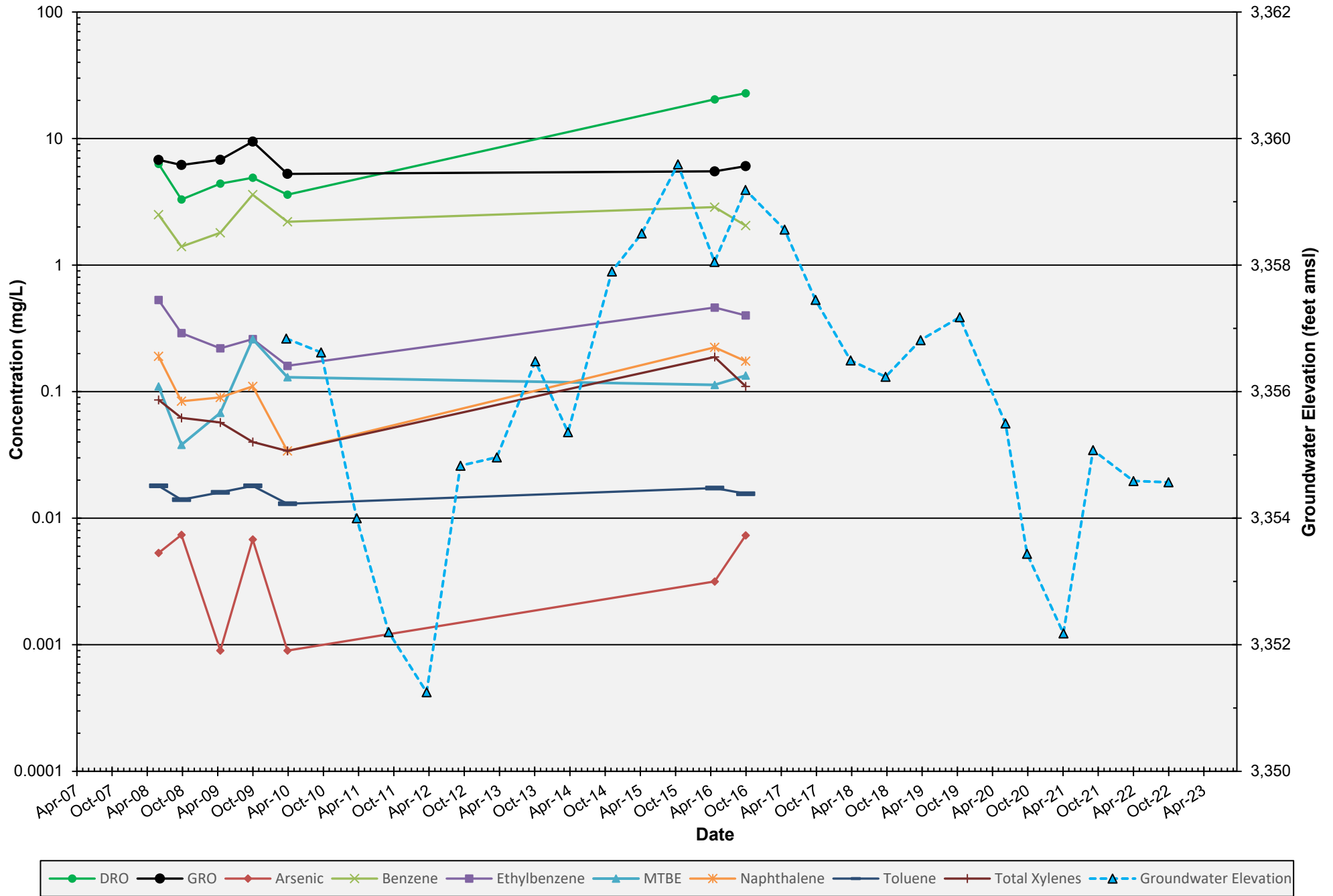
North Refinery Area



MW-92: COC Concentrations and Groundwater Elevations

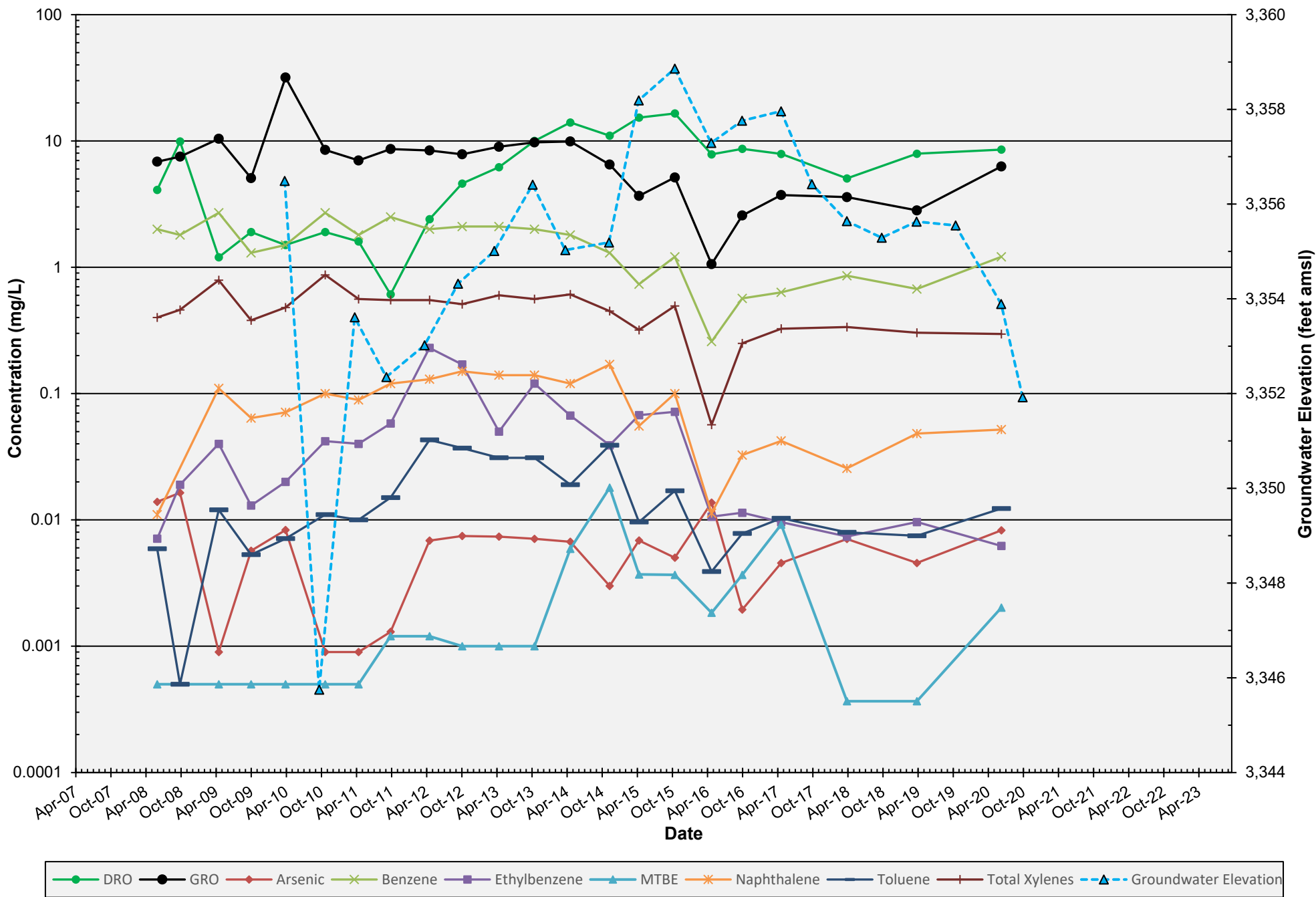
HF Sinclair Navajo Refining LLC - Artesia Refinery

North Refinery Area



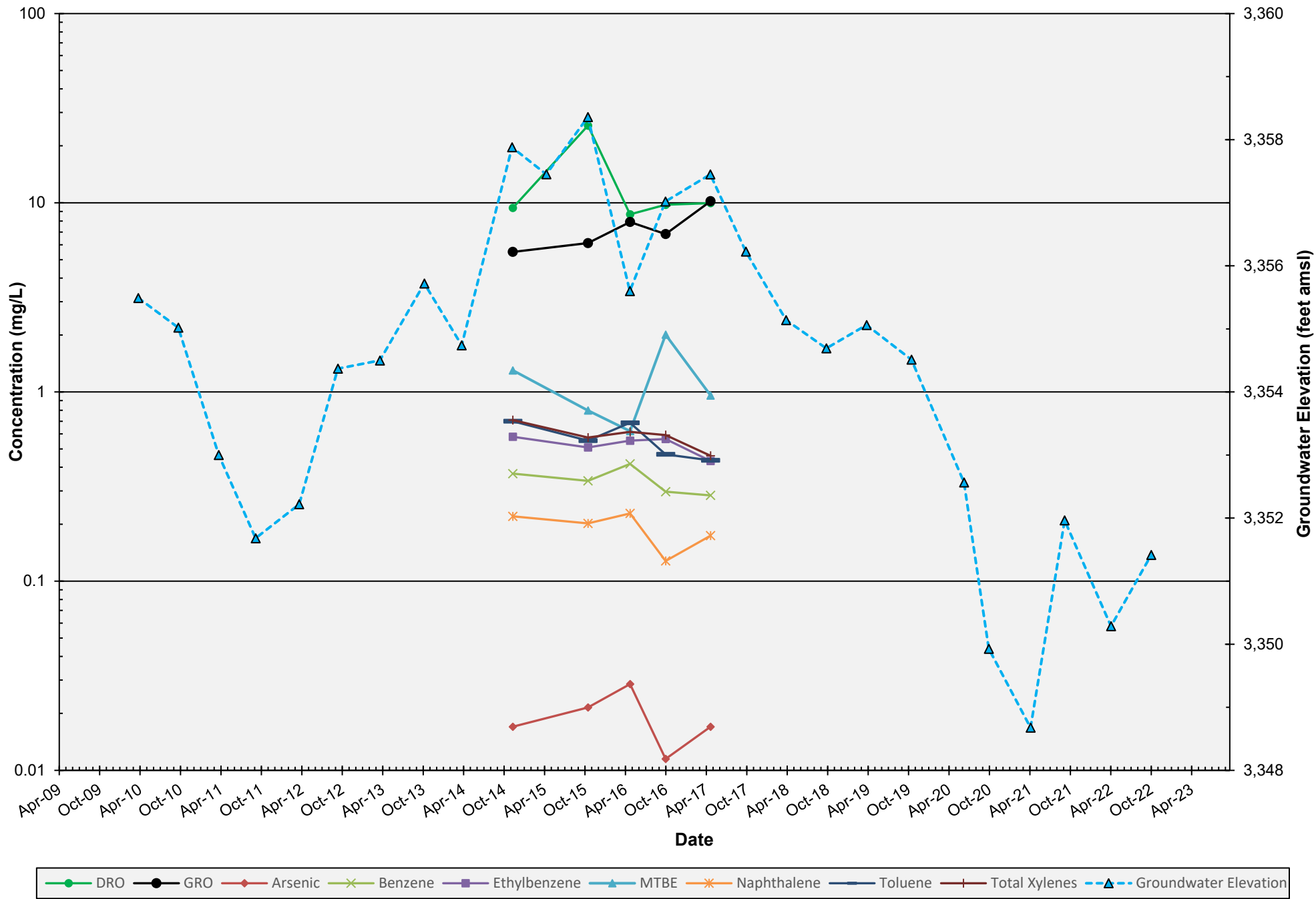
MW-93: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery
North Refinery Area



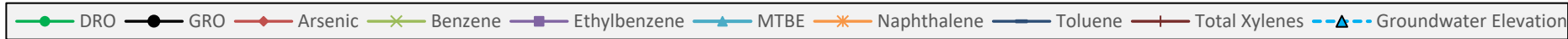
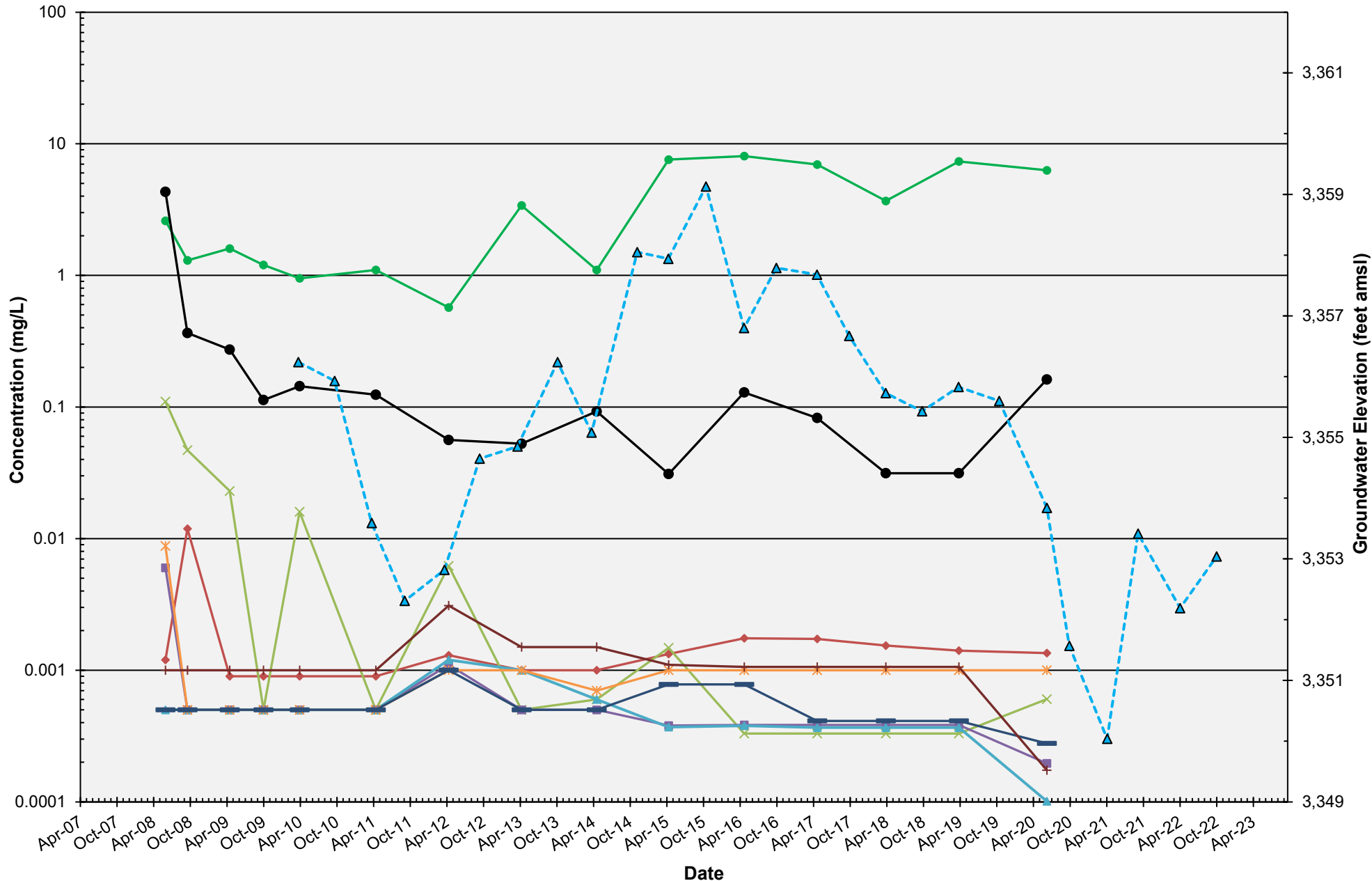
MW-94: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery
North Refinery Area



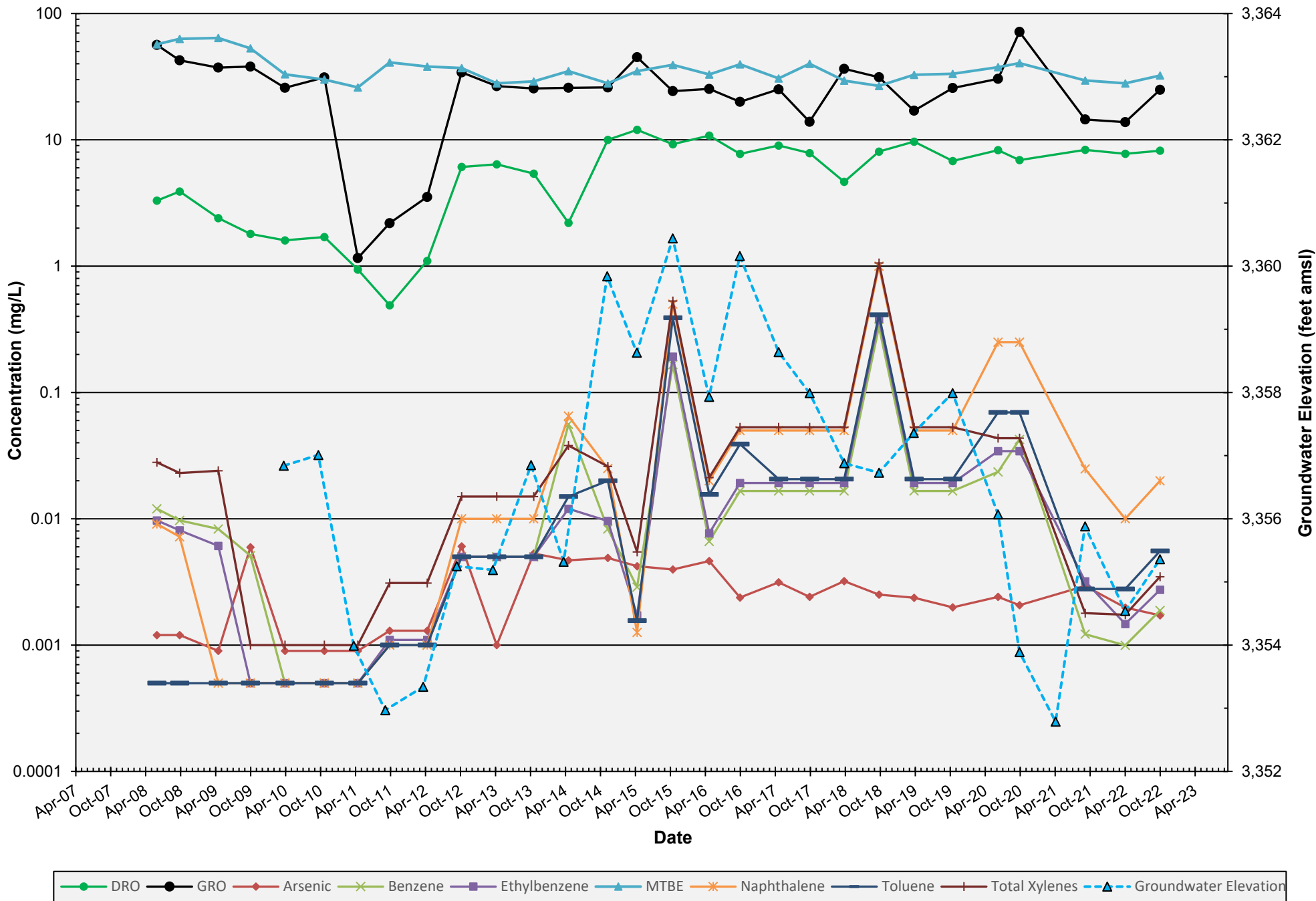
MW-95: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery
North Refinery Area



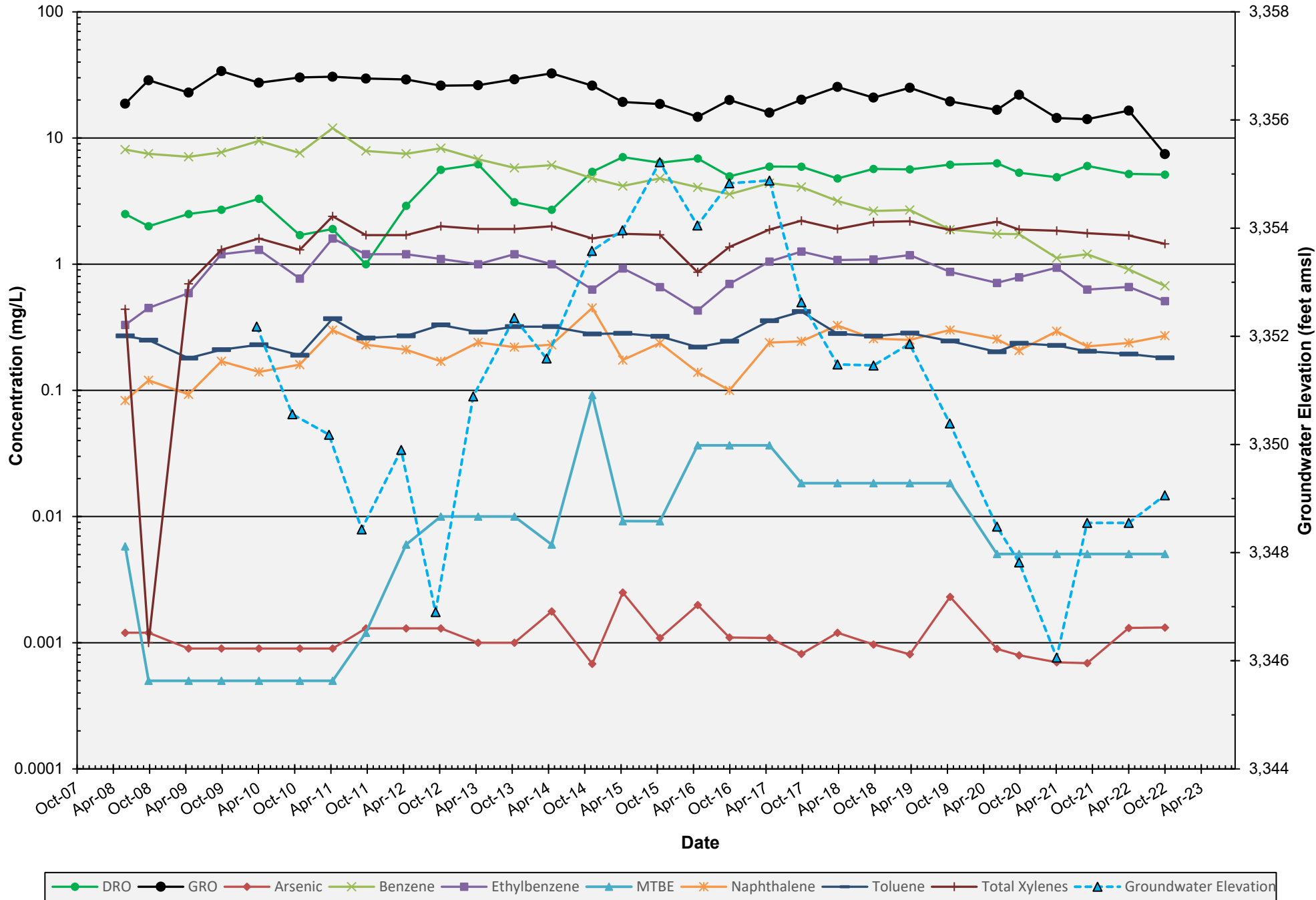
MW-96: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery
North Refinery Area



MW-98: COC Concentrations and Groundwater Elevations

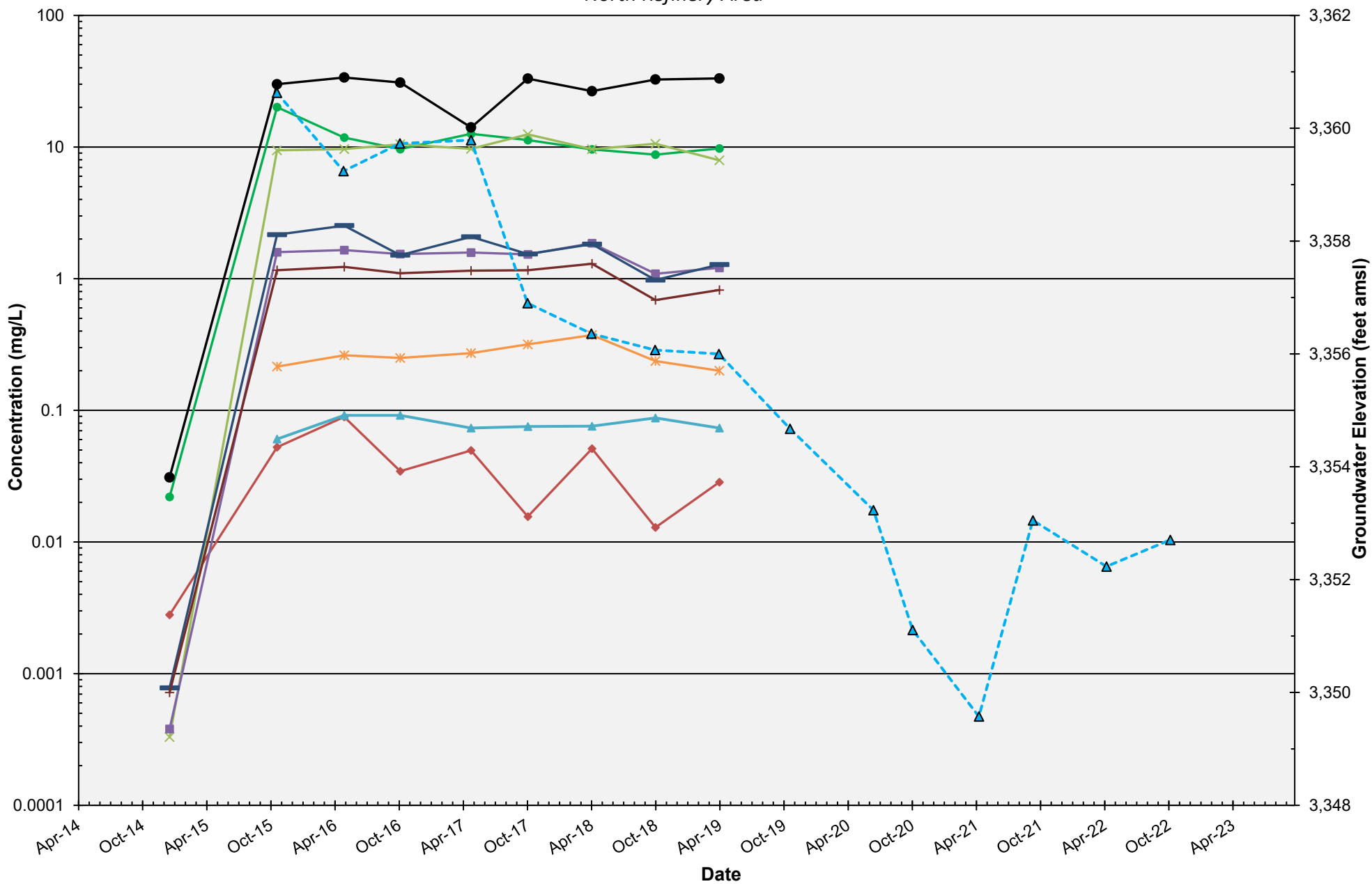
HF Sinclair Navajo Refining LLC - Artesia Refinery
North Refinery Area



MW-137: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery

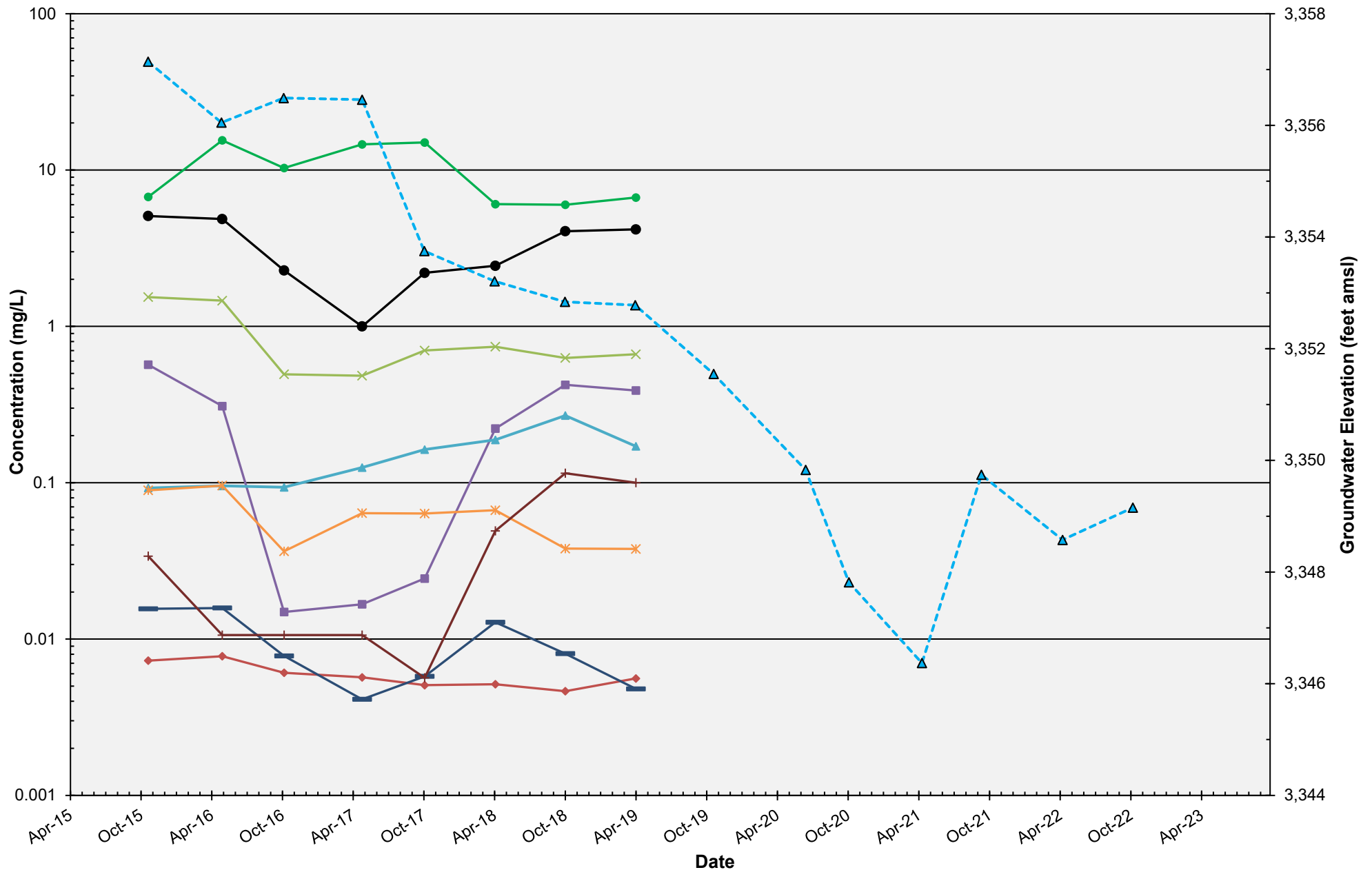
North Refinery Area



MW-138: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery

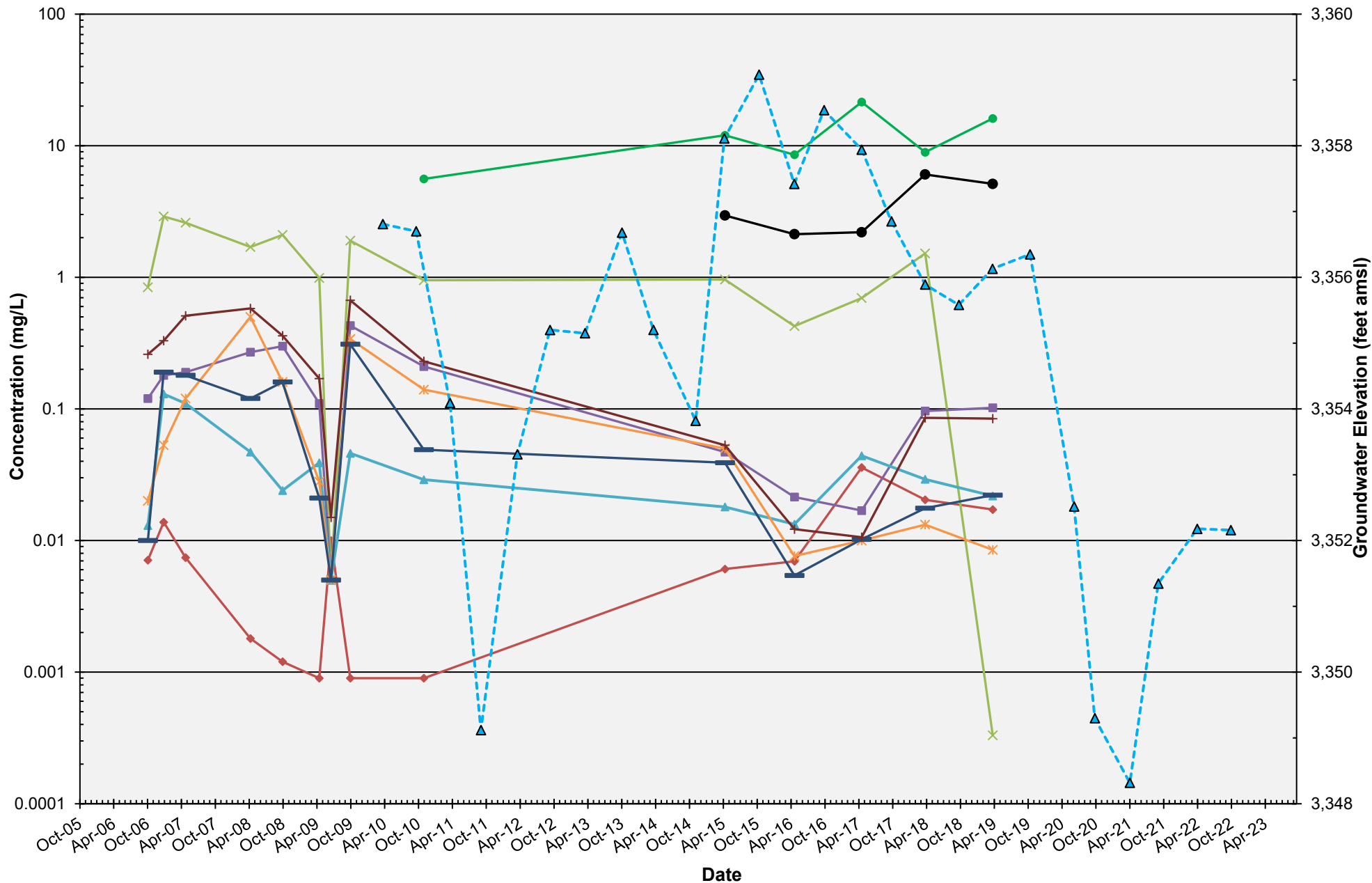
North Refinery Area



DRO GRO Arsenic Benzene Ethylbenzene MTBE Naphthalene Toluene Total Xylenes Groundwater Elevation

RW-1: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery
North Refinery Area

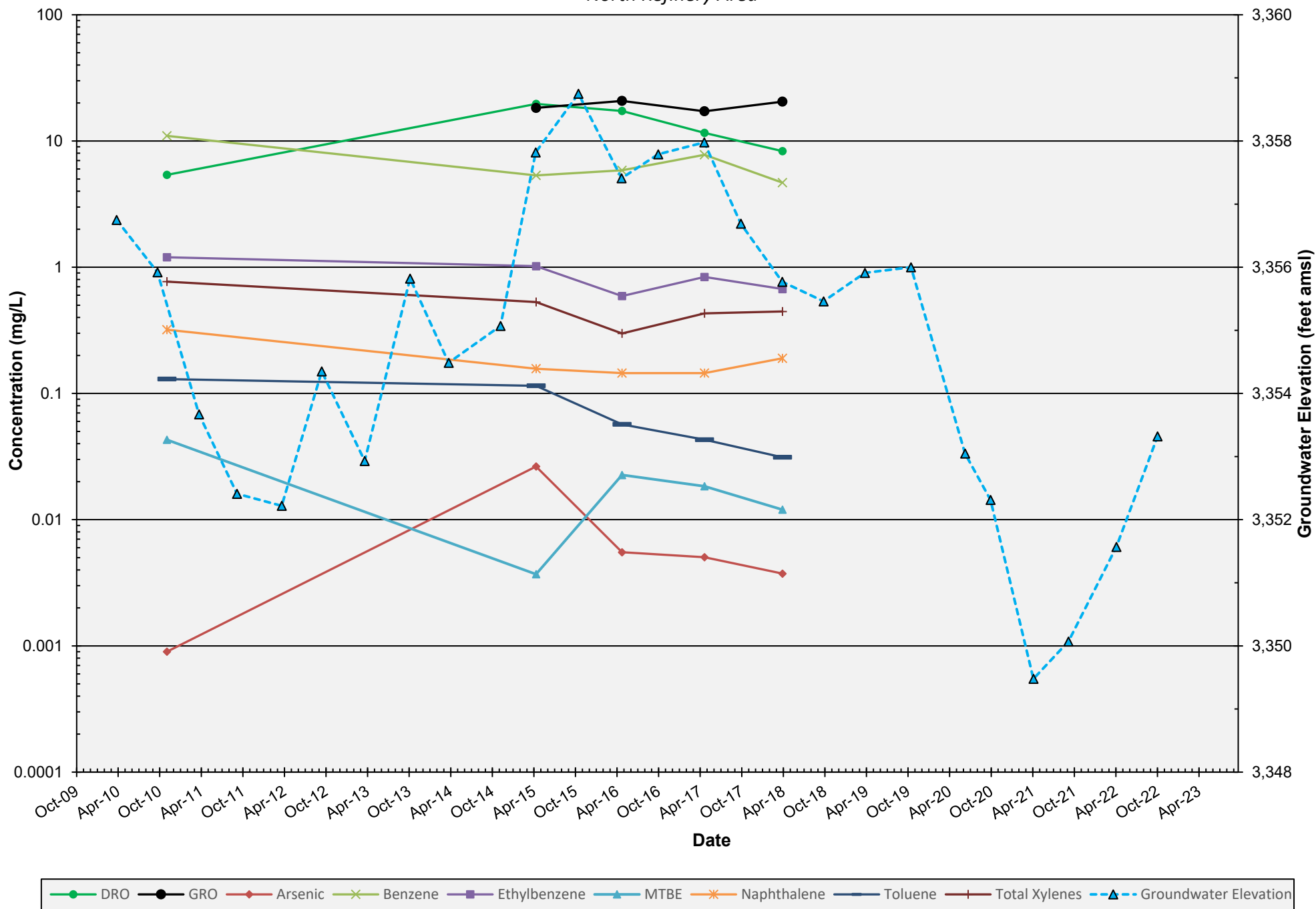


DRO GRO Arsenic Benzene Ethylbenzene MTBE Naphthalene Toluene Total Xylenes Groundwater Elevation

RW-2: COC Concentrations and Groundwater Elevations

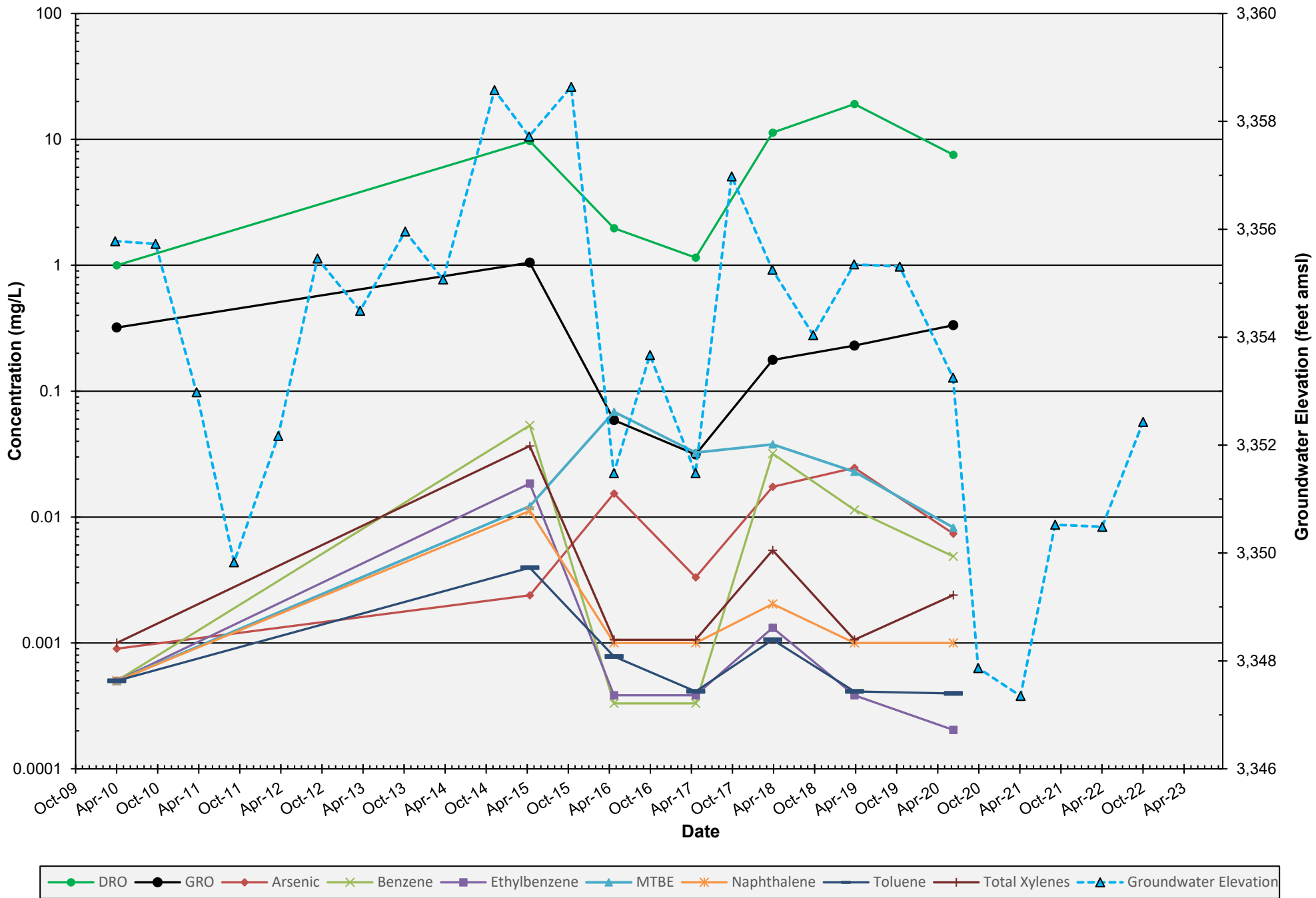
HF Sinclair Navajo Refining LLC - Artesia Refinery

North Refinery Area



RW-7: COC Concentrations and Groundwater Elevations

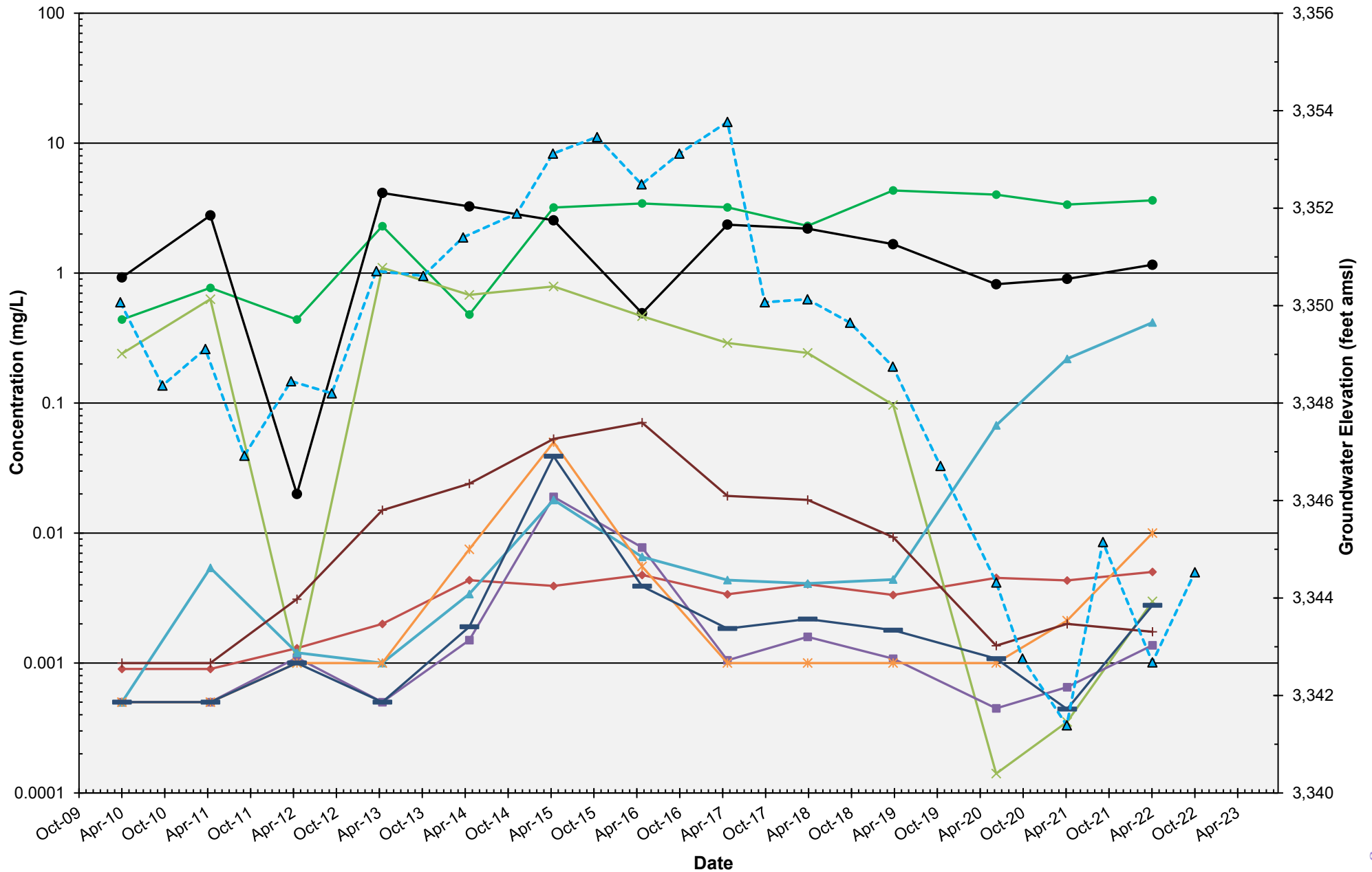
HF Sinclair Navajo Refining LLC - Artesia Refinery
North Refinery Area



RW-9: COC Concentrations and Groundwater Elevations

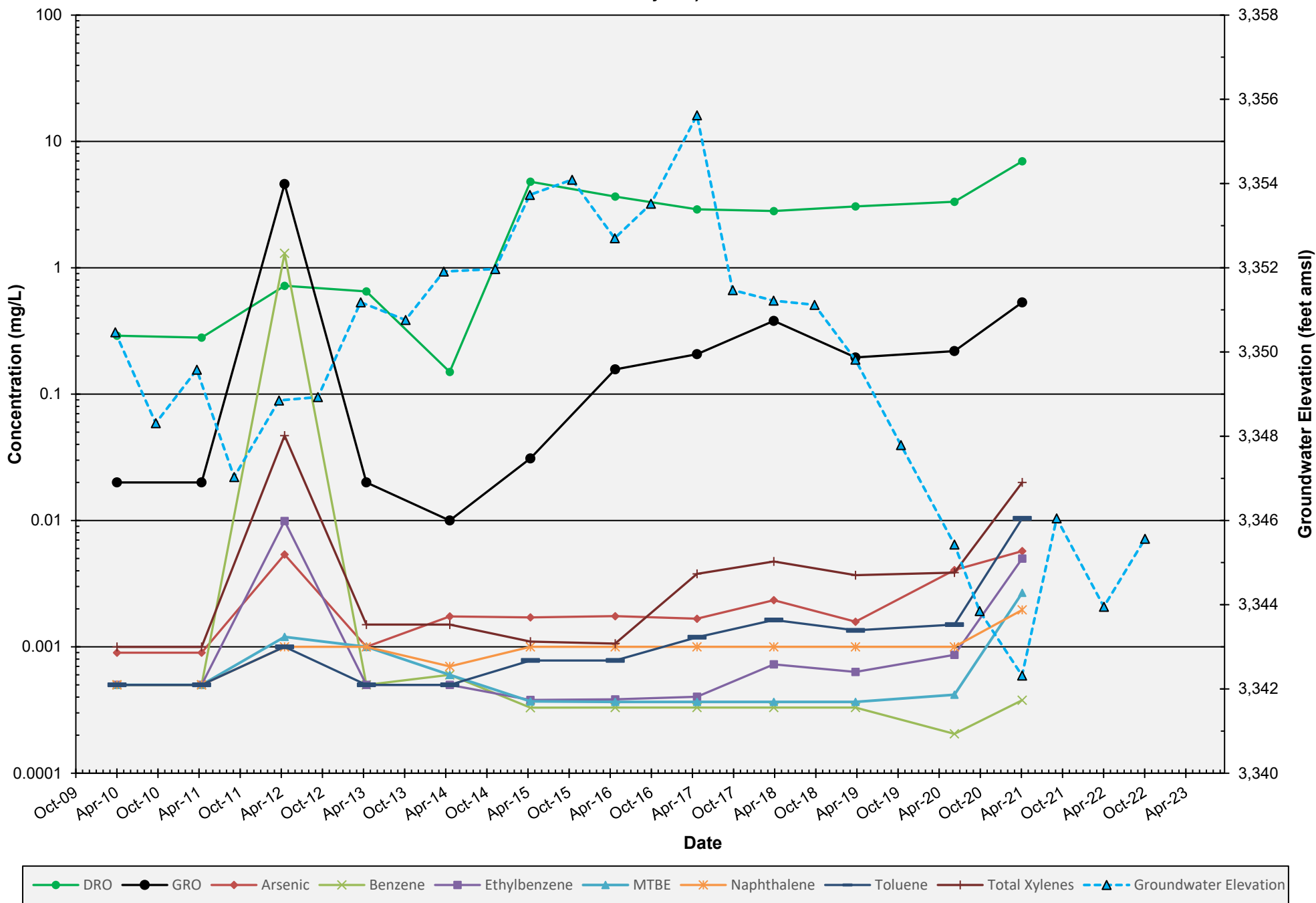
HF Sinclair Navajo Refining LLC - Artesia Refinery

North Refinery Area



RW-10: COC Concentrations and Groundwater Elevations

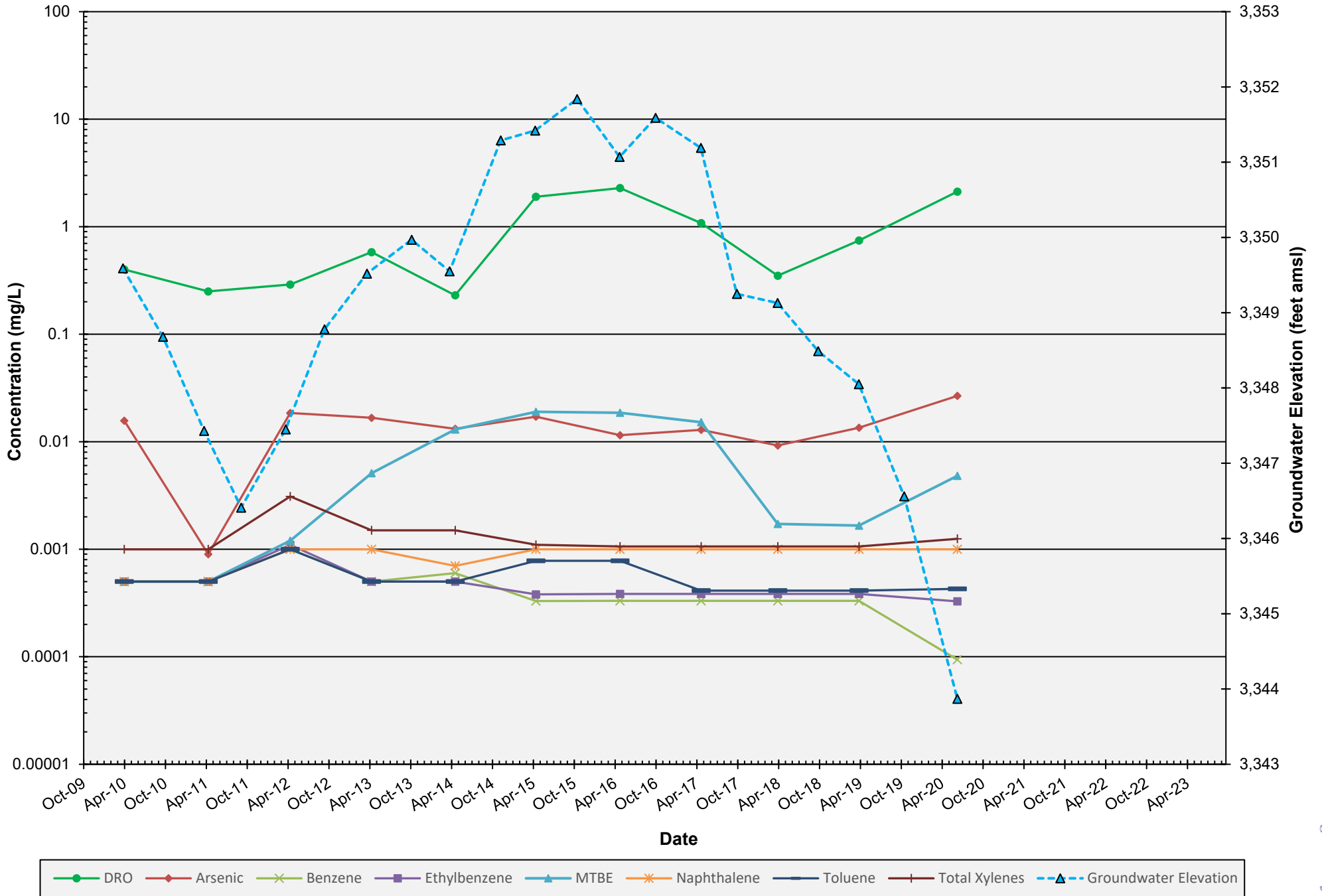
HF Sinclair Navajo Refining LLC - Artesia Refinery
North Refinery Area



RW-16: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery

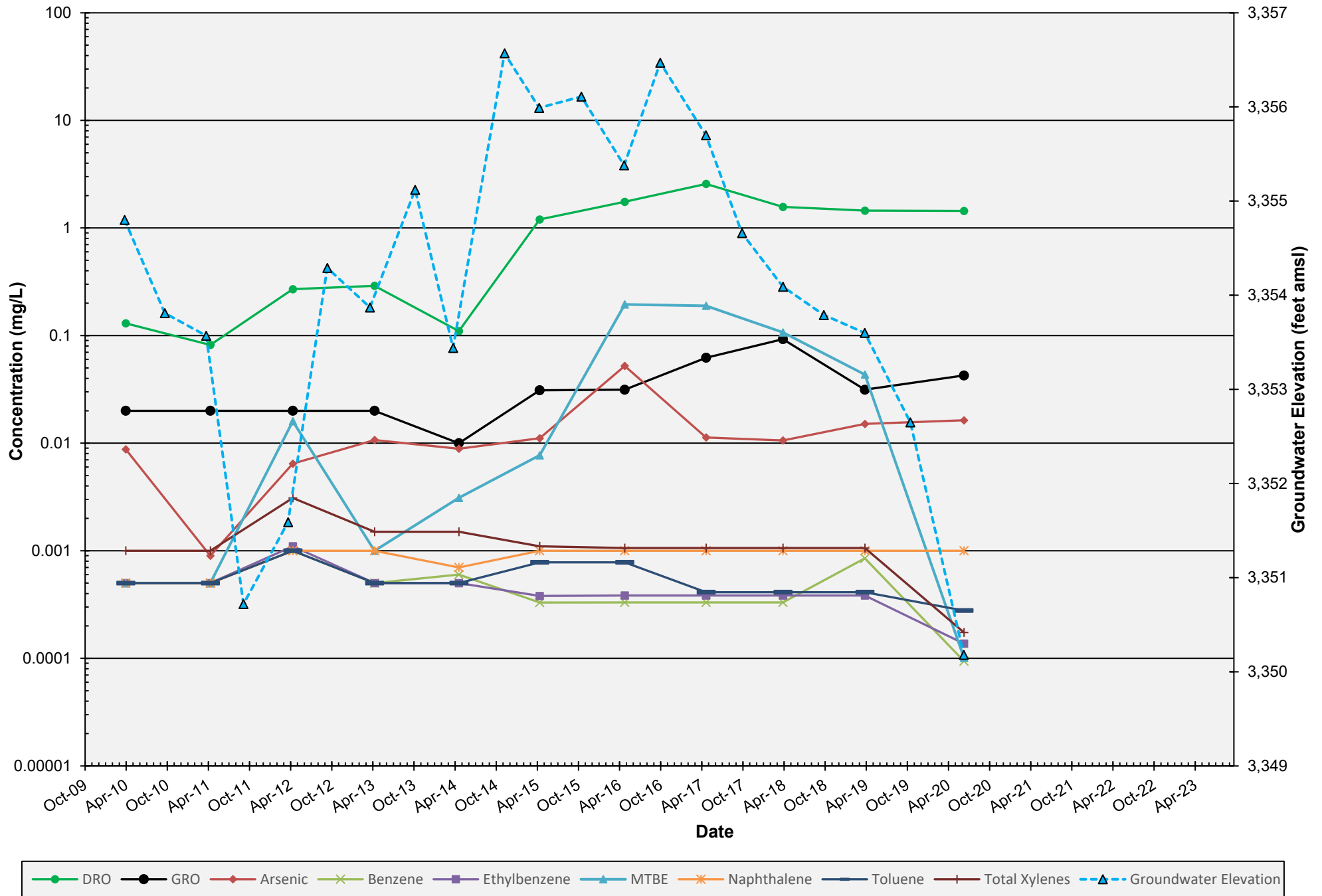
North Refinery Area



RW-17: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery

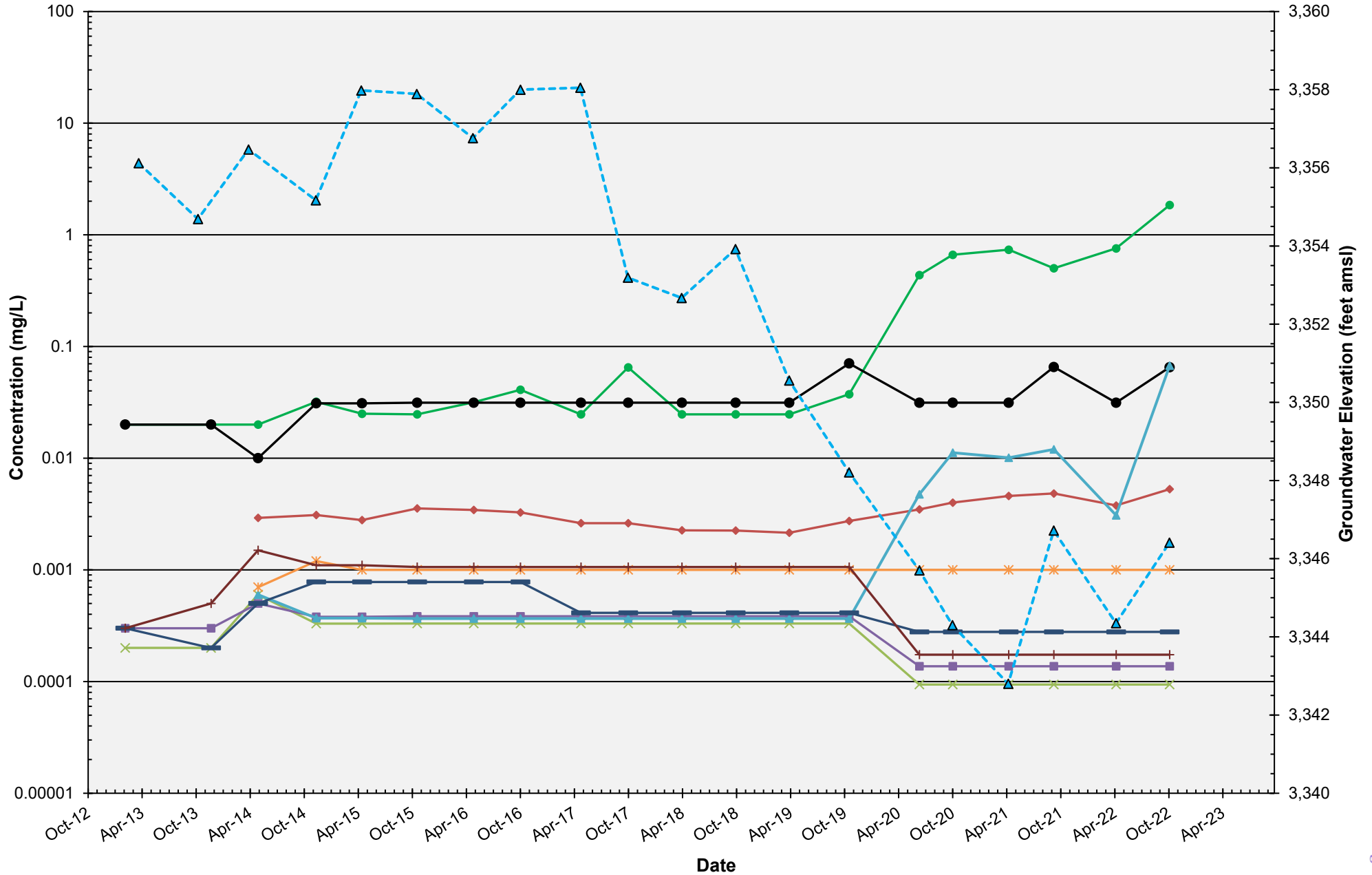
North Refinery Area



MW-114: COC Concentrations and Groundwater Elevations

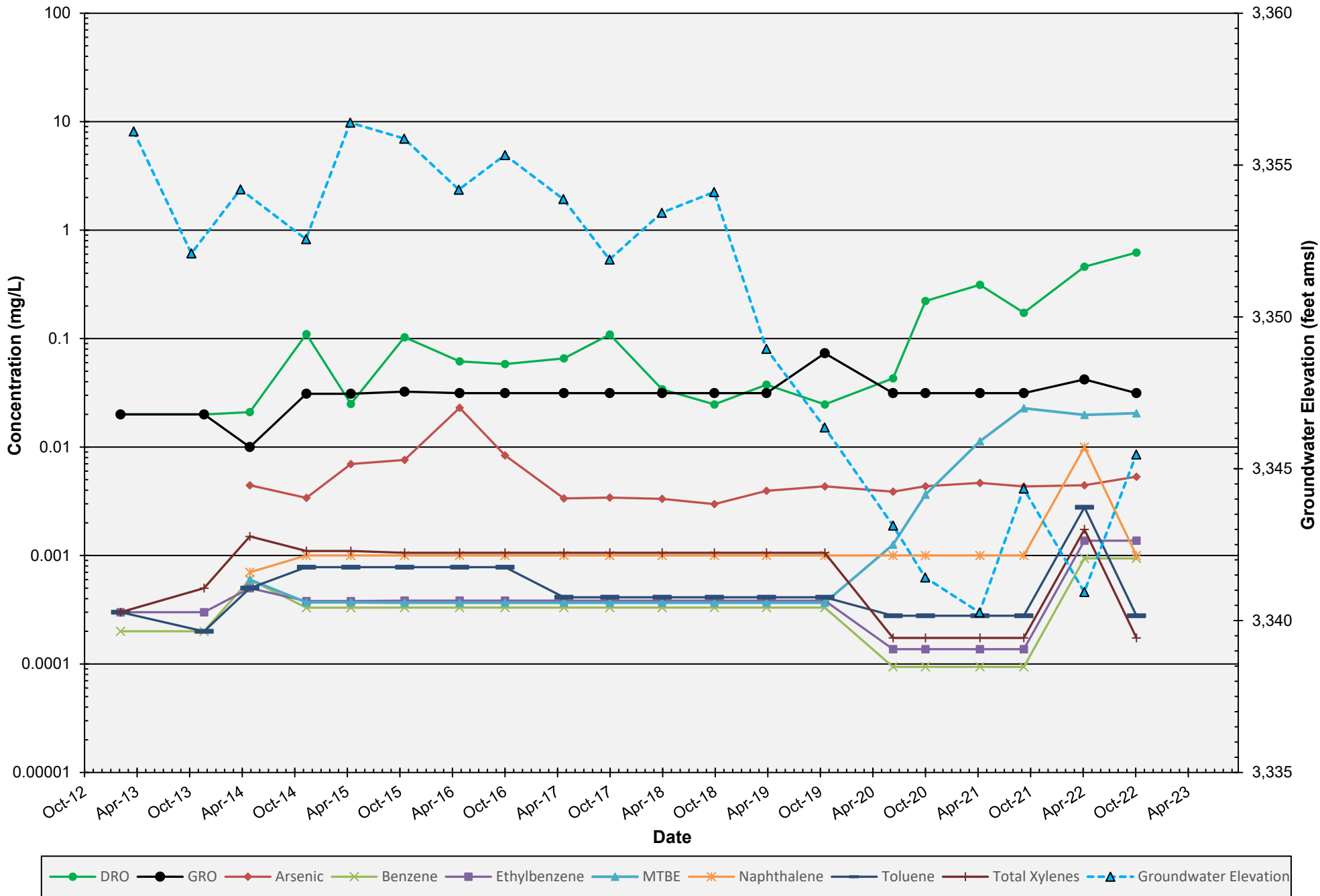
HF Sinclair Navajo Refining LLC - Artesia Refinery

South Reverse Osmosis Reject Field



MW-115: COC Concentrations and Groundwater Elevations

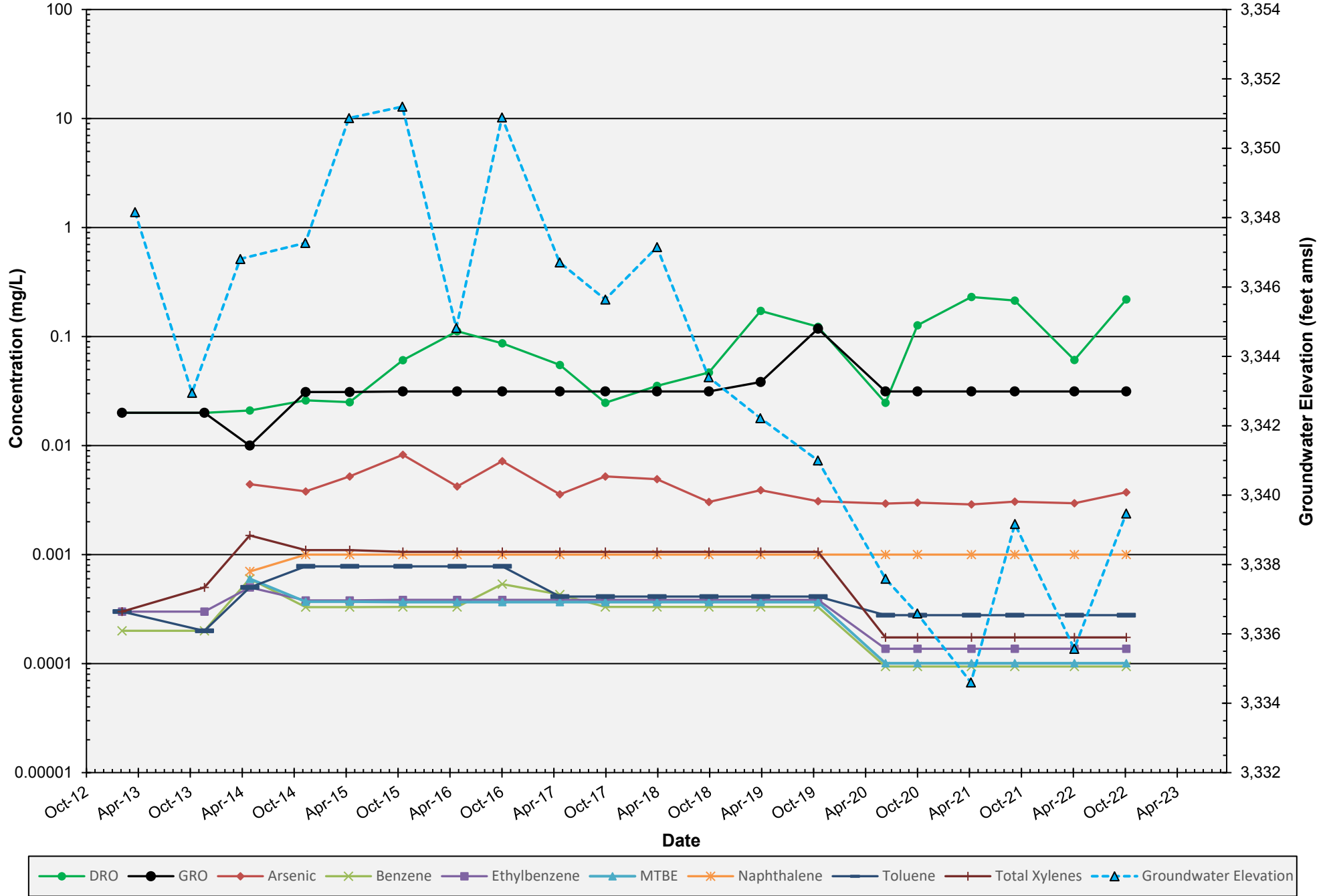
HF Sinclair Navajo Refining LLC - Artesia Refinery
South Reverse Osmosis Reject Fields



MW-116: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery

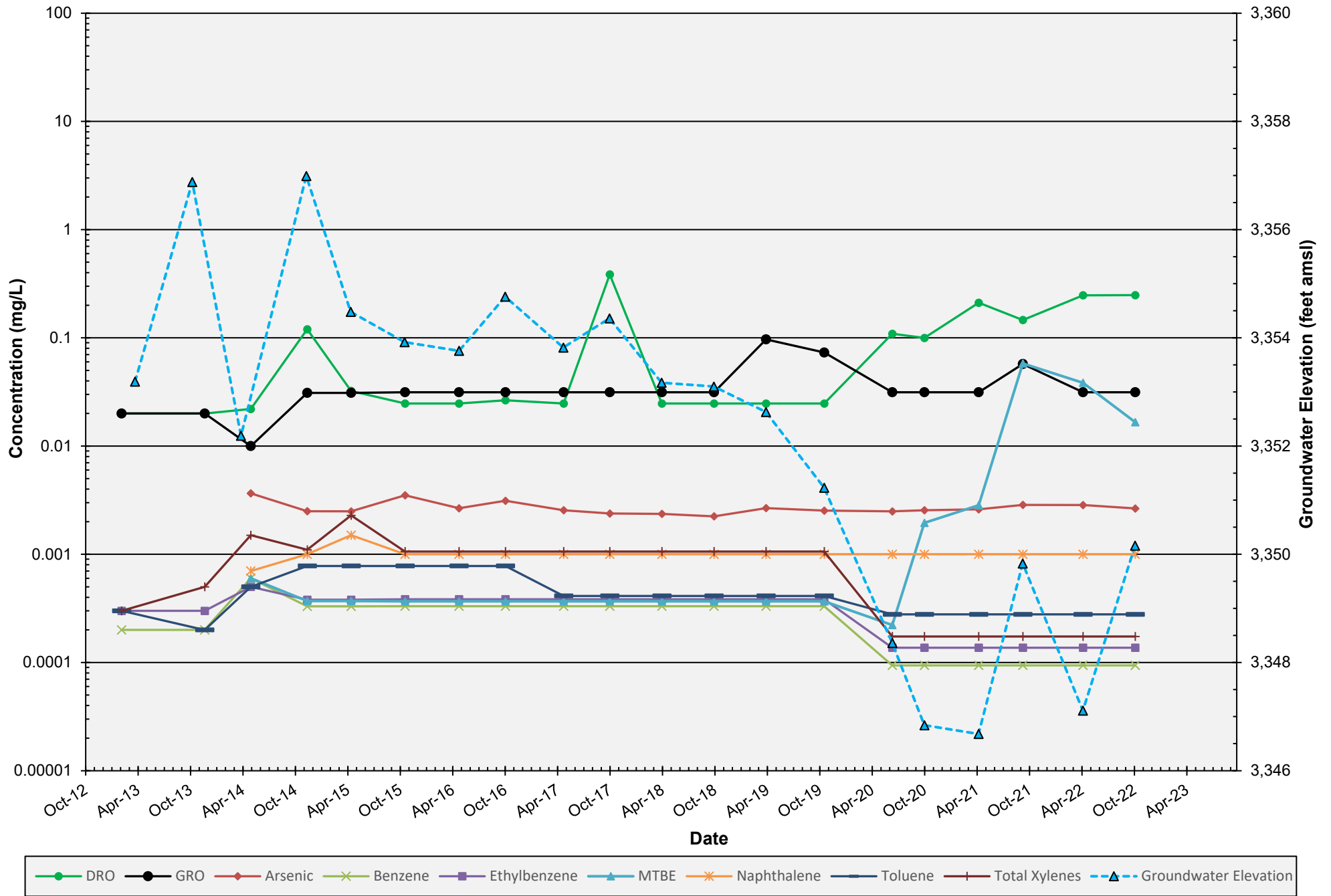
South Reverse Osmosis Reject Field



MW-117: COC Concentrations and Groundwater Elevations

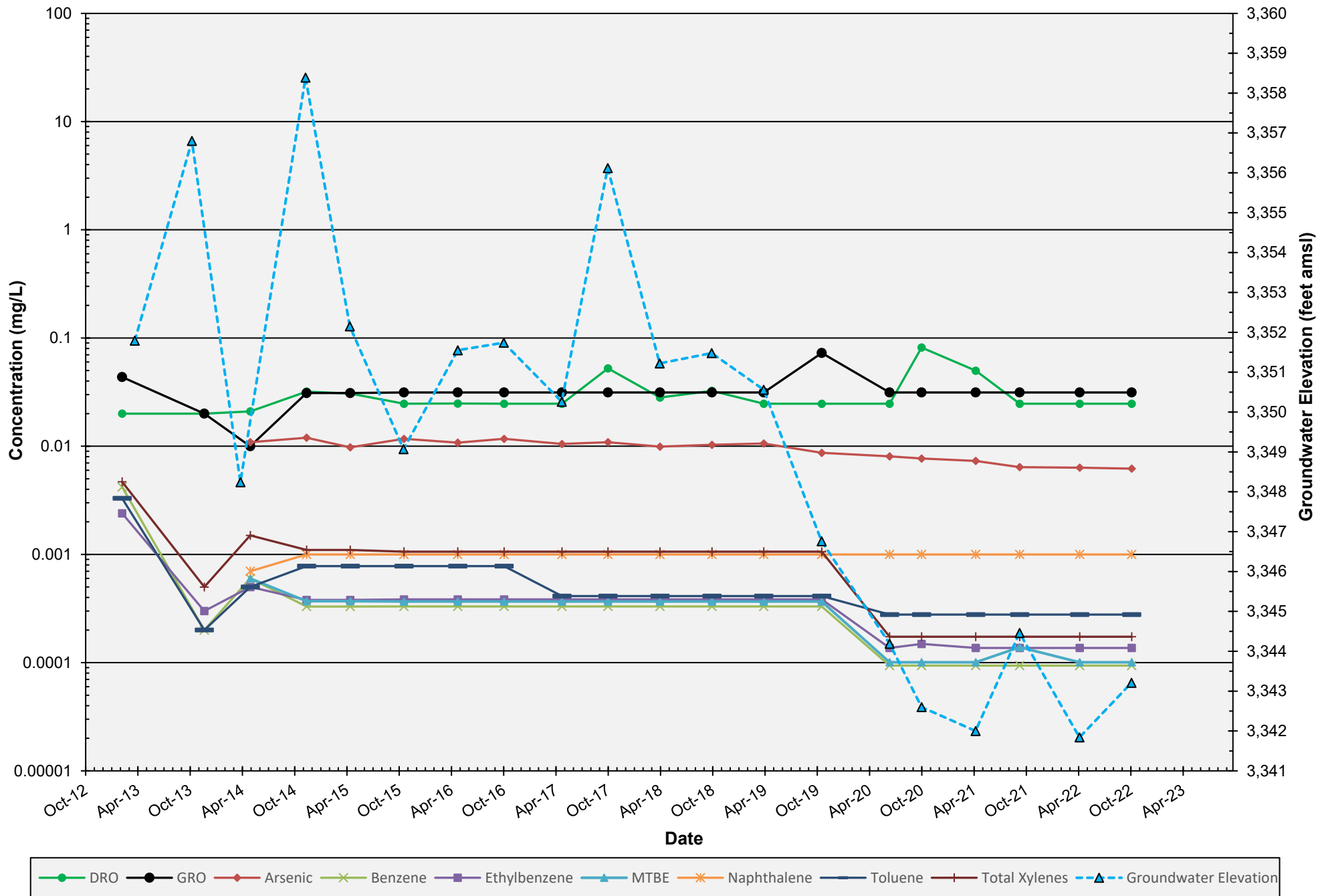
HF Sinclair Navajo Refining LLC - Artesia Refinery

North Reverse Osmosis Reject Fields



MW-118: COC Concentrations and Groundwater Elevations

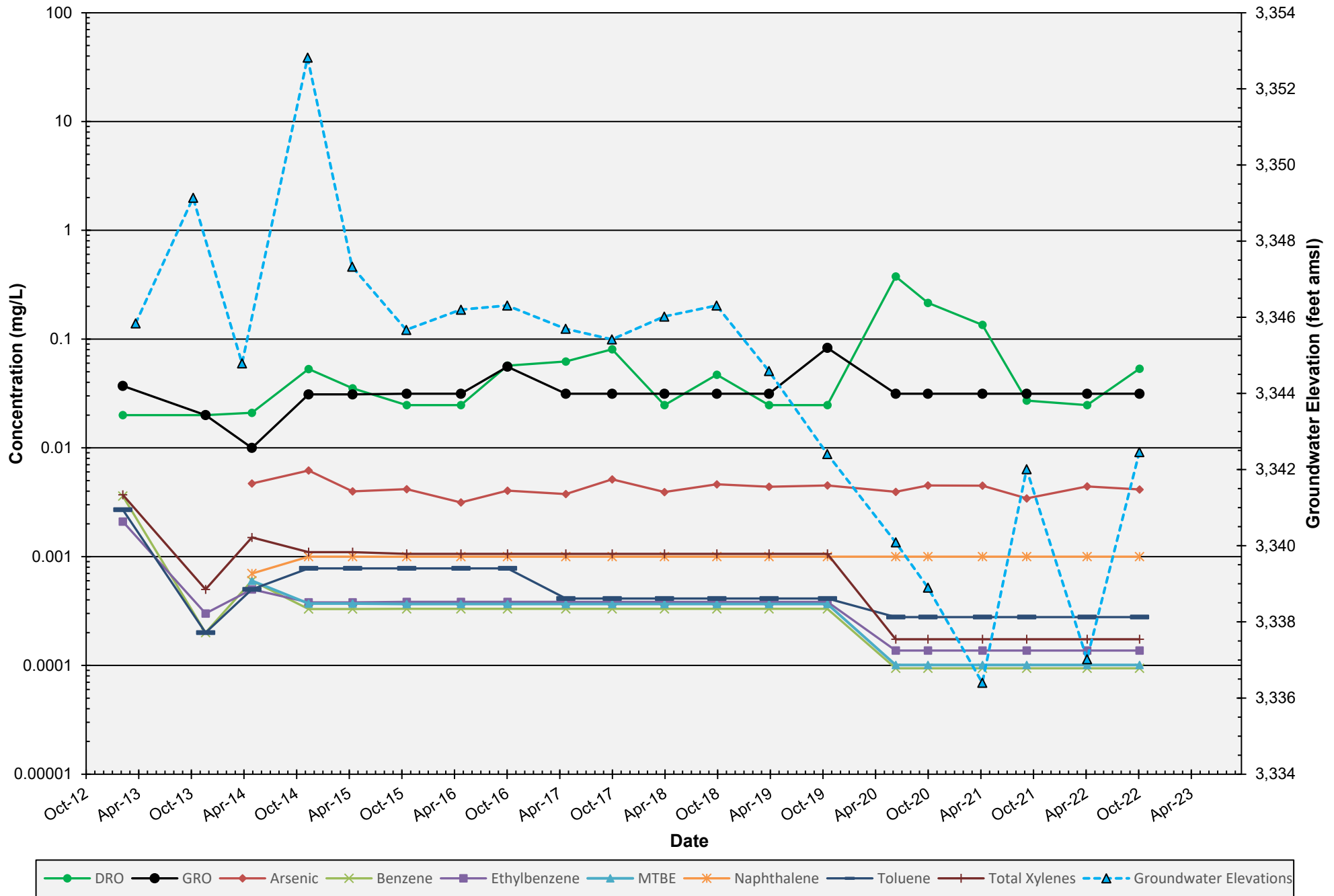
HF Sinclair Navajo Refining LLC - Artesia Refinery
North Reverse Osmosis Reject Fields



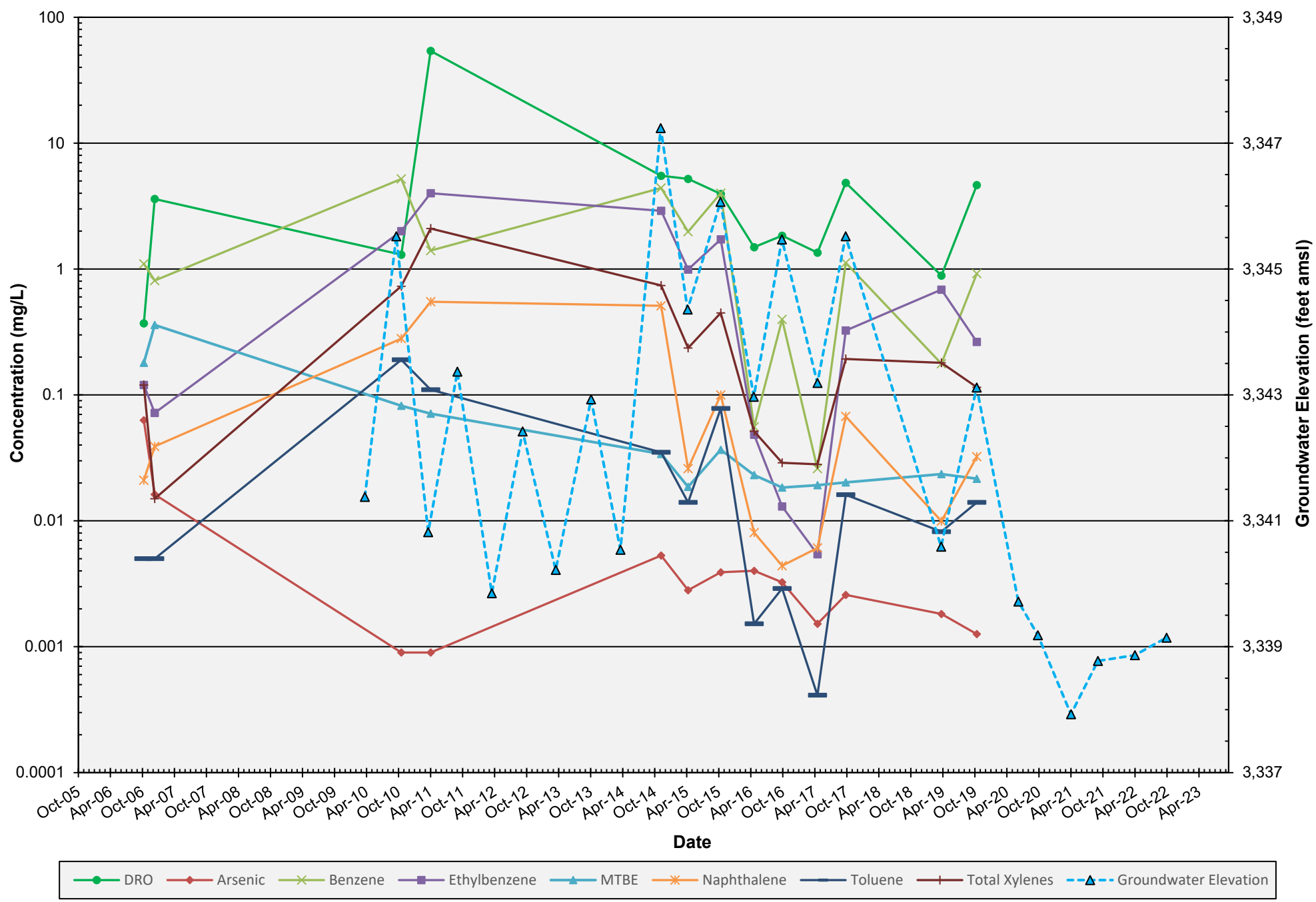
MW-119: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery

North Reverse Osmosis Reject Fields

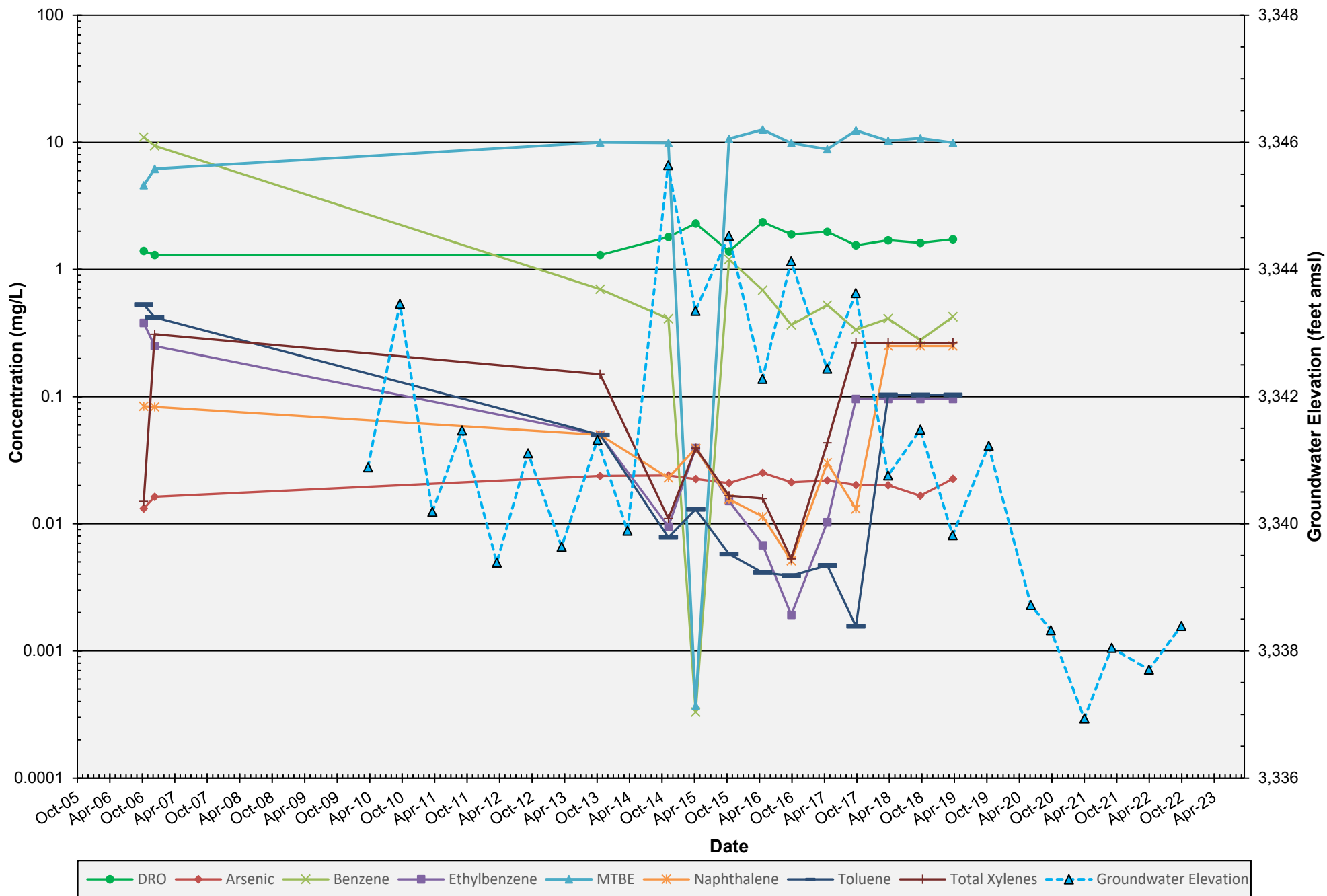


KWB-2R: COC Concentrations and Groundwater Elevations
HF Sinclair Navajo Refining LLC - Artesia Refinery
South Refinery Area



KWB-5: COC Concentrations and Groundwater Elevations

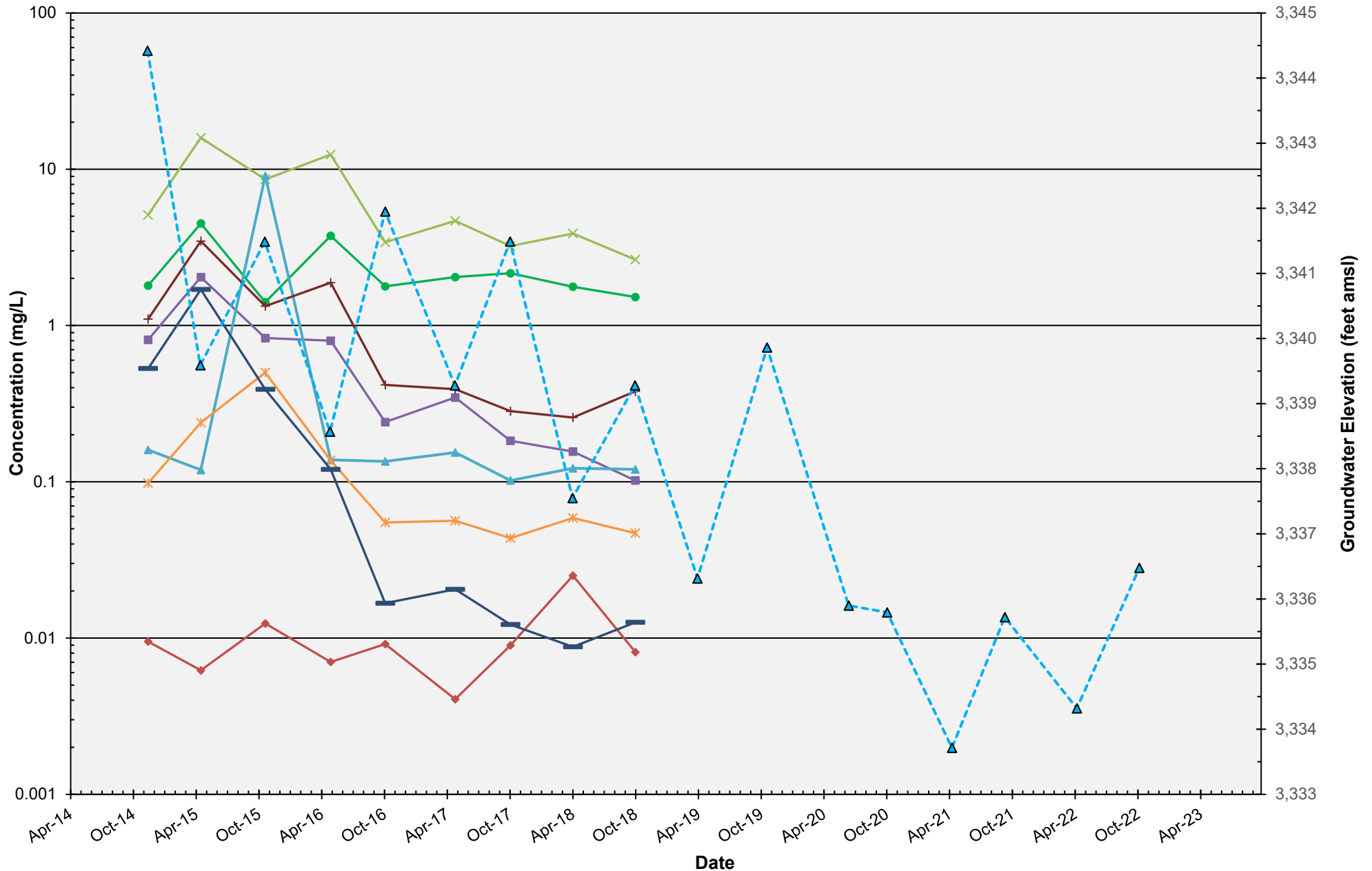
HF Sinclair Navajo Refining LLC - Artesia Refinery
South Refinery Area



KWB-6: COC Concentrations and Groundwater Elevations

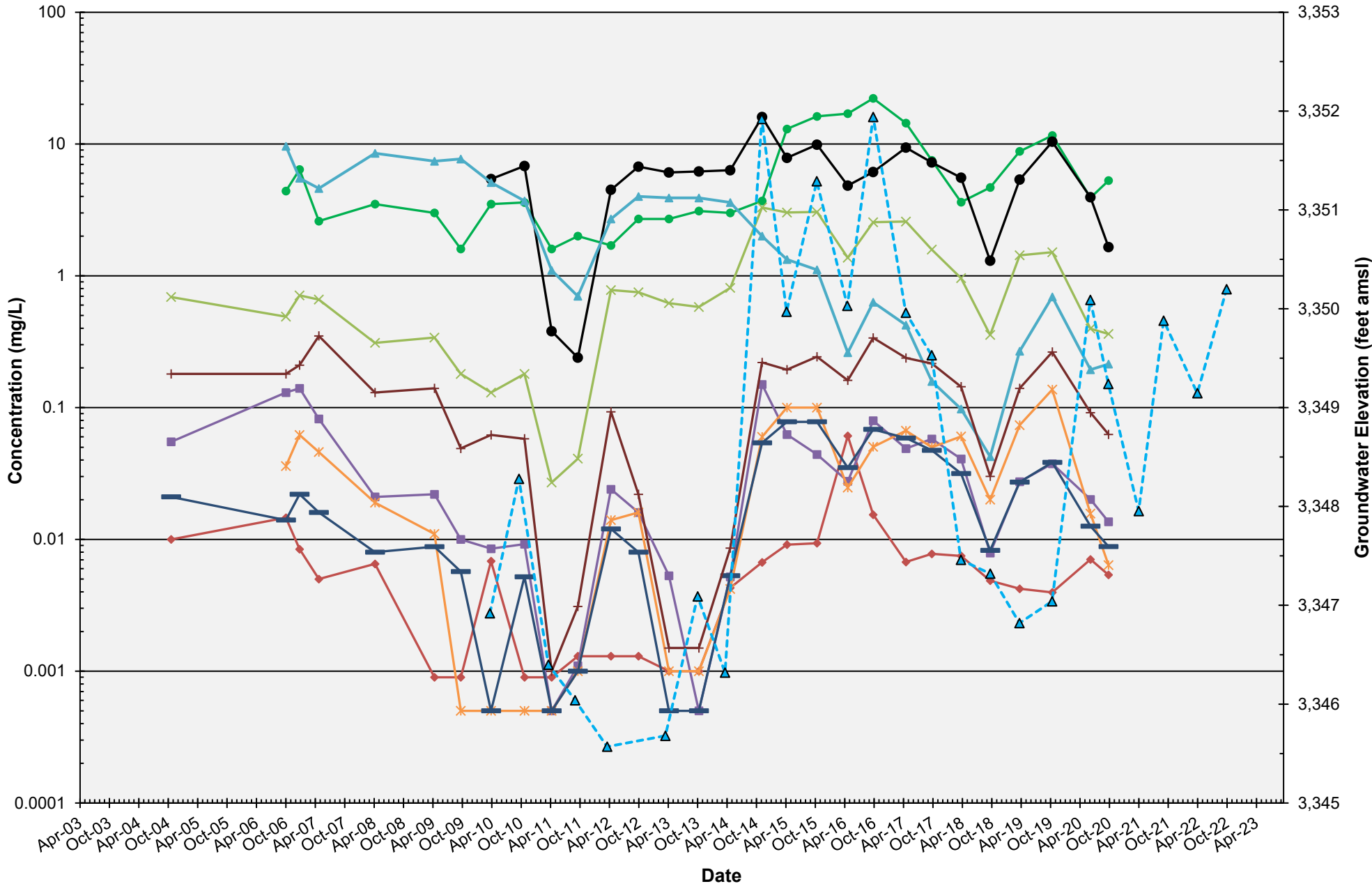
HF Sinclair Navajo Refining LLC - Artesia Refinery

South Refinery Area



MW-28: COC Concentrations and Groundwater Elevations

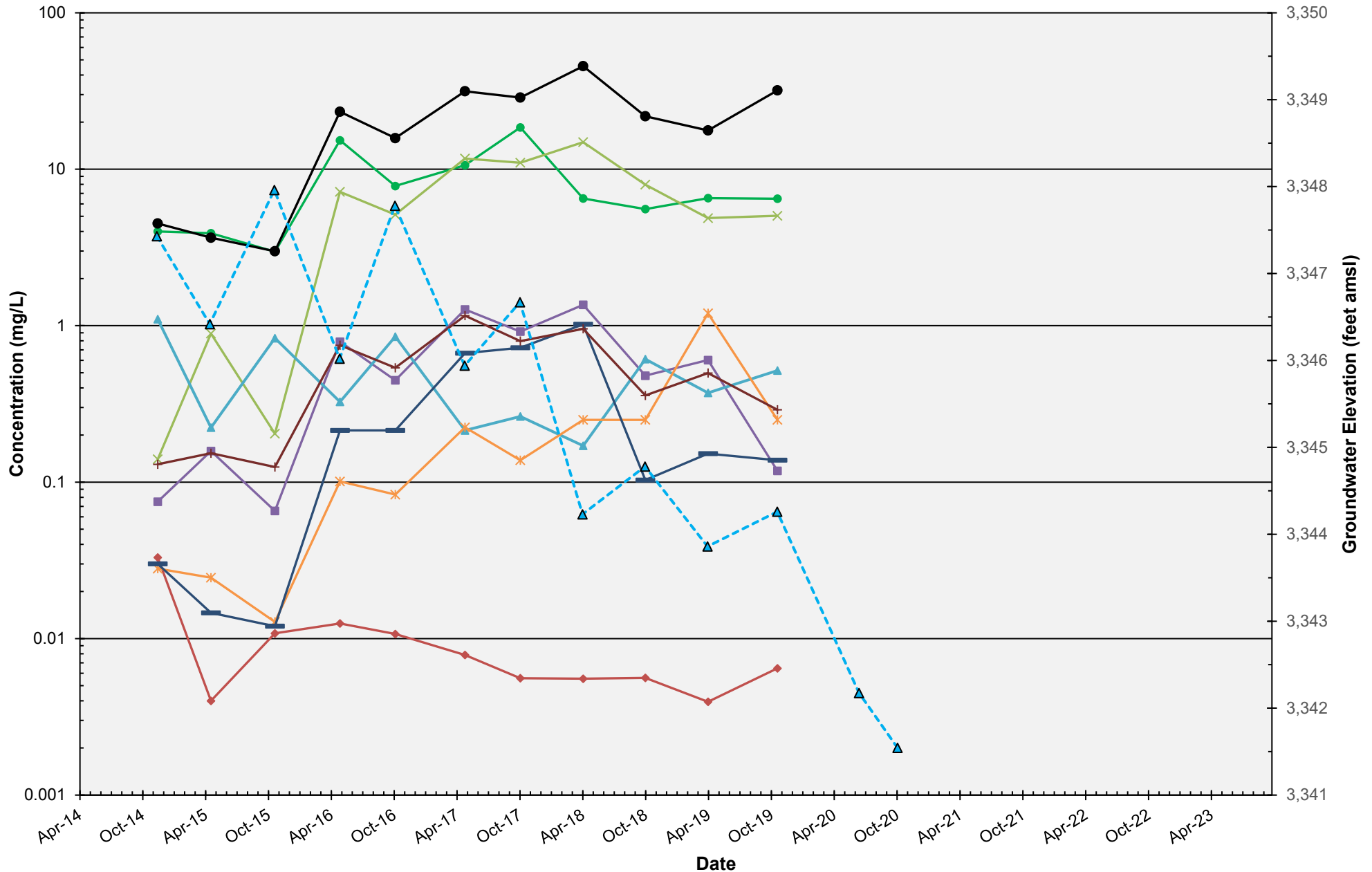
HF Sinclair Navajo Refining LLC - Artesia Refinery
South Refinery Area



MW-48: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery

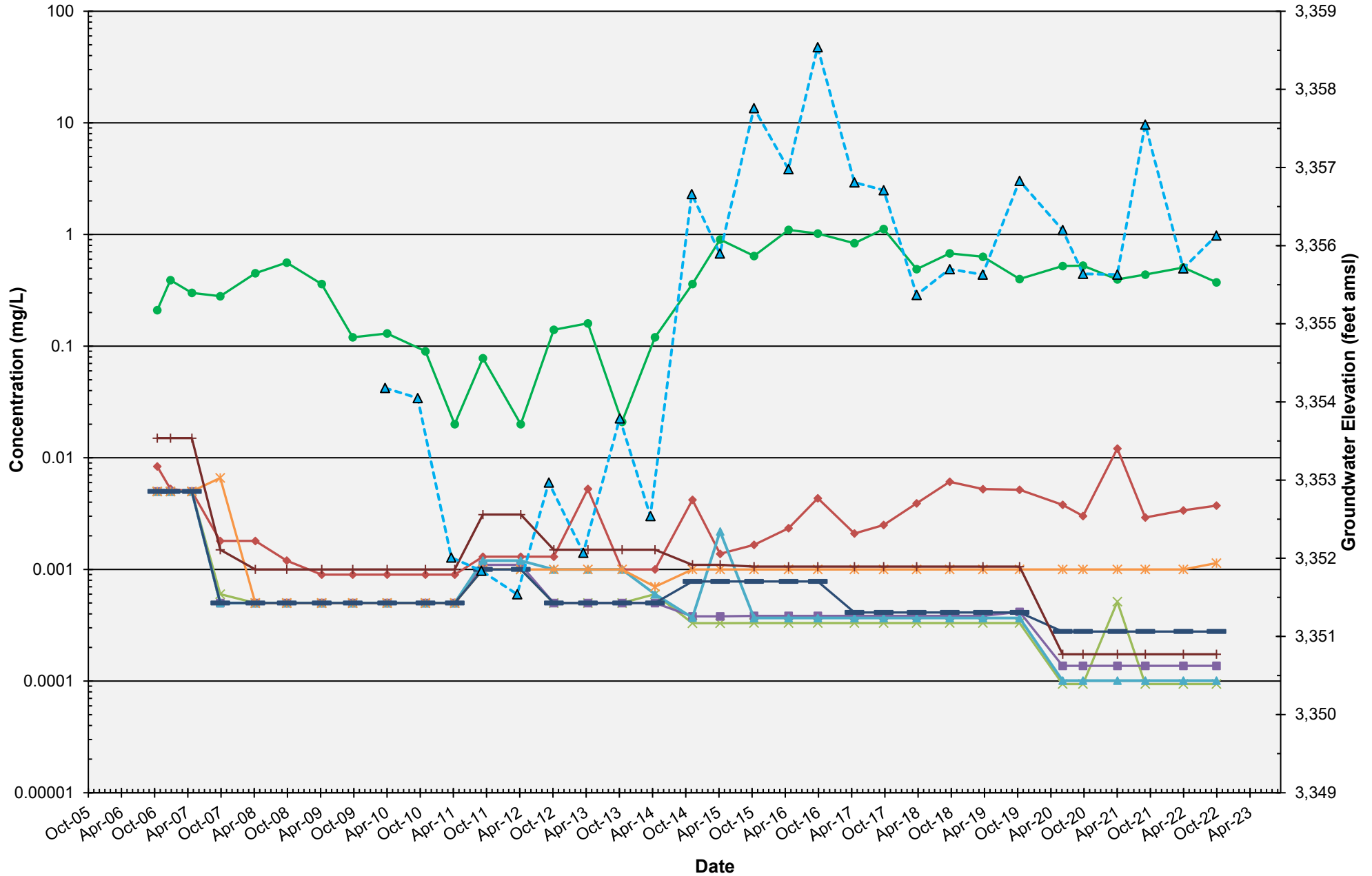
South Refinery Area



MW-50: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery

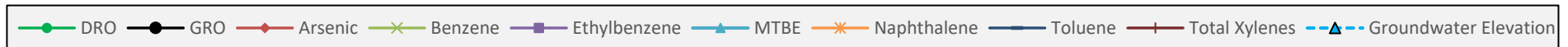
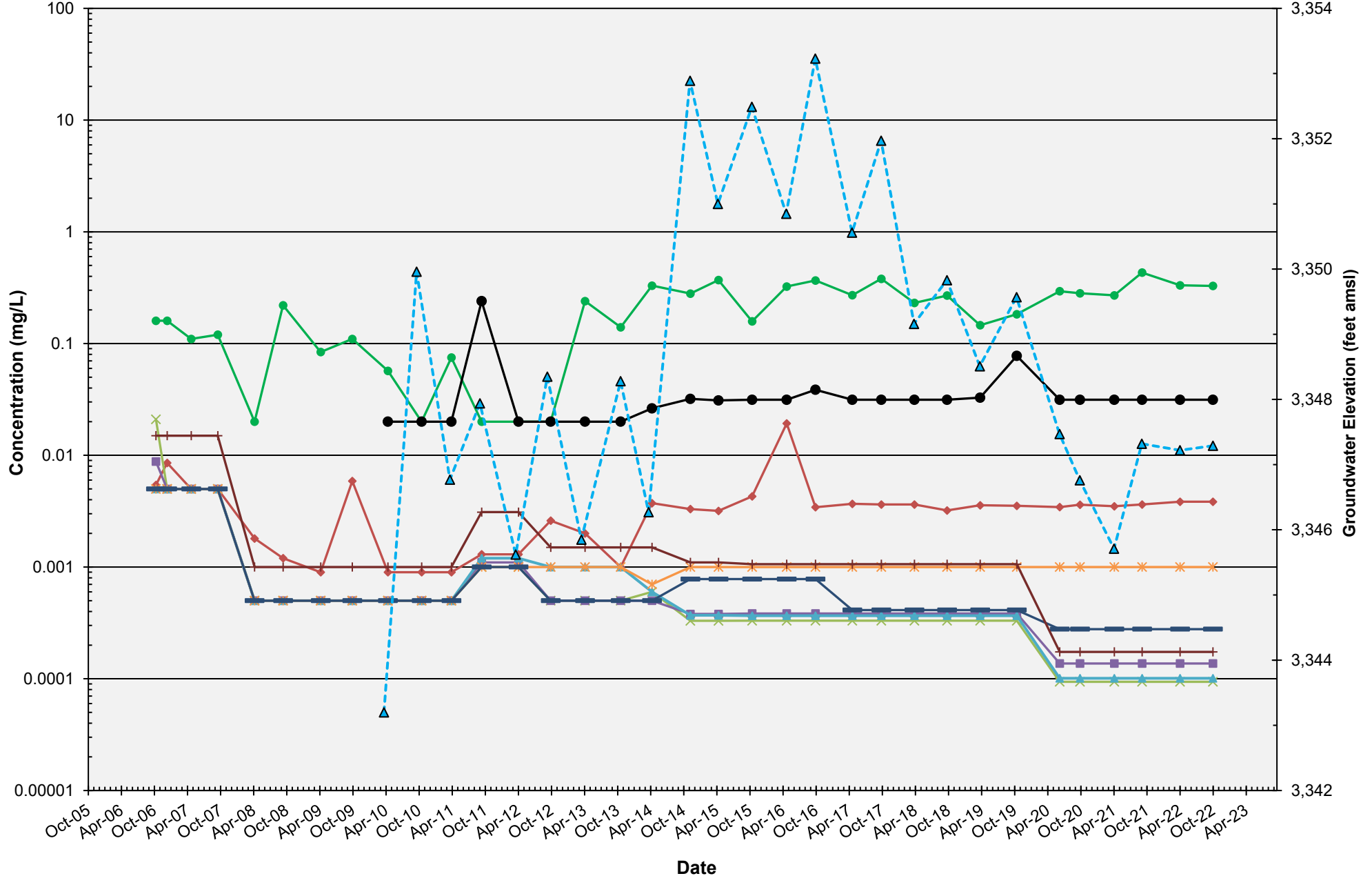
South Refinery Area



MW-52: COC Concentrations and Groundwater Elevations

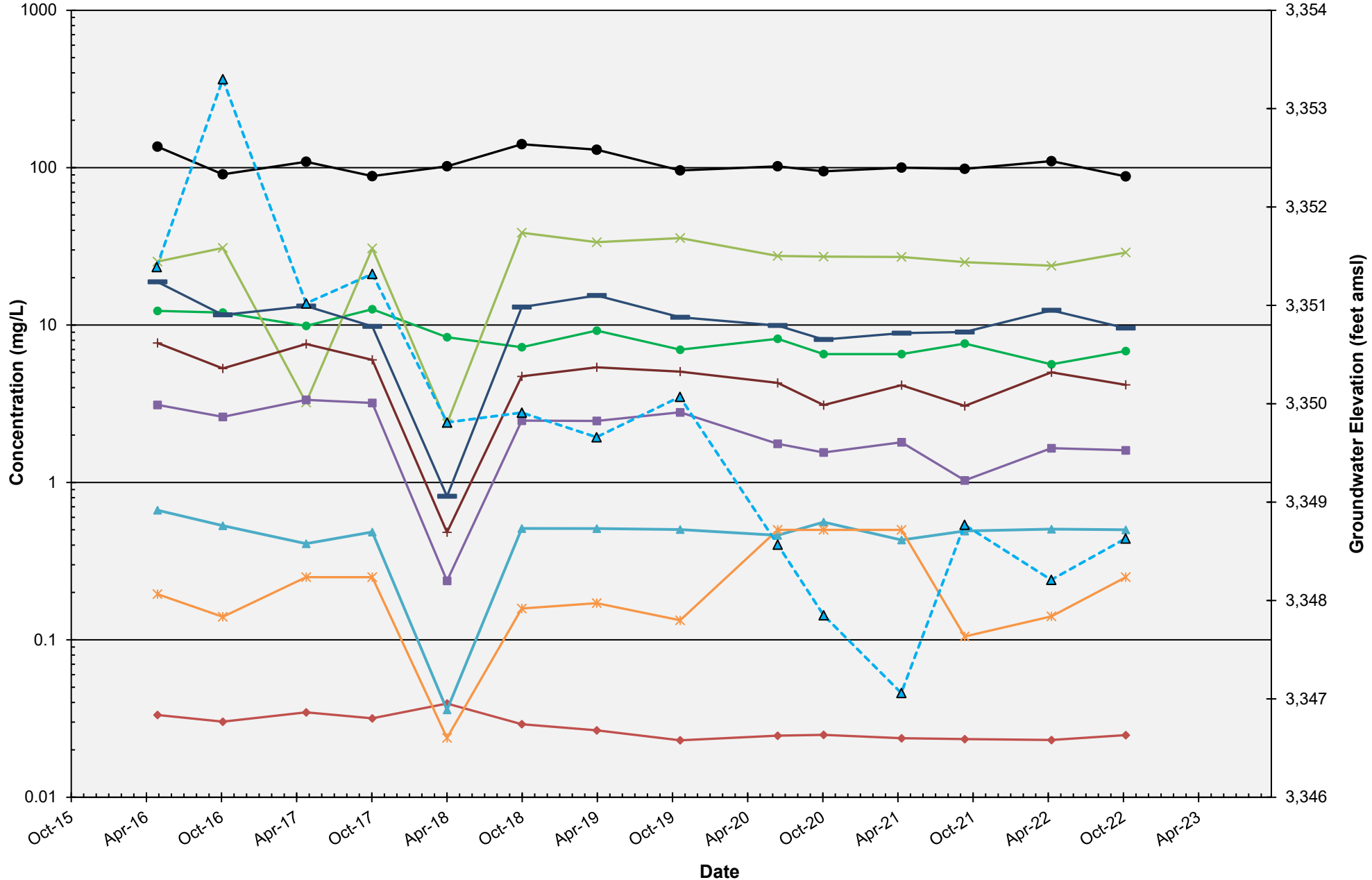
HF Sinclair Navajo Refining LLC - Artesia Refinery

South Refinery Area



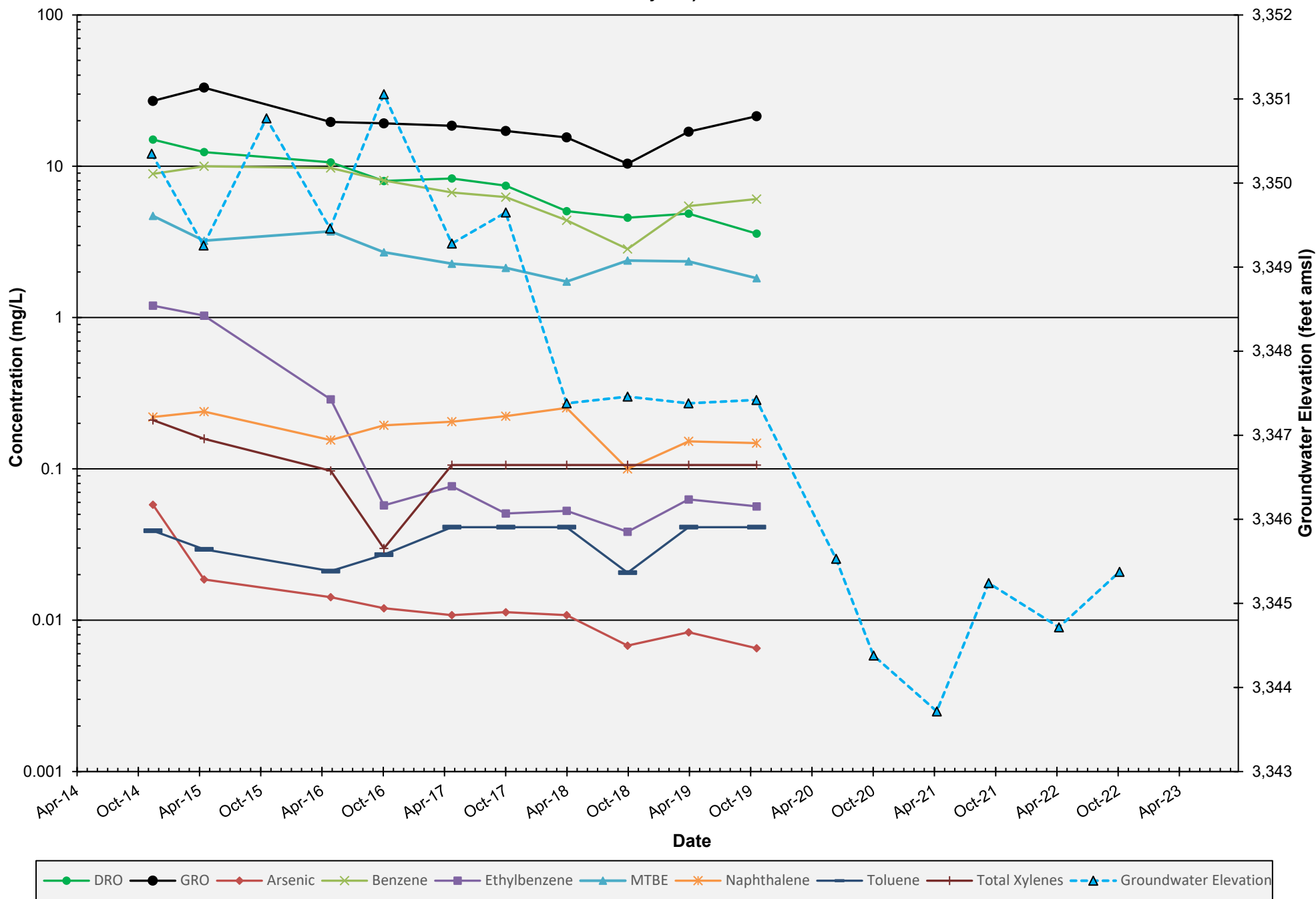
MW-64: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery
South Refinery Area



MW-65: COC Concentrations and Groundwater Elevations

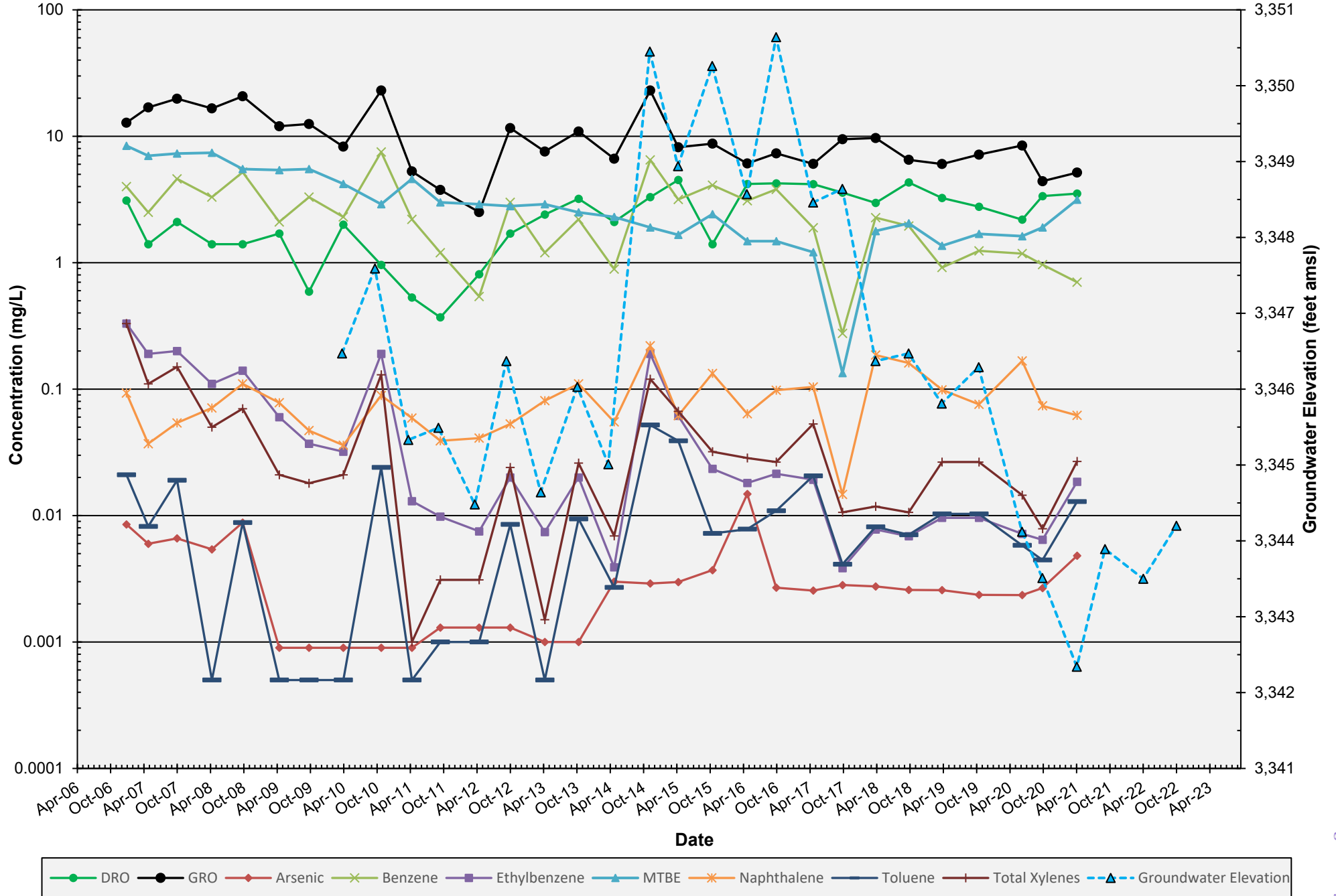
HF Sinclair Navajo Refining LLC - Artesia Refinery
South Refinery Area



MW-66: COC Concentrations and Groundwater Elevations

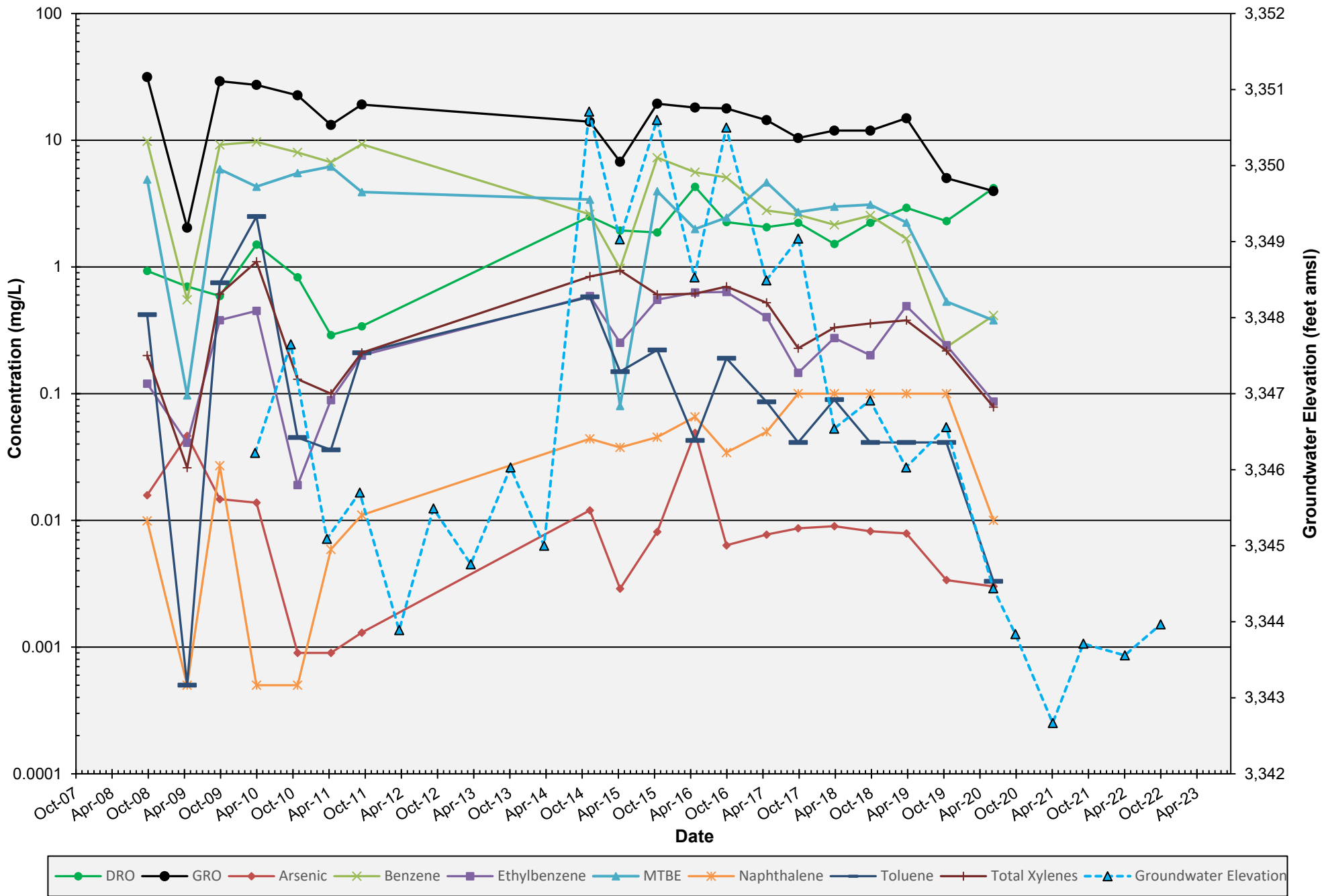
HF Sinclair Navajo Refining LLC - Artesia Refinery

South Refinery Area



MW-99: COC Concentrations and Groundwater Elevations

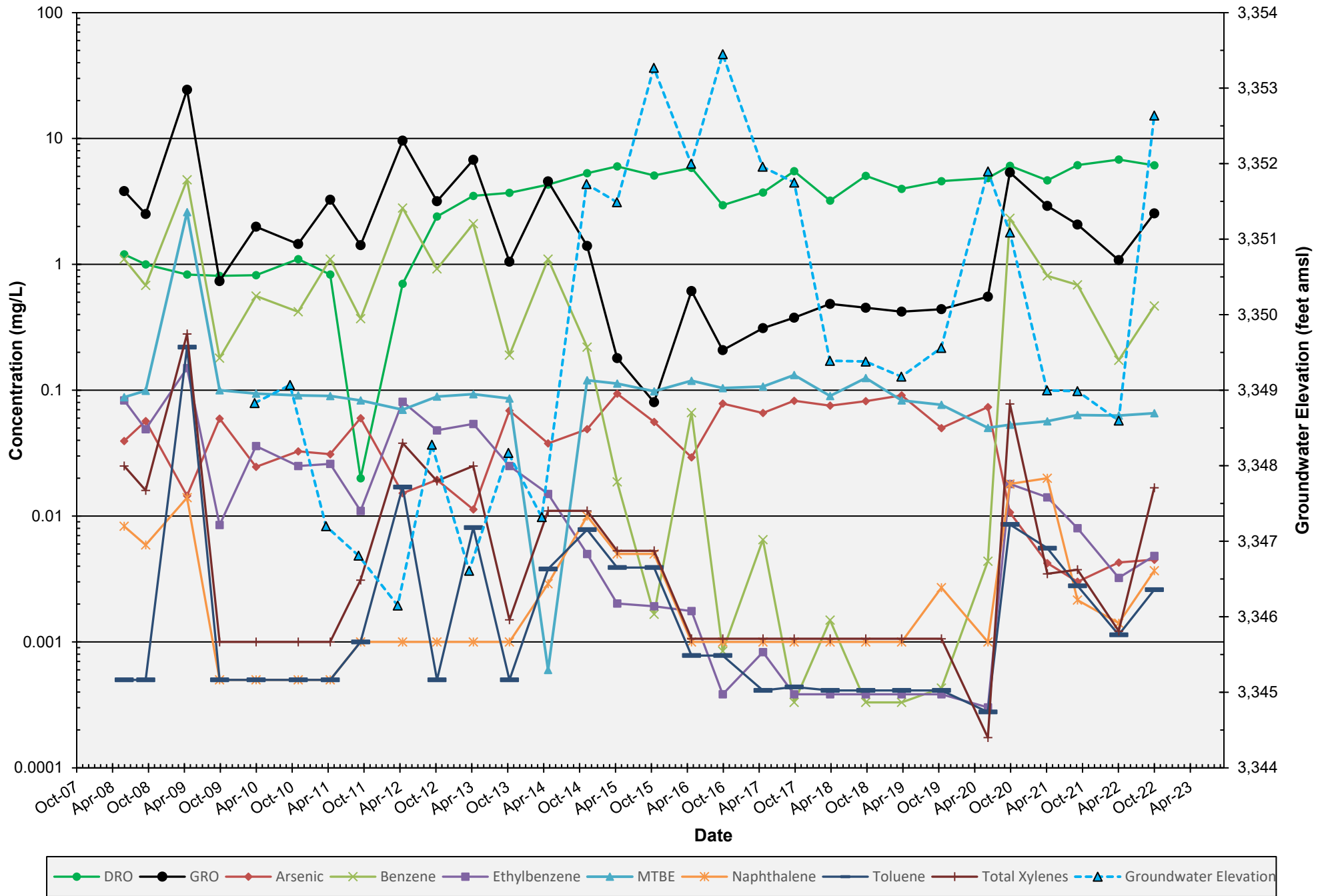
HF Sinclair Navajo Refining LLC - Artesia Refinery
South Refinery Area



MW-101: COC Concentrations and Groundwater Elevations

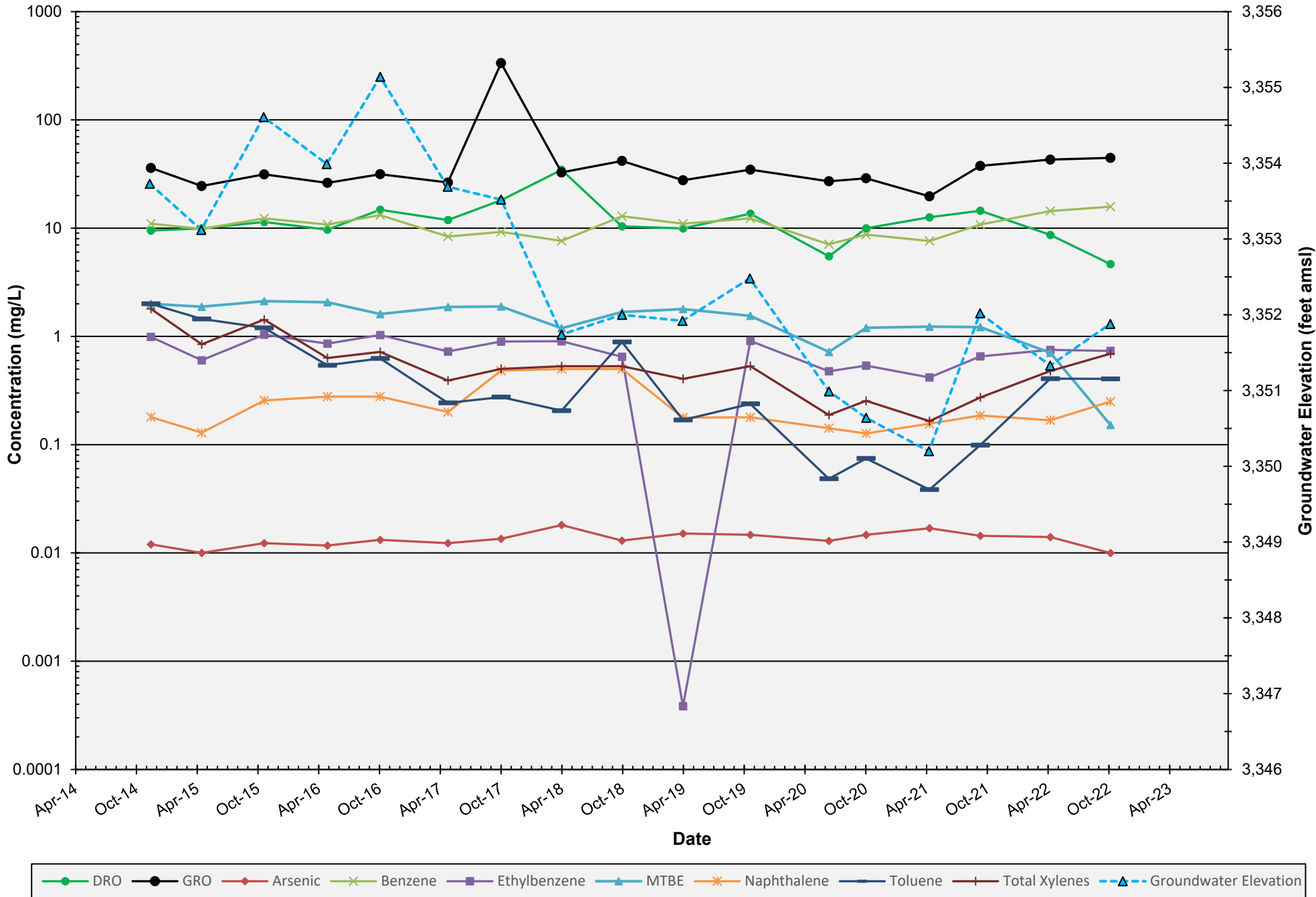
HF Sinclair Navajo Refining LLC - Artesia Refinery

South Refinery Area



MW-102: COC Concentrations and Groundwater Elevations

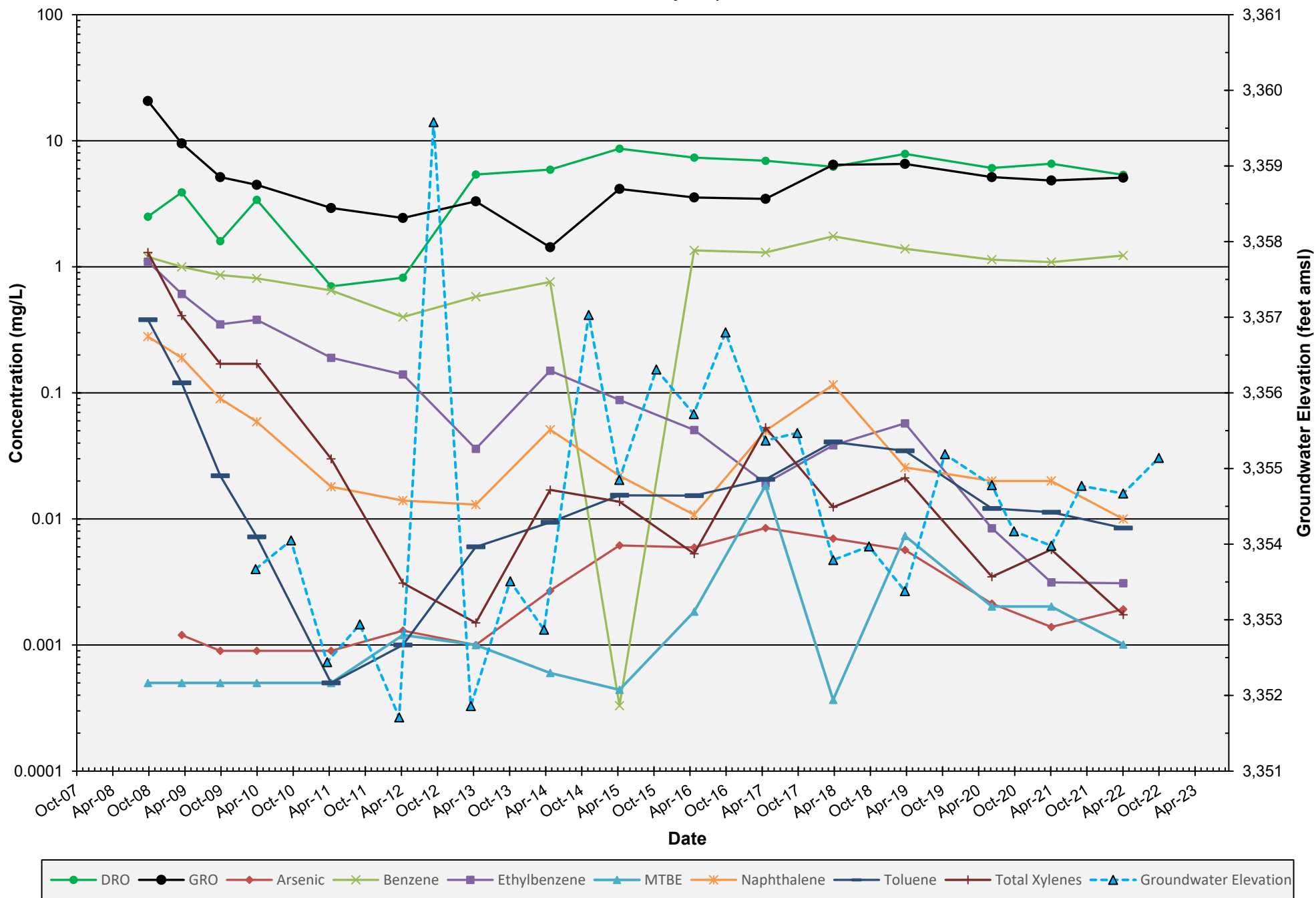
HF Sinclair Navajo Refining LLC - Artesia Refinery
South Refinery Area



MW-103: COC Concentrations and Groundwater Elevations

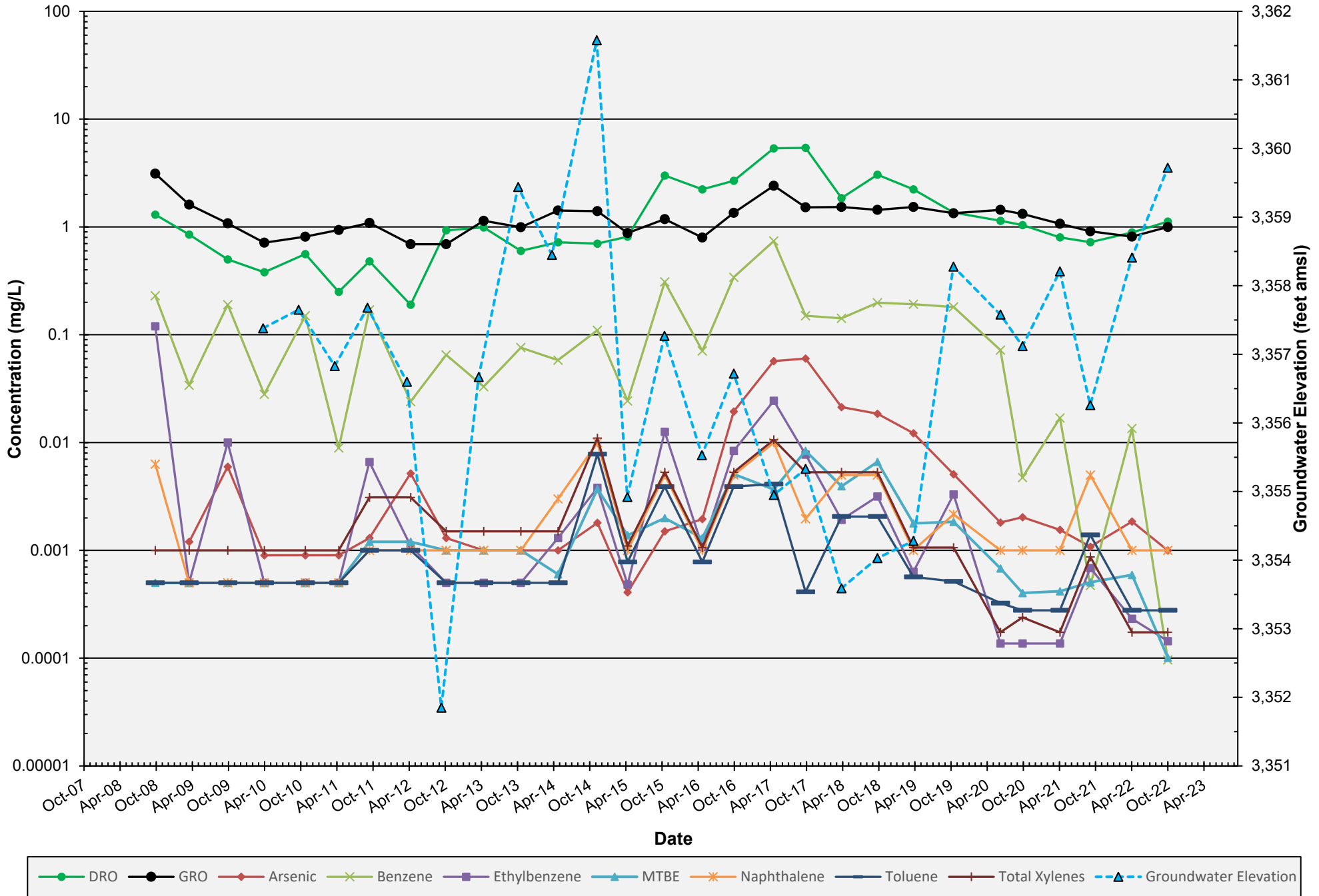
HF Sinclair Navajo Refining LLC - Artesia Refinery

South Refinery Area



MW-104: COC Concentrations and Groundwater Elevations

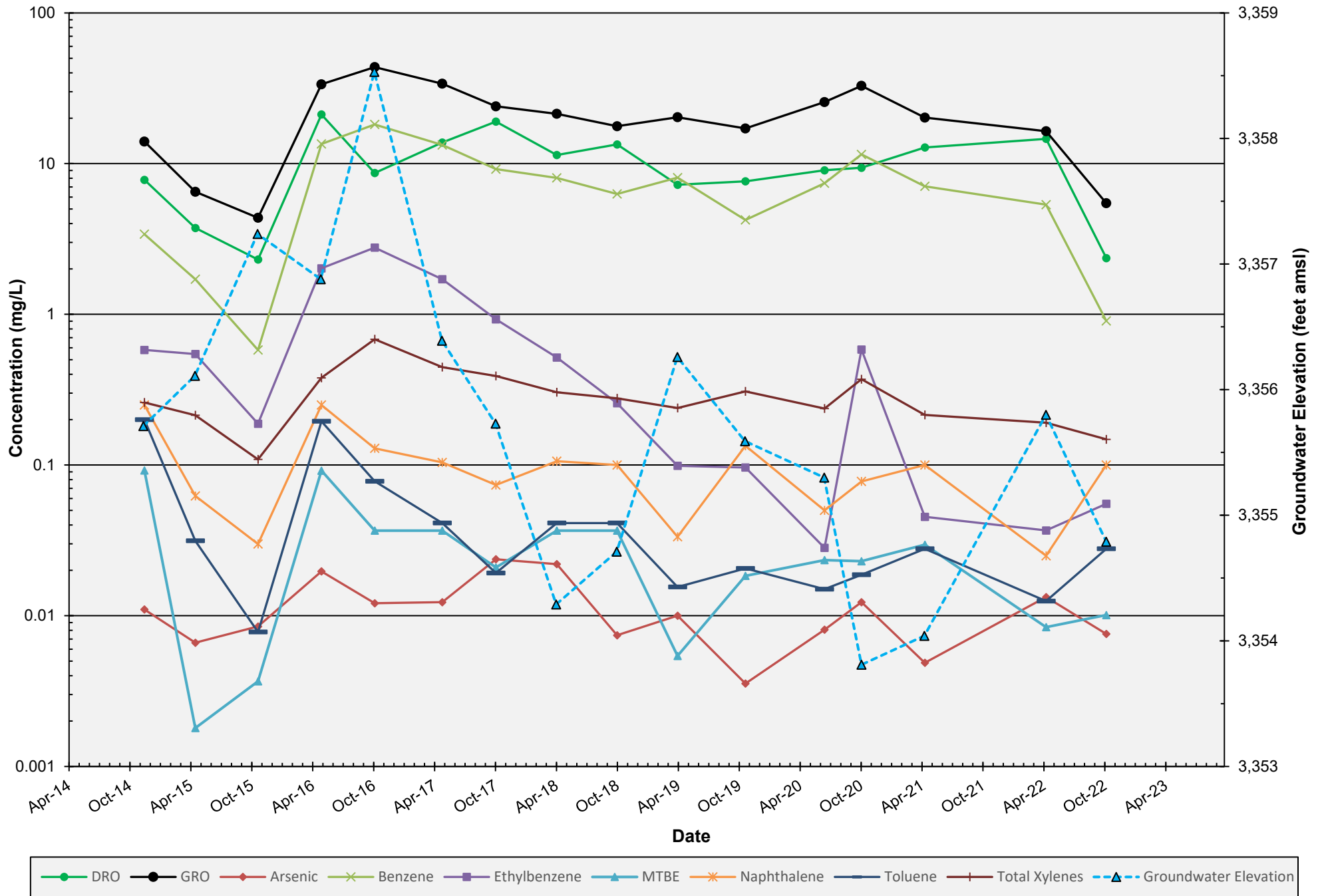
HF Sinclair Navajo Refining LLC - Artesia Refinery
South Refinery Area



MW-105: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery

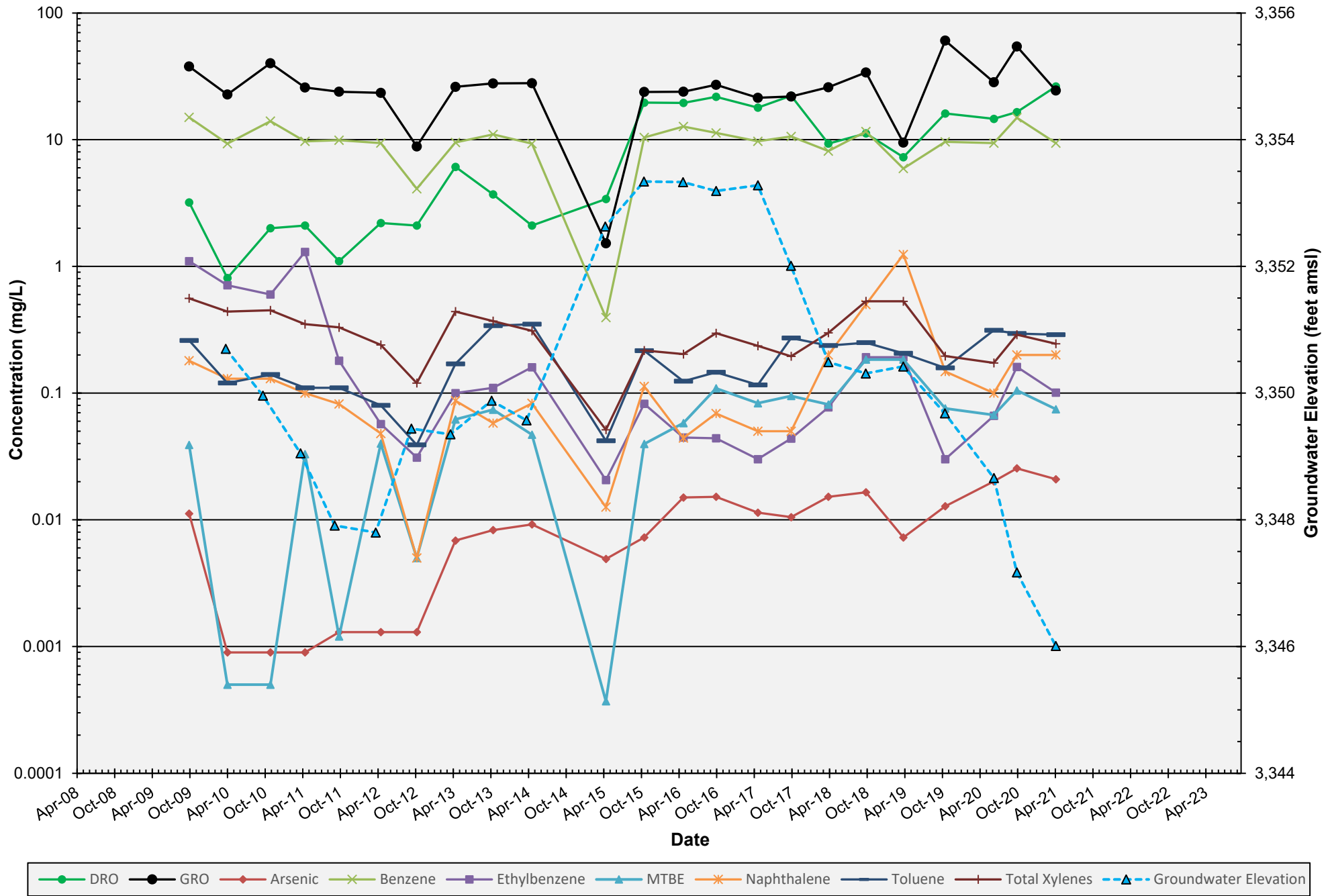
South Refinery Area



MW-106: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery

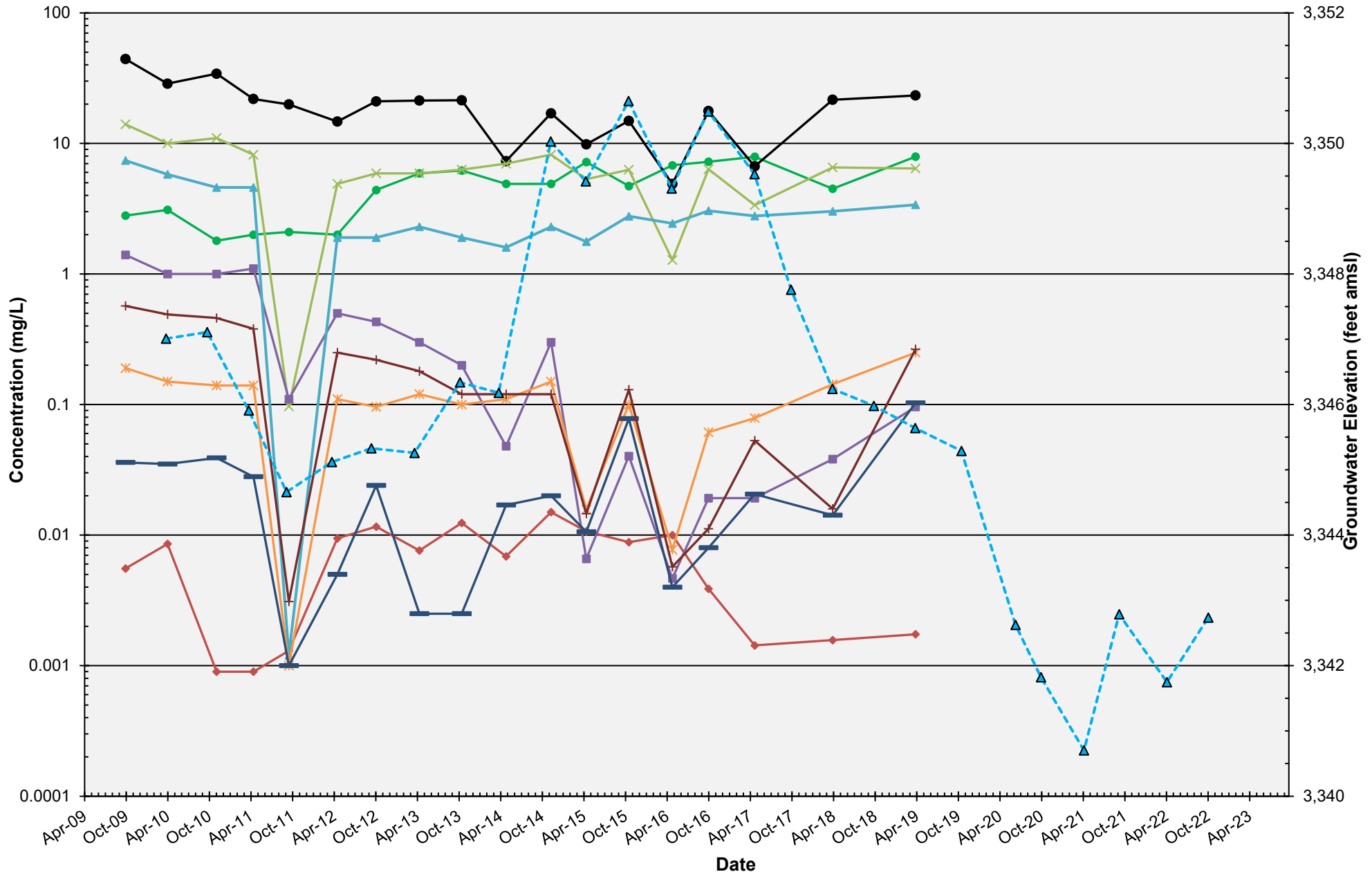
South Refinery Area



MW-107: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery

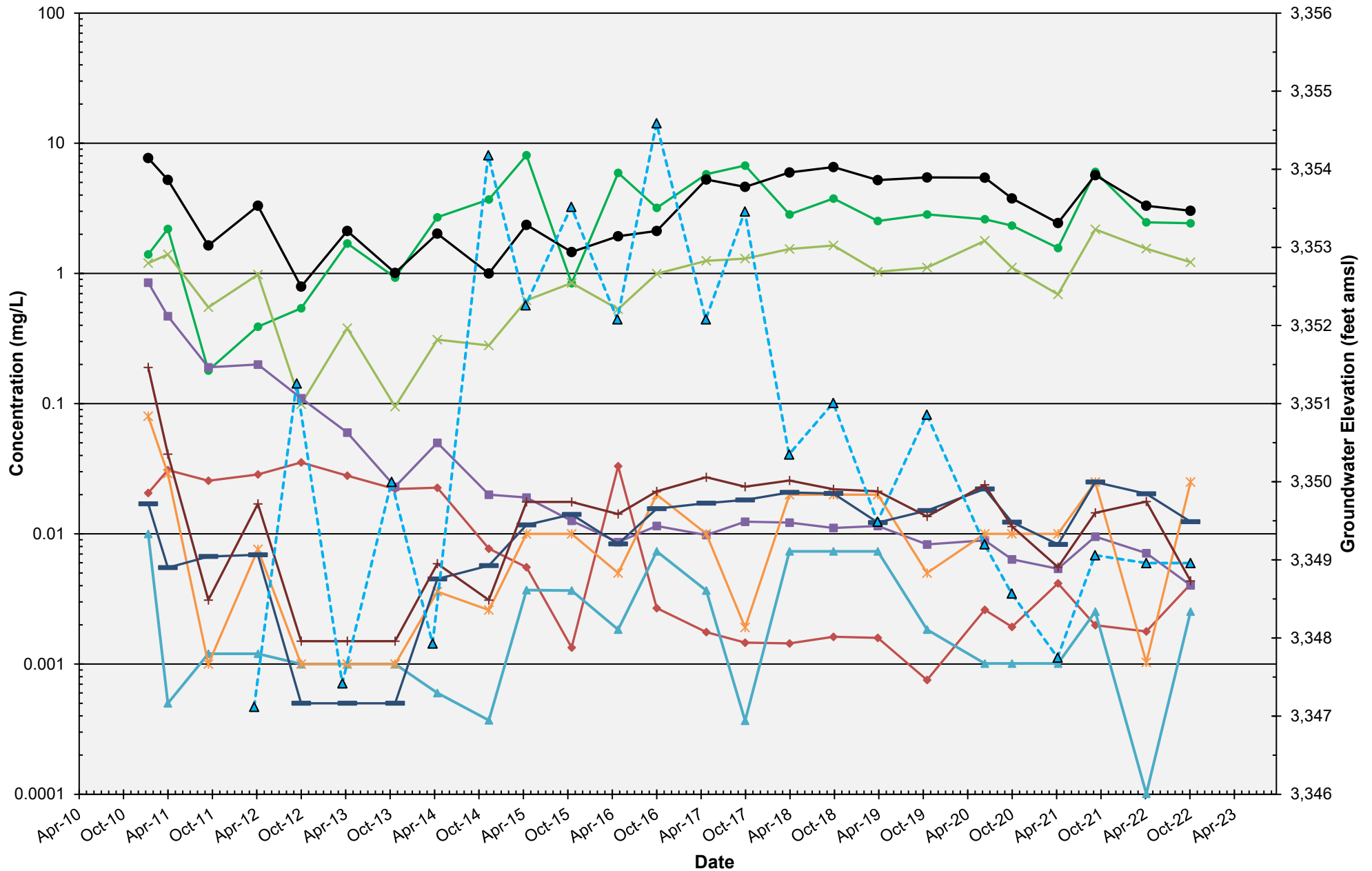
South Refinery Area



MW-109: COC Concentrations and Groundwater Elevations

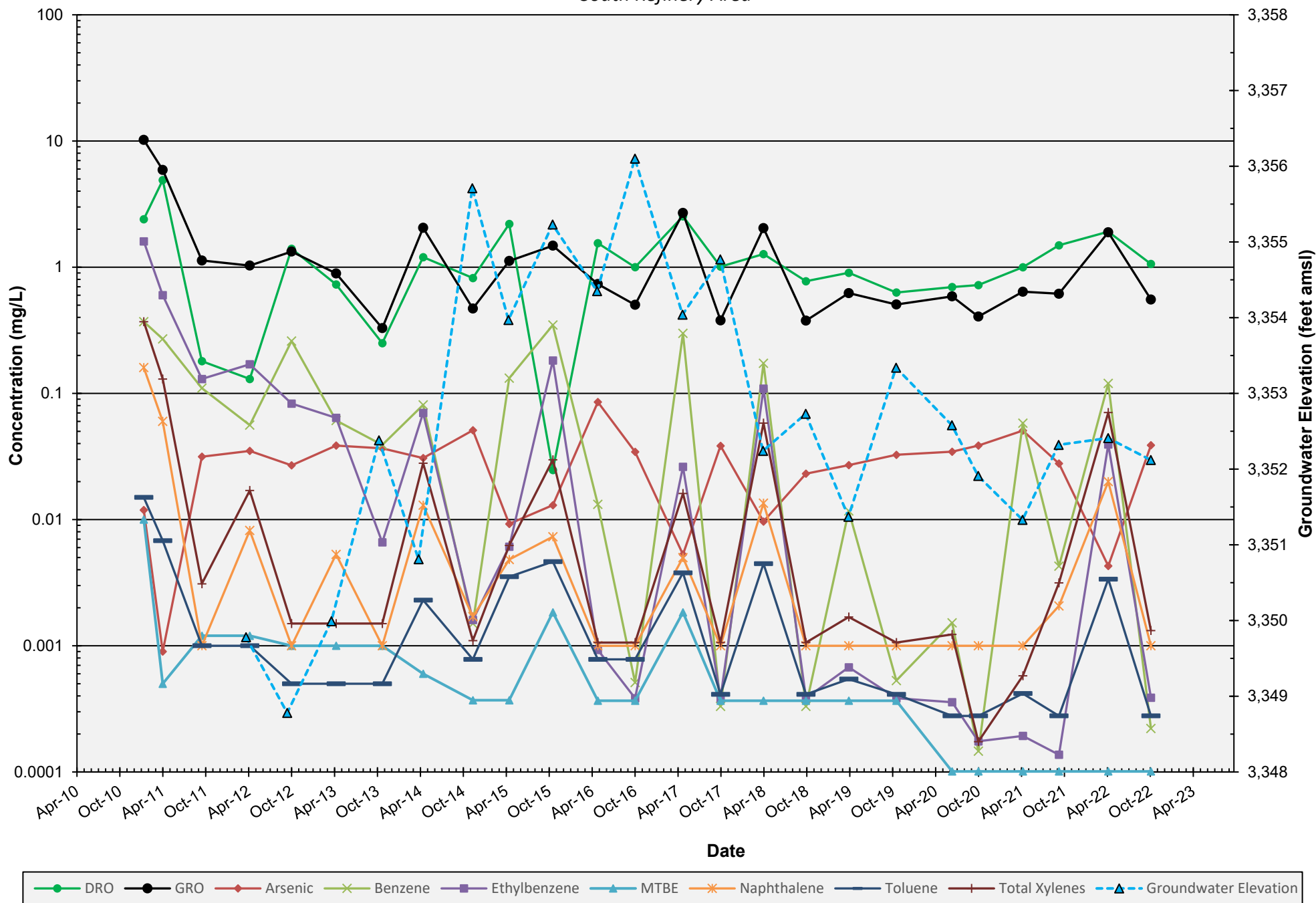
HF Sinclair Navajo Refining LLC - Artesia Refinery

South Refinery Area



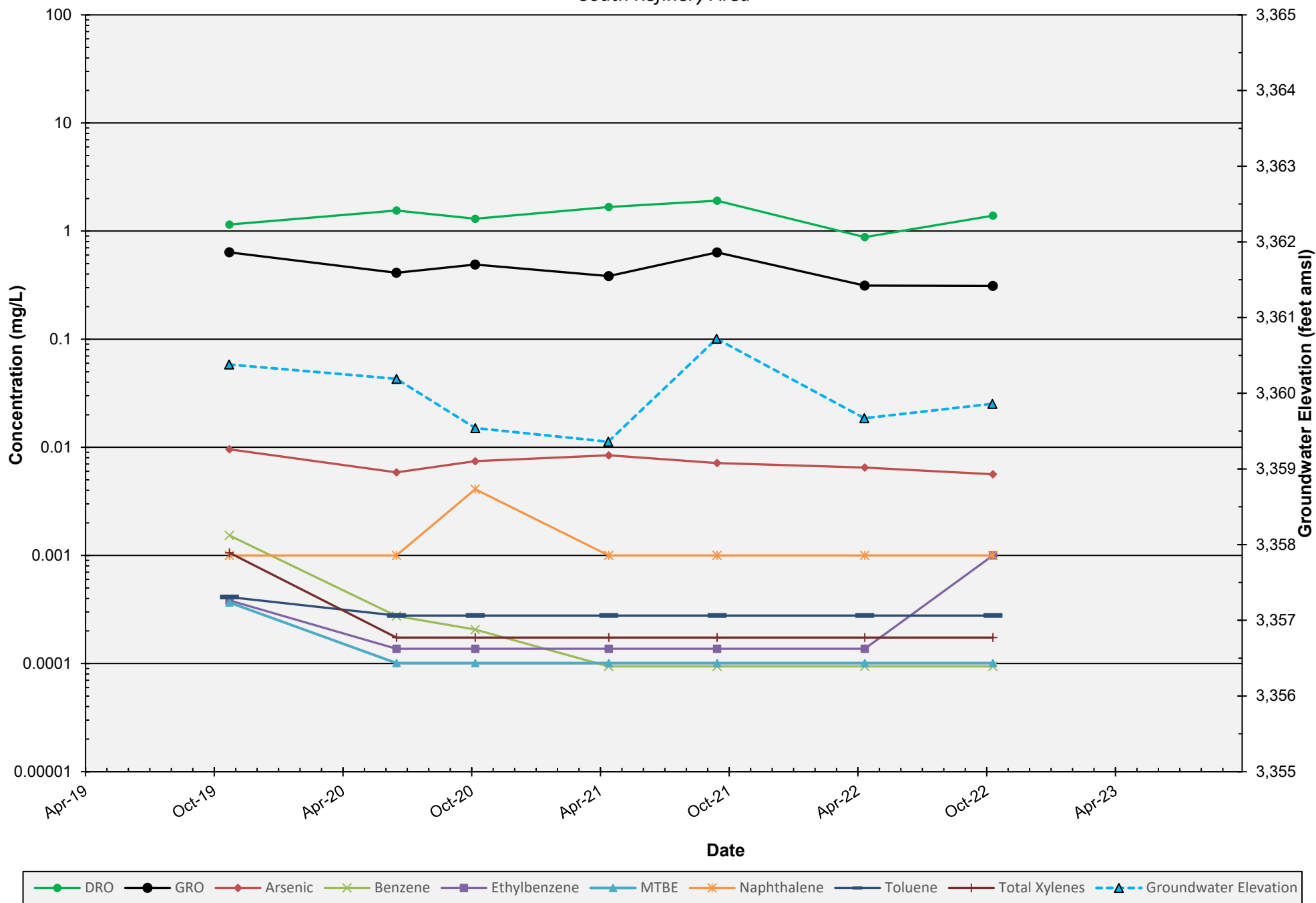
MW-110: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery
South Refinery Area



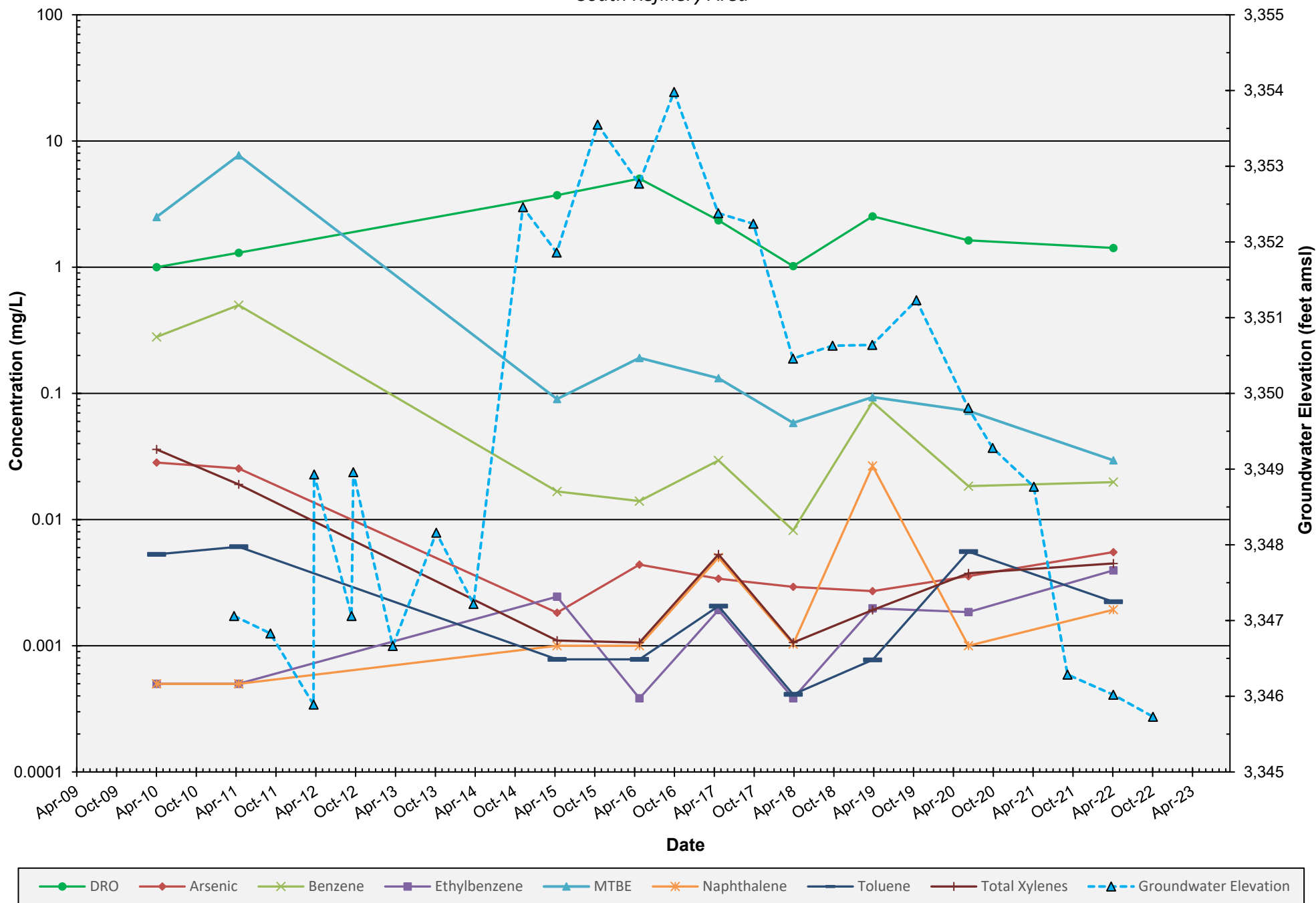
MW-139: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery
South Refinery Area



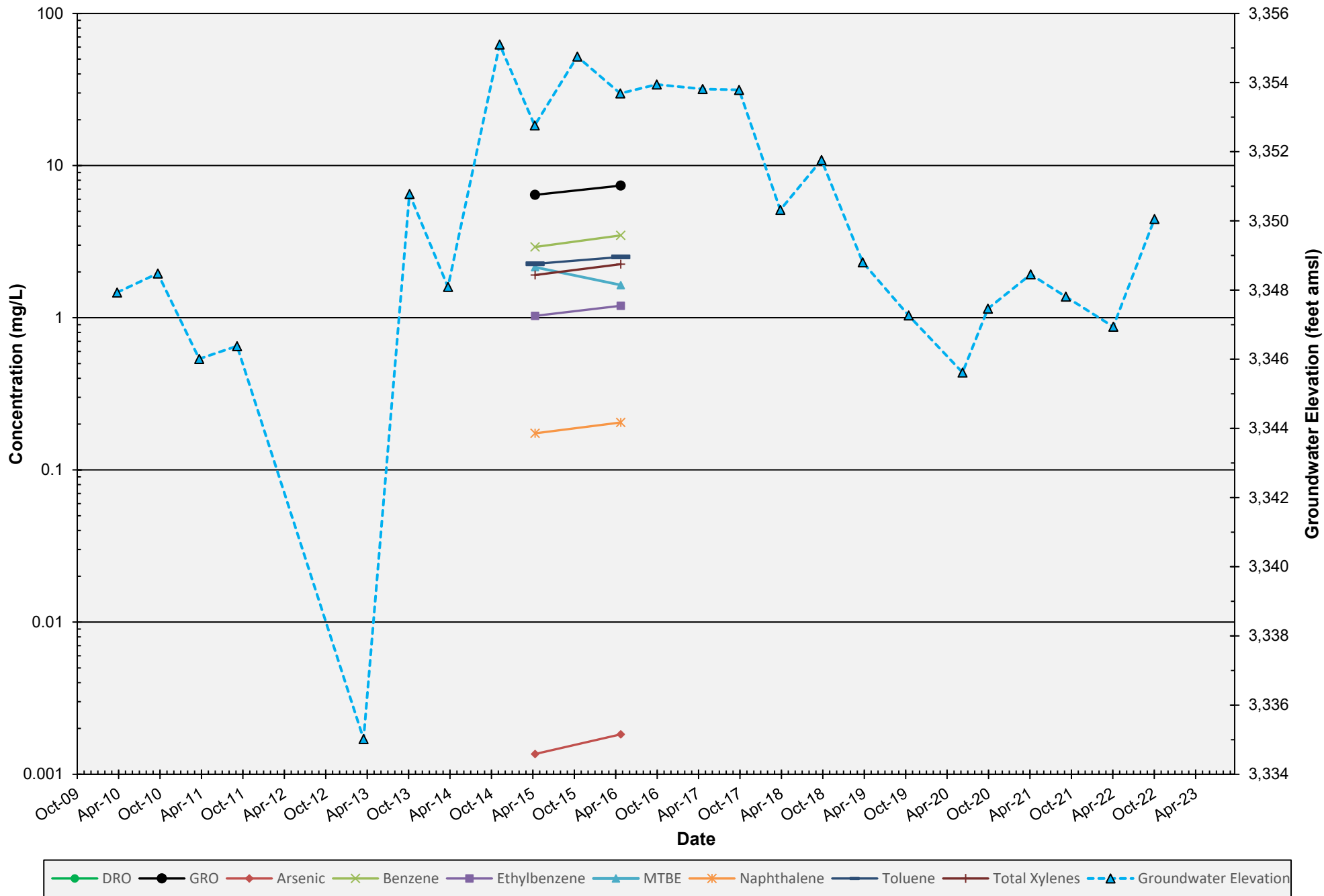
RW-4: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery
South Refinery Area



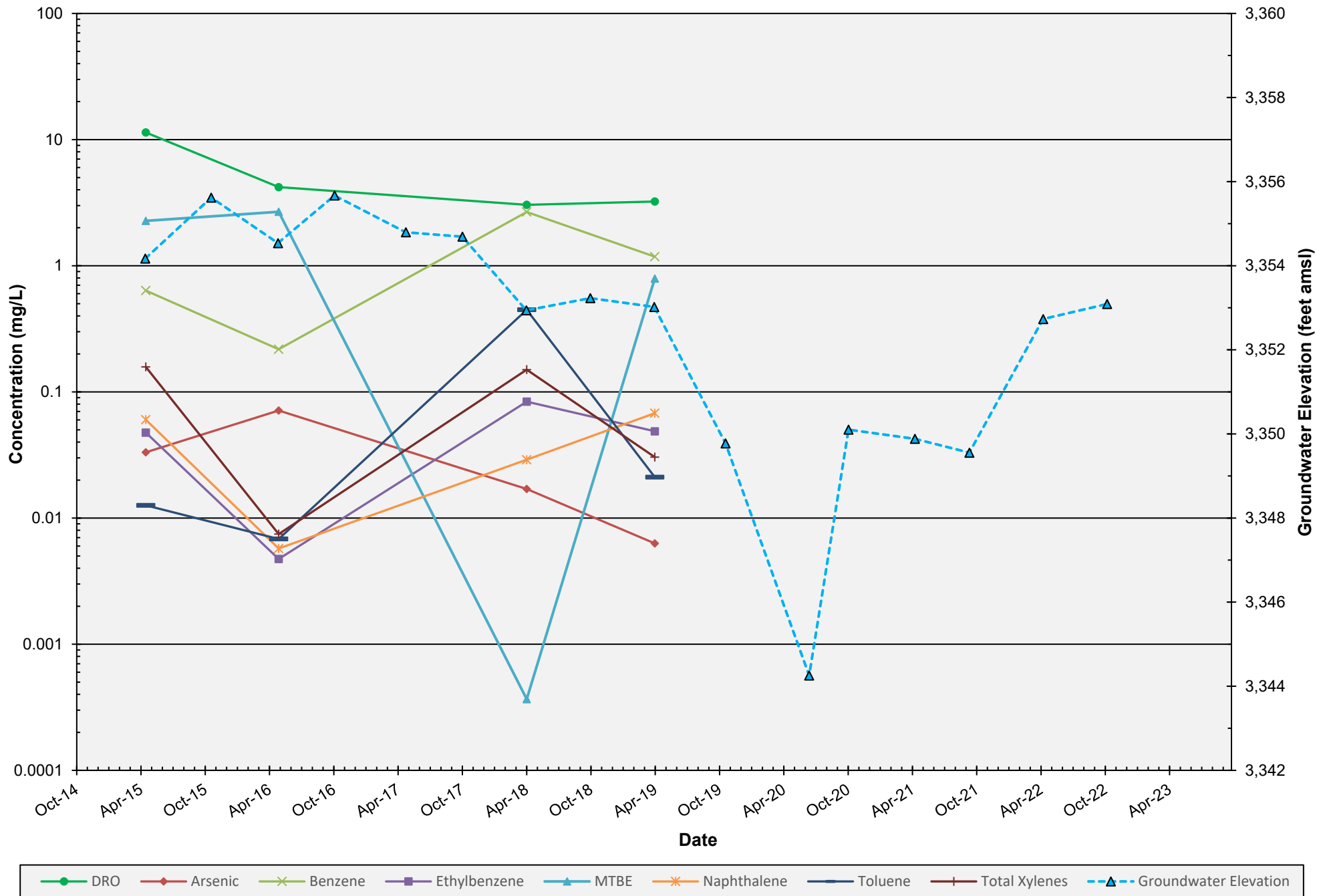
RW-5 and RW-5R: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery
South Refinery Area



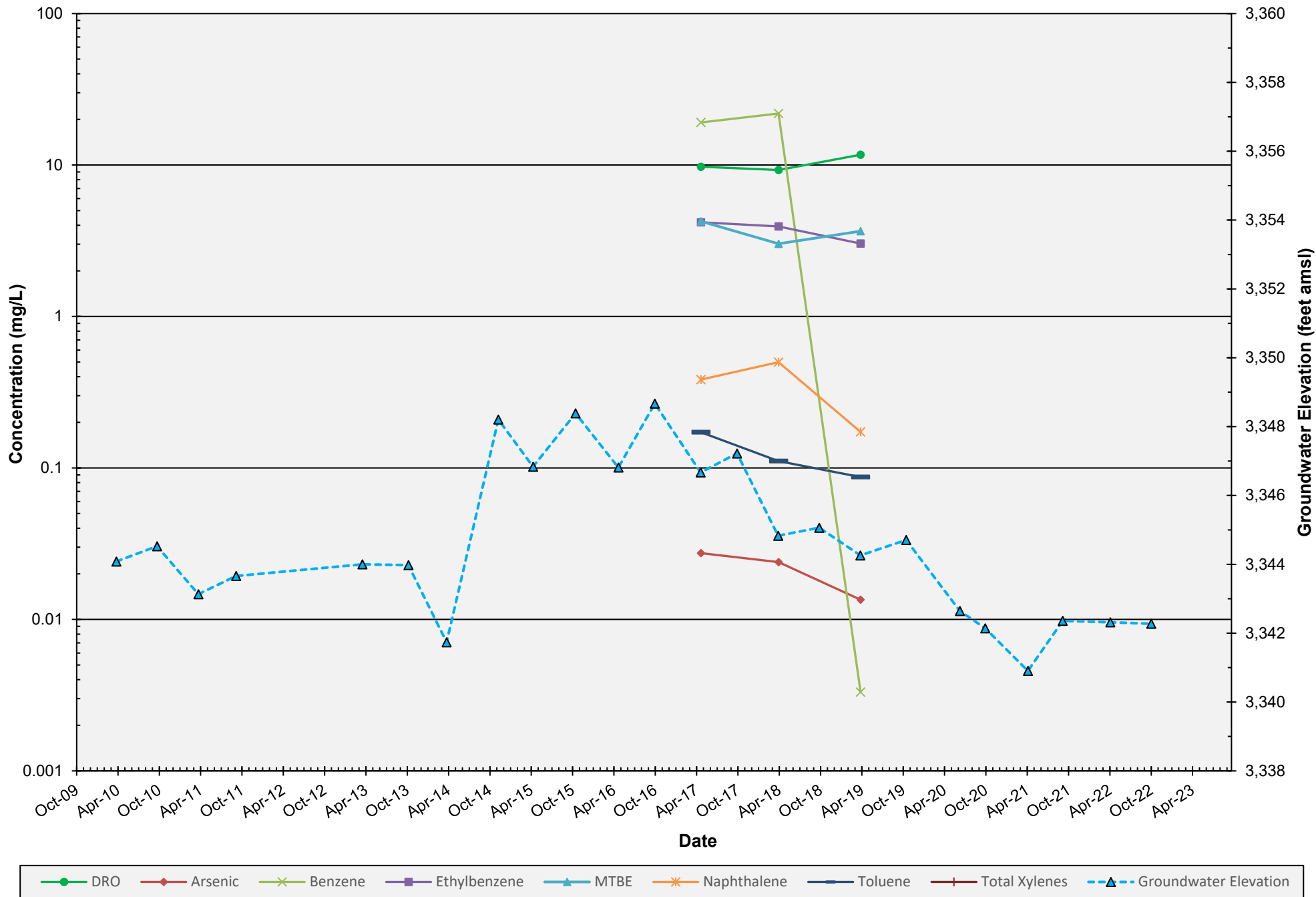
RW-6: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery
South Refinery Area



RW-15C: COC Concentrations and Groundwater Elevations

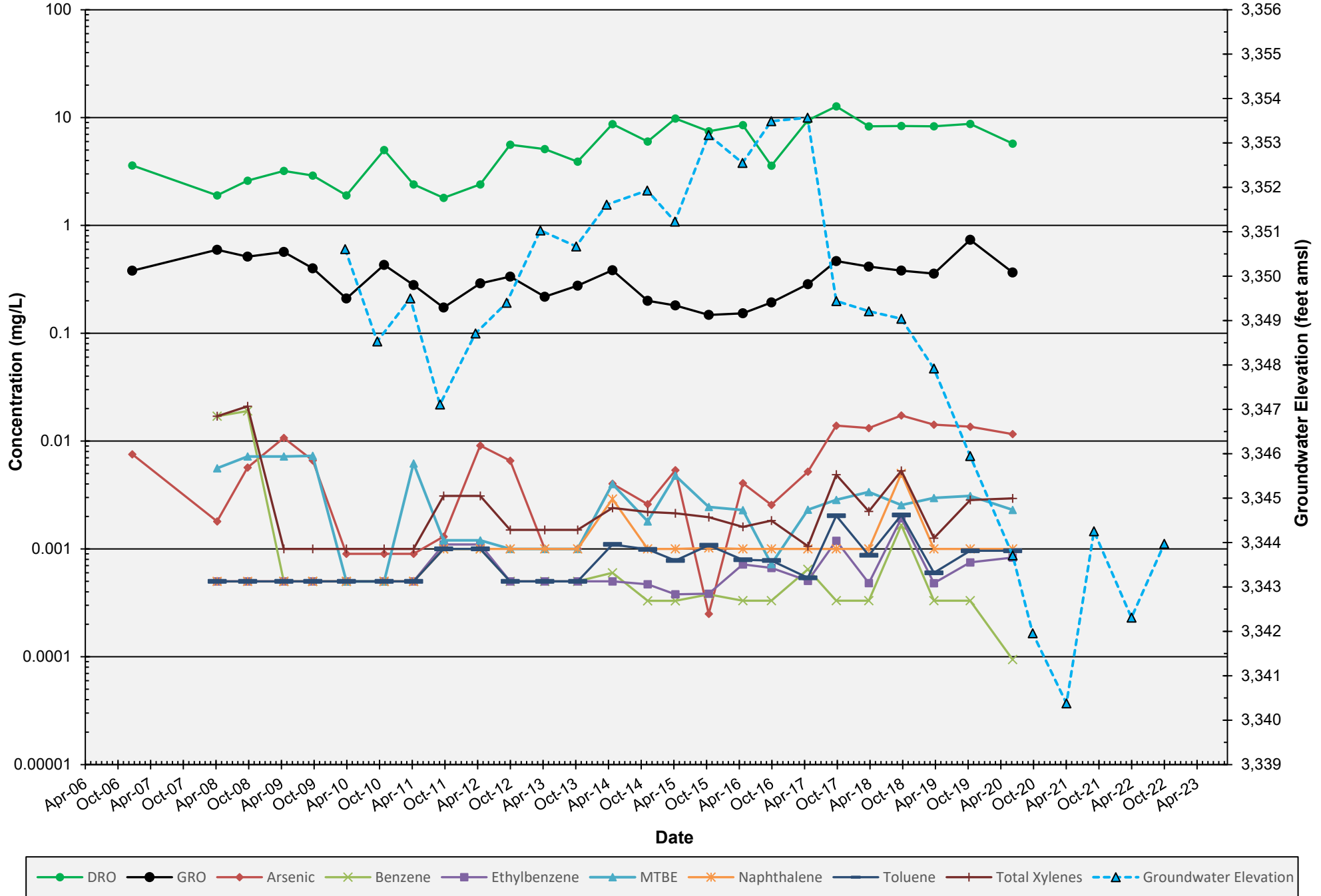
HF Sinclair Navajo Refining LLC - Artesia Refinery
South Refinery Area



TEL-1: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery

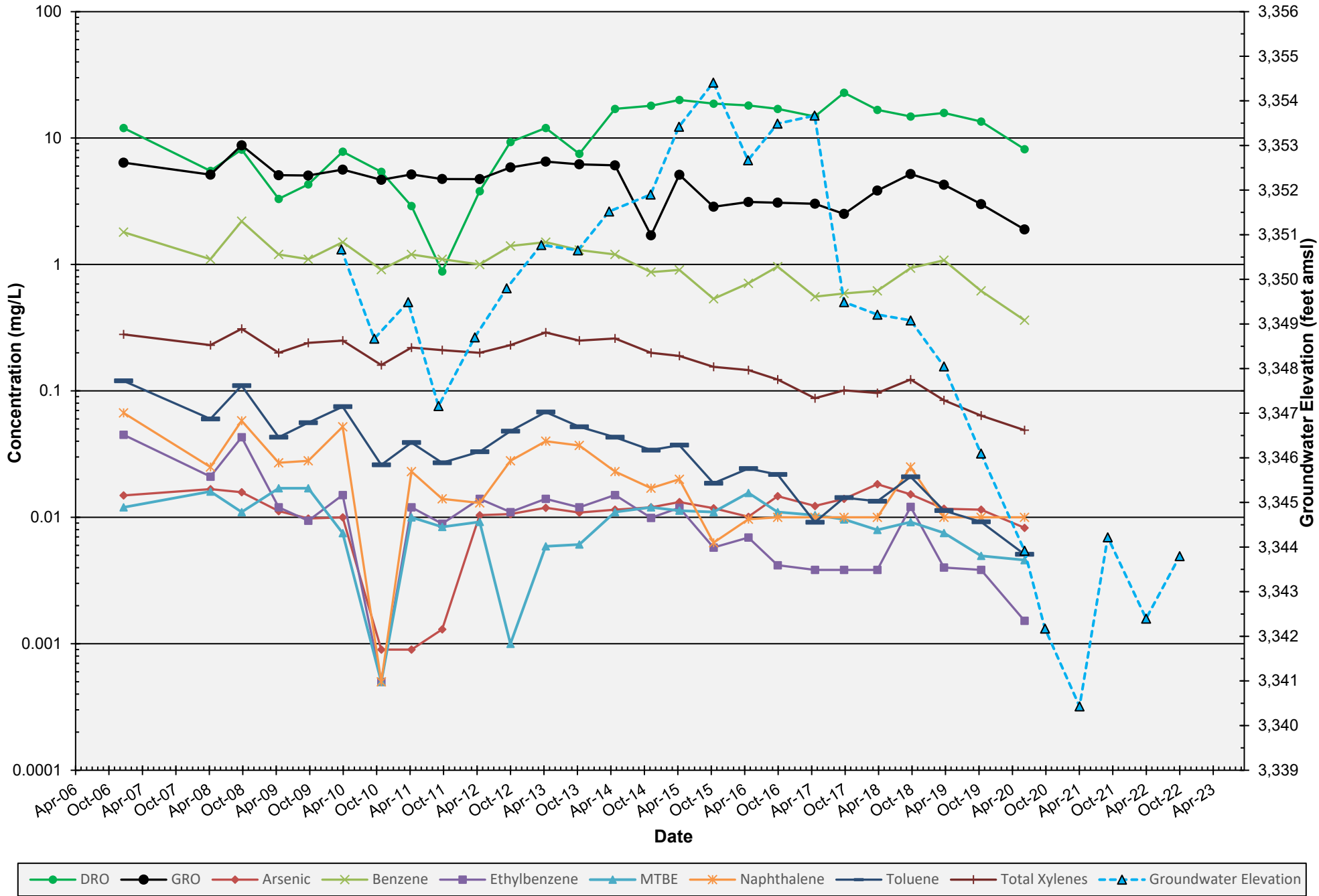
Tetra Ethyl Lead Impoundment



TEL-2: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery

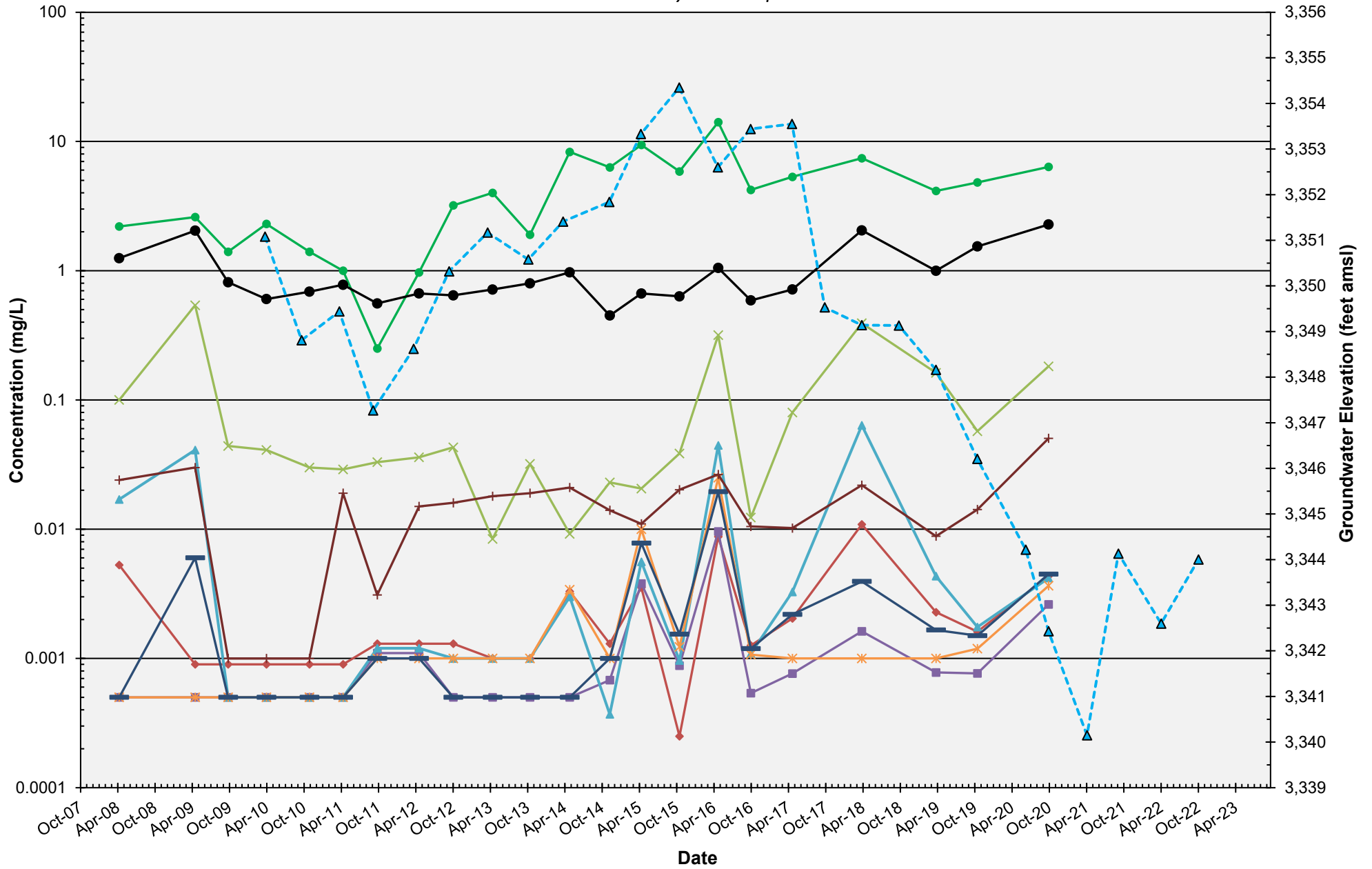
Tetra Ethyl Lead Impoundment



TEL-3: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery

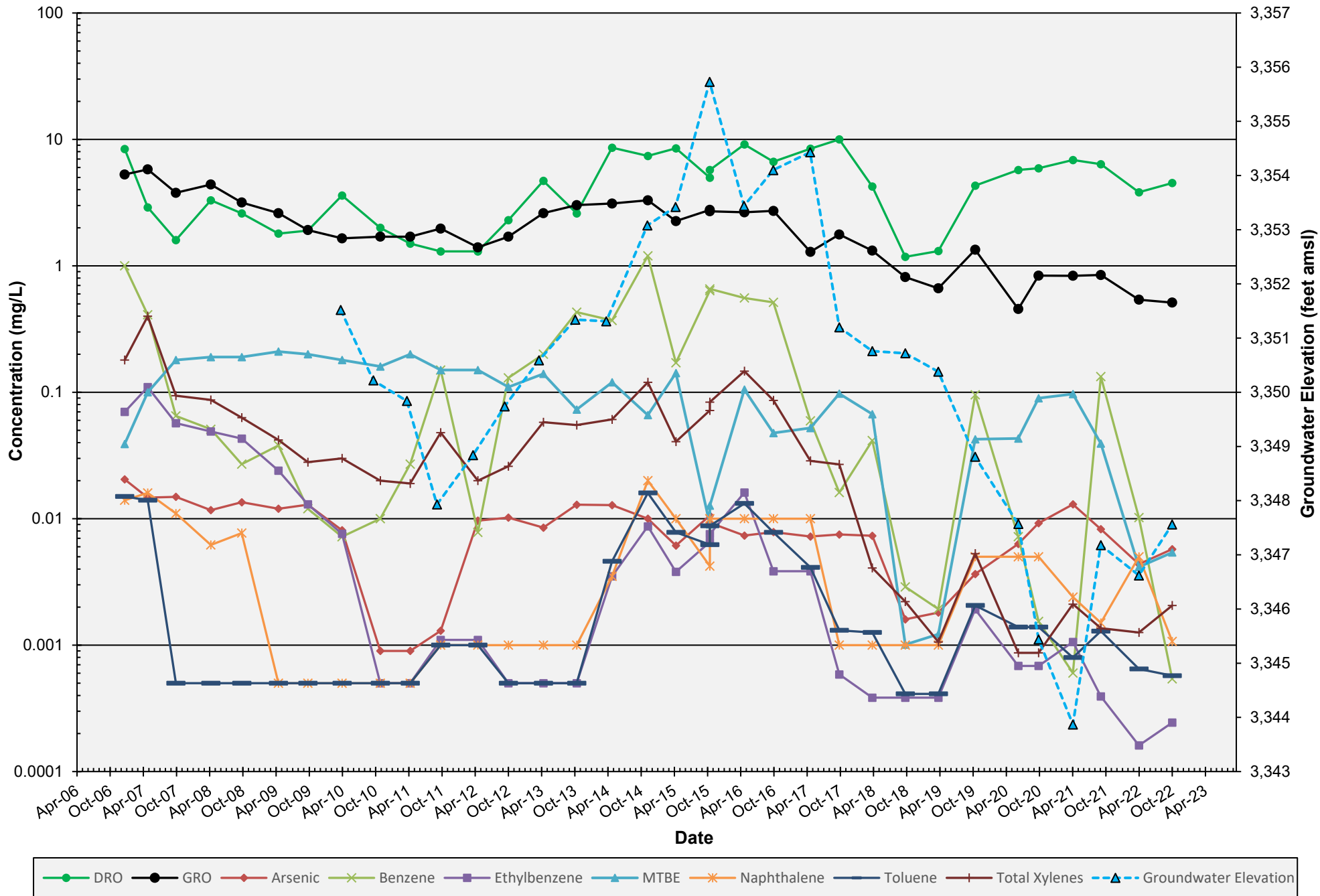
Tetra Ethyl Lead Impoundment



TEL-4: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery

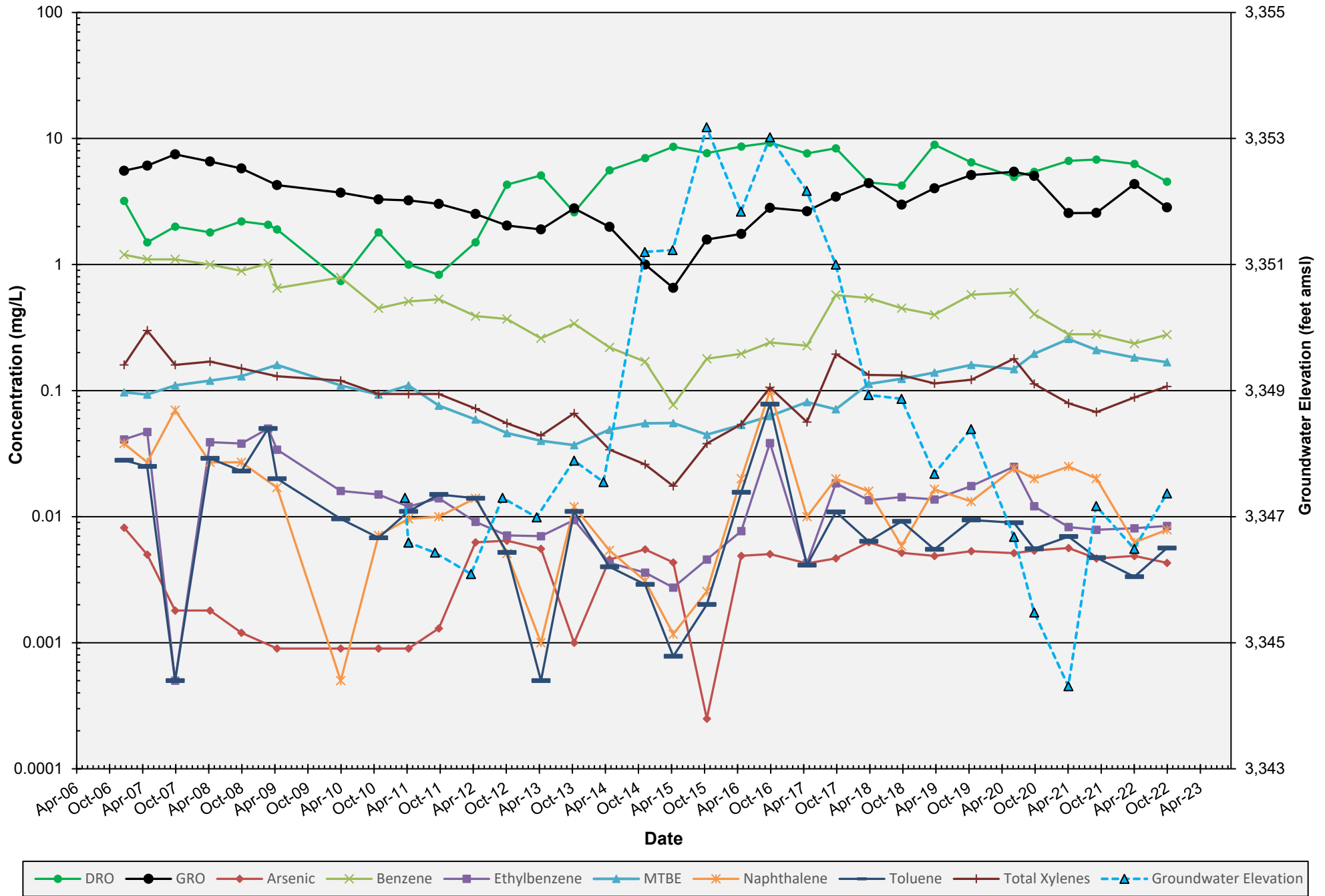
Tetra Ethyl Lead Impoundment



MW-49: COC Concentrations and Groundwater Elevations

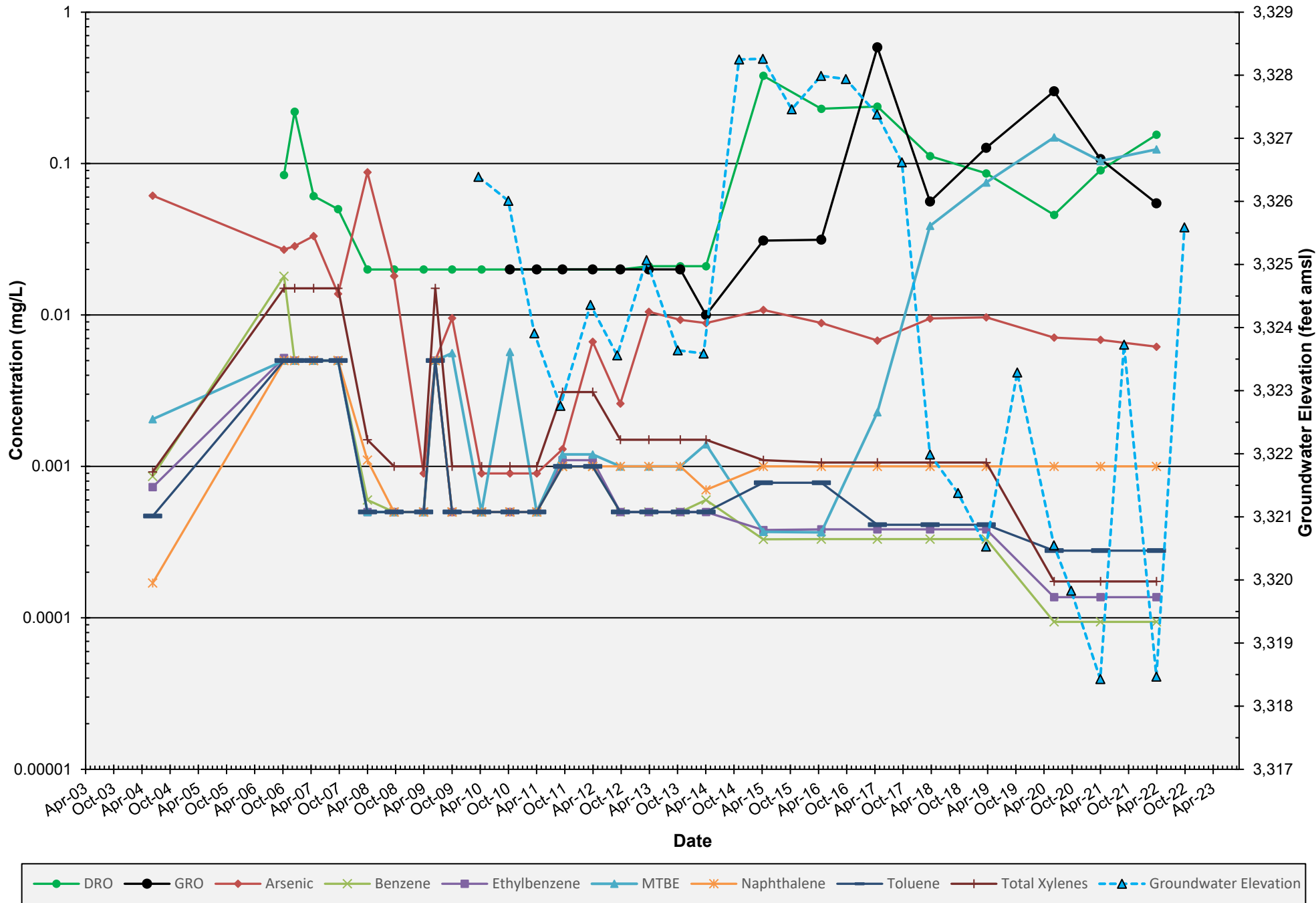
HF Sinclair Navajo Refining LLC - Artesia Refinery

Tetra Ethyl Lead Impoundment



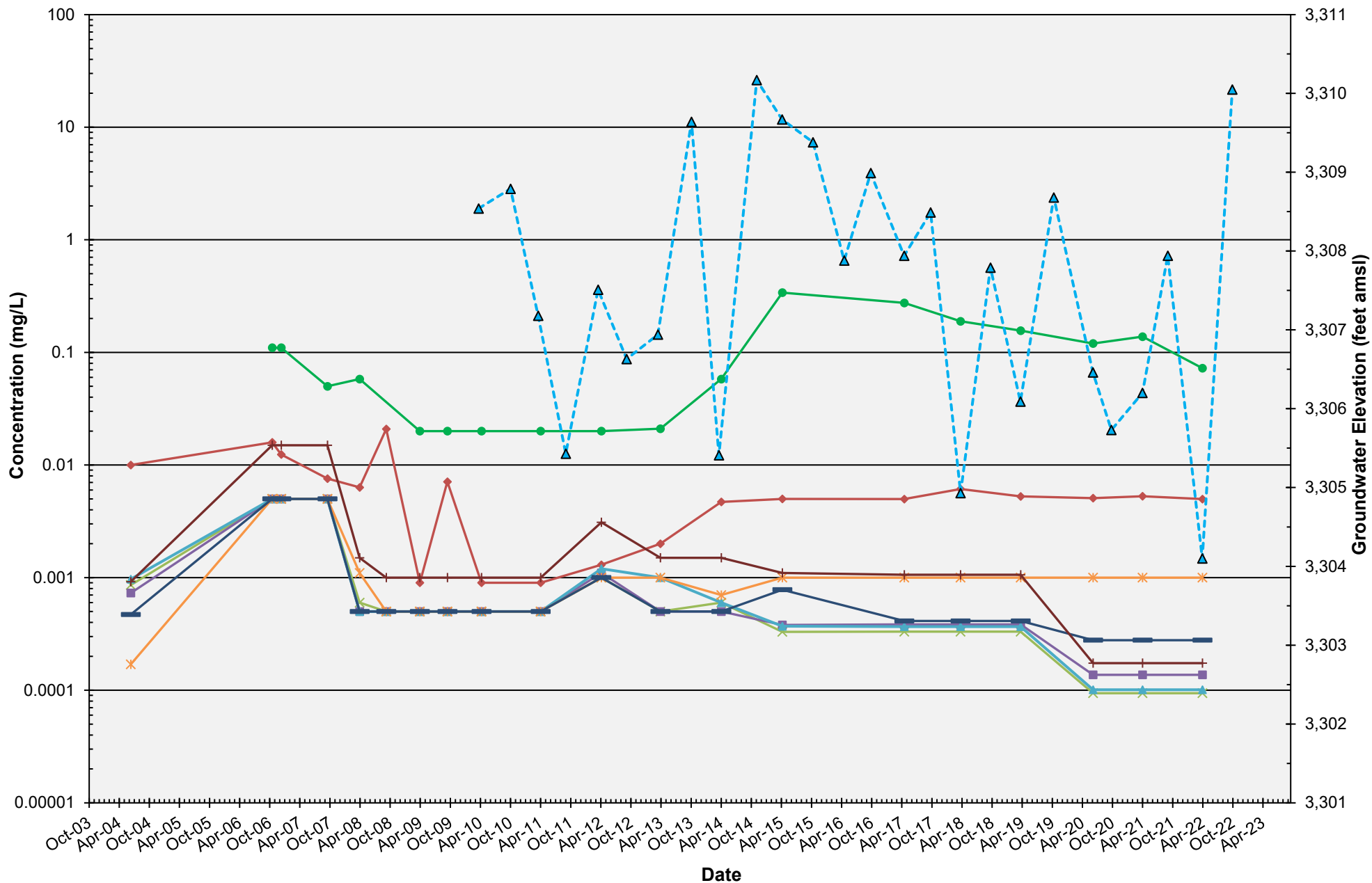
MW-8: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery
Three Mile Ditch



MW-16: COC Concentrations and Groundwater Elevations

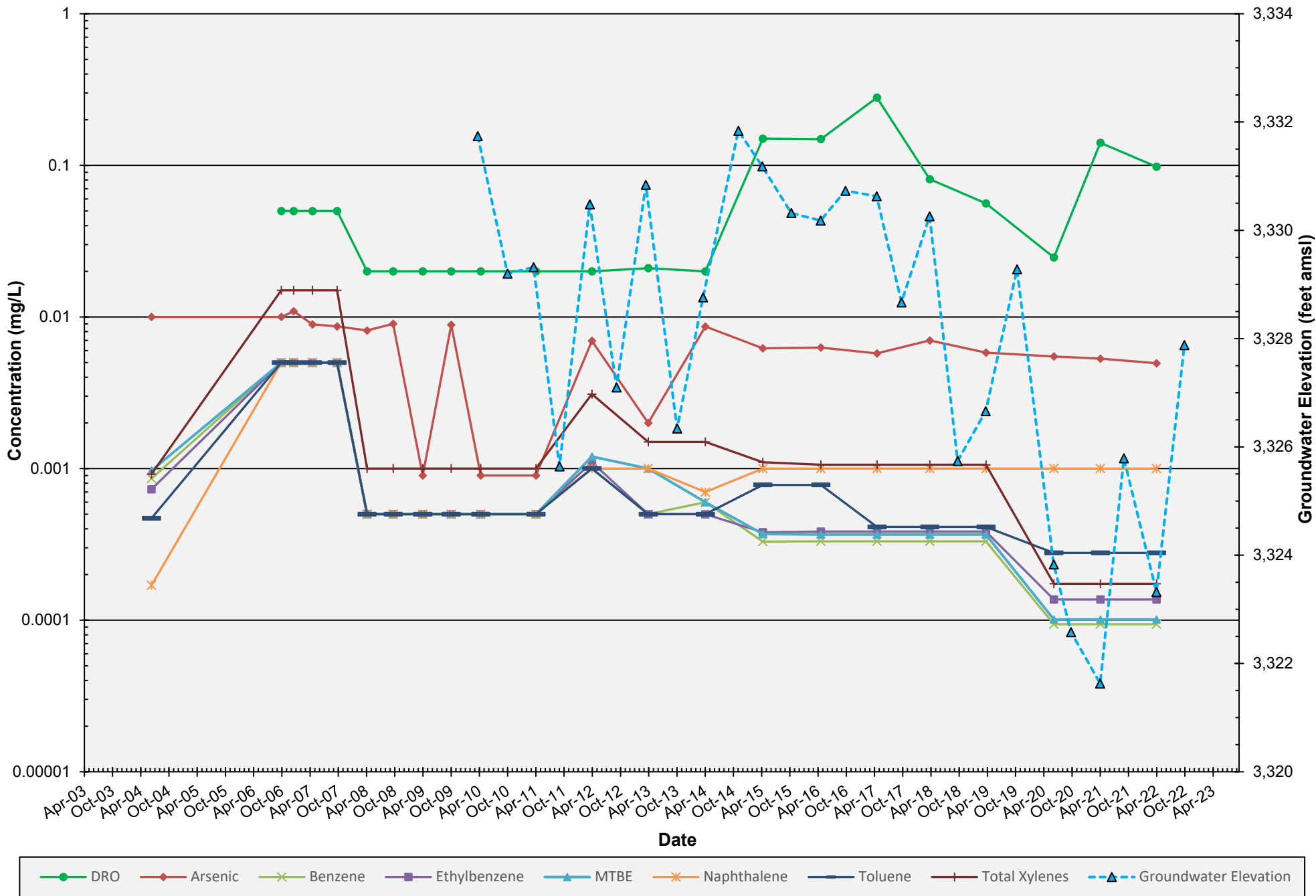
HF Sinclair Navajo Refining LLC - Artesia Refinery
Three Mile Ditch



MW-20: COC Concentrations and Groundwater Elevations

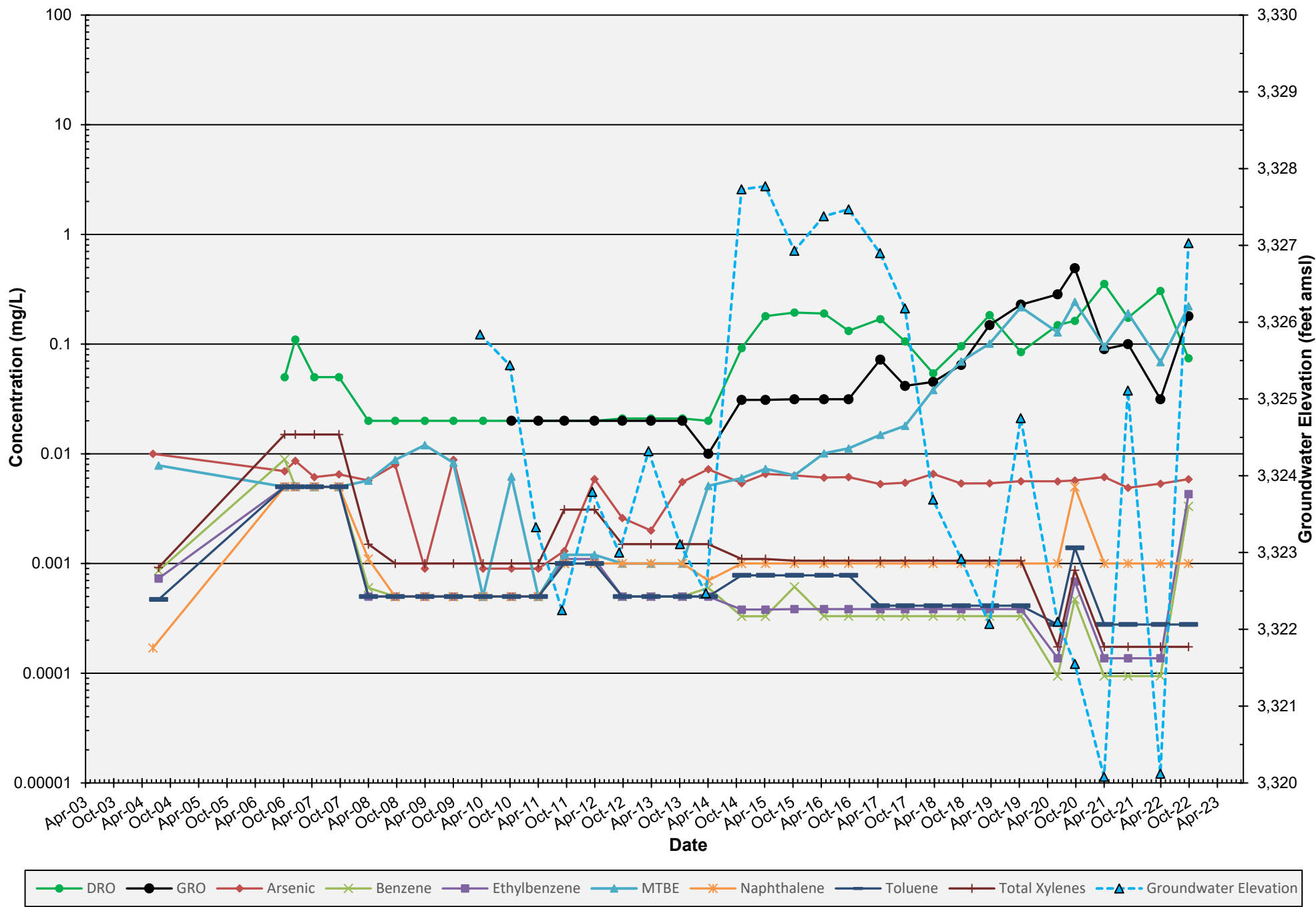
HF Sinclair Navajo Refining LLC - Artesia Refinery

Three Mile Ditch



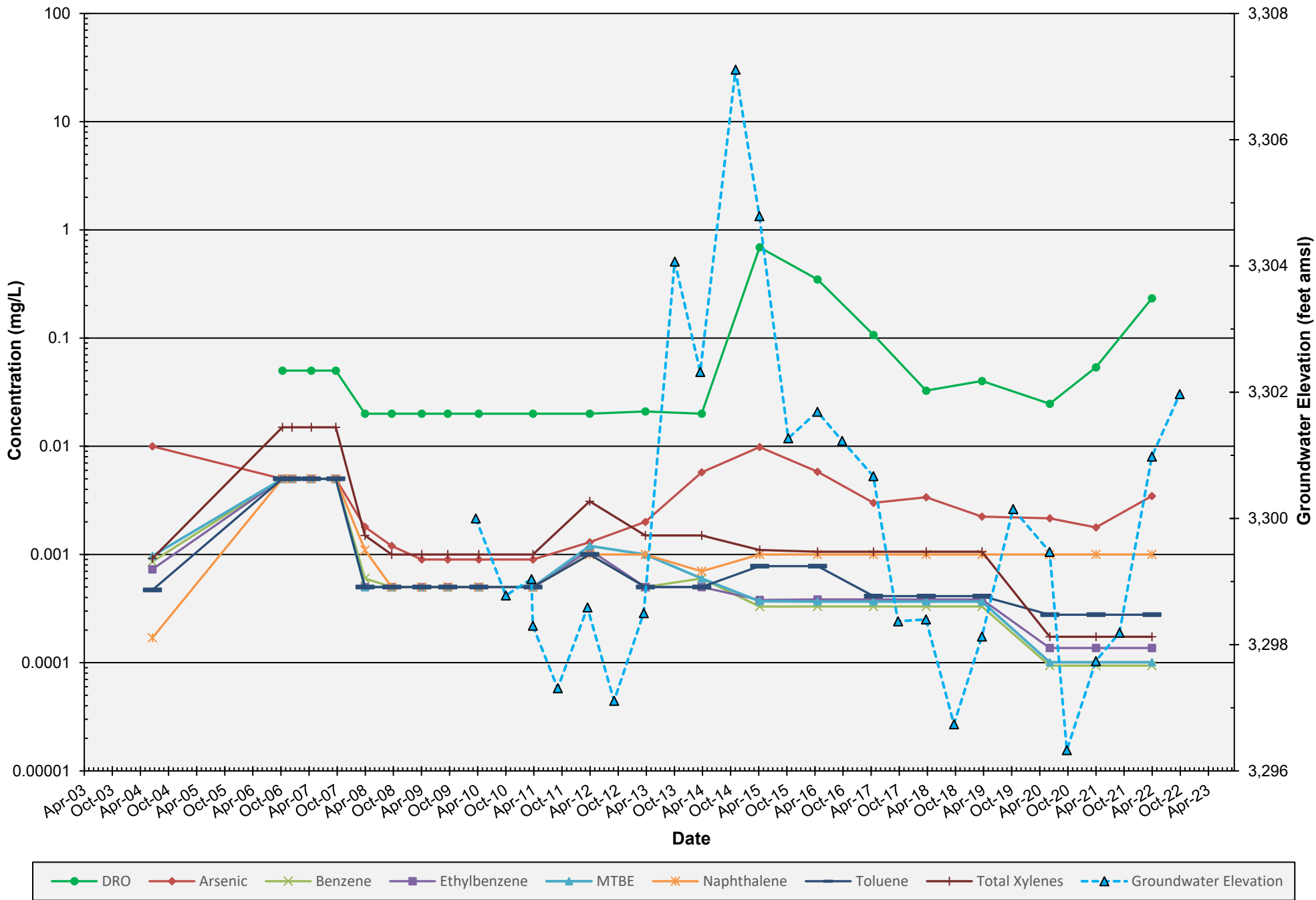
MW-21: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery
Three Mile Ditch



MW-25: COC Concentrations and Groundwater Elevations

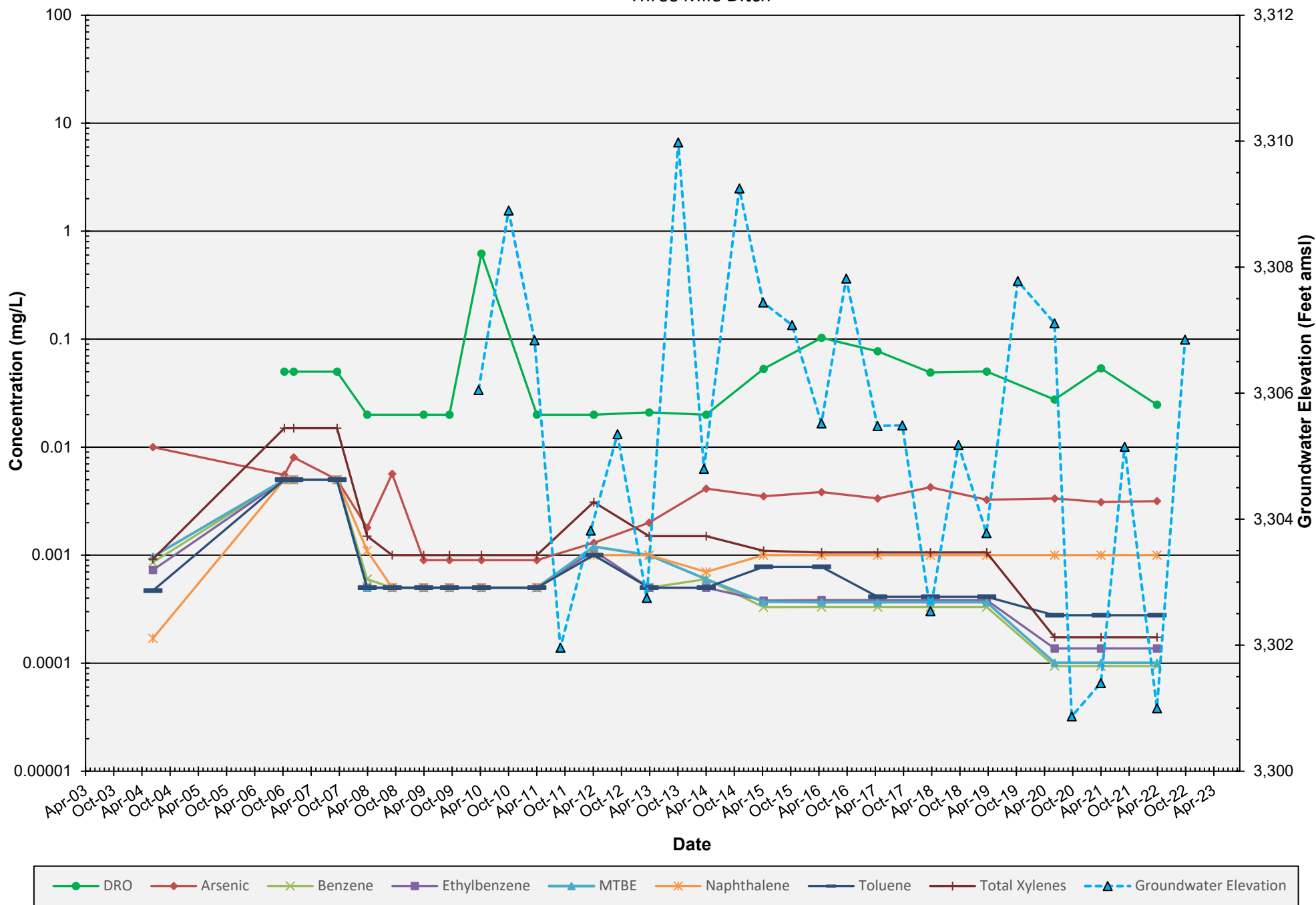
HF Sinclair Navajo Refining LLC - Artesia Refinery
Three Mile Ditch



MW-26: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery

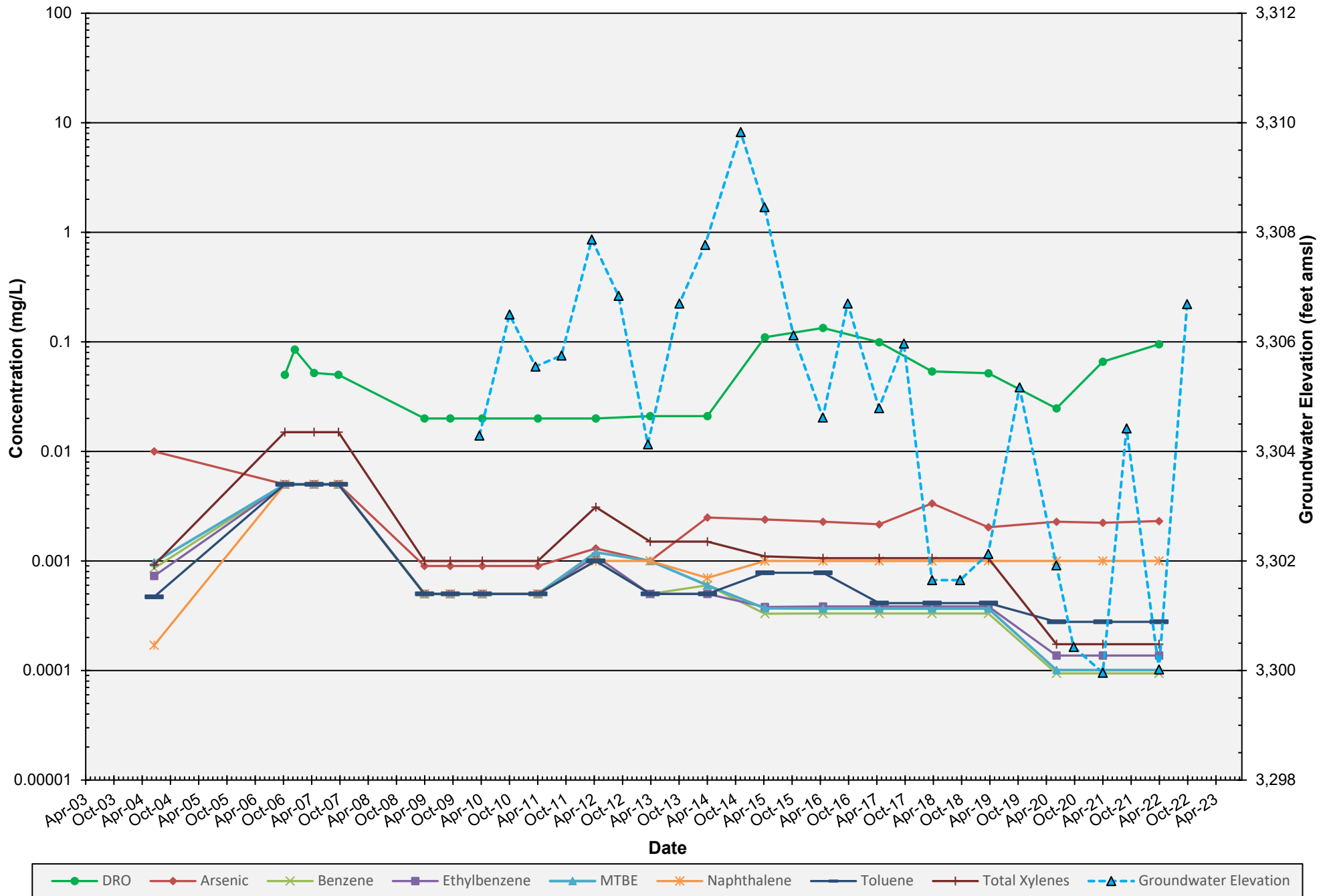
Three Mile Ditch



MW-27: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery

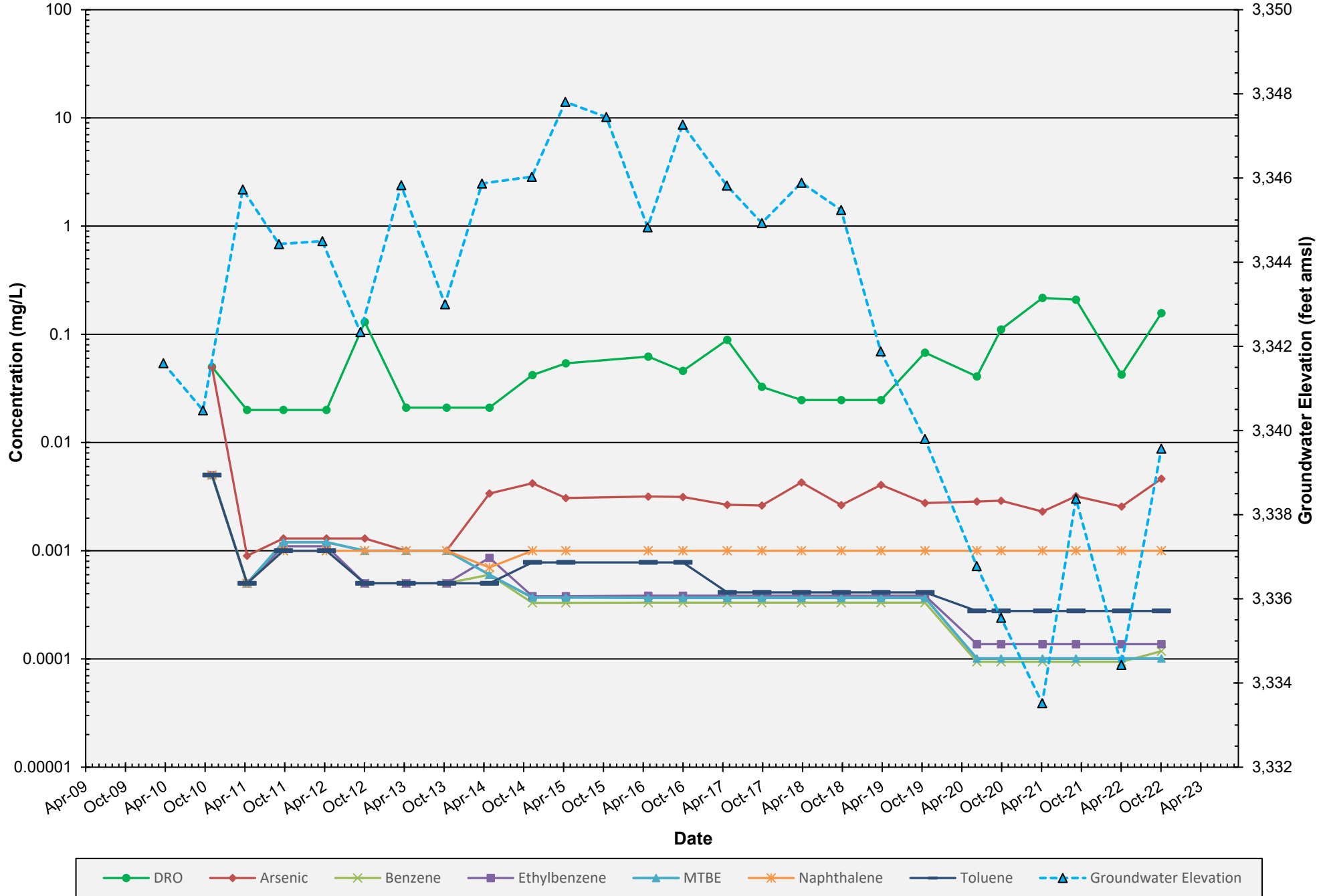
Three Mile Ditch



MW-46 & MW-46R: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery

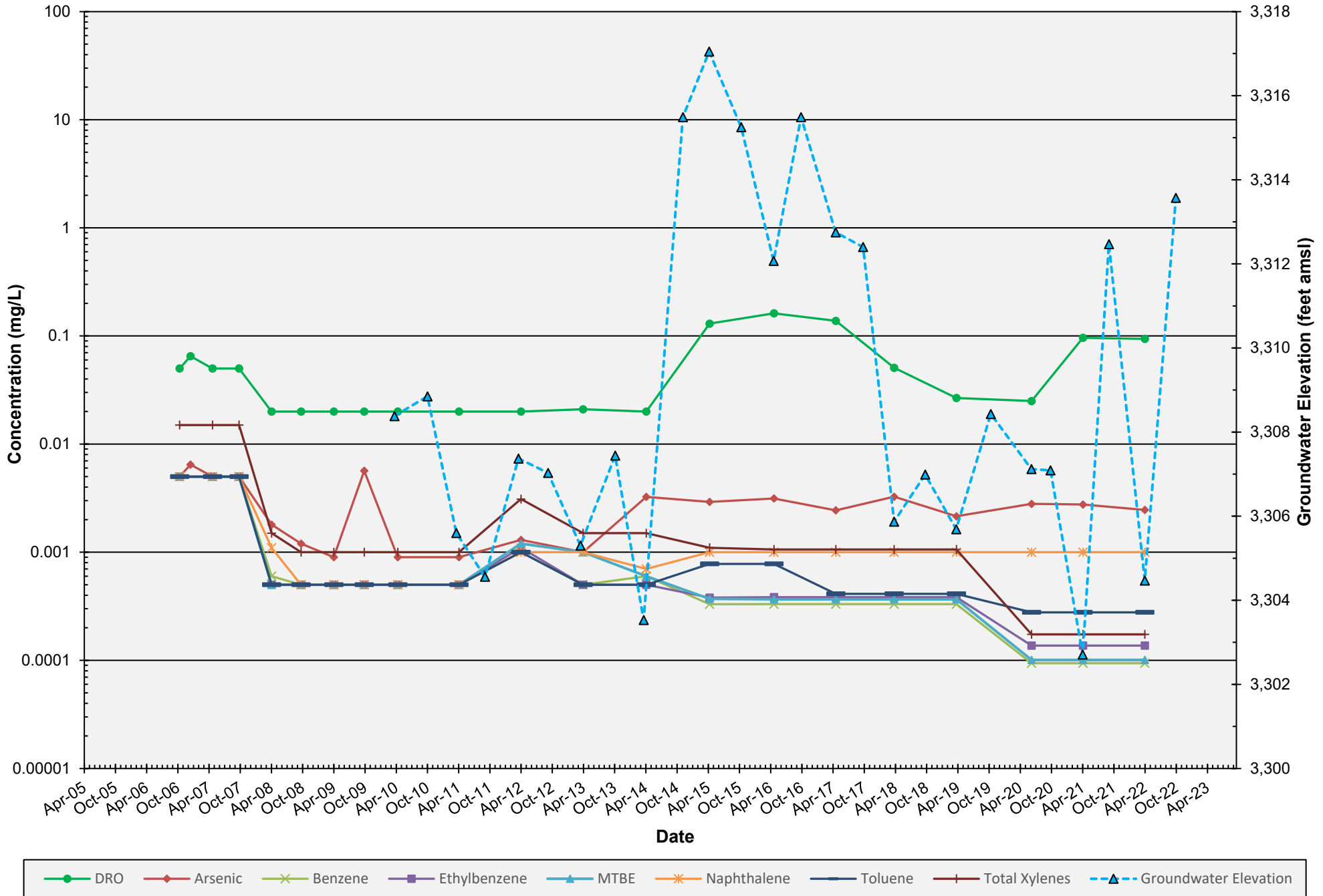
Three Mile Ditch



MW-68: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery

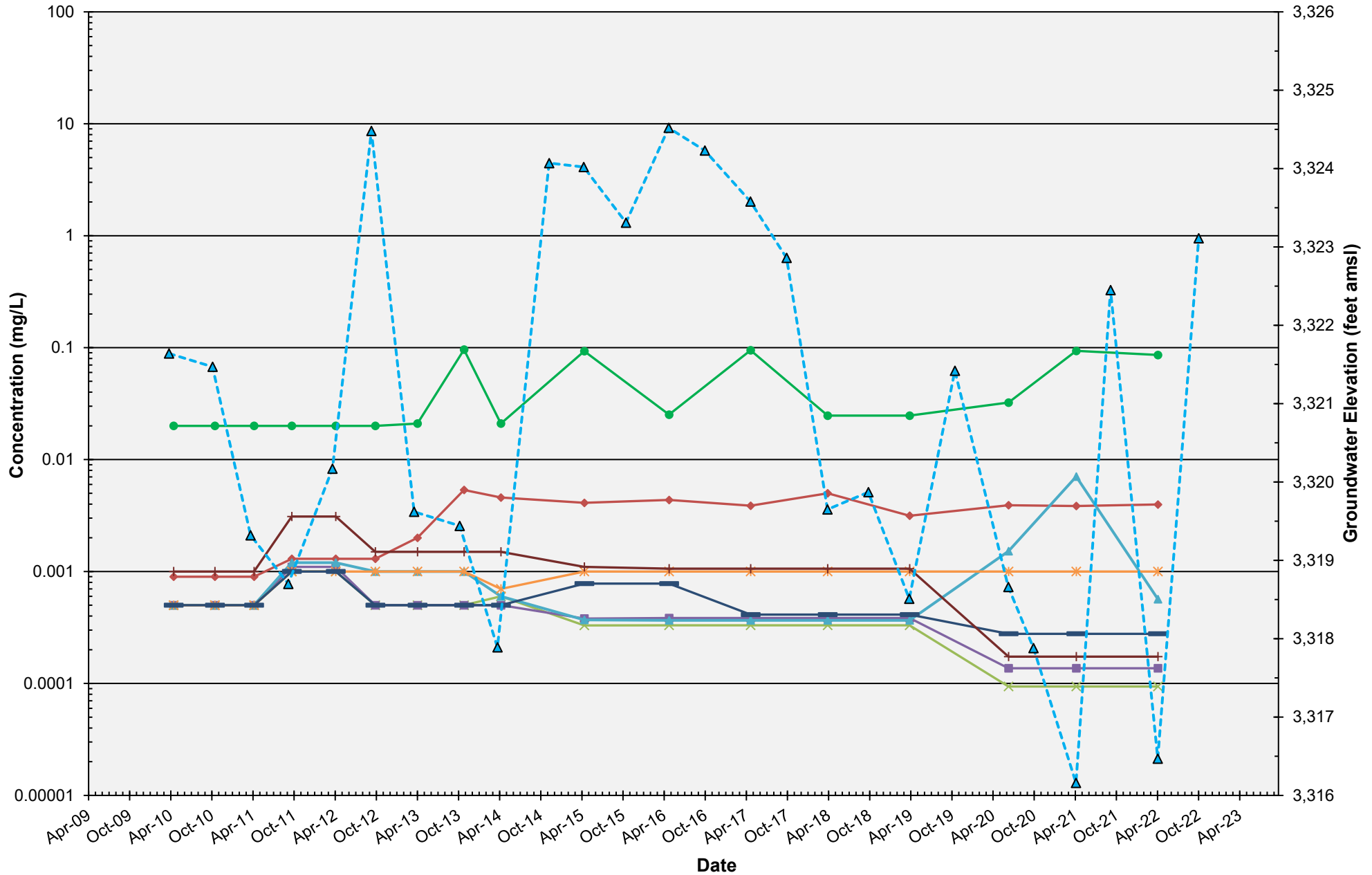
Three Mile Ditch



MW-71: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery

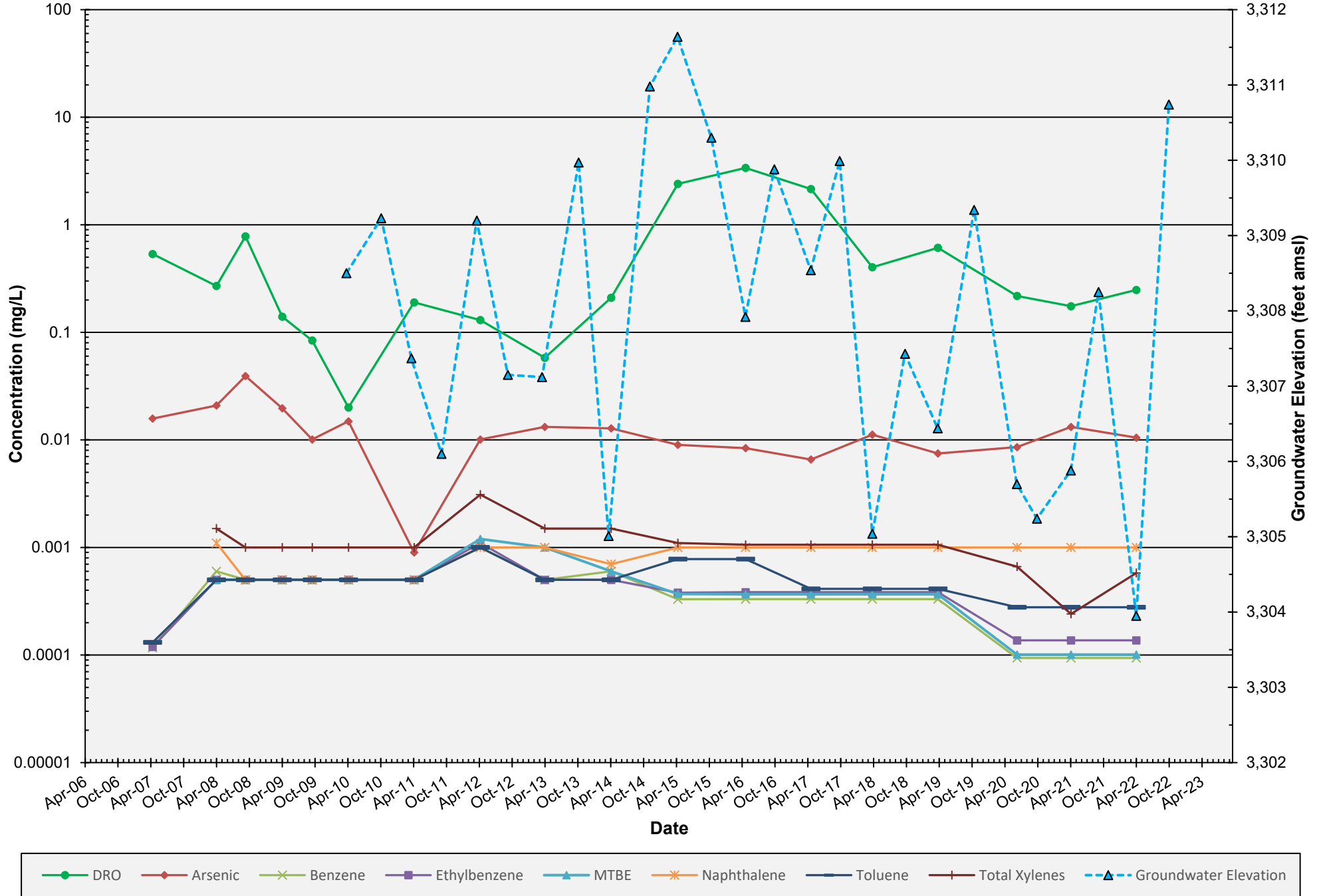
Three Mile Ditch



MW-89: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery

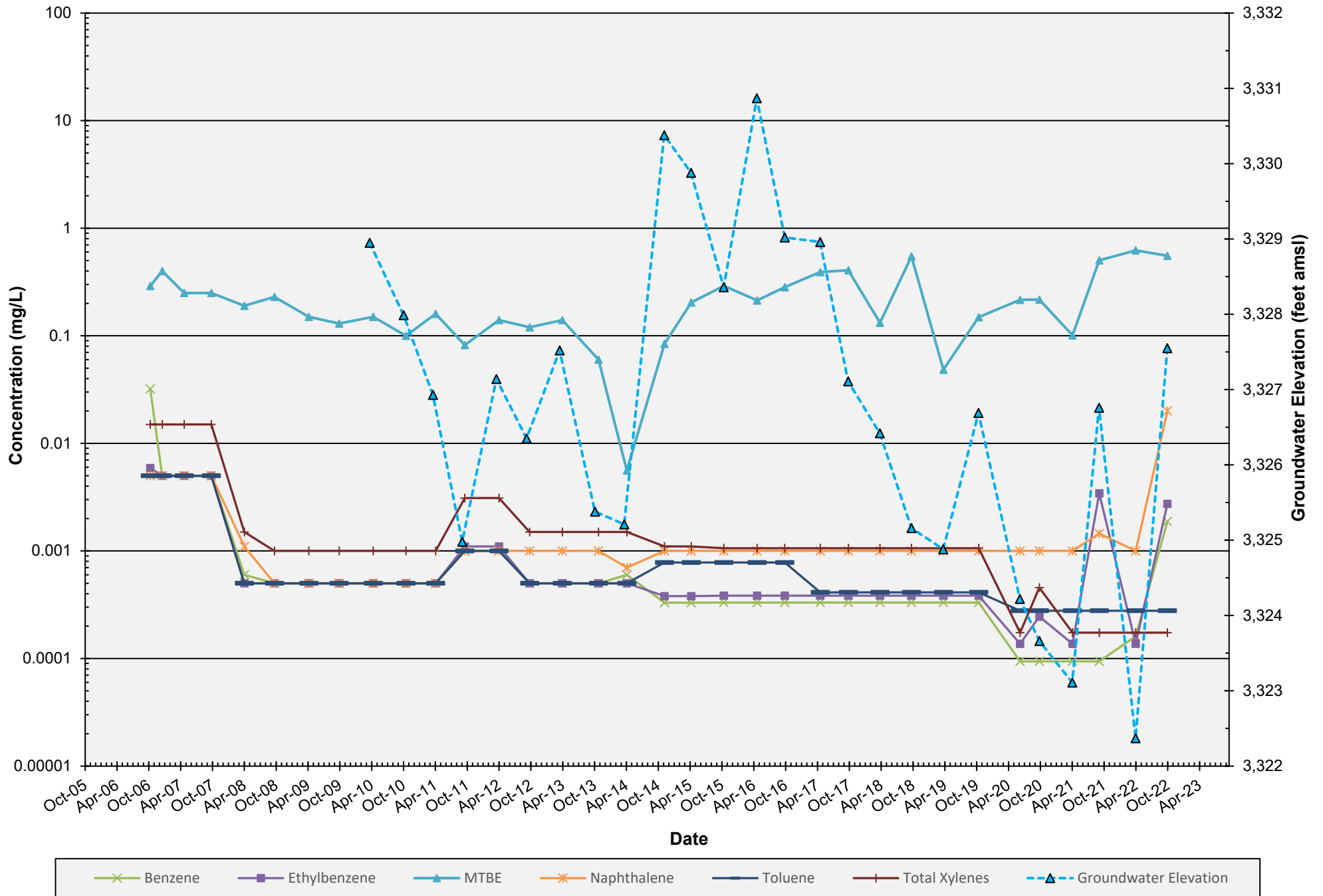
Three Mile Ditch



NP-1: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery

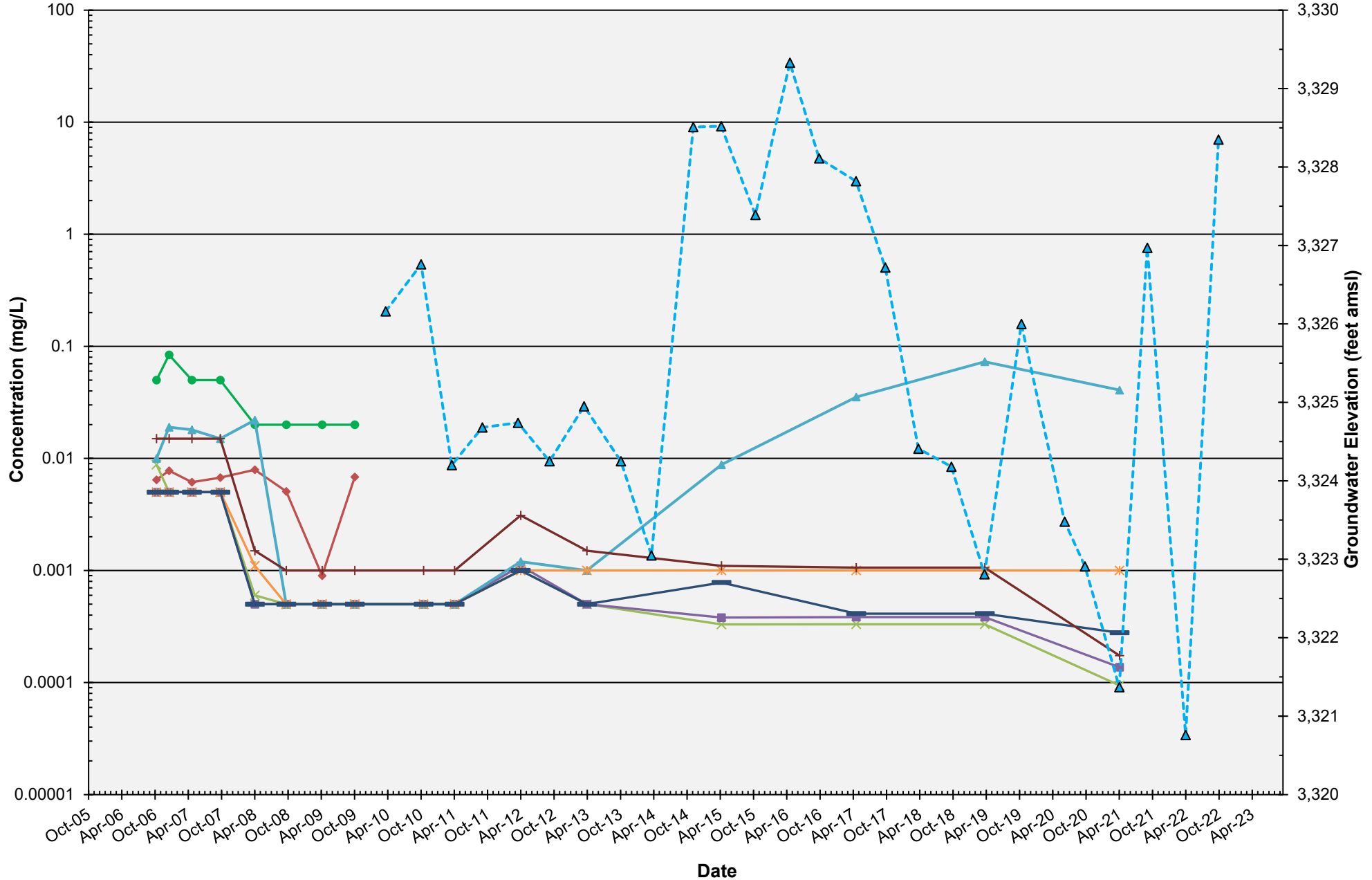
Three Mile Ditch



NP-6: COC Concentrations and Groundwater Elevations

HF Sinclair Navajo Refining LLC - Artesia Refinery

Three Mile Ditch



Appendix D: Data Validation

Data reported by Pace Analytical in Mount Juliet, Tennessee, for the groundwater samples collected in April and October 2022 were reviewed to ensure that reported analytical results met the data quality requirements contained in the United States Environmental Protection Agency (USEPA) *National Functional Guidelines for Organic Superfund Methods Data Review* (USEPA, November 2020), *National Functional Guidelines for Inorganic Superfund Methods Data Review* (USEPA, November 2020), and the individual methods, as applicable. Quality control (QC) data indicate that measurement data are sufficient to meet method quality objectives, reported data are defensible, and QC mechanisms were generally effective in ensuring measurement data reliability within the expected limits of sampling and analytical error.

The following significant issue was identified. Due to lack of or inadequate preservation, the nondetect result for nitrate-nitrite in sample MW-74 collected on October 11, 2022 is not useable for project objectives.

The following sections discuss the QC issues identified during the data review for each of the data reports listed below.

April 2022 Data Packages	October 2022 Data Packages
L1481749	L1546101 (Revised 1/26/23)*
L1482377 (Revised 1/23/23)	L1579898*
L1482988	

*Data package L1579898 was issued in January 2023 to report only missing cation data for two samples collected in October 2022 that were not reported by the laboratory in data package L1546101; thus, the data validation for both October 2022 data packages listed above were combined into one data review checklist/data review summary section below.

Analytes that were detected in the both the associated blank and sample were evaluated as follows: Corresponding samples at concentrations within five times the maximum blank concentration for inorganic analytes and within 10 times the maximum blank concentrations for organic analytes may include measurement contributions from the laboratory (for method blanks) and/or field (for equipment and trip blanks).

The following criteria were used in evaluation of the field duplicates: When both results are $\geq$ five times the reporting limit (RL), relative percent differences (RPDs) must be $<30\%$. When one or both results are $<$ five times the RL, the absolute difference must be $<$ the RL.

The following criteria were used in evaluation of laboratory duplicates: When both results are $\geq$ five times the RL, RPDs must be $<20\%$.

Lab Report L1481749

Sample identifiers cross-referenced to laboratory identifications are presented below.

Sample ID	Lab ID
L1481749-01	UG-3R
L1481749-02	UG-4
L1481749-03	UG-1
L1481749-04	UG-2

Data Review Checklist	Yes	No	Not applicable
Did all samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X		
All samples within holding times?	X		
Any detection in method blanks?	X		
Any detection in equipment blanks?	X*		
Any detection in trip blanks?			X
Any LCS or LCS duplicates (LCSD) percent recoveries (%R) out of laboratory defined limits?	X		
Any LCS/LCSD RPD above laboratory defined limits?		X	
Any matrix spike (MS) or MS duplicate (MSD) %R outside of laboratory defined limits?	X		
Any MS/MSD RPD above laboratory defined limits?		X	
Any surrogate %R outside of laboratory defined limits?		X	
Any laboratory duplicate RPD above laboratory defined limits?		X	
Any field duplicate data additionally flagged as estimated?			X
Any analyte analyzed by a nonequivalent method than planned?		X	

Other

RLs for dissolved solids were 2.5-5 times higher than the associated method blank but the laboratory did not include a sample narrative explaining the elevated RLs. The samples were likely prepared at a reduced volume due to the elevated concentrations of dissolved solids. There is no impact on data usability since dissolved solids results were detected above the RLs in the affected samples.

Select samples were analyzed at dilutions for nitrate-nitrite, chloride, and/or sulfate but the laboratory did not include a sample narrative explaining the dilutions. The samples were likely diluted due to the presence of these target and/or non-target analytes which would have exceeded the calibration range if undiluted. There is no impact on data usability since these analytes were detected in the diluted samples.

Laboratory Method Blanks

The following analytes were detected in the method blanks: total barium, total manganese, and TPH (GC/FID) low fraction. The analytes listed below were detected in the corresponding

samples at concentrations within five times the blank concentration for inorganic analytes and within 10 times the blank concentrations for organic analytes. Therefore, these samples may include measurement contributions from the laboratory.

- Total manganese: UG-3R, UG-2

Equipment Blanks

*Although an equipment blank was not submitted in this laboratory report, the equipment blanks submitted with laboratory report L1482377 were evaluated with the samples in this laboratory report (L1481749) since they were collected within one day of each other and were from a similar location at the site. The following analytes were detected in one or both equipment blanks submitted with the data set in laboratory report L1482377, EB-REST-04 and/or EB-REST-05: total barium, total calcium, chloride⁺, total iron, total manganese, nitrate-nitrite, total selenium, and TPH (GC/FID) high fraction. The analytes listed below were detected in the corresponding samples at concentrations within five times the maximum equipment blank concentration for inorganic analytes and within 10 times the equipment blank concentrations for organic analytes. Therefore, these samples may include measurement contributions from the field.

- Total iron: UG-4
- Total manganese: UG-2, UG-3R
- TPH (GC/FID) high fraction: UG-3R

+The result for chloride in equipment blank sample EB-REST-04 was less than five times the associated method blank concentration in laboratory report L1482377 and was likely the result of laboratory contamination; therefore, this result did not likely impact any field sample results.

LCS/LCSD

The LCS %R for bromoform (67.4%) was below the laboratory-defined limits (68-132%) in QC batch WG1848590. Potential low bias exists for the nondetect results for bromoform in the samples from this QC batch, UG-1, UG-2, UG-3R, and UG-4.

MS/MSDs

MS/MSD analyses were performed on sample UG-4 for nitrate-nitrite and total mercury, sample UG-3R for cyanide, dissolved boron, and total 6020 metals, and sample UG-1 for dissolved mercury. All criteria were met except as noted below.

The %Rs of total calcium in the MS and MSD performed on sample UG-3R were outside of the laboratory-defined recovery limits (75-125%). However, the concentration of total calcium in the unspiked sample was greater than four times the spiked concentration; thus, the %Rs of total calcium were not used to evaluate potential matrix effects.

Laboratory Duplicates

Laboratory duplicate analyses were performed on sample UG-2 for dissolved solids and sample UG-4 for nitrate-nitrite and cyanide. All criteria were met.

Lab Report L1482377 (Revised 1/23/23)

Sample identifiers cross-referenced to laboratory identifications are presented below.

Lab ID	Sample ID
L1482377-01	MW-122
L1482377-02	MW-81
L1482377-03	MW-80
L1482377-04	MW-79
L1482377-05	MW-74
L1482377-06	MW-73
L1482377-07	MW-2A
L1482377-08	MW-72
L1482377-09	OCD-6
L1482377-10	OCD-7AR
L1482377-11	EB-EP-01
L1482377-12	EB-EP-04
L1482377-13	TRIP BLANK-EP-01
L1482377-14	OCD-1R
L1482377-15	OCD-2A
L1482377-16	OCD-3
L1482377-17	OCD-4
L1482377-18	MW-11A
L1482377-19	OCD-5
L1482377-20	MW-87
L1482377-21	MW-18A
L1482377-22	MW-70
L1482377-23	MW-124
L1482377-24	EB-EP-02
L1482377-25	TRIP BLANK-EP-03
L1482377-26	NP-1
L1482377-27	MW-8
L1482377-28	MW-21
L1482377-29	MW-71
L1482377-30	MW-68
L1482377-31	MW-27
L1482377-32	MW-89
L1482377-33	MW-16
L1482377-34	MW-26
L1482377-35	TRIP BLANK-TMD-01
L1482377-36	MW-117
L1482377-37	MW-118
L1482377-38	MW-119
L1482377-39	MW-136
L1482377-40	MW-126B
L1482377-41	MW-57

Lab ID	Sample ID
L1482377-42	KWB-12B
L1482377-43	KWB-13
L1482377-44	DUP-REST-05 ¹
L1482377-45	EB-REST-05
L1482377-46	MW-116
L1482377-47	MW-46R
L1482377-48	MW-145
L1482377-49	MW-146
L1482377-50	MW-135
L1482377-51	MW-147
L1482377-52	MW-148
L1482377-53	DUP-REST-04 ²
L1482377-54	EB-REST-04
L1482377-55	TRIP BLANK-REST-03
L1482377-56	MW-62
L1482377-57	MW-62R
L1482377-58	TEL-4
L1482377-59	MW-98
L1482377-60	MW-42
L1482377-61	MW-29
L1482377-62	DUP-TEL-01 ³
L1482377-63	EB-TEL-01
L1482377-64	TRIP BLANK-TEL-01
L1482377-65	MW-139
L1482377-66	MW-50
L1482377-67	MW-90
L1482377-68	MW-96
L1482377-69	NCL-33
L1482377-70	NCL-44
L1482377-71	NCL-32
L1482377-72	MW-108
L1482377-73	NCL-31
L1482377-74	MW-55
L1482377-75	MW-18
L1482377-76	MW-54A
L1482377-77	NCL-49
L1482377-78	MW-53R
L1482377-79	DUP-NCL-01 ⁴
L1482377-80	EB-NCL-01
L1482377-81	TRIP BLANK-NCL-01
L1482377-83	TRIP BLANK-REST-02

¹Field duplicate of KWB-12B²Field duplicate of MW-146³Field duplicate of TEL-4⁴Field duplicate of NCL-49

Items	Yes	No	Not applicable
Did all samples meet the laboratory's standard conditions of sample acceptability upon receipt?		X	
All samples within holding times?		X	
Any detection in method blanks?	X		
Any detection in equipment blanks?	X		
Any detection in trip blanks?	X		
Any LCS/LCSD %R out of laboratory defined limits?	X		
Any LCS/LCSD RPD above laboratory defined limits?		X	
Any MS/MSD %R outside of laboratory defined limits?	X		
Any MS/MSD RPD above laboratory defined limits?		X	
Any surrogate %R outside of laboratory defined limits?	X		
Any laboratory duplicate RPD above laboratory defined limits?	X		
Any field duplicate data additionally flagged as estimated?	X		
Any analyte analyzed by a nonequivalent method than planned?		X	

Other

The laboratory report was revised on 1/20/23 to remove an incorrect narrative comment regarding the cyanide container for sample MW-18 and to complete the sample receipt checklist on the COC.

RLs for dissolved solids in all samples except five of the equipment blanks (EB-EP-02, EB-REST-05, EB-REST-04, EB-TEL-01, and EB-NCL-01) were two to 40 times higher than the associated method blank but the laboratory did not include a sample narrative explaining the elevated RLs. The samples were likely prepared at a reduced volume due to the elevated concentrations of dissolved solids. There is no impact on data usability since dissolved solids results were detected above the RLs in the affected samples with the exception of equipment blank samples EB-EP-01 and EB-EP-04; dissolved solids was not detected in these two samples and the laboratory likely prepared these two samples at a reduced volume. Therefore, the RLs for dissolved solids in these two equipment blank samples were elevated accordingly.

The laboratory noted that the nitrate-nitrite analyses of samples MW-62, MW-62R, MW-90, MW-96, and MW-108 (20-fold), samples TEL-4 and DUP-TEL-1 (10-fold), and sample MW-98 (50-fold) were diluted due to the elevated concentrations of sulfide. Therefore, the RLs for nitrate-nitrite in these samples were elevated accordingly.

The laboratory noted that the SVOC analysis of sample MW-62 was diluted 5-fold due to matrix interference. Therefore, the RLs for SVOCs in this sample were elevated accordingly.

The laboratory noted that the VOC analysis of sample MW-55 was diluted 10-fold due to elevated concentrations of non-target analytes. Therefore, the RLs for VOCs in this sample were elevated accordingly.

The laboratory noted that the chloride, fluoride, and/or sulfate analyses of samples NCL-49 and MW-53R were diluted due to matrix interference. There is no impact on data usability for chloride, fluoride, and sulfate since these analytes were detected above the RLs in these samples.

Several other samples were analyzed at dilutions for nitrate-nitrite, total sodium, total calcium, chloride, fluoride, sulfate, VOCs, TPH (GC/FID) high fraction, and/or TPH (GC/FID) low fraction but the laboratory did not include a sample narrative explaining the dilutions. The samples were likely diluted either due to matrix interference and/or the presence of target and/or non-target analytes which would have exceeded the calibration range if undiluted. There is no impact on data usability for nitrate-nitrite, total sodium, total calcium, chloride, fluoride, sulfate, TPH (GC/FID) high fraction, and/or TPH (GC/FID) low fraction since these analytes were detected above the method detection limits (MDLs) and/or RLs in the diluted samples. The nondetect RLs for several VOCs in samples MW-42, MW-62, MW-62R, MW-96, MW-98, and DUP-TEL-01 were elevated accordingly.

The results for total and dissolved manganese in samples MW-11A, MW-42, MW-72, MW-81, OCD-1R, OCD-2A, and OCD-4, total and dissolved iron in sample MW-72, total and dissolved barium in sample MW-62R, and total and dissolved arsenic in sample MW-62R may be considered estimated since the dissolved result exceeded the total result by greater than 20% and both results were greater than 5x the RL.

The laboratory flagged the result for dissolved barium in sample OCD-5 with an "O1" qualifier indicating that either a serial dilution (SD) or post-digestion spike (PDS) result was outside of the acceptance criteria. The laboratory was contacted during this review and specified that the SD performed on this sample was outside of the acceptance criteria (10 percent difference [%D]) for dissolved barium (10.6%D). Thus, potential uncertainty exists for the dissolved barium result in sample OCD-5; this uncertainty may extend to other positive results for dissolved barium in samples collected during the April 2022 sampling event.

The laboratory flagged the results for total calcium, total chromium, and total manganese in sample MW-79 with an "O1" qualifier indicating that either a serial dilution or post-digestion spike result was outside of the acceptance criteria. The laboratory was contacted during this review and specified the following:

- Total calcium: PDS (258%R) performed on this sample was outside of the acceptance criteria (75-125%). There is no impact on the data usability due to this issue since the concentration of total calcium in the unspiked sample was greater than four times the spiked concentration; thus, the %R of total calcium was not used to evaluate potential matrix effects.
- Total chromium: SD (100%D) and PDS (0%R) performed on this sample were outside of the acceptance criteria (10 %D and 75-125%, respectively). Thus, potential uncertainty exists for the total chromium result in sample MW-79 due to the SD variability and lack of PDS recovery; this uncertainty may extend to other positive results for total chromium in groundwater samples collected during the April 2022 sampling event.
- Total manganese: SD (15.8%D) and PDS (40.1%R) performed on this sample were outside of the acceptance criteria (10 %D and 75-125%, respectively). There is no impact on the data usability due to the PDS issue since the concentration of total manganese in the unspiked sample was greater than four times the spiked concentration; thus, the %R of total manganese was not used to evaluate potential matrix effects. Potential uncertainty exists for the total manganese result in sample

MW-79 due to the SD variability; this uncertainty may extend to other positive results for total manganese in groundwater samples collected during the April 2022 sampling event.

Standard Conditions

The laboratory noted that the TPH (GC/FID) high fraction analyses of samples MW-62, MW-62R, TEL-4, MW-42, MW-29, DUP-TEL-01, MW-139, MW-50, MW-90, MW-96, NCL-33, MW-108, and MW-55 were performed using a container with a pH outside of the method requirement (≤ 2). This pH issue shortens the extraction holding time to seven days and these samples were extracted for TPH (GC/FID) high fraction after seven days of collection. Therefore, the positive results for TPH (GC/FID) high fraction in samples MW-62, MW-62R, TEL-4, MW-42, MW-29, DUP-TEL-01, MW-139, MW-50, MW-90, MW-96, NCL-33, MW-108, and MW-55 may be biased low.

Holding Times

Several samples were initially prepared for dissolved solids >7 days after collection but <8 days after collection; there is no impact on the data usability due to this issue. However, several samples also had two sets of results reported for dissolved solids due to an issue encountered by the laboratory with the initial dissolved results analyses. According to the project narrative of the laboratory report and discussions with the laboratory during data review, the initial dissolved solids results for several samples were lower than expected based on the relationship between dissolved solids, anions/cations, and specific conductance; thus, the laboratory re-prepared several samples for dissolved solids outside of the 7-day holding time in order to confirm this assumption. The laboratory stated that the low bias seen in the initial analyses was likely due to the samples not fully adjusting to room temperature before being filtered. In some cases, samples that have high concentrations of dissolved sodium, calcium, sulfates, and chlorides will have a low bias if the samples do not reach room temperature because these compounds can become trapped in the filter and not pass through during the filtration process; therefore, the laboratory reported both initial and out-of-hold dissolved solids results on several samples. With the exception of sample MW-74, the re-prepared/out-of-hold dissolved results were higher than the initial/potentially low-biased results; the initial dissolved solids result in sample MW-74 was higher than the re-prepared analysis but only differed by 2%. In order to remain conservative, when two sets of dissolved results were reported (including MW-74), the dissolved solids results from the re-prepared analyses (which were higher in almost every instance and were allowed to properly adjust to room temperature before being filtered) should be used for project objectives; these results are potentially biased low due to the holding time exceedance.

Sample EB-TEL-01 was prepared two days beyond the 7-day holding time for dissolved solids; the laboratory only reported the out-of-hold dissolved solids result for this sample. Therefore, potential low bias exists for the nondetect result for dissolved solids in this sample.

Several samples were extracted for TPH (GC/FID) high fraction greater than 14 days after collection but less than 15 days after collection. Since all affected samples were extracted for TPH (GC/FID) high fraction on the 14th day after collection, there is no adverse impact on the data usability due to this issue.

Sample MW-62 was extracted for SVOCs 1.5 hours after the 7-day holding time. Since this sample was extracted for SVOCs on the 7th day after collection, there is no adverse impact on the data usability due to this issue.

Laboratory Method Blanks

The following analytes were detected in the method blanks: chloride, dissolved chromium, dissolved nickel, dissolved vanadium, total barium, total calcium, total manganese, total vanadium, total potassium, TPH (GC/FID) low fraction, TPH (GC/FID) high fraction, methylene chloride, n-butylbenzene, carbon disulfide, and p-isopropyltoluene. The analytes listed below were detected in the corresponding samples at concentrations within five times the method blank concentration for inorganic analytes and within 10 times the method blank concentration for organic analytes. Therefore, these samples may include measurement contributions from the laboratory.

- Chloride: EB-REST-04, TEL-4, MW-98, MW-139
- Dissolved chromium: KWB-12B, MW-116, MW-146, MW-148, MW-98
- Dissolved nickel: KWB-12B, KWB-13
- Total barium: EB-EP-04, EB-EP-02
- Total calcium: EB-EP-01, EB-EP-04, EB-EP-02, EB-NCL-01
- Total manganese: EB-EP-01, EB-EP-04
- Total vanadium: MW-18A
- Total potassium: MW-108, NCL-31, MW-55, MW-54A, NCL-49, DUP-NCL-01, EB-NCL-01
- TPH (GC/FID) low fraction: MW-122, MW-81, MW-80, MW-79, MW-73, MW-2A, MW-72, OCD-6, EB-EP-04, OCD-1R, OCD-2A
- TPH (GC/FID) high fraction: MW-122, MW-80, MW-2A, MW-72
- Carbon disulfide: MW-18A
- n-Butylbenzene: MW-18A

Equipment Blanks

The following table summarizes the analytes were detected in the equipment blank samples and the associated samples based on the location at the site. The analytes listed in the table below were detected in the corresponding samples at concentrations within five times the maximum equipment blank concentration for inorganic analytes and within 10 times the maximum equipment blank concentration for organic analytes, where applicable. Therefore, the analytes for the impacted samples listed in the table below may include measurement contributions from the field.

Blank ID(s)	Analyte	Impacted Sample Results*
EB-EP-02, EB-EP-04	Total barium**	None
EB-EP-01, EB-EP-02, EB-EP-04	Total calcium**	
	Total sodium	
EB-EP-02	Sulfate	
EB-EP-04	TPH (GC/FID) low fraction**	
EB-EP-01, EB-EP-04	Total manganese**	
	Dissolved: barium, manganese	

Blank ID(s)	Analyte	Impacted Sample Results*
EB-EP-01, EB-EP-04	Total chromium	MW-122, MW-18A, MW-2A, MW-72, MW-73, MW-74, MW-80, MW-87, OCD-1R, OCD-2A, OCD-3, OCD-4, OCD-5, OCD-7AR
EB-EP-01	Total iron	MW-2A, MW-74, MW-81, MW-87, OCD-3
EB-EP-01, EB-EP-02, EB-EP-04	TPH (GC/FID) High Fraction	MW-2A***, MW-11A, MW-72***, MW-79, MW-80***, MW-87, MW-122***, MW-124, OCD-1R, OCD-2A, OCD-3, OCD-4
Associated samples (EP Area of the site from this report): MW-18A, MW-2A, MW-11A, MW-70, MW-72, MW-73, MW-74, MW-79, MW-80, MW-81, MW-87, MW-122, MW-124, OCD-1R, OCD-2A, OCD-3, OCD-4, OCD-5, OCD-6, OCD-7AR		
EB-TEL-01	1,4-Dioxane	DUP-TEL-01
	TPH (GC/FID) High Fraction	None
	Dissolved: barium, chromium	
	Total: barium, calcium, sodium	
	Nitrate-nitrite	
Associated samples (TEL Area of the site from this report): TEL-4, DUP-TEL-01		
EB-NCL-01	Total: calcium**, potassium**, barium, manganese, sodium	None
	Dissolved solids	MW-108, NCL-49, DUP-NCL-01
	Total arsenic	
Associated samples (NCL Area of the site from this report): DUP-NCL-01, MW-108, MW-18, MW-53R, MW-54A, MW-55, NCL-31, NCL-32, NCL-33, NCL-44, NCL-49		
EB-REST-05	Total barium	MW-21, MW-26, MW-46R, MW-50, MW-71, MW-89, MW-116, MW-117, MW-118, MW-136, MW-126B, MW-146, KWB-12B, DUP-REST-05, DUP-REST-04
EB-REST-04, EB-REST-05	Total calcium	None
	Chloride**	
EB-REST-05	Total iron	MW-8, MW-21, MW-42, MW-46R, MW-50, MW-62, MW-68, MW-89, MW-90, MW-116, MW-118, MW-119, MW-136, MW-126B, MW-135, MW-139 MW-145, MW-146, MW-147, DUP-REST-04
	Nitrate-nitrite	MW-139
	Total manganese	MW-62, MW-68, MW-96, MW-117, MW-118, MW-146, DUP-REST-04
EB-REST-04	Total selenium	KWB-12B, DUP-REST-05, MW-42, MW-62, MW-62R, MW-90, MW-96, MW-126B, MW-145
	TPH (GC/FID) High Fraction	MW-8, MW-16, MW-21, MW-27, MW-46R, MW-50, MW-57, MW-68, MW-71, MW-89, MW-116, MW-117, MW-126B, MW-136, MW-145, DUP-REST-04
Associated samples (the remaining Areas of the site from this report. i.e., REST and TMD): TMD: NP-1, MW-8, MW-21, MW-71, MW-68, MW-27, MW-89, MW-16, MW-26, MW-46R REST: MW-29, MW-42, MW-50, MW-57, MW-62, MW-62R, MW-90, MW-96, MW-98, MW-139, MW-116, MW-117, MW-118, MW-119, MW-126B, MW-135, MW-136, MW-145, MW-146, MW-147, MW-148, KWB-12B, KWB-13, DUP-REST-04, DUP-REST-05		

Blank ID(s)	Analyte	Impacted Sample Results*
*Impacted sample results are those that were detected at concentrations within five times the maximum associated equipment blank concentration for inorganic analytes and within 10 times the maximum associated equipment blank concentration for organic analytes.		

**Note that these asterisked results in the equipment blank samples noted in the table above were less than 10 times the concentration detected in the associated method blank for organic analytes and less than five times the concentration detected in the associated method blank for inorganic analytes; therefore, the results for the asterisked results in the equipment blank samples noted in the table above were probably the result of laboratory method blank contamination and did not affect any associated field samples.

***Note that these asterisked results in the samples noted in the table above were also less than 10 times the concentration detected in the associated method blank.

Trip Blanks

Carbon disulfide and benzene were detected in the trip blank sample, TRIP BLANK-EP-01. Therefore, potential high bias exists for the positive results for carbon disulfide and benzene in sample MW-18A (collected from the EP location of the site in this laboratory report) since the sample results were less than 10 times the concentrations detected in the associated trip blank; note that the result for carbon disulfide in sample MW-18A was also less than 10 times the concentration detected in the associated method blank. There was no impact on data usability for nondetect results or for samples collected from a different location at the site.

LCS/LCSD

The LCS %R for naphthalene (VOC) (51.4%) was below the laboratory-defined limits (54-135%) in QC batch WG1849425. Therefore the nondetect results for naphthalene (VOC) that were reported from this batch in samples MW-124, EB-EP-02, TRIP BLANK-EP-03, NP-1, MW-8, MW-21, MW-71, MW-68, MW-27, MW-89, MW-16, MW-26, TRIP BLANK-TMD-01, MW-117, and MW-118 are potentially biased low.

The LCS %Rs for 1,1,1-trichloroethane (130%) and trichloroethene (137%) were above the laboratory-defined limits (73-124% and 78-124%, respectively) in QC batch WG1849458. However, since these compounds were not detected in the samples from this QC batch, NCL-44, NCL-32, NCL-31, MW-55, MW-18, MW-54A, NCL-49, MW-53R, DUP-NCL-01, EB-NCL-01, TRIP BLANK-NCL-01, and TRIP BLANK-REST-02, there is no impact on data usability.

The LCS/LCSD %Rs for naphthalene (VOC) (51%/52.2%) were below the laboratory-defined limits (54-135%) in QC batch WG1850722. Therefore the nondetect result for naphthalene (VOC) in the associated sample, MW-108, is potentially biased low.

The LCS %R for benzaldehyde (204%) was above the laboratory-defined limits (10-160%) in QC batch WG1850340. However, since benzaldehyde was not detected in the associated sample, MW-62, there is no impact on data usability.

MS/MSDs

MS and/or MS/MSD analyses were performed on the following samples:

- MW-11A, MW-26, MW-73, MW-122, MW-126B, NCL-44, OCD-1R, EB-TEL-01: Nitrate-nitrite
- MW-80: Fluoride
- MW-27, EB-EP-01, EB-EP-02, EB-REST-04, EB-REST-05, EB-NCL-01: Chloride, fluoride, sulfate
- KWB-12B, MW-122, OCD-5, EB-TEL-01: Dissolved metals
- MW-46R, MW-79, NCL-33, NP-1: Total metals
- MW-11A: TPH (GC/FID) low fraction

The %Rs of sulfate in the MS performed on sample MW-27 was outside of the laboratory-defined recovery limits (80-120%). However, the concentration of sulfate in the unspiked sample was greater than four times the spiked concentration; thus, the %R of sulfate was not used to evaluate potential matrix effects.

The %Rs of total calcium, total manganese, and total sodium in the MS and/or MSD performed on sample MW-79 were outside of the laboratory-defined recovery limits (75-125%). However, the concentrations of total calcium, total manganese, and total sodium in the unspiked sample were greater than four times the spiked concentrations; thus, the %Rs of these three metals were not used to evaluate potential matrix effects.

The %Rs of total chromium (0%/0%) and total nickel (0%/0%) in the MS and MSD performed on sample MW-79 were outside of the laboratory-defined recovery limits (75-125%); therefore, the positive and nondetect results for total chromium and total nickel in all groundwater samples from this lab report except MW-46R, NCL-33, and NP-1 may be biased low. It should be noted that professional judgment was used and no nondetect results were rejected due to the lack of recoveries for total chromium and total nickel in the MS/MSD analyses performed on sample MW-79 since there were other MS/MSD analyses performed on the samples in this laboratory report that had acceptable recoveries for total chromium and total nickel.

The %Rs of total calcium in the MS and MSD performed on sample NP-1 were outside of the laboratory-defined recovery limits (75-125%). However, the concentration of this analyte in the unspiked sample was greater than four times the spiked concentration; thus, the %Rs of total calcium were not used to evaluate potential matrix effects.

The %Rs of total calcium and total sodium in the MS and/or MSD performed on samples MW-46R and NCL-33 were outside of the laboratory-defined recovery limits (75-125%). However, the concentrations of these analytes in the unspiked samples were greater than four times the spiked concentrations; thus, the %Rs of total calcium and total sodium were not used to evaluate potential matrix effects.

Surrogate Recoveries

The surrogate (o-terphenyl) recovered above the laboratory control limits (31.0-160%) in the TPH (GC/FID) high fraction analysis of sample MW-62R (163%). The laboratory noted that

this surrogate issue was due to matrix interference. Therefore, the positive result for TPH (GC/FID) high fraction in sample MW-62R may be biased high.

Laboratory Duplicates

Laboratory duplicate analyses were performed on the following samples:

- MW-27, MW-62, MW-62R, MW-89, MW-96 (initial and re-prepared analyses), MW-108, MW-122, NCL-31, OCD-3, EB-EP-01, EB-EP-04, EB-TEL-01: Dissolved solids
- MW-11A, MW-26, MW-73, MW-122, MW-126B, NCL-44, OCD-1R, EB-TEL-01: Nitrate-nitrite
- MW-55: Cyanide
- MW-27, MW-80, EB-EP-01, EB-EP-02, EB-REST-04, EB-REST-05, EB-NCL-01: Chloride, fluoride, sulfate

The RPDs for dissolved solids in the duplicate analyses performed on samples MW-62 (8.89%) and MW-62R (6.23%) exceeded the laboratory-defined control limit (5%). However, there was no impact on the data usability since the RPDs were within the acceptance criteria used in this evaluation (20%).

The RPDs for nitrate-nitrite in the duplicate analyses performed on samples MW-122 and EB-TEL-01, sulfate in the duplicate analysis performed on sample EB-EP-02, and chloride in the duplicate analyses performed on samples EB-REST-05 and EB-REST-04 exceeded the laboratory-defined control limits (20% for nitrate-nitrite and 15% for sulfate). However, the results in the parent and duplicate samples were less than 5x the RL so the laboratory duplicate RPD was not applicable.

Field Duplicates

Samples DUP-NCL-01/NCL-49, DUP-TEL-01/TEL-4, DUP-REST-04/MW-146 and DUP-REST-05/KWB-12B were submitted as the field duplicate pairs. All criteria were met except as noted below:

- The RPDs for total chromium (64.3%), tert-butyl alcohol (30.2%), and TPH (GC/FID) high fraction (32.9%) were above the acceptance criteria (30%) in field duplicate pair TEL-4/DUP-TEL-01. Further, the results for total iron, n-propylbenzene, and TPH (GC/FID) low fraction were <5x the RL in one or both samples in this field duplicate pair and the absolute differences were greater than the RL. Therefore, the positive results for total chromium, tert-butyl alcohol, TPH (GC/FID) high fraction, total iron, n-propylbenzene, and TPH (GC/FID) low fraction in samples TEL-4 and DUP-TEL-01 may be considered estimated.
- It should be noted that the re-prepared dissolved solids result was used in the field duplicate evaluation for samples MW-146/DUP-REST-04 due to the potential low bias explained above for the initial dissolved solids result in sample DUP-REST-04. The initial dissolved solids result in the duplicate sample was not evaluated. No field duplicate variability issues

were noted (using the re-prepared dissolved solids result from the duplicate sample) for this field duplicate pair.

- It should be noted that samples KWB-12B and DUP-REST-05 were not analyzed for the same analyte list. The duplicate sample (DUP-REST-05) was not analyzed for cyanide and several total and dissolved metals (boron, cadmium, cobalt, mercury, nickel, uranium, and vanadium) while the parent sample (KWB-12B) was analyzed for these analytes. Therefore, an evaluation of these analytes could not be performed for this field duplicate pair.

Lab Report L1482988

Sample identifiers cross-referenced to laboratory identifications are presented below.

Lab ID	Sample ID
L1482988-01	MW-6A
L1482988-02	MW-120
L1482988-03	MW-121
L1482988-04	MW-84
L1482988-05	MW-82
L1482988-07	MW-130
L1482988-08	MW-76
L1482988-09	MW-77
L1482988-10	MW-78
L1482988-11	MW-75
L1482988-12	MW-83
L1482988-13	MW-3
L1482988-14	MW-88
L1482988-15	MW-22A
L1482988-16	MW-10
L1482988-17	MW-123
L1482988-18	MW-4A
L1482988-19	MW-5A
L1482988-20	MW-7A
L1482988-21	OCD-8A
L1482988-22	DUP-EP-01 ¹
L1482988-23	DUP-EP-02 ²
L1482988-24	DUP-EP-03 ³
L1482988-25	EB-EP-03
L1482988-26	TRIP BLANK-EP-02
L1482988-27	MW-25
L1482988-28	MW-1R
L1482988-29	MW-15
L1482988-30	MW-52
L1482988-31	MW-109
L1482988-32	MW-110
L1482988-33	MW-113
L1482988-34	MW-134
L1482988-35	RA-4798
L1482988-36	RA-3156
L1482988-37	RA-313
L1482988-38	KWB-7
L1482988-39	MW-20
L1482988-40	KWB-11B
L1482988-41	MW-115
L1482988-42	MW-114

Lab ID	Sample ID
L1482988-43	MW-125
L1482988-44	DUP-REST-01 ⁴
L1482988-45	EB-REST-01
L1482988-46	DUP-REST-03 ⁵
L1482988-47	EB-REST-03
L1482988-48	TRIP BLANK-REST-01
L1482988-49	MW-103
L1482988-50	MW-104
L1482988-51	MW-64
L1482988-52	MW-102
L1482988-53	RW-4
L1482988-54	DUP-REST-02 ⁶
L1482988-55	EB-REST-02
L1482988-56	MW-105
L1482988-57	MW-61
L1482988-58	RW-9
L1482988-59	MW-56
L1482988-60	MW-49
L1482988-61	MW-45
L1482988-62	TRIP BLANK-REST-04
L1482988-64	MW-101

¹Field duplicate of MW-7A²Field duplicate of MW-22A³Field duplicate of MW-3⁴Field duplicate of MW-113⁵Field duplicate of MW-134⁶Field duplicate of MW-102

Items	Yes	No	Not applicable
Did all samples meet the laboratory's standard conditions of sample acceptability upon receipt?		X	
All samples within holding times?		X	
Any detection in method blanks?	X		
Any detection in equipment blanks?	X		
Any detection in trip blanks?	X		
Any LCS/LCSD %R out of laboratory defined limits?	X		
Any LCS/LCSD RPD above laboratory defined limits?	X		
Any MS/MSD %R outside of laboratory defined limits?	X		
Any MS/MSD RPD above laboratory defined limits?		X	
Any surrogate %R outside of laboratory defined limits?	X		
Any laboratory duplicate RPD above laboratory defined limits?	X		
Any field duplicate data additionally flagged as estimated?	X		
Any analyte analyzed by a nonequivalent method than planned?		X	

Other

Sample TRIP BLANK-REST-02 was listed on the COC in laboratory report L1482988; however, the results were reported in laboratory report L1482377 per client request.

The laboratory noted that sample RW-4 was not received and that containers for sample RW-6 were received but that sample RW-6 was crossed off on the COC. The samples received for "RW-6" were in fact containers for sample RW-4. The laboratory logged in these containers as RW-4 per the COC.

Sample EB-REST-03 was not analyzed for dissolved solids as requested on the COC. Therefore, the dissolved solids results for the samples collected from the "REST" portion of the site were only evaluated using the dissolved solids results from equipment blank samples EB-REST-01 and EB-REST-02 from this laboratory report.

RLs for dissolved solids in all samples except three of the equipment blanks (EB-EP-03, EB-REST-01, and EB-REST-02) were two to 20 times higher than the associated method blank but the laboratory did not include a sample narrative explaining the elevated RLs. The samples were likely prepared at a reduced volume due to the elevated concentrations of dissolved solids. There is no impact on data usability since dissolved solids results were detected above the RLs in the affected samples.

The laboratory noted that the nitrate-nitrite analysis of sample MW-84 was diluted 5-fold due to color. Therefore, the RL for nitrate-nitrite in this sample was elevated accordingly.

The laboratory noted that the VOC analysis of sample MW-84 was diluted 20-fold, and the VOC analyses of samples MW-78, MW-103, and MW-115 were diluted 10-fold due to sample foaming. Therefore, the RLs for VOCs in these samples were elevated accordingly.

The laboratory noted that the TPH (GC/FID) low fraction analyses of samples MW-75, MW-78, and DUP-EP-03 were diluted 5-fold due to sample foaming. Therefore, the RLs for TPH (GC/FID) low fraction in these samples were elevated accordingly.

The laboratory noted that the chloride, fluoride, and sulfate analyses of samples OCD-8A, DUP-EP-01, DUP-EP-02, and DUP-EP-03 were diluted due to matrix. There is no impact on data usability for chloride, fluoride, and sulfate since these analytes were detected above the RLs in these samples.

The laboratory noted that the nitrate-nitrite analyses of sample MW-109 (20-fold), samples MW-49, MW-64, MW-101, MW-103, MW-104, and KWB-7 (10-fold), and samples MW-61, MW-102, MW-105, DUP-REST-02, RW-4, and RW-9 (50-fold) were diluted due to the elevated concentrations of sulfide. Therefore, the RLs for nitrate-nitrite in these samples were elevated accordingly.

Several other samples were analyzed at dilutions for cyanide, nitrate-nitrite, total sodium, select dissolved metals, total calcium, chloride, fluoride, sulfate, benzene, VOCs, TPH (GC/FID) high fraction, and/or TPH (GC/FID) low fraction but the laboratory did not include a sample narrative explaining the dilutions. The samples were likely diluted either due to matrix interference and/or the presence of target and/or non-target analytes which would have exceeded the calibration range if undiluted. There is no impact on data usability for nitrate-nitrite, total

sodium, select dissolved metals except as noted below, total calcium, chloride, fluoride, sulfate, benzene, TPH (GC/FID) high fraction, and/or TPH (GC/FID) low fraction since these analytes were detected above the method detection limits (MDLs) and/or RLs in the diluted samples. The nondetect RLs for dissolved chromium and dissolved lead in sample MW-84, several VOCs in samples MW-49, MW-61, MW-64, MW-102, MW-105, RW-9, and DUP-REST-02, and cyanide in samples MW-49 and KWB-7 were elevated accordingly.

The results for total and dissolved manganese in sample MW-109, and total and dissolved iron and total and dissolved selenium in sample MW-77 may be considered estimated since the dissolved result exceeded the total result by greater than 20% and both results were greater than 5x the RL.

Standard Conditions

The laboratory noted that the TPH (GC/FID) high fraction analyses of samples MW-49, MW-61, MW-64, MW-76, MW-77, MW-82, MW-84, MW-101, MW-102, MW-103, MW-109, MW-110, MW-130, KWB-7, RW-4, RW-9, and DUP-REST-02 were performed using a container with a pH outside of the method requirement (≤ 2). This pH issue shortens the extraction holding time to seven days and these samples were extracted for TPH (GC/FID) high fraction after seven days of collection. Therefore, the positive results for TPH (GC/FID) high fraction in samples MW-49, MW-61, MW-64, MW-76, MW-77, MW-82, MW-84, MW-101, MW-102, MW-103, MW-109, MW-110, MW-130, KWB-7, RW-4, RW-9, and DUP-REST-02 may be biased low.

The laboratory noted that the TPH (GC/FID) low fraction analyses of samples MW-103 and RW-9 were performed using a container with a pH outside of the method requirement (≤ 2). This pH issue shortens the analysis holding time to seven days and these samples were analyzed for TPH (GC/FID) low fraction after seven days of collection. Therefore, the positive results for TPH (GC/FID) low fraction in samples MW-103 and RW-9 may be biased low.

Holding Times

Sample MW-114 was prepared one day outside of the 7-day holding time for dissolved solids; therefore, the positive result for dissolved solids in sample MW-114 may be biased low.

Sample EB-REST-02 was prepared for dissolved solids approximately two hours after the 7-day holding time expired; there is no impact on the data usability due to this issue since the sample was prepared on the 7th day after collection.

Several samples also had two sets of results reported for dissolved solids due to an issue encountered by the laboratory with the initial dissolved results analyses; one sample (DUP-EP-02) had three sets of dissolved solids results reported due to this issue. According to the project narrative of the laboratory report and discussions with the laboratory during data review, the initial dissolved solids results for several samples were lower than expected based on the relationship between dissolved solids, anions/cations, and specific conductance; thus, the laboratory re-prepared several samples for dissolved solids outside of the 7-day holding time in order to confirm this assumption. The laboratory stated that the low bias seen in the initial analyses was likely due to the samples not fully adjusting to room temperature before being filtered. In some cases, samples that have high concentrations of dissolved sodium, calcium, sulfates, and chlorides will have a low

bias if the samples do not reach room temperature because these compounds can become trapped in the filter and not pass through during the filtration process; therefore, the laboratory reported both initial and out-of-hold dissolved solids results on several samples. In all of the samples with duplicate dissolved results reported, the re-prepared/out-of-hold dissolved results were higher than the initial/potentially low-biased results; in the one sample with three sets of dissolved solids results (DUP-EP-02), the final re-prepared/out-of-hold dissolved result (prepared on 5/11/22) was the higher of all three results. In order to remain conservative, when multiple sets of dissolved results were reported, the dissolved solids results from the re-prepared analyses (and the re-prepared result from 5/11/22 for sample DUP-EP-02) (which were higher in every instance and were allowed to properly adjust to room temperature before being filtered) should be used for project objectives. These results are potentially biased low due to the holding time exceedance.

Laboratory Method Blanks

The following analytes were detected in the method blanks: dissolved barium, dissolved cobalt, dissolved manganese, dissolved vanadium, dissolved iron, dissolved nickel, total vanadium, total sodium, total calcium, TPH (GC/FID) low fraction, methylene chloride, n-butylbenzene, carbon disulfide, p-isopropyltoluene, and 1,3,5-trimethylbenzene. The analytes listed below were detected in the corresponding samples at concentrations within five times the method blank concentration for inorganic analytes and within 10 times the method blank concentration for organic analytes. Therefore, these samples may include measurement contributions from the laboratory.

- Dissolved barium: MW-84
- Dissolved manganese: EB-EP-03
- Dissolved vanadium: OCD-8A, KWB-7, MW-45, MW-49
- Dissolved iron: MW-49, MW-101, MW-105
- Total vanadium: OCD-8A, KWB-7
- Total calcium: EB-REST-01, EB-REST-03
- TPH (GC/FID) low fraction: MW-82, MW-120, MW-130
- 1,3,5-Trimethylbenzene: MW-102, MW-114, RW-4
- n-Butylbenzene: MW-49, MW-102, MW-103, MW-114
- p-Isopropyltoluene: MW-102, RW-4
- Carbon disulfide: MW-3, MW-49, MW-78, MW-83, MW-84, MW-101, TRIP BLANK-REST-04

Equipment Blanks

The following table summarizes the analytes were detected in the equipment blank samples and the associated samples based on the location at the site. The analytes listed in the table below were detected in the corresponding samples at concentrations within five times the maximum equipment blank concentration, where applicable, for inorganic analytes and within 10 times the maximum equipment blank concentration for organic analytes. Therefore, the analytes for the impacted samples listed in the table below may include measurement contributions from the field.

Blank ID(s)	Analyte	Impacted Sample Results*
EB-EP-03	Dissolved solids	None
	Total: barium, calcium, manganese, and sodium	
	Dissolved manganese**	
	TPH (GC/FID) high fraction	MW-1R, MW-120, MW-121
Associated samples (EP Area of the site from this report): DUP-EP-01, DUP-EP-02, DUP-EP-03, MW-1R, MW-3, MW-4A, MW-5A, MW-6A, MW-7A, MW-10, MW-15, MW-22A, MW-75, MW-76, MW-77, MW-78, MW-82, MW-83, MW-84, MW-88, MW-120, MW-121, MW-123, OCD-8A		
EB-REST-01	1,2,4-Trimethylbenzene	DUP-REST-02, KWB-7, MW-101, MW-102, MW-105, MW-109, RW-4
	sec-Butylbenzene	DUP-REST-01, DUP-REST-02, KWB-11B, MW-20, MW-49, MW-61, MW-102, MW-103, MW-105, MW-113, MW-125
	Dissolved manganese	KWB-11B, MW-103
EB-REST-02	Benzene	DUP-REST-02, MW-61, MW-102, MW-104, MW-105, RW-4, RW-9
EB-REST-01, EB-REST-03	Carbon disulfide	DUP-REST-01, DUP-REST-03, KWB-11B, KWB-7, MW-20, MW-49***, MW-64, MW-101***, MW-102, MW-103, MW-104, MW-109, MW-114, MW-115, MW-125, MW-134, RA-313, RA-3156, RA-4798, RW-4
EB-REST-01, EB-REST-02, EB-REST-03	TPH (GC/FID) high fraction	DUP-REST-01, DUP-REST-03, KWB-11B, MW-20, MW-25, MW-52, MW-56, MW-113, MW-115, MW-125, MW-134
EB-REST-02, EB-REST-03	Total barium	DUP-REST-03, KWB-11B, MW-20, MW-45, MW-52, MW-56, MW-114, MW-115, MW-125, MW-134
EB-REST-02	Total arsenic	MW-113, KWB-11B, DUP-REST-01
	Dissolved arsenic	MW-113, KWB-7, KWB-11B, DUP-REST-01
	Total chromium	DUP-REST-03, MW-103, MW-104, MW-105, MW-115, MW-130, RW-9
	Dissolved chromium	KWB-11B, KWB-7, MW-49, MW-56, MW-61, MW-102, MW-103, MW-104, MW-105, MW-109, MW-125, MW-134, RW-4
	Total manganese	DUP-REST-03, KWB-11B, MW-20, MW-103, MW-134
	Total potassium	DUP-REST-01, DUP-REST-02, KWB-7, MW-20, MW-52, MW-64, MW-102, MW-110, MW-113, MW-115
	Total iron	DUP-REST-02, DUP-REST-03, KWB-11B, MW-49, MW-56, MW-61, MW-64, MW-101, MW-102, MW-103, MW-104, MW-105, MW-134, RW-4, RW-9
	Dissolved solids	None
	Total sodium	
EB-REST-03	Dissolved barium	
EB-REST-01**, EB-REST-02, EB-REST-03**	Total calcium	

Blank ID(s)	Analyte	Impacted Sample Results*
Associated samples (the remaining Areas of the site from this report. i.e., REST, NCL, TEL, and TMD): NCL: MW-45, MW-56 TEL: MW-49 TMD: MW-20, MW-25 REST: DUP-REST-01, DUP-REST-02, DUP-REST-03, KWB-11B, KWB-7, MW-52, MW-61, MW-64, MW-101, MW-102, MW-103, MW-104, MW-105, MW-109, MW-110, MW-113, MW-114, MW-115, MW-125, MW-130, MW-134, RA-313, RA-3156, RA-4798, RW-4, RW-9		
*Impacted sample results are those that were detected at concentrations within five times the maximum associated equipment blank concentration for inorganic analytes and within 10 times the maximum associated equipment blank concentration for organic analytes.		

**Note that these asterisked results in the equipment blank samples noted in the table above were less than five times the concentration detected in the associated method blank for inorganic analytes; therefore, the results for the asterisked results in the equipment blank samples noted in the table above were probably the result of laboratory method blank contamination and did not affect any associated field samples.

***Note that these asterisked results in the samples noted in the table above were also less than 10 times the concentration detected in the associated method blank.

Trip Blanks

Carbon disulfide was detected in two of the trip blank samples, TRIP BLANK-REST-01 and TRIP BLANK-REST-04. Note that the result for carbon disulfide in sample TRIP BLANK-REST-04 was less than 10 times the concentration detected in the associated method blank; therefore, this result was probably the result of laboratory method blank contamination and did not affect any associated field samples. Potential high bias exists for the positive results for carbon disulfide in samples DUP-REST-01, DUP-REST-03, EB-REST-01, EB-REST-03, KWB-11B, KWB-7, MW-3, MW-20, MW-49*, MW-64, MW-78*, MW-84*, MW-101*, MW-102, MW-103, MW-104, MW-109, MW-114, MW-115, MW-125, MW-134, RA-313, RA-3156, RA-4798, and RW-4 since the sample results were less than 10 times the concentrations detected in the associated trip blank; note that the result for carbon disulfide in the asterisked samples (*) were also less than 10 times the concentrations detected in the associated method blank.

LCS/LCSD

The LCS %R for naphthalene (VOC) (50.2%) was below the laboratory-defined recovery limits (54-135%) in QC batch WG1849677. Therefore the nondetect results for naphthalene (VOC) in the associated samples, MW-6A, MW-75, MW-76, MW-77, MW-82, MW-120, MW-121, and MW-130, are potentially biased low.

The LCS %R for naphthalene (VOC) (48.6%) was below the laboratory-defined recovery limits (54-135%) in QC batch WG1849914. Therefore the positive and nondetect results for naphthalene (VOC) in the associated samples, DUP-EP-01, DUP-EP-02, EB-EP-03, MW-1R, MW-4A, MW-5A, MW-7A, MW-10, MW-15, MW-22A, MW-25, MW-52, MW-88, MW-109, MW-110, MW-113, MW-123, OCD-8A, and TRIP BLANK-EP-02, are potentially biased low.

The LCSD %R for bromoform (67.6%), the LCS %R for carbon disulfide (131%), and the LCS/LCSD RPD for acetone (30.6%) were outside of the laboratory-defined recovery limits (68-

132%, 61-128%, and 27%, respectively) in QC batch WG1850790. Sample MW-109 was only analyzed for benzene in this QC batch so there is no impact on the data usability due to these issues in that sample. Potential low bias exists for the nondetect results for bromoform and carbon disulfide in sample DUP-EP-03 due to the low LCS and LCSD %Rs; there is no impact on the data usability for acetone due to the RPD issue since acetone was not detected in sample DUP-EP-03.

The LCS %R for benzaldehyde (202%) was above the laboratory-defined recovery limits (10-160%) in QC batch WG1850343. However, since benzaldehyde was not detected in the associated sample, MW-61, there is no impact on data usability.

MS/MSD

MS and/or MS/MSD analyses were performed on the following samples:

- KWB-11B, MW-6A, MW-25, EB-REST-01, DUP-EP-02: Nitrate-nitrite
- MW-45: Cyanide
- KWB-7, MW-123, MW-130, EB-EP-03, EB-REST-03: Chloride, fluoride, sulfate
- KWB-7: Dissolved mercury
- OCD-8A: Total boron
- MW-3, MW-110, EB-REST-02: Dissolved metals
- MW-7A, MW-20, MW-49: Total metals
- MW-109, MW-110: TPH (GC/FID) low fraction
- RW-9: Ethylene dibromide

The %Rs of chloride and sulfate in the MSs performed on samples MW-123 and KWB-7 were below the laboratory-defined recovery limits (80-120%). However, the concentrations of chloride and sulfate in the unspiked samples were greater than four times the spiked concentrations; thus, the %Rs of chloride and sulfate were not used to evaluate potential matrix effects.

The %Rs of sulfate in the MS/MSD performed on sample MW-130 were below the laboratory-defined recovery limits (80-120%). However, the concentration of sulfate in the unspiked sample was greater than four times the spiked concentration; thus, the %Rs of sulfate were not used to evaluate potential matrix effects.

The %Rs of chloride (39.1%), fluoride (37.9%), and sulfate (38.9%) in the MS performed on sample EB-REST-03 were below the laboratory-defined recovery limits (80-120%). Therefore, potential low bias exists for the nondetect results for chloride, fluoride, and sulfate in this equipment blank sample.

The %Rs of dissolved manganese in the MS/MSD performed on sample MW-3 were below the laboratory-defined recovery limits (75-125%). However, the concentration of dissolved manganese in the unspiked sample was greater than four times the spiked concentration; thus, the %Rs of dissolved manganese were not used to evaluate potential matrix effects.

The %Rs of total calcium and total sodium in the MS and/or MSD performed on samples MW-7A, MW-20, and MW-49 were outside of the laboratory-defined recovery limits (75-125%). However, the concentrations of these analytes in the unspiked samples were greater than four times

the spiked concentrations; thus, the %Rs of total calcium and total sodium were not used to evaluate potential matrix effects.

The %R of total manganese (68.1%) in the MS performed on sample MW-49 was outside of the laboratory-defined recovery limits (75-125%); therefore, the positive results for total manganese in all groundwater samples from this lab report except MW-7A and MW-20 may be biased low.

Surrogate Recoveries

The surrogate (o-terphenyl) recovered below the laboratory-defined control limits (31.0-160%) in the TPH (GC/FID) high fraction analyses of samples MW-76 (1.66%), MW-77 (0%), and MW-84 (0%). There was no impact on the data usability due to this issue since the samples were diluted ≥ 10 -fold; therefore, the surrogate recoveries were not applicable.

The surrogate (o-terphenyl) recovered above the laboratory-defined control limits (31.0-160%) in the TPH (GC/FID) high fraction analysis of sample DUP-REST-02 (166%). The laboratory noted that this surrogate issue was due to matrix interference. Therefore, the positive result for TPH (GC/FID) high fraction in sample DUP-REST-02 may be biased high.

Laboratory Duplicates

Laboratory duplicate analyses were performed on the following samples:

- MW-78, MW-102, MW-104, MW-110, MW-114, MW-115 (re-prep), MW-121 (re-prep), MW-130, RA-4798, DUP-EP-02 (4/28/22), EB-REST-02: Dissolved solids
- KWB-11B, MW-6A, MW-25, EB-REST-01, DUP-EP-02: Nitrate-nitrite
- KWB-11B: Cyanide
- KWB-7, MW-123, MW-130, EB-EP-03, EB-REST-03: Chloride, fluoride, sulfate
- EB-REST-02: Ethylene dibromide

The RPDs for dissolved solids in the duplicate analyses performed on samples MW-78 (15.5%) and MW-130 (9.40%) exceeded the laboratory-defined control limit (5%). However, there was no impact on the data usability since the RPDs were within the acceptance criteria used in this evaluation (20%).

Field Duplicates

Samples DUP-EP-01/MW-7A, DUP-EP-02/MW-22A, DUP-EP-03/MW-3, DUP-REST-01/MW-113, DUP-REST-02/MW-102, and DUP-REST-03/MW-134 were submitted as the field duplicate pairs. All criteria were met except as noted below:

- The results for total chromium were $< 5 \times$ the RL in both samples in the field duplicate pair MW-7A/DUP-EP-01 and the absolute difference was greater than the RL. Therefore, the positive results for total chromium in samples MW-7A and DUP-EP-01 may be considered estimated.

- The RPD for TPH (GC/FID) high fraction (32.5%) was above the acceptance criteria (30%) in field duplicate pair MW-102/DUP-REST-02. Therefore, the positive results for TPH (GC/FID) high fraction in samples MW-102 and DUP-REST-02 may be considered estimated.
- It should be noted that the re-prepared dissolved solids results from 5/11/22 were used in the field duplicate evaluation for samples MW-22A/DUP-EP-02 due to the potential low bias explained above for the initial dissolved solids results in these two samples. The initial dissolved solids results in these two samples were not evaluated. No field duplicate variability issues were noted with the re-prepared dissolved solids results from 5/11/22 in this field duplicate pair. It should also be noted that samples MW-22A/DUP-EP-02 were not analyzed for the same analyte list. The duplicate sample (DUP-EP-02) was not analyzed for 1,4-dioxane while the parent sample (MW-22A) was. Therefore, an evaluation of 1,4-dioxane could not be performed for this field duplicate pair.
- It should be noted that samples MW-3/DUP-EP-03 were not analyzed for the same analyte list. The duplicate sample (DUP-EP-03) was not analyzed for 1,4-dioxane while the parent sample (MW-3) was. Therefore, an evaluation of 1,4-dioxane could not be performed for this field duplicate pair. Further, the results for TPH (GC/FID) low fraction were analyzed at two different dilutions in this field duplicate pair; TPH (GC/FID) low fraction was detected > the RL but < 5x the RL in sample MW-3 and TPH (GC/FID) low fraction was not detected at a higher RL in the duplicate sample, DUP-EP-03. There is no adverse impact on the data usability due to this issue since the absolute difference was < the lower parent sample RL for TPH (GC/FID) low fraction.

Lab Report L1546101 (Revised 1/26/23)/L1579898*

*Data package L1579898 was issued in January 2023 to report only missing cation data for two samples collected in October 2022 that were not reported by the laboratory in data package L1546101; thus, the data validation for both October 2022 data packages listed above were combined into one data review checklist/data review summary section below.

Sample identifiers cross-referenced to laboratory identifications are presented below.

Lab ID	Sample ID
L1546101-01	MW-120
L1546101-02	MW-121
L1546101-03	MW-84
L1546101-04	MW-122
L1546101-05	MW-79
L1546101-06	MW-74
L1546101-07	MW-2A
L1546101-08	OCD-6
L1546101-09	OCD-7AR
L1546101-10	MW-130
L1546101-11	EB-EP-01
L1546101-12	EB-EP-04
L1546101-13	TRIP BLANK-EP-01
L1546101-14	MW-76
L1546101-15	MW-75
L1546101-16	MW-83
L1546101-17	MW-3
L1546101-18	MW-88
L1546101-19	MW-22A
L1546101-20	MW-10
L1546101-21	MW-123
L1546101-22	MW-4A
L1546101-23	MW-5A
L1546101-24	MW-7A
L1546101-25	OCD-8A
L1546101-26	DUP-EP-01 ¹
L1546101-27	DUP-EP-02 ²
L1546101-28	DUP-EP-03 ³
L1546101-29	EB-EP-03
L1546101-30	TRIP BLANK-EP-02
L1546101-31	OCD-1R
L1546101-32	OCD-2A
L1546101-33	OCD-3
L1546101-34	OCD-4
L1546101-35	MW-11A
L1546101-36	OCD-5

Lab ID	Sample ID
L1546101-37	MW-87
L1546101-38	MW-18A
L1546101-39	MW-70
L1546101-40	MW-124
L1546101-41	MW-52
L1546101-42	MW-109
L1546101-43	MW-110
L1546101-44	EB-EP-02
L1546101-45	TRIP BLANK-EP-03
L1546101-46	MW-113
L1546101-47	MW-134
L1546101-48	KWB-7
L1546101-49	MW-135
L1546101-50	NP-1
L1546101-51	MW-21
L1546101-52	KWB-11A
L1546101-53	KWB-11B
L1546101-54	MW-115
L1546101-55	MW-114
L1546101-56	MW-125
L1546101-57	DUP-REST-01 ⁴
L1546101-58	EB-REST-01
L1546101-59	DUP-REST-03 ⁵
L1546101-60	EB-REST-03
L1546101-61	TRIP BLANK-REST-01
L1546101-62	TRIP BLANK-TMD-01
L1546101-63	MW-117
L1546101-64	MW-118
L1546101-65	MW-119
L1546101-66	MW-136
L1546101-67	MW-126B
L1546101-68	KWB-1A
L1546101-69	KWB-12A
L1546101-70	KWB-12B
L1546101-71	DUP-REST-05 ⁶
L1546101-72	EB-REST-05
L1546101-73	TRIP BLANK-REST-02
L1546101-74	MW-104
L1546101-75	MW-64
L1546101-76	MW-102
L1546101-77	MW-116
L1546101-78	MW-46R
L1546101-79	MW-145
L1546101-80	MW-146

Lab ID	Sample ID
L1546101-81	MW-147
L1546101-82	MW-148
L1546101-83	DUP-REST-02 ⁷
L1546101-84	EB-REST-02
L1546101-85/ L1579898-01**	DUP-REST-04 ⁸
L1546101-86/ L1579898-02**	EB-REST-04
L1546101-87	TRIP BLANK-REST-03
L1546101-88	MW-101
L1546101-89	MW-105
L1546101-90	MW-61
L1546101-91	MW-62
L1546101-93	TEL-4
L1546101-94	MW-98
L1546101-95	MW-49
L1546101-96	MW-45
L1546101-97	MW-29
L1546101-98	DUP-TEL-01 ⁹
L1546101-99	EB-TEL-01
L1546101-100	TRIP BLANK-REST-04
L1546101-101	TRIP BLANK-TEL-01
L1546101-102	MW-139
L1546101-103	MW-50
L1546101-104	MW-90
L1546101-105	MW-96
L1546101-106	MW-55
L1546101-107	NCL-33
L1546101-108	NCL-44
L1546101-109	NCL-32
L1546101-110	MW-108
L1546101-111	NCL-31
L1546101-112	MW-54A
L1546101-113	NCL-49
L1546101-114	DUP-NCL-01 ¹⁰
L1546101-115	EB-NCL-01
L1546101-116	TRIP BLANK-NCL-01

¹Field duplicate of MW-7A²Field duplicate of MW-22A³Field duplicate of MW-3⁴Field duplicate of MW-113⁵Field duplicate of MW-134⁶Field duplicate of KWB-12B⁷Field duplicate of MW-102⁸Field duplicate of MW-146⁹Field duplicate of TEL-4¹⁰Field duplicate of NCL-49

**Only cations results (calcium, potassium, sodium) were reported in laboratory report L1579898 for this sample.

Items	Yes	No	Not applicable
Did all samples meet the laboratory's standard conditions of sample acceptability upon receipt?		X	
All samples within holding times?		X	
Any detection in method blanks?	X		
Any detection in equipment blanks?	X		
Any detection in trip blanks?	X		
Any LCS/LCSD %R out of laboratory defined limits?	X		
Any LCS/LCSD RPD above laboratory defined limits?	X		
Any MS/MSD %R outside of laboratory defined limits?	X		
Any MS/MSD RPD above laboratory defined limits?		X	
Any surrogate %R outside of laboratory defined limits?	X		
Any laboratory duplicate RPD above laboratory defined limits?	X		
Any field duplicate data additionally flagged as estimated?	X		
Any analyte analyzed by a nonequivalent method than planned?		X	

Other

The laboratory report was revised on 1/20/26 to report all VOC results from the 1-fold diluted VOC analysis of sample MW-90.

The laboratory noted that containers for 1,4-dioxane and ethylene dibromide analyses were submitted but not requested on the COC for sample MW-126B; these containers were inadvertently collected and submitted so the laboratory was instructed not to perform these two analyses for this sample.

The laboratory noted that containers for sulfide analysis were submitted but not requested on the COC for samples MW-102 and MW-105; these containers were for a different data set and were therefore, not analyzed or reported in this laboratory report.

Sample MW-62R was inadvertently listed on the bottle order and therefore, inadvertently sampled and listed on the COC; no analyses were performed for this sample.

RLs for dissolved solids in all samples except all but one (EB-TEL-01) of the equipment blanks (EB-EP-01, EB-EP-02, EB-EP-03, EB-EP-04, EB-NCL-01, EB-REST-01, EB-REST-02, EB-REST-03, EB-REST-04, and EB-REST-05) were 1.33 to 100 times higher than the associated method blank but the laboratory did not include a sample narrative explaining the elevated RLs. The samples were likely prepared at a reduced volume due to the elevated concentrations of dissolved solids. There is no impact on data usability since dissolved solids results were detected above the RLs in the affected samples except for EB-TEL-01; the nondetect RL for dissolved solids in sample EB-TEL-01 was elevated accordingly.

The laboratory noted that the nitrate-nitrite analyses of sample MW-84 (due to color) and samples DUP-REST-02, DUP-TEL-01, KWB-7, MW-49, MW-61, MW-62, MW-64, MW-90, MW-96, MW-98, MW-101, MW-102, MW-104, MW-108, MW-109, MW-113, MW-139, and TEL-4 (due to sulfide interference) were diluted between 5 and 50-fold for the listed reasons. Therefore, the RLs for nitrate-nitrite in these samples were elevated accordingly.

The laboratory noted that the VOC analysis of sample NP-1 was diluted 20-fold due to elevated concentrations of target analytes (i.e., methyl tert-butyl ether). Therefore, the RLs for VOCs in this sample were elevated accordingly.

The laboratory noted that the cyanide analysis of sample MW-49 was diluted 25-fold due to sulfide interference. Therefore, the RL for cyanide in this sample was elevated accordingly.

The laboratory noted that the chloride, fluoride, and sulfate analyses of samples KWB-7, KWB-11A, KWB-11B, MW-7A, MW-11A, MW-45, MW-54A, MW-55, MW-123, MW-124, MW-125, MW-134, MW-135, MW-139, NCL-49, OCD-5, OCD-6, OCD-7AR, DUP-EP-01, DUP-REST-03, and DUP-NCL-01 were diluted between 10 and 100-fold due to matrix. Fluoride was not detected in samples OCD-6 and OCD-7AR; the RLs were elevated accordingly. There is no impact on data usability for remaining chloride, fluoride, and sulfate results in the listed samples since these analytes were detected above the MDLs and/or RLs in these samples.

Several other samples were analyzed at dilutions for nitrate-nitrite, total metals, chloride, fluoride, sulfate, VOCs, TPH (GC/FID) high fraction, and/or TPH (GC/FID) low fraction but the laboratory did not include a sample narrative explaining the dilutions. The samples were likely diluted either due to matrix interference and/or the presence of target and/or non-target analytes which would have exceeded the calibration range if undiluted. There is no impact on data usability for nitrate-nitrite, select total metals except as noted below, chloride, fluoride, sulfate, TPH (GC/FID) high fraction, and/or TPH (GC/FID) low fraction since these analytes were detected above the MDLs and/or RLs in the diluted samples. The nondetect RLs for select total metals in samples DUP-EP-01, DUP-EP-02, DUP-EP-03, MW-2A, MW-3, MW-4A, MW-5A, MW-7A, MW-10, MW-18A, MW-22A, MW-74, MW-75, MW-79, MW-84, MW-87, MW-88, MW-120, MW-123, MW-124, OCD-1R, OCD-2A, OCD-4, OCD-5, and OCD-8A, and select VOCs in samples MW-61, MW-62, MW-64, MW-96, MW-98, MW-102, MW-105, MW-109, MW-113, and DUP-REST-02 were elevated accordingly.

The laboratory flagged the result for total arsenic in sample MW-123 with an "O1" qualifier indicating that either a SD or PDS result was outside of the acceptance criteria. The laboratory was contacted during this review and specified that the SD performed on this sample was outside of the acceptance criteria (10 %D) for total arsenic (15.8 %D). However, the result for total arsenic in the parent sample (MW-123) was < 50x the MDL; thus, the SD %D was not applicable. There is no impact on the data usability due to this issue.

The laboratory flagged the result for total barium in sample OCD-5 with an "O1" qualifier indicating that either a SD or PDS result was outside of the acceptance criteria. The laboratory was contacted during this review and specified that the SD performed on this sample was outside of the acceptance criteria (10 %D) for total barium (15.8 %D). However, the result for total barium in the parent sample (OCD-5) was < 50x the MDL; thus, the SD %D was not applicable. There is no impact on the data usability due to this issue.

Standard Conditions

The laboratory noted in the narrative that the nitrate-nitrite analysis of sample MW-74 was performed from an unpreserved, insufficiently or inadequately preserved sample container. **Due**

to lack of or inadequate preservation, the nondetect result for nitrate-nitrite in sample MW-74 collected on October 11, 2022 is not useable for project objectives.

The laboratory noted that the TPH (GC/FID) low fraction analyses of samples MW-113 and DUP-REST-01 were performed using a container with a pH outside of the method requirement (≤ 2). This pH issue shortens the analysis holding time to seven days and these samples were analyzed for TPH (GC/FID) low fraction after seven days of collection. Therefore, the positive results for TPH (GC/FID) low fraction in samples MW-113 and DUP-REST-01 may be biased low.

The laboratory noted that the VOC analyses of samples DUP-REST-02, DUP-TEL-01, MW-49, MW-62, MW-64, MW-102, MW-108, and TEL-4 were performed using a container with a pH outside of the method requirement (≤ 2). This pH issue shortens the analysis holding time to seven days and samples DUP-REST-02, MW-49 (benzene only), and MW-102 were analyzed for VOCs after seven days of collection. Samples MW-49 (all VOCs except benzene), MW-62, MW-64, MW-108, DUP-TEL-01, and TEL-4 were analyzed within 7 days of collection; therefore, there is no impact on the data usability in these samples due to this issue. The positive and nondetect results for all VOCs in samples DUP-REST-02 and MW-102, and benzene in sample MW-49 may be biased low.

Holding Times

Sample NCL-33 was prepared one day outside of the 7-day holding time for dissolved solids; therefore, the positive result for dissolved solids in sample NCL-33 may be biased low.

Several samples were prepared for dissolved solids after the 7-day holding time expired but before the 8th day after collection; there is no impact on the data usability due to this issue since the affected samples were prepared on the 7th day after collection.

Sample MW-4A was re-analyzed one day outside of the 14-day holding time for TPH (GC/FID) low fraction due to over dilution of the original, in-hold analysis; the laboratory reported both the in-hold and out of hold TPH (GC/FID) low fraction results for this sample. In order to remain conservative, the higher result for TPH (GC/FID) low fraction from the re-analysis should be used for project objectives for this sample. The positive result for TPH (GC/FID) low fraction in the re-analysis of sample MW-4A may be biased low due to the holding time exceedance.

Sample DUP-EP-02 was analyzed one day outside of the 14-day holding time for TPH (GC/FID) low fraction; therefore, the positive result for TPH (GC/FID) low fraction in sample DUP-EP-02 may be biased low.

Sample MW-90 (total xylenes only) and sample MW-96 (methyl tert-butyl ether only) were analyzed for the listed VOCs approximately 6.5-7 hours after the 14-day holding time expired; there is no impact on the data usability due to this issue since these samples were analyzed on the 14th day after collection.

Laboratory Method Blanks

The following analytes were detected in the method blanks: total chromium, TPH (GC/FID) low fraction, naphthalene (VOC), n-butylbenzene, carbon disulfide, p-isopropyltoluene,

and 1,3,5-trimethylbenzene. The analytes listed below were detected in the corresponding samples at concentrations within five times the method blank concentration for inorganic analytes and within 10 times the method blank concentration for organic analytes. Therefore, these samples may include measurement contributions from the laboratory.

- Total chromium: DUP-REST-03, MW-46R, MW-102
- TPH (GC/FID) low fraction: MW-3, MW-126B, MW-136, OCD-8A
- Naphthalene (VOC): DUP-REST-01, MW-113, KWB-7
- 1,3,5-Trimethylbenzene: KWB-7
- Carbon disulfide: KWB-7
- n-Butylbenzene: KWB-7

Equipment Blanks

The following table summarizes the analytes were detected in the equipment blank samples and the associated samples based on the location at the site. The analytes listed in the table below were detected in the corresponding samples at concentrations within five times the maximum equipment blank concentration, where applicable, for inorganic analytes and within 10 times the maximum equipment blank concentration for organic analytes. Therefore, the analytes for the impacted samples listed in the table below may include measurement contributions from the field.

Blank ID(s)	Analyte	Impacted Sample Results*
EB-EP-01, EB-EP-02, EB-EP-03, EB-EP-04	Total barium	DUP-EP-01, DUP-EP-02, DUP-EP-03, MW-2A, MW-3, MW-4A, MW-5A, MW-7A, MW-10, MW-18A, MW-22A, MW-74, MW-75, MW-79, MW-84, MW-87, MW-88, MW-120, MW-123, MW-124, OCD-4, OCD-5, OCD-8A
EB-EP-02, EB-EP-04	Total sodium	None
EB-EP-01, EB-EP-02	Total calcium	
EB-EP-03	Chloride	
	Total chromium	
	TPH (GC/FID) high fraction	MW-2A, MW-4A, MW-18A, MW-76, MW-79, MW-87, MW-88, MW-120, MW-121, MW-122, MW-124, OCD-1R, OCD-2A, OCD-6
EB-EP-01, EB-EP-04	Total selenium	DUP-EP-02, DUP-EP-03, MW-2A, MW-3, MW-22A, MW-74, MW-76, MW-83, MW-84, MW-121, OCD-3, OCD-6, OCD-7AR
Associated samples (EP Area of the site from this report): DUP-EP-01, DUP-EP-02, DUP-EP-03, MW-10, MW-11A, MW-18A, MW-22A, MW-2A, MW-3, MW-4A, MW-5A, MW-7A, MW-70, MW-74, MW-75, MW-76, MW-79, MW-83, MW-84, MW-87, MW-88, MW-120, MW-121, MW-122, MW-123, MW-124, OCD-1R, OCD-2A, OCD-3, OCD-4, OCD-5, OCD-6, OCD-7AR, OCD-8A		
EB-TEL-01	Total iron	MW-49
	Carbon disulfide	DUP-TEL-01, MW-49, TEL-4
	TPH (GC/FID) high fraction	None
	Total: barium, calcium, chromium, manganese, sodium	
Associated samples (TEL Area of the site from this report): MW-49, TEL-4, DUP-TEL-01		

Blank ID(s)	Analyte	Impacted Sample Results*
EB-NCL-01	Total calcium	None
	Dissolved solids	
	Total selenium	DUP-NCL-01, MW-54A, MW-55, NCL-31, NCL-32, NCL-33, NCL-44, NCL-49
Associated samples (NCL Area of the site from this report): DUP-NCL-01, MW-45, MW-54A, MW-55, MW-108, NCL-31, NCL-32, NCL-33, NCL-44, NCL-49		
EB-REST-01	Carbon disulfide	DUP-REST-01, DUP-REST-03, KWB-7**, KWB-11A, KWB-11B, MW-21, MW-29, MW-46R, MW-61, MW-62, MW-98, MW-101, MW-104, MW-105, MW-113, MW-116, MW-134, MW-135, MW-145, MW-147
	Dissolved Solids	KWB-12A
EB-REST-01, EB-REST-02, EB-REST-04, EB-REST-05	Total barium	None
	Total calcium	
EB-REST-01, EB-REST-04, EB-REST-05	Total sodium	
EB-REST-03	Chloride	MW-64
	Sulfate	
EB-REST-04	Total chromium	DUP-REST-01, DUP-REST-03**, MW-46R**, MW-62, MW-102**, MW-105, MW-109, MW-130, MW-134, MW-148
	Total manganese	DUP-REST-05, KWB-11B, KWB-12A, KWB-12B, MW-62, MW-96, MW-98, MW-117, MW-118, MW-119, MW-135, MW-147
EB-REST-05	Total mercury	KWB-11B, KWB-12B
	Total vanadium	KWB-7
Associated samples (the remaining Areas of the site from this report. i.e., REST and TMD): TMD: NP-1, MW-21, MW-46R REST: DUP-REST-01, DUP-REST-02, DUP-REST-03, DUP-REST-04, DUP-REST-05, KWB-11A, KWB-11B, KWB-12A, KWB-12B, KWB-1A, KWB-7, MW-29, MW-50, MW-52, MW-61, MW-62, MW-64, MW-90, MW-96, MW-98, MW-101, MW-102, MW-104, MW-105, MW-109, MW-110, MW-113, MW-114, MW-115, MW-116, MW-117, MW-118, MW-119, MW-125, MW-126B, MW-130, MW-134, MW-135, MW-136, MW-139, MW-145, MW-146, MW-147, MW-148		
*Impacted sample results are those that were detected at concentrations within five times the maximum associated equipment blank concentration for inorganic analytes and within 10 times the maximum associated equipment blank concentration for organic analytes.		

**Note that these asterisked results in the samples noted in the table above were also less than five times the concentration detected in the associated method blank.

Trip Blanks

Carbon disulfide and chloroform were detected in one of the trip blank samples, TRIP BLANK-EP-01. There is no impact on the data usability due to this issue since carbon disulfide and chloroform were not detected in the groundwater samples collected from the EP location of the site in this laboratory report (DUP-EP-01, DUP-EP-02, DUP-EP-03, MW-10, MW-11A, MW-18A, MW-22A, MW-2A, MW-3, MW-4A, MW-5A, MW-7A, MW-70, MW-74, MW-75, MW-76, MW-79, MW-83, MW-84, MW-87, MW-88, MW-120, MW-121, MW-122, MW-123, MW-124, OCD-1R, OCD-2A, OCD-3, OCD-4, OCD-5, OCD-6, OCD-7AR, and OCD-8A).

LCS/LCSD

The LCS/LCSD %Rs for bromoform (61.4%/61.0%) and the LCSD %R for chlorodibromomethane (76.6%) were below the laboratory-defined recovery limits (68-132% and 77-125%, respectively) in QC batch WG1943418. Therefore the nondetect results for bromoform and chlorodibromomethane in the associated samples, KWB-11A, KWB-11B, MW-21, MW-113, MW-134, MW-135, NP-1, TRIP BLANK-EP-01, and TRIP BLANK-EP-03, are potentially biased low.

The LCSD %Rs for bromoform (63.0%), cis-1,3-dichloropropene (74.6%), and trans-1,3-dichloropropene (71.6%) were below the laboratory-defined recovery limits (68-132%, 80-123%, and 78-124%, respectively) in QC batch WG1943622. Therefore the nondetect results for bromoform, cis-1,3-dichloropropene, and trans-1,3-dichloropropene in the associated samples, DUP-REST-04, DUP-REST-05, EB-REST-02, EB-REST-04, EB-REST-05, KWB-1A, KWB-12A, KWB-12B, MW-46R, MW-64, MW-104, MW-116, MW-145, MW-146, MW-147, MW-148, TRIP BLANK-REST-02, and TRIP BLANK-REST-03, are potentially biased low.

The LCS/LCSD RPD for chloromethane (20.7%) was outside of the laboratory-defined control limit (20%) in QC batch WG1943622. However, since chloromethane was not detected in the associated samples, DUP-REST-04, DUP-REST-05, EB-REST-02, EB-REST-04, EB-REST-05, KWB-1A, KWB-12A, KWB-12B, MW-46R, MW-64, MW-104, MW-116, MW-145, MW-146, MW-147, MW-148, TRIP BLANK-REST-02, and TRIP BLANK-REST-03, there is no impact on data usability.

The LCS/LCSD %Rs for bromoform (64.6%/65.0%), and LCS %Rs for cis-1,3-dichloropropene (74.2%) and trans-1,3-dichloropropene (73.6%) were below the laboratory-defined control limits (68-132%, 80-123%, and 78-124%, respectively) in QC batch WG1943691. Therefore the positive and nondetect results for bromoform, cis-1,3-dichloropropene, and trans-1,3-dichloropropene in the associated samples, DUP-NCL-01, DUP-TEL-01, EB-TEL-01, MW-29, MW-45, MW-49, MW-54A, MW-61, MW-62, MW-98, MW-101, MW-105, MW-108, NCL-31, NCL-32, NCL-33, NCL-44, NCL-49, and TEL-4, are potentially biased low.

The LCS/LCSD RPD for vinyl chloride (20.2%) was outside of the laboratory-defined control limit (20%) in QC batch WG1943691. Therefore, potential uncertainty exists for the positive result for vinyl chloride in associated sample MW-49. Since vinyl chloride was not detected in the remaining associated samples, DUP-NCL-01, DUP-TEL-01, EB-TEL-01, MW-29, MW-45, MW-54A, MW-61, MW-62, MW-98, MW-101, MW-105, MW-108, NCL-31, NCL-32, NCL-33, NCL-44, NCL-49, and TEL-4, there is no impact on data usability.

The LCS %R (53.0%) and the LCS/LCSD RPD (32.5%) for naphthalene (VOC) were outside of the laboratory-defined control limits (54-135% and 20%, respectively) in QC batch WG1944540. Therefore, the nondetect results for naphthalene (VOC) in the associated samples, EB-NCL-01 and TRIP BLANK-NCL-01, are potentially biased low.

The LCS %R for n-nitrosodiphenylamine (46.2%) was below the laboratory-defined recovery limits (47-120%) in QC batch WG1943567. Therefore, the nondetect results for n-nitrosodiphenylamine in the associated samples, MW-61 and MW-62, are potentially biased low.

MS/MSD

MS and/or MS/MSD analyses were performed on the following samples:

- KWB-11A, MW-2A, MW-7A, MW-46R, MW-79, MW-116, MW-117, DUP-EP-03: Nitrate-nitrite
- MW-4A, MW-96, MW-101, MW-104, EB-EP-01, EB-EP-02, EB-EP-03, EB-REST-01, EB-REST-05: Chloride, fluoride, sulfate
- KWB-11B: Total boron
- MW-120, MW-123, MW-147, OCD-5, OCD-6, EB-REST-01: Total metals

The %Rs of chloride and sulfate in the MS and MSDs performed on sample MW-4A were below the laboratory-defined recovery limits (80-120%). However, the concentrations of chloride and sulfate in the unspiked sample were greater than four times the spiked concentrations; thus, the %Rs of chloride and sulfate were not used to evaluate potential matrix effects.

The %R of sulfate in the MS performed on sample MW-104 was below the laboratory-defined recovery limits (80-120%). However, the concentration of sulfate in the unspiked sample was greater than four times the spiked concentration; thus, the %R of sulfate was not used to evaluate potential matrix effects.

The %Rs of total calcium, total manganese, and total sodium in the MS and/or MSD performed on samples MW-120, MW-123, and OCD-6 were outside of the laboratory-defined recovery limits (75-125%). However, the concentrations of these analytes in the unspiked samples were greater than four times the spiked concentrations; thus, the %Rs of total calcium, total manganese, and total sodium were not used to evaluate potential matrix effects.

The %Rs of total calcium and total sodium in the MS and MSD performed on samples MW-147 and OCD-5 were outside of the laboratory-defined recovery limits (75-125%). However, the concentrations of these analytes in the unspiked samples were greater than four times the spiked concentrations; thus, the %Rs of total calcium and total sodium were not used to evaluate potential matrix effects.

Surrogate Recoveries

The surrogate 1,2-dichloroethane-d4 recovered above the laboratory-defined recovery limits (70-130%) in the VOC analysis of sample EB-TEL-01 (135%). Therefore, the positive result for carbon disulfide in sample EB-TEL-01 may be biased high; there is no impact on nondetect results due to this issue.

Laboratory Duplicates

Laboratory duplicate analyses were performed on the following samples:

- KWB-11B, MW-90, MW-101, MW-105, MW-113, MW-130, MW-139, DUP-NCL-01, EB-NCL-01, EB-EP-03: Dissolved solids
- KWB-11A, MW-2A, MW-7A, MW-46R, MW-79, MW-116, MW-117, DUP-EP-03: Nitrate-nitrite

- MW-4A, MW-96, MW-104, EB-EP-01, EB-EP-02, EB-EP-03, EB-REST-01, EB-REST-05: Chloride, fluoride, sulfate

The RPD dissolved solids in the duplicate analysis performed on sample EB-NCL-01 (137%) exceeded the laboratory-defined control limit (5%). However, the results in the parent and duplicate samples were less than 5x the RL so the laboratory duplicate RPD was not applicable.

The RPDs for dissolved solids in the duplicate analyses performed on samples MW-101 (6.41%), MW-105 (5.43%), and MW-130 (10%) exceeded the laboratory-defined control limit (5%). However, there was no impact on the data usability since the RPDs were within the acceptance criteria used in this evaluation (20%).

Field Duplicates

Samples DUP-EP-01/MW-7A, DUP-EP-02/MW-22A, DUP-EP-03/MW-3, DUP-NCL-01/NCL-49, DUP-TEL-01/TEL-4, DUP-REST-01/MW-113, DUP-REST-02/MW-102, DUP-REST-03/MW-134, DUP-REST-04/MW-146, and DUP-REST-05/KWB-12B were submitted as the field duplicate pairs. All criteria were met except as noted below:

- The RPD for TPH (GC/FID) high fraction (49.1%) was above the acceptance criteria (30%) in field duplicate pair MW-7A/DUP-EP-01. Therefore, the positive results for TPH (GC/FID) high fraction in samples MW-7A and DUP-EP-01 may be considered estimated.
- The RPD for TPH (GC/FID) high fraction (47.4%) was above the acceptance criteria (30%) in field duplicate pair MW-22A/DUP-EP-02. Therefore, the positive results for TPH (GC/FID) high fraction in samples MW-22A and DUP-EP-02 may be considered estimated.
- The RPD for total selenium (42.8%) was above the acceptance criteria (30%) in field duplicate pair NCL-49/DUP-NCL-01. Therefore, the positive results for total selenium in samples NCL-49 and DUP-NCL-01 may be considered estimated.
- The RPD for total chromium (45.3%) was above the acceptance criteria (30%) in field duplicate pair TEL-4/DUP-TEL-01. Therefore, the positive results for total chromium in samples TEL-4 and DUP-TEL-01 may be considered estimated.
- The result for nitrate-nitrite was nondetect in sample MW-113 and the result for nitrate-nitrite was >5x the RL in sample DUP-REST-01; the absolute difference was greater than the RL. Therefore, the positive and nondetect results for nitrate-nitrite in samples MW-113 and DUP-REST-01 may be considered estimated.
- The results for benzene were <5x the RL in both samples in the field duplicate pair MW-134/DUP-REST-03 and the absolute difference was greater than the RL. Therefore, the positive results for benzene in samples MW-134 and DUP-REST-03 may be considered estimated.

- The RPD for dissolved solids (38.9%) was above the acceptance criteria (30%) in field duplicate pair KWB-12B/DUP-REST-05. Therefore, the positive results for dissolved solids in samples KWB-12B and DUP-REST-05 may be considered estimated.

Appendix E.1 - Summary of Production from Recovery Trenches and Wells

2022 Annual Groundwater Monitoring Report

HF Sinclair Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

Recovery Well	Recovery Method	Volume of Water Recovered ⁽¹⁾ (gallons)					Volume of PSH Recovered ⁽¹⁾ (gallons)				
		1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Total 2022	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Total 2022
RW-1R	Automated Pump	0	0	0	0	0	5,161	2,645	4,850	0	12,656
RW-2R	Automated Pump	227,055	241,450	457,113	410,806	1,336,424	8,797	17,048	12,778	19,443	58,066
RW-4R	Automated Pump	1,523,721	25,202	932,582	835,080	3,316,585	1	3	190	0	194
RW-5R	Automated Pump	18,958	16,788	6,221	33,330	75,297	0	7	127	1,666	1,800
RW-6R	Automated Pump	0	0	0	0	0	3	14	34	0	51
RW-7R	Automated Pump	169,072	13,587	467,432	306,602	956,693	5,761	10,561	3,043	11,755	31,120
RW-8R	Automated Pump	0	0	0	0	0	0	0	0	0	0
RW-12R	Automated Pump	0	0	0	0	0	0	0	0	0	0
RW-13R	Automated Pump	0	0	0	0	0	0	0	0	0	0
RW-14R	Automated Pump	0	258,635	1	1	258,637	0	12,589	13,315	2,253	28,157
RW-15	Automated Pump	0	0	0	0	0	0	0	0	0	0
RW-19	Automated Pump	0	0	151,624	7,133	158,757	0	0	60	181	241
RW-20	Automated Pump	0	0	0	0	0	0	0	0	0	0
RW-22 ⁽²⁾	Automated Pump	1	1	0	3	5	0	12,333	14,422	2	26,757
TOTAL VOLUME RECOVERED:		1,938,807	555,663	2,014,973	1,592,955	6,102,398	19,723	55,200	48,819	35,300	159,042

⁽¹⁾ Volumes of recovered water and PSH are based on automated system readings, rounded to the nearest gallon

Appendix E.1 - Recovery System Gauging Data
 2022 Annual Groundwater Monitoring Report
 HF Sinclair Navajo Refining LLC, Artesia Refinery, Artesia, NM

Automated Fluid Readings - Skid Area T-9012

Date	Total Fluids Readings				PSH Readings				Tank Reading T-9012
	RW-1R	RW-2R	RW-7R	RW-8R	RW-1R	RW-2R	RW-7R	RW-8R	
12/27/2021	502,787	2,612,776	3,304,807	3,692,647	61,091	35,266	49,659	74,717	322,360
1/3/2022	502,787	2,700,045	3,382,786	3,692,647	61,091	35,266	49,659	74,717	322,360
1/18/2022	502,787	2,768,586	3,422,698	3,692,647	61,091	35,266	49,659	74,717	322,389
1/24/2022	502,787	2,768,587	3,422,698	3,692,647	61,091	35,266	49,659	74,717	322,405
2/1/2022	502,787	2,768,587	3,422,698	3,692,647	61,091	35,266	49,659	74,717	322,407
2/8/2022	502,787	2,768,587	3,422,698	3,692,647	61,091	35,266	49,659	74,717	322,432
2/14/2022	502,787	2,768,587	3,422,698	3,692,647	61,091	35,266	49,659	74,717	322,435
2/21/2022	502,787	2,768,896	3,422,882	3,692,647	61,091	35,272	49,660	74,717	322,437
2/28/2022	502,787	2,787,432	3,437,769	3,692,647	61,091	36,852	50,682	74,717	322,438
3/8/2022	502,787	2,802,691	3,451,534	3,692,647	61,091	39,013	52,125	74,717	322,443
3/15/2022	502,787	2,815,584	3,460,701	3,692,647	61,096	41,187	53,546	74,717	322,444
3/22/2022	502,787	2,829,000	3,469,670	3,692,647	64,354	42,890	54,671	74,717	322,450
3/29/2022	502,787	2,839,831	3,473,879	3,692,647	66,252	44,063	55,420	74,717	322,450
1Q Totals:	-	227,055	169,072	-	5,161	8,797	5,761	-	90
4/5/2022	502,787	2,856,498	3,477,487	3,692,647	67,813	45,275	56,220	74,717	322,452
4/12/2022	502,787	2,875,937	3,479,708	3,692,647	67,896	45,375	56,271	74,717	322,565
4/19/2022	502,787	2,893,001	3,482,502	3,692,647	68,247	45,907	56,405	74,717	322,730
4/26/2022	502,787	2,915,077	3,484,418	3,692,647	68,265	46,820	56,902	74,717	323,339
5/3/2022	502,787	2,947,288	3,485,801	3,692,647	68,265	47,509	57,317	74,717	324,284
5/10/2022	502,787	2,983,423	3,486,647	3,692,647	68,292	48,235	57,847	74,717	325,021
5/17/2022	502,787	2,999,805	3,486,859	3,692,647	68,896	50,500	59,268	74,717	326,645
5/24/2022	502,787	2,999,805	3,486,859	3,692,647	68,896	50,500	59,268	74,717	326,645
5/31/2022	502,787	3,062,829	3,486,877	3,692,647	68,897	51,350	59,876	74,717	327,098
6/7/2022	502,787	3,070,083	3,486,907	3,692,647	68,897	53,417	61,237	74,717	327,885
6/14/2022	502,787	3,070,083	3,486,907	3,692,647	68,897	53,417	61,237	74,717	327,885
6/21/2022	502,787	3,078,084	3,486,926	3,692,647	68,897	58,590	64,420	74,717	330,175
6/28/2022	502,787	3,081,281	3,487,466	3,692,647	68,897	61,111	65,981	74,717	331,313
2Q Totals:	-	241,450	13,587	0	2,645	17,048	10,561	-	8,863
7/5/2022	502,787	3,105,205	3,528,007	3,692,647	69,644	64,175	65,981	74,717	332,443
7/12/2022	502,787	3,123,349	3,558,241	3,692,647	70,581	66,274	66,050	74,717	333,778
7/19/2022	502,787	3,152,243	3,594,159	3,692,647	70,581	67,210	66,064	74,717	334,601
7/26/2022	502,787	3,175,735	3,630,337	3,692,647	71,552	67,221	66,065	74,717	334,601
8/2/2022	502,787	3,202,834	3,666,497	3,692,647	72,357	68,723	66,065	74,717	335,677
8/9/2022	502,787	3,202,834	3,666,497	3,692,647	72,357	68,723	66,065	74,717	335,677
8/16/2022	502,787	3,279,985	3,741,198	3,692,647	73,746	70,704	66,287	74,717	337,648
8/23/2022	502,787	3,279,985	3,741,198	3,692,647	73,746	70,704	66,287	74,717	337,648
8/30/2022	502,787	3,361,888	3,808,448	3,692,647	73,747	71,438	67,479	74,717	337,935
9/6/2022	502,787	3,415,795	3,850,485	3,692,647	73,747	71,935	69,024	74,717	337,935
9/13/2022	502,787	3,415,795	3,850,485	3,692,647	73,747	71,935	69,024	74,717	337,935
9/20/2022	502,787	3,495,540	3,918,408	3,692,647	73,747	73,324	69,024	74,717	339,095
9/27/2022	502,787	3,538,394	3,954,898	3,692,647	73,747	73,889	69,024	74,717	339,095
3Q Totals:	-	457,113	467,432	-	4,850	12,778	3,043	-	7,782
10/4/2022	502,787	3,574,769	3,991,254	3,692,647	73,747	75,723	69,024	74,717	341,490
10/11/2022	502,787	3,575,965	3,996,167	3,692,647	73,747	75,759	69,024	74,717	342,981
10/18/2022	502,787	3,610,349	3,996,180	3,692,647	73,747	77,788	69,024	74,717	342,981
10/25/2022	502,787	3,610,349	3,996,180	3,692,647	73,747	77,788	69,024	74,717	342,981
11/1/2022	502,787	3,610,349	3,996,180	3,692,647	73,747	77,788	69,024	74,717	342,981
11/8/2022	502,787	3,755,039	3,996,180	3,692,647	73,747	80,365	69,024	74,717	343,098
11/15/2022	502,787	3,786,018	3,996,180	3,692,647	73,747	83,401	69,024	74,717	343,373
11/22/2022	502,787	3,786,018	3,996,180	3,692,647	73,747	83,401	69,024	74,717	343,373
11/29/2022	502,787	3,833,650	4,067,924	3,692,647	73,747	87,134	73,026	74,717	343,373
12/6/2022	502,787	3,833,650	4,067,924	3,692,647	73,747	87,134	73,026	74,717	343,373
12/13/2022	502,787	3,871,150	4,166,078	3,692,647	73,747	91,211	77,538	74,717	346,203
12/20/2022	502,787	3,910,282	4,211,761	3,692,647	73,747	92,023	79,778	74,717	346,493
12/27/2022	502,787	3,949,200	4,261,500	3,692,647	73,747	93,332	80,779	74,717	346,804
4Q Totals:	0	410,806	306,602	-	-	19,443	11,755	-	7,709

Appendix E.1 - Recovery System Gauging Data
 2022 Annual Groundwater Monitoring Report
 HF Sinclair Navajo Refining LLC, Artesia Refinery, Artesia, NM

Automated Fluid Readings - Skid Area T-9003

Date	Total Fluids Readings		PSH Readings		Tank Reading T-9003
	RW-4R	RW-6R	RW-4R	RW-6R	
12/27/2021	3,102,836	2,941,779	13,851	73,048	45,977
1/3/2022	3,477,494	2,941,779	13,851	73,048	45,984
1/18/2022	3,848,111	2,941,779	13,851	73,048	45,987
1/24/2022	3,848,111	2,941,779	13,851	73,048	46,024
2/1/2022	3,848,111	2,941,779	13,851	73,048	46,025
2/8/2022	3,848,111	2,941,779	13,851	73,048	46,026
2/14/2022	3,848,111	2,941,779	13,851	73,048	46,026
2/21/2022	3,848,504	2,941,779	13,851	73,048	46,026
2/28/2022	3,999,986	2,941,779	13,851	73,048	46,027
3/8/2022	4,176,964	2,941,779	13,851	73,048	46,051
3/15/2022	4,325,785	2,941,779	13,852	73,051	46,051
3/22/2022	4,508,786	2,941,779	13,852	73,051	46,057
3/29/2022	4,626,557	2,941,779	13,852	73,051	46,057
1Q Totals:	1,523,721	0	1	3	80
4/5/2022	4,651,759	2,941,779	13,852	73,051	46,059
4/12/2022	4,651,759	2,941,779	13,852	73,051	46,059
4/19/2022	4,651,759	2,941,779	13,852	73,051	46,059
4/26/2022	4,651,759	2,941,779	13,855	73,065	46,060
5/3/2022	4,651,759	2,941,779	13,855	73,065	46,060
5/10/2022	4,651,759	2,941,779	13,855	73,065	46,060
5/17/2022	4,651,759	2,941,779	13,855	73,065	46,060
5/24/2022	4,651,759	2,941,779	13,855	73,065	46,060
5/31/2022	4,651,759	2,941,779	13,855	73,065	46,060
6/7/2022	4,651,759	2,941,779	13,855	73,065	46,060
6/14/2022	4,651,759	2,941,779	13,855	73,065	46,060
6/21/2022	4,651,759	2,941,779	13,855	73,065	46,060
6/28/2022	4,651,759	2,941,779	13,855	73,065	46,060
2Q Totals:	25,202	0	3	14	3
7/5/2022	4,651,759	2,941,779	13,855	73,065	46,060
7/12/2022	4,651,759	2,941,779	13,855	73,065	46,060
7/19/2022	4,651,759	2,941,779	13,855	73,065	46,060
7/26/2022	4,651,759	2,941,779	13,855	73,065	46,060
8/2/2022	4,651,759	2,941,779	13,855	73,065	46,060
8/9/2022	4,651,759	2,941,779	13,855	73,065	46,060
8/16/2022	4,667,036	2,941,779	13,855	73,065	46,060
8/23/2022	4,667,036	2,941,779	13,855	73,065	46,060
8/30/2022	4,924,495	2,941,779	13,855	73,065	46,061
9/6/2022	5,114,102	2,941,779	13,855	73,065	46,061
9/13/2022	5,114,102	2,941,779	13,855	73,065	46,061
9/20/2022	5,425,574	2,941,779	13,856	73,095	46,061
9/27/2022	5,584,341	2,941,779	14,045	73,099	46,061
3Q Totals:	932,582	0	190	34	1
10/4/2022	5,748,541	2,941,779	14,045	73,099	46,061
10/11/2022	5,936,778	2,941,779	14,045	73,099	46,061
10/18/2022	6,065,596	2,941,779	14,045	73,099	46,061
10/25/2022	6,065,596	2,941,779	14,045	73,099	46,061
11/1/2022	6,065,596	2,941,779	14,045	73,099	46,061
11/8/2022	6,414,717	2,941,779	14,045	73,099	46,061
11/15/2022	6,419,421	2,941,779	14,045	73,099	46,063
11/22/2022	6,419,421	2,941,779	14,045	73,099	46,063
11/29/2022	6,419,421	2,941,779	14,045	73,099	46,063
12/6/2022	6,419,421	2,941,779	14,045	73,099	46,063
12/13/2022	6,419,421	2,941,779	14,045	73,099	46,106
12/20/2022	6,419,421	2,941,779	14,045	73,099	46,192
12/27/2022	6,419,421	2,941,779	14,045	73,099	46,364
4Q Totals:	835,080	-	-	-	303

Appendix E.1 - Recovery System Gauging Data
 2022 Annual Groundwater Monitoring Report
 HF Sinclair Navajo Refining LLC, Artesia Refinery, Artesia, NM

Automated Fluid Readings - Skid Area T-9021

Date	Total Fluids Readings			PSH Readings			Tank Reading T-9021
	RW-5R	RW-15	RW-19	RW-5R	RW-15	RW-19	
12/27/2021	663,682	2,559	391,048	28,860	13,070	10,505	664,304
1/3/2022	663,682	2,559	391,048	28,860	13,070	10,505	664,304
1/18/2022	663,682	2,559	391,048	28,860	13,070	10,505	664,304
1/24/2022	663,682	2,559	391,048	28,860	13,070	10,505	664,304
2/1/2022	663,682	2,559	391,048	28,860	13,070	10,505	664,304
2/8/2022	663,682	2,559	391,048	28,860	13,070	10,505	664,304
2/14/2022	663,682	2,559	391,048	28,860	13,070	10,505	664,304
2/21/2022	663,686	2,559	391,048	28,860	13,070	10,505	664,304
2/28/2022	667,733	2,559	391,048	28,860	13,070	10,505	664,304
3/8/2022	672,364	2,559	391,048	28,860	13,070	10,505	664,304
3/15/2022	676,174	2,559	391,048	28,860	13,070	10,505	664,304
3/22/2022	680,293	2,559	391,048	28,860	13,070	10,505	664,304
3/29/2022	682,640	2,559	391,048	28,860	13,070	10,505	664,304
1Q Totals:	18,958	-	0	0	-	-	0
4/5/2022	685,672	2,559	391,048	28,860	13,070	10,505	664,304
4/12/2022	688,399	2,559	391,048	28,860	13,070	10,505	664,304
4/19/2022	690,971	2,559	391,048	28,860	13,070	10,505	664,304
4/26/2022	693,638	2,559	391,048	28,860	13,070	10,505	664,304
5/3/2022	693,683	2,559	391,048	28,860	13,070	10,505	664,304
5/10/2022	694,280	2,559	391,048	28,860	13,070	10,505	664,309
5/17/2022	694,280	2,559	391,048	28,860	13,070	10,505	664,309
5/24/2022	694,280	2,559	391,048	28,860	13,070	10,505	664,309
5/31/2022	696,494	2,559	391,048	28,866	13,070	10,505	664,309
6/7/2022	698,187	2,559	391,048	28,866	13,070	10,505	664,310
6/14/2022	698,187	2,559	391,048	28,866	13,070	10,505	664,310
6/21/2022	699,119	2,559	391,048	28,867	13,070	10,505	664,634
6/28/2022	699,428	2,559	391,048	28,867	13,070	10,505	664,634
2Q Totals:	16,788	-	-	7	-	-	330
7/5/2022	699,937	2,559	391,048	28,867	13,070	10,505	664,768
7/12/2022	700,347	2,559	391,048	28,878	13,070	10,505	664,913
7/19/2022	700,848	2,559	391,048	28,878	13,070	10,505	666,046
7/26/2022	700,930	2,559	391,048	28,878	13,070	10,505	666,205
8/2/2022	701,108	2,559	391,048	28,891	13,070	10,505	670,116
8/9/2022	701,108	2,559	391,048	28,891	13,070	10,505	670,116
8/16/2022	704,667	2,559	391,048	28,915	13,070	10,505	674,475
8/23/2022	704,667	2,559	391,048	28,915	13,070	10,505	674,475
8/30/2022	705,649	2,559	542,672	28,954	13,070	10,565	679,249
9/6/2022	705,649	2,559	542,672	28,965	13,070	10,565	679,249
9/13/2022	705,649	2,559	542,672	28,965	13,070	10,565	679,249
9/20/2022	705,649	2,559	542,672	28,978	13,070	10,565	679,249
9/27/2022	705,649	2,559	542,672	28,994	13,070	10,565	679,249
3Q Totals:	6,221	-	151,624	127	-	60	14,615
10/4/2022	705,654	2,559	542,672	30,640	13,070	10,565	679,249
10/11/2022	705,654	2,559	542,672	30,640	13,070	10,565	679,250
10/18/2022	705,657	2,559	542,672	30,640	13,070	10,565	679,250
10/25/2022	705,657	2,559	542,672	30,640	13,070	10,565	679,250
11/1/2022	705,657	2,559	542,672	30,640	13,070	10,565	679,250
11/8/2022	705,859	2,559	542,672	30,640	13,070	10,565	679,250
11/15/2022	705,660	2,559	542,672	30,640	13,070	10,565	679,250
11/22/2022	705,660	2,559	542,672	30,640	13,070	10,565	679,250
11/29/2022	714,424	2,559	542,672	30,648	13,070	10,565	679,250
12/6/2022	714,424	2,559	542,672	30,648	13,070	10,565	679,250
12/13/2022	726,134	2,559	542,672	30,648	13,070	10,565	679,362
12/20/2022	732,117	2,559	544,433	30,656	13,070	10,746	679,362
12/27/2022	738,979	2,559	549,805	30,660	13,070	10,746	679,362
4Q Totals:	33,330	-	7,133	1,666	-	181	113

Appendix E.1 - Recovery System Gauging Data
 2022 Annual Groundwater Monitoring Report
 HF Sinclair Navajo Refining LLC, Artesia Refinery, Artesia, NM

Automated Fluid Readings - Skid Area T-9020

Date	Total Fluids Readings					PSH Readings					Tank Reading T-9020
	RW-12R	RW-13R	RW-14R	RW-20	RW-22	RW-12R	RW-13R	RW-14R	RW-20	RW-22	
12/27/2021	234	2,034,440	4,043,048	1,767,306	2,413,266	4,755	12,831	351,027	48,816	129,421	519,044
1/3/2022	234	2,034,440	4,043,048	1,767,306	2,413,266	4,755	12,831	351,027	48,816	129,421	519,059
1/18/2022	234	2,034,440	4,043,048	1,767,306	2,413,266	4,755	12,831	351,027	48,816	129,421	519,059
1/24/2022	234	2,034,440	4,043,048	1,767,306	2,413,266	4,755	12,831	351,027	48,816	129,421	519,088
2/1/2022	234	2,034,440	4,043,048	1,767,306	2,413,266	4,755	12,831	351,027	48,816	129,421	519,101
2/8/2022	234	2,034,440	4,043,048	1,767,306	2,413,266	4,755	12,831	351,027	48,816	129,421	519,112
2/14/2022	234	2,034,440	4,043,048	1,767,306	2,413,266	4,755	12,831	351,027	48,816	129,421	519,122
2/21/2022	234	2,034,440	4,043,048	1,767,306	2,413,267	4,755	12,831	351,027	48,816	129,421	519,128
2/28/2022	234	2,034,440	4,043,048	1,767,306	2,413,267	4,755	12,831	351,027	48,816	129,421	519,151
3/8/2022	234	2,034,440	4,043,048	1,767,306	2,413,267	4,755	12,831	351,027	48,816	129,421	519,155
3/15/2022	234	2,034,440	4,043,048	1,767,306	2,413,267	4,755	12,831	351,027	48,816	129,421	519,173
3/22/2022	234	2,034,440	4,043,048	1,767,306	2,413,267	4,755	12,831	351,027	48,816	129,421	519,175
3/29/2022	234	2,034,440	4,043,048	1,767,306	2,413,267	4,755	12,831	351,027	48,816	129,421	519,177
1Q Totals:	-	-	0	-	1	-	-	0	-	0	133
4/5/2022	234	2,034,440	4,043,048	1,767,306	2,413,267	4,755	12,831	351,027	48,816	129,421	519,177
4/12/2022	234	2,034,440	4,043,048	1,767,306	2,413,267	4,755	12,831	351,027	48,816	129,421	519,177
4/19/2022	234	2,034,440	4,043,048	1,767,306	2,413,267	4,755	12,831	351,027	48,816	129,421	519,177
4/26/2022	234	2,034,440	4,043,048	1,767,306	2,413,267	4,755	12,831	351,027	48,816	129,421	519,177
5/3/2022	234	2,034,440	4,043,048	1,767,306	2,413,267	4,755	12,831	351,027	48,816	129,421	519,177
5/10/2022	234	2,034,440	4,086,628	1,767,306	2,413,267	4,755	12,831	352,961	48,816	131,425	519,884
5/17/2022	234	2,034,440	4,131,581	1,767,306	2,413,267	4,755	12,831	352,968	48,816	131,437	519,884
5/24/2022	234	2,034,440	4,131,581	1,767,306	2,413,267	4,755	12,831	352,968	48,816	131,437	519,884
5/31/2022	234	2,034,440	4,264,861	1,767,306	2,413,267	4,755	12,831	352,972	48,816	136,440	519,884
6/7/2022	234	2,034,440	4,301,683	1,767,306	2,413,267	4,755	12,831	353,518	48,816	137,189	520,895
6/14/2022	234	2,034,440	4,301,683	1,767,306	2,413,267	4,755	12,831	353,518	48,816	137,189	520,895
6/21/2022	234	2,034,440	4,301,683	1,767,306	2,413,267	4,755	12,831	363,298	48,816	138,918	550,106
6/28/2022	234	2,034,440	4,301,683	1,767,306	2,413,268	4,755	12,831	363,616	48,816	141,754	554,510
2Q Totals:	-	0	258,635	-	1	-	0	12,589	-	12,333	35,333
7/5/2022	234	2,034,440	4,301,683	1,767,306	2,413,268	4,755	12,831	363,787	48,816	144,580	554,643
7/12/2022	234	2,034,440	4,301,683	1,767,306	2,413,268	4,755	12,831	363,787	48,816	146,585	554,643
7/19/2022	234	2,034,440	4,301,683	1,767,306	2,413,268	4,755	12,831	364,623	48,816	148,793	555,222
7/26/2022	234	2,034,440	4,301,683	1,767,306	2,413,268	4,755	12,831	365,213	48,816	151,358	555,481
8/2/2022	234	2,034,440	4,301,683	1,767,306	2,413,268	4,755	12,831	368,160	48,816	152,859	562,119
8/9/2022	234	2,034,440	4,301,683	1,767,306	2,413,268	4,755	12,831	368,160	48,816	152,859	562,119
8/16/2022	234	2,034,440	4,301,683	1,767,306	2,413,268	4,755	12,831	374,658	48,816	156,045	570,783
8/23/2022	234	2,034,440	4,301,683	1,767,306	2,413,268	4,755	12,831	374,658	48,816	156,045	570,783
8/30/2022	234	2,034,440	4,301,683	1,767,306	2,413,268	4,755	12,831	376,931	48,816	156,176	576,225
9/6/2022	234	2,034,440	4,301,683	1,767,306	2,413,268	4,755	12,831	376,931	48,816	156,176	576,225
9/13/2022	234	2,034,440	4,301,683	1,767,306	2,413,268	4,755	12,831	376,931	48,816	156,176	576,225
9/20/2022	234	2,034,440	4,301,683	1,767,306	2,413,268	4,755	12,831	376,931	48,816	156,176	576,225
9/27/2022	234	2,034,440	4,301,684	1,767,306	2,413,268	4,755	12,831	376,931	48,816	156,176	576,225
3Q Totals:	-	0	1	-	0	-	0	13,315	-	14,422	21,715
10/4/2022	234	2,034,440	4,301,684	1,767,306	2,413,268	4,755	12,831	376,931	48,816	156,176	576,227
10/11/2022	234	2,034,440	4,301,684	1,767,306	2,413,270	4,755	12,831	376,931	48,816	156,176	576,389
10/18/2022	234	2,034,440	4,301,684	1,767,306	2,413,270	4,755	12,831	376,931	48,816	156,176	576,389
10/25/2022	234	2,034,440	4,301,684	1,767,306	2,413,270	4,755	12,831	376,931	48,816	156,176	576,389
11/1/2022	234	2,034,440	4,301,684	1,767,306	2,413,270	4,755	12,831	376,931	48,816	156,176	576,389
11/8/2022	234	2,034,440	4,301,684	1,767,306	2,413,270	4,755	12,831	376,931	48,816	156,176	576,389
11/15/2022	234	2,034,440	4,301,684	1,767,306	2,413,270	4,755	12,831	376,931	48,816	156,176	576,416
11/22/2022	234	2,034,440	4,301,684	1,767,306	2,413,270	4,755	12,831	376,931	48,816	156,176	576,416
11/29/2022	234	2,034,440	4,301,685	1,767,306	2,413,271	4,755	12,831	379,180	48,816	156,178	576,416
12/6/2022	234	2,034,440	4,301,685	1,767,306	2,413,271	4,755	12,831	379,180	48,816	156,178	576,416
12/13/2022	234	2,034,440	4,301,685	1,767,306	2,413,271	4,755	12,831	379,180	48,816	156,178	576,746
12/20/2022	234	2,034,440	4,301,685	1,767,306	2,413,271	4,755	12,831	379,184	48,816	156,178	576,821
12/27/2022	234	2,034,440	4,301,685	1,767,306	2,413,271	4,755	12,831	379,184	48,816	156,178	576,946
4Q Totals:	-	-	1	-	3	-	-	2,253	-	2	721

Appendix E.2 - Recovery System Gauging Data
 2022 Annual Groundwater Monitoring Report
 HF Sinclair Navajo Refining LLC, Artesia Refinery, Artesia, NM

Well	RW-1R							RW-2R							RW-4R						
	Date:	Depth to PSH (feet bto)	Depth to Water (feet bto)	Product Pump (feet bto)	PSH Thickness (feet)	TOC Elevation (feet)	PSH Elevation (feet)	Water Elevation (feet)	Depth to PSH (feet bto)	Depth to Water (feet bto)	Product Pump (feet bto)	PSH Thickness (feet)	TOC Elevation (feet)	PSH Elevation (feet)	Water Elevation (feet)	Depth to PSH (feet bto)	Depth to Water (feet bto)	Product Pump (feet bto)	PSH Thickness (feet)	TOC Elevation (feet)	PSH Elevation (feet)
12/14/21	14.80	17.80	17.5	3.00	3384.03	3369.23	3366.23	18.90	27.70	20	8.80	3385.17	3366.27	3357.47	20.1	20.25	20.1	0.15	3381.86	3361.76	3361.61
1/3/22	15.30	17.90	17.5	2.60	3384.03	3368.73	3366.13	18.75	26.75	20	8.00	3385.17	3366.42	3358.42	0.00	19.85	20.1	0.00	3381.86	--	3362.01
1/18/22	14.20	17.50	17.5	3.30	3384.03	3369.83	3366.53	17.80	20.00	20	2.20	3385.17	3367.37	3365.17	0.00	19.65	OUT	0.00	3381.86	--	3362.21
1/24/22	12.85	16.90	17.5	4.05	3384.03	3371.18	3367.13	N/A	14.80	20	--	3385.17	0.00	3370.37	0.00	14.65	OUT	0.00	3381.86	--	3367.21
2/1/22	12.70	17.20	17.5	4.50	3384.03	3371.33	3366.83	N/A	14.64	20	--	3385.17	0.00	3370.53	0.00	14.65	OUT	0.00	3381.86	--	3367.21
2/8/22	12.60	17.00	17.5	4.40	3384.03	3371.43	3367.03	N/A	14.55	20	--	3385.17	0.00	3370.62	0.00	14.65	OUT	0.00	3381.86	--	3367.21
2/14/22	12.40	16.60	17.5	4.20	3384.03	3371.63	3367.43	N/A	14.30	20	--	3385.17	0.00	3370.87	0.00	14.70	OUT	0.00	3381.86	--	3367.16
2/21/22	13.70	17.00	17.5	3.30	3384.03	3370.33	3367.03	N/A	14.05	20	--	3385.17	0.00	3371.12	0.00	14.70	OUT	0.00	3381.86	--	3367.16
2/28/22	15.15	15.25	17.5	0.10	3384.03	3368.88	3368.78	17.05	17.40	20	0.35	3385.17	3368.12	3367.77	0.00	19.60	OUT	0.00	3381.86	--	3362.26
3/8/22	14.15	15.70	17.5	1.55	3384.03	3369.88	3368.33	16.00	18.50	20	2.50	3385.17	3369.17	3366.67	0.00	19.60	20.1	0.00	3381.86	--	3362.26
3/15/22	13.65	17.10	17.5	3.45	3384.03	3370.38	3366.93	17.30	20.20	20	2.90	3385.17	3367.87	3364.97	0.00	19.40	OUT	0.00	3381.86	--	3362.46
3/23/22	14.60	17.90	17.5	3.30	3384.03	3369.43	3366.13	17.00	20.80	20	3.80	3385.17	3368.17	3364.37	0.00	18.95	OUT	0.00	3381.86	--	3362.91
3/28/22	15.20	15.30	17.5	0.10	3384.03	3368.83	3368.73	16.75	21.00	20	4.25	3385.17	3368.42	3364.17	0.00	19.35	OUT	0.00	3381.86	--	3362.51
4/4/22	0.00	15.25	17.5	--	3384.03	--	3368.78	17.10	17.30	20	0.20	3385.17	3368.07	3367.87	0.00	19.25	OUT	0.00	3381.86	--	3362.61
4/11/22	0.00	14.70	17.5	--	3384.03	--	3369.33	16.40	17.50	20	1.10	3385.17	3368.77	3367.67	0.00	19.05	OUT	0.00	3381.86	--	3362.81
4/18/22	15.00	15.10	17.5	0.10	3384.03	3369.03	3368.93	15.95	18.40	20	2.45	3385.17	3369.22	3366.77	0.00	18.45	OUT	0.00	3381.86	--	3363.41
4/25/22	16.00	16.25	17.5	0.25	3384.03	3368.03	3367.78	19.85	23.00	20	3.15	3385.17	3365.32	3362.17	0.00	18.65	OUT	0.00	3381.86	--	3363.21
5/2/22	15.15	15.45	17.5	0.30	3384.03	3368.88	3368.58	19.20	19.60	20	0.40	3385.17	3365.97	3365.57	0.00	18.85	OUT	0.00	3381.86	--	3363.01
5/10/22	15.05	17.60	17.5	2.55	3384.03	3368.88	3366.43	19.30	19.60	20	0.30	3385.17	3365.87	3365.57	0.00	19.00	OUT	0.00	3381.86	--	3362.86
5/16/22	14.90	14.95	17.5	0.05	3384.03	3369.13	3369.08	19.40	19.60	20	0.20	3385.17	3365.77	3365.57	0.00	19.05	OUT	0.00	3381.86	--	3362.81
5/31/22	15.10	15.30	17.5	0.20	3384.03	3368.93	3368.73	19.30	19.75	20	0.45	3385.17	3365.87	3365.42	0.00	19.20	OUT	0.00	3381.86	--	3362.66
6/6/22	15.05	15.10	17.5	0.05	3384.03	3368.98	3368.93	18.90	19.60	20	0.70	3385.17	3366.27	3365.57	0.00	18.80	OUT	0.00	3381.86	--	3363.06
6/14/22	15.05	15.10	17.5	0.05	3384.03	3368.98	3368.93	18.90	19.60	20	0.70	3385.17	3366.27	3365.57	0.00	18.80	OUT	0.00	3381.86	--	3363.06
6/20/22	15.00	15.03	17.5	0.03	3384.03	3369.03	3369.00	19.15	19.65	20	0.50	3385.17	3366.02	3365.52	0.00	19.00	OUT	0.00	3381.86	--	3362.86
6/27/22	13.75	14.10	17.5	0.35	3384.03	3370.28	3369.93	19.10	19.70	20	0.60	3385.17	3366.07	3365.47	0.00	19.70	OUT	0.00	3381.86	--	3362.16
7/5/22	0.00	14.75	17.5	0.00	3384.03	--	3369.28	19.00	19.75	20	0.75	3385.17	3366.17	3365.42	0.00	19.15	OUT	0.00	3381.86	--	3362.71
7/11/22	14.50	14.55	17.5	0.05	3384.03	3369.53	3369.48	19.90	20.00	20	0.10	3385.17	3365.27	3365.17	19.35	19.40	OUT	0.00	3381.86	--	3362.46
7/18/22	0.00	14.90	17.5	0.00	3384.03	--	3369.13	19.62	19.90	20	0.28	3385.17	3365.55	3365.27	0.00	19.85	OUT	0.00	3381.86	--	3362.01
7/25/22	0.00	15.10	17.5	0.00	3384.03	--	3368.93	17.25	29.15	20	11.90	3385.17	3367.92	3356.02	0.00	19.80	OUT	0.00	3381.86	--	3362.06
8/1/22	15.10	15.20	17.5	0.10	3384.03	3368.93	3368.83	19.70	20.60	20	0.90	3385.17	3365.47	3364.57	0.00	20.15	OUT	0.00	3381.86	--	3361.71
8/8/22	15.10	15.20	17.5	0.10	3384.03	3368.93	3368.83	19.70	20.60	20	0.90	3385.17	3365.47	3364.57	0.00	20.15	OUT	0.00	3381.86	--	3361.71
8/16/22	14.40	14.60	17.5	0.20	3384.03	3369.63	3369.43	21.10	22.00	20	0.90	3385.17	3364.07	3363.17	0.00	20.50	OUT	0.00	3381.86	--	3361.36
8/23/22	14.40	14.60	17.5	0.20	3384.03	3369.63	3369.43	21.10	22.00	20	0.90	3385.17	3364.07	3363.17	0.00	20.50	OUT	0.00	3381.86	--	3361.36
8/29/22	13.90	14.40	17.5	0.50	3384.03	3370.13	3369.63	22.30	23.60	20	1.30	3385.17	3362.87	3361.57	0.00	20.90	OUT	0.00	3381.86	--	3360.96
9/6/22	14.00	14.50	17.5	0.50	3384.03	3370.03	3369.53	21.90	23.30	20	1.40	3385.17	3363.27	3361.87	0.00	20.85	OUT	0.00	3381.86	--	3361.01
9/12/22	14.00	14.50	17.5	0.50	3384.03	3370.03	3369.53	21.90	23.30	20	1.40	3385.17	3363.27	3361.87	0.00	20.85	OUT	0.00	3381.86	--	3361.01
9/19/22	14.30	14.65	17.5	0.35	3384.03	3369.73	3369.38	21.70	22.70	20	1.00	3385.17	3363.47	3362.47	0.00	19.70	OUT	0.00	3381.86	--	3362.16
9/26/22	13.80	14.80	17.5	1.00	3384.03	3370.23	3369.23	22.05	22.85	20	0.80	3385.17	3363.12	3362.32	0.00	19.50	OUT	0.00	3381.86	--	3362.36
10/3/22	14.70	15.10	17.5	0.40	3384.03	3369.33	3368.93	21.80	22.95	20	1.15	3385.17	3363.37	3362.22	0.00	19.70	OUT	0.00	3381.86	--	3362.16
10/11/22	12.60	13.20	17.5	0.60	3384.03	3371.43	3370.83	14.50	14.90	20	0.40	3385.17	3370.67	3370.27	0.00	19.20	OUT	0.00	3381.86	--	3362.66
10/17/22	13.20	13.60	17.5	0.40	3384.03	3370.83	3370.43	0.00	23.43	20	0.00	3385.17	--	3361.74	0.00	19.65	OUT	0.00	3381.86	--	3362.21
10/25/22	13.20	13.60	17.5	0.40	3384.03	3370.83	3370.43	0.00	23.43	20	0.00	3385.17	--	3361.74	0.00	19.65	OUT	0.00	3381.86	--	3362.21
11/1/22	13.20	13.60	17.5	0.40	3384.03	3370.83	3370.43	0.00	23.43	20	0.00	3385.17	--	3361.74	0.00	19.65	OUT	0.00	3381.86	--	3362.21
11/7/22	13.30	13.80	17.5	0.50	3384.03	3370.73	3370.23	21.20	21.80	20	0.60	3385.17	3363.97	3363.37	0.00	19.10	OUT	0.00	3381.86	--	3362.76
11/14/22	13.30	13.55	17.5	0.25	3384.03	3370.73	3370.48	19.00	20.20	20	1.20	3385.17	3366.17	3364.97	0.00	19.55	OUT	0.00	3381.86	--	3362.31
11/21/22	13.30	13.																			

Appendix E.2 - Recovery System Gauging Data
 2022 Annual Groundwater Monitoring Report
 HF Sinclair Navajo Refining LLC, Artesia Refinery, Artesia, NM

Well	RW-5R							RW-6R							RW-7R						
	Date:	Depth to PSH (feet btoc)	Depth to Water (feet btoc)	Product Pump (feet btoc)	PSH Thickness (feet)	TOC Elevation (feet)	PSH Elevation (feet)	Water Elevation (feet)	Depth to PSH (feet btoc)	Depth to Water (feet btoc)	Product Pump (feet btoc)	PSH Thickness (feet)	TOC Elevation (feet)	PSH Elevation (feet)	Water Elevation (feet)	Depth to PSH (feet btoc)	Depth to Water (feet btoc)	Product Pump (feet btoc)	PSH Thickness (feet)	TOC Elevation (feet)	PSH Elevation (feet)
12/14/21	18.17	19.96	21	1.79	3385.56	3367.39	3365.60	18.20	21.40	19.6	3.20	3385.36	3367.16	3363.96	16.50	17.55	15.55	1.05	3384.09	3367.59	3366.54
1/3/22	18.30	20.00	21	1.70	3385.56	3367.26	3365.56	20.30	21.00	19.6	0.70	3385.36	3365.06	3364.36	16.40	18.45	15.55	2.05	3384.09	3367.69	3365.64
1/18/22	18.29	20.05	21	1.76	3385.56	3367.27	3365.51	19.20	21.00	22.5	1.80	3385.36	3366.16	3364.36	16.05	18.50	21	2.45	3384.09	3368.04	3365.59
1/24/22	18.30	19.95	21	1.65	3385.56	3367.26	3365.61	18.85	21.05	22.5	2.20	3385.36	3366.51	3364.31	15.75	17.55	21	1.80	3384.09	3368.34	3366.54
2/1/22	18.42	20.19	21	1.77	3385.56	3367.14	3365.37	20.30	21.00	22.5	0.70	3385.36	3365.06	3364.36	15.75	17.55	21	1.80	3384.09	3368.34	3366.54
2/8/22	18.45	20.30	21	1.85	3385.56	3367.11	3365.26	19.25	21.40	22.5	2.15	3385.36	3366.11	3363.96	15.80	17.55	21	1.75	3384.09	3368.29	3366.54
2/14/22	18.45	20.20	21	1.75	3385.56	3367.11	3365.36	18.35	21.15	22.5	2.80	3385.36	3367.01	3364.21	15.80	17.60	21	1.80	3384.09	3368.29	3366.49
2/21/22	18.40	20.20	21	1.80	3385.56	3367.16	3365.36	15.35	15.80	22.5	0.45	3385.36	3370.01	3369.56	15.70	17.60	21	1.90	3384.09	3368.39	3366.49
2/28/22	20.25	24.17	21	3.92	3385.56	3365.31	3361.39	15.30	15.75	22.5	0.45	3385.36	3370.06	3369.61	16.25	17.30	21	1.05	3384.09	3367.84	3366.79
3/8/22	20.50	26.47	21	5.97	3385.56	3365.06	3359.09	15.00	15.35	19.6	0.35	3385.36	3370.36	3370.01	16.30	17.70	15.55	1.40	3384.09	3367.79	3366.39
3/15/22	20.30	27.68	21	7.38	3385.56	3365.26	3357.88	15.40	15.90	22.5	0.50	3385.36	3369.96	3369.46	16.30	17.70	21	1.40	3384.09	3367.79	3366.39
3/23/22	19.75	28.65	21	8.90	3385.56	3365.81	3356.91	15.40	16.00	22.5	0.60	3385.36	3369.96	3369.36	16.75	18.00	21	1.25	3384.09	3367.34	3366.09
3/28/22	19.83	29.80	21	9.97	3385.56	3365.73	3355.76	15.30	15.75	22.5	0.45	3385.36	3370.06	3369.61	16.20	17.50	21	1.30	3384.09	3367.89	3366.59
4/4/22	18.95	30.40	21	11.55	3385.56	3366.61	3355.16	15.35	16.20	22.5	0.85	3385.36	3370.01	3369.16	16.40	17.55	21	1.15	3384.09	3367.69	3366.54
4/11/22	18.95	30.65	21	11.70	3385.56	3366.61	3354.91	15.50	16.00	22.5	0.50	3385.36	3369.86	3369.36	16.10	17.45	21	1.35	3384.09	3367.99	3366.64
4/18/22	19.04	30.93	21	11.89	3385.56	3366.52	3354.63	15.70	16.15	22.5	0.45	3385.36	3369.66	3369.21	16.25	17.50	21	1.25	3384.09	3367.84	3366.59
4/25/22	20.50	27.89	21	7.39	3385.56	3365.06	3357.67	15.75	16.70	22.5	0.95	3385.36	3369.61	3368.66	16.35	17.55	21	1.20	3384.09	3367.74	3366.54
5/2/22	21.32	28.53	21	7.21	3385.56	3364.24	3357.03	15.70	16.30	22.5	0.60	3385.36	3369.66	3369.06	16.33	17.60	21	1.27	3384.09	3367.76	3366.49
5/10/22	21.40	28.30	21	6.90	3385.56	3364.16	3357.26	15.90	16.35	22.5	0.45	3385.36	3369.46	3369.01	16.45	16.90	21	0.45	3384.09	3367.64	3367.19
5/16/22	21.26	28.40	21	6.90	3385.56	3364.30	3357.16	15.85	16.30	22.5	0.45	3385.36	3369.51	3369.06	16.50	18.40	21	1.90	3384.09	3367.59	3365.69
5/31/22	21.60	26.25	21	6.90	3385.56	3363.96	3359.31	15.90	16.30	22.5	0.40	3385.36	3369.46	3369.06	16.75	18.55	21	1.80	3384.09	3367.34	3365.54
6/6/22	20.30	26.10	21	5.80	3385.56	3365.26	3359.46	15.90	16.25	22.5	0.35	3385.36	3369.46	3369.11	16.30	20.00	21	3.70	3384.09	3367.79	3364.09
6/14/22	20.30	26.10	21	5.80	3385.56	3365.26	3359.46	15.90	16.25	22.5	0.35	3385.36	3369.46	3369.11	16.30	20.00	21	3.70	3384.09	3367.79	3364.09
6/20/22	21.42	27.80	21	6.38	3385.56	3364.14	3357.76	16.05	16.45	22.5	0.40	3385.36	3369.31	3368.91	16.70	19.35	21	2.65	3384.09	3367.39	3364.74
6/27/22	21.50	27.00	21	5.50	3385.56	3364.06	3358.56	16.00	16.70	22.5	0.70	3385.36	3369.36	3368.66	16.85	18.70	21	1.85	3384.09	3367.24	3365.39
7/5/22	21.70	26.67	21	4.97	3385.56	3363.86	3358.89	15.85	16.00	22.5	0.15	3385.36	3369.51	3369.36	17.60	18.75	21	1.15	3384.09	3366.49	3365.34
7/11/22	23.25	24.50	21	1.25	3385.56	3362.31	3361.06	15.75	16.00	22.5	0.25	3385.36	3369.61	3369.36	17.50	17.80	21	0.30	3384.09	3366.59	3366.29
7/18/22	22.10	25.00	21	2.90	3385.56	3363.46	3360.56	15.90	16.20	22.5	0.30	3385.36	3369.46	3369.16	16.65	17.85	21	1.20	3384.09	3367.44	3366.24
7/25/22	21.70	26.00	21	4.30	3385.56	3363.86	3359.56	15.65	16.05	22.5	0.40	3385.36	3369.71	3369.31	0.00	16.80	21	0.00	3384.09	--	3367.29
8/1/22	22.15	25.30	21	3.15	3385.56	3363.41	3360.26	15.60	15.90	22.5	0.30	3385.36	3369.76	3369.46	17.10	18.20	21	1.10	3384.09	3366.99	3365.89
8/8/22	22.15	25.30	21	3.15	3385.56	3363.41	3360.26	15.60	15.90	22.5	0.30	3385.36	3369.76	3369.46	17.10	18.20	21	1.10	3384.09	3366.99	3365.89
8/16/22	21.18	24.40	21	3.22	3385.56	3364.38	3361.16	14.50	14.80	22.5	0.30	3385.36	3370.86	3370.56	17.40	18.45	21	1.05	3384.09	3366.69	3365.64
8/23/22	21.18	24.40	21	3.22	3385.56	3364.38	3361.16	14.50	14.80	22.5	0.30	3385.36	3370.86	3370.56	17.40	18.45	21	1.05	3384.09	3366.69	3365.64
8/29/22	22.40	22.85	21	0.45	3385.56	3363.16	3362.71	15.30	15.70	22.5	0.40	3385.36	3370.06	3369.66	17.70	17.90	21	0.20	3384.09	3366.39	3366.19
9/6/22	22.39	22.85	21	0.46	3385.56	3363.17	3362.71	15.25	15.60	22.5	0.35	3385.36	3370.11	3369.76	0.00	17.25	21	0.00	3384.09	--	3366.84
9/12/22	22.39	22.85	21	0.46	3385.56	3363.17	3362.71	15.25	15.60	22.5	0.35	3385.36	3370.11	3369.76	0.00	17.25	21	0.00	3384.09	--	3366.84
9/19/22	22.27	23.50	21	1.23	3385.56	3363.29	3362.06	15.20	15.70	22.5	0.50	3385.36	3370.16	3369.66	17.35	17.55	21	0.20	3384.09	3366.74	3366.54
9/26/22	22.45	22.90	21	0.45	3385.56	3363.11	3362.66	15.45	15.60	22.5	0.15	3385.36	3369.91	3369.76	17.45	17.60	21	0.15	3384.09	3366.64	3366.49
10/3/22	15.50	15.55	21	0.05	3385.56	3370.06	3370.01	19.05	19.34	22.5	0.29	3385.36	3366.31	3366.02	17.50	17.90	21	0.40	3384.09	3366.59	3366.19
10/11/22	15.45	15.50	21	0.05	3385.56	3370.11	3370.06	19.05	19.34	22.5	0.29	3385.36	3366.31	3366.02	14.65	15.90	21	1.25	3384.09	3369.44	3368.19
10/17/22	18.55	18.65	21	0.10	3385.56	3367.01	3366.91	15.25	15.35	22.5	0.10	3385.36	3370.11	3370.01	14.50	16.65	21	2.15	3384.09	3369.59	3367.44
10/25/22	18.55	18.65	21	0.10	3385.56	3367.01	3366.91	15.25	15.35	22.5	0.10	3385.36	3370.11	3370.01	14.50	16.65	21	2.15	3384.09	3369.59	3367.44
11/1/22	18.55	18.65	21	0.10	3385.56	3367.01	3366.91	15.25	15.35	22.											

Appendix E.2 - Recovery System Gauging Data
 2022 Annual Groundwater Monitoring Report
 HF Sinclair Navajo Refining LLC, Artesia Refinery, Artesia, NM

Well	RW-8R							RW-12R							RW-13R						
Date:	Depth to PSH (feet bto)	Depth to Water (feet bto)	Product Pump (feet bto)	PSH Thickness (feet)	TOC Elevation (feet)	PSH Elevation (feet)	Water Elevation (feet)	Depth to PSH (feet bto)	Depth to Water (feet bto)	Product Pump (feet bto)	PSH Thickness (feet)	TOC Elevation (feet)	PSH Elevation (feet)	Water Elevation (feet)	Depth to PSH (feet bto)	Depth to Water (feet bto)	Product Pump (feet bto)	PSH Thickness (feet)	TOC Elevation (feet)	PSH Elevation (feet)	Water Elevation (feet)
12/14/21	15.00	17.25	18.5	2.25	3385.10	3370.10	3367.85	0.00	24.50	OUT	0.00	3368.54	--	3344.04	22.60	22.69	24.75	0.09	3368.54	3345.94	3345.85
1/3/22	15.35	17.55	18.5	2.20	3385.10	3369.75	3367.55	0.00	25.75	OUT	0.00	3368.54	--	3342.79	23.40	23.52	24.75	0.12	3368.54	3345.14	3345.02
1/18/22	15.50	17.70	18.5	2.20	3385.10	3369.60	3367.40	0.00	25.95	OUT	0.00	3368.54	--	3342.59	23.89	24.07	21.64	0.18	3368.54	3344.65	3344.47
1/24/22	15.35	17.38	18.5	2.03	3385.10	3369.75	3367.72	0.00	26.55	OUT	0.00	3368.54	--	3341.99	24.02	24.15	21.64	0.13	3368.54	3344.52	3344.39
2/1/22	15.35	17.35	18.5	2.00	3385.10	3369.75	3367.75	0.00	26.75	OUT	0.00	3368.54	--	3341.79	24.28	24.38	21.64	0.10	3368.54	3344.26	3344.16
2/8/22	15.30	17.50	18.5	2.20	3385.10	3369.80	3367.60	0.00	26.77	OUT	0.00	3368.54	--	3341.77	24.49	24.68	21.64	0.19	3368.54	3344.05	3343.86
2/14/22	15.20	17.00	18.5	1.80	3385.10	3369.90	3368.10	0.00	27.06	OUT	0.00	3368.54	--	3341.48	24.63	24.70	21.64	0.07	3368.54	3343.91	3343.84
2/21/22	15.10	16.80	18.5	1.70	3385.10	3370.00	3368.30	0.00	27.23	OUT	0.00	3368.54	--	3341.31	25.75	26.85	21.64	1.10	3368.54	3342.79	3341.69
2/28/22	15.40	17.20	18.5	1.80	3385.10	3369.70	3367.90	0.00	27.35	OUT	0.00	3368.54	--	3341.19	24.95	25.47	21.64	0.52	3368.54	3343.59	3343.07
3/8/22	15.40	17.40	18.5	2.00	3385.10	3369.70	3367.70	0.00	27.50	OUT	0.00	3368.54	--	3341.04	0.00	25.10	24.75	0.00	3368.54	--	3343.44
3/15/22	15.55	17.65	18.5	2.10	3385.10	3369.55	3367.45	0.00	27.60	OUT	0.00	3368.54	--	3340.94	0.00	25.25	21.64	0.00	3368.54	--	3343.29
3/23/22	15.55	17.35	18.5	1.80	3385.10	3369.55	3367.75	0.00	27.60	OUT	0.00	3368.54	--	3340.94	25.36	25.40	21.64	0.04	3368.54	3343.18	3343.14
3/28/22	15.65	17.30	18.5	1.65	3385.10	3369.45	3367.80	27.75	27.95	OUT	0.20	3368.54	--	3340.59	25.40	25.55	21.64	0.15	3368.54	3343.14	3342.99
4/4/22	15.70	17.75	18.5	2.05	3385.10	3369.40	3367.35	27.75	28.27	OUT	0.52	3368.54	--	3340.27	25.26	25.78	21.64	0.52	3368.54	3343.28	3342.76
4/11/22	15.80	17.70	18.5	1.90	3385.10	3369.30	3367.40	27.65	28.68	OUT	1.03	3368.54	--	3339.86	25.67	26.78	21.64	1.11	3368.54	3342.87	3341.76
4/18/22	15.85	17.75	18.5	1.90	3385.10	3369.25	3367.35	27.70	29.21	OUT	1.51	3368.54	--	3339.33	25.60	27.88	21.64	2.28	3368.54	3342.94	3340.66
4/25/22	15.90	17.85	18.5	1.95	3385.10	3369.20	3367.25	27.50	29.47	OUT	1.97	3368.54	--	3339.07	25.20	27.76	21.64	2.56	3368.54	3343.34	3340.78
5/2/22	16.00	17.80	18.5	1.80	3385.10	3369.10	3367.30	26.50	28.28	OUT	1.78	3368.54	--	3340.26	24.30	25.35	21.64	1.05	3368.54	3344.24	3343.19
5/10/22	16.20	21.05	18.5	4.85	3385.10	3368.90	3364.05	0.00	21.59	OUT	0.00	3368.54	--	3346.95	20.85	23.29	21.64	2.44	3368.54	3347.69	3345.25
5/16/22	16.30	17.60	18.5	1.30	3385.10	3368.80	3367.50	0.00	22.95	OUT	0.00	3368.54	--	3345.59	22.50	31.27	21.64	8.77	3368.54	3346.04	3337.27
5/31/22	16.50	18.30	18.5	1.80	3385.10	3368.60	3366.80	25.14	25.15	OUT	0.00	3368.54	--	3343.39	23.40	31.27	21.64	7.87	3368.54	3345.14	3337.27
6/6/22	16.40	18.35	18.5	1.95	3385.10	3368.70	3366.75	0.00	21.77	OUT	0.00	3368.54	--	3346.77	21.28	24.60	21.64	3.32	3368.54	3347.26	3343.94
6/14/22	16.40	18.35	18.5	1.95	3385.10	3368.70	3366.75	0.00	21.77	OUT	0.00	3368.54	--	3346.77	21.28	24.60	21.64	3.32	3368.54	3347.26	3343.94
6/20/22	16.50	18.35	18.5	1.85	3385.10	3368.60	3366.75	0.00	20.53	OUT	0.00	3368.54	--	3348.01	19.40	21.79	21.64	2.39	3368.54	3349.14	3346.75
6/27/22	16.15	17.90	18.5	1.75	3385.10	3368.95	3367.20	0.00	20.87	OUT	0.00	3368.54	--	3347.67	20.12	22.21	21.64	2.09	3368.54	3348.42	3346.33
7/5/22	15.80	17.30	18.5	1.50	3385.10	3369.30	3367.80	0.00	22.63	OUT	0.00	3368.54	--	3345.91	22.08	25.17	21.64	3.09	3368.54	3346.46	3343.37
7/11/22	15.75	17.20	18.5	1.45	3385.10	3369.35	3367.90	0.00	23.45	OUT	0.00	3368.54	--	3345.09	23.10	29.80	21.64	6.70	3368.54	3345.44	3338.74
7/18/22	15.80	17.20	18.5	1.40	3385.10	3369.30	3367.90	0.00	20.75	OUT	0.00	3368.54	--	3347.79	19.85	21.97	21.64	2.12	3368.54	3348.69	3346.57
7/25/22	15.75	17.20	18.5	1.45	3385.10	3369.35	3367.90	0.00	21.15	OUT	0.00	3368.54	--	3347.39	20.48	22.97	21.64	2.49	3368.54	3348.06	3345.57
8/1/22	15.80	17.35	18.5	1.55	3385.10	3369.30	3367.75	0.00	21.20	OUT	0.00	3368.54	--	3347.34	18.45	20.85	21.64	2.40	3368.54	3350.09	3347.69
8/8/22	15.80	17.35	18.5	1.55	3385.10	3369.30	3367.75	0.00	21.20	OUT	0.00	3368.54	--	3347.34	18.45	20.85	21.64	2.40	3368.54	3350.09	3347.69
8/16/22	16.00	17.45	18.5	1.45	3385.10	3369.10	3367.65	0.00	19.10	OUT	0.00	3368.54	--	3349.44	18.30	20.50	21.64	2.20	3368.54	3350.24	3348.04
8/23/22	16.00	17.45	18.5	1.45	3385.10	3369.10	3367.65	0.00	19.10	OUT	0.00	3368.54	--	3349.44	18.30	20.50	21.64	2.20	3368.54	3350.24	3348.04
8/29/22	15.50	16.70	18.5	1.20	3385.10	3369.60	3368.40	0.00	19.50	OUT	0.00	3368.54	--	3349.04	15.30	17.47	21.64	2.17	3368.54	3353.24	3351.07
9/6/22	15.90	16.70	18.5	0.80	3385.10	3369.20	3368.40	0.00	17.60	OUT	0.00	3368.54	--	3350.94	16.78	18.59	21.64	1.81	3368.54	3351.76	3349.95
9/12/22	15.90	16.70	18.5	0.80	3385.10	3369.20	3368.40	0.00	17.60	OUT	0.00	3368.54	--	3350.94	16.78	18.59	21.64	1.81	3368.54	3351.76	3349.95
9/19/22	16.00	17.00	18.5	1.00	3385.10	3369.10	3368.10	0.00	17.37	OUT	0.00	3368.54	--	3351.17	15.84	17.80	21.64	1.96	3368.54	3352.70	3350.74
9/26/22	15.60	17.10	18.5	1.50	3385.10	3369.50	3368.00	0.00	17.40	OUT	0.00	3368.54	--	3351.14	14.88	16.82	21.64	1.94	3368.54	3353.66	3351.72
10/3/22	15.70	17.25	18.5	1.55	3385.10	3369.40	3367.85	0.00	16.00	OUT	0.00	3368.54	--	3352.54	14.00	16.15	21.64	2.15	3368.54	3354.54	3352.39
10/11/22	15.00	15.70	18.5	0.70	3385.10	3370.10	3369.40	0.00	15.32	OUT	0.00	3368.54	--	3353.22	13.55	15.47	21.64	1.92	3368.54	3354.99	3353.07
10/17/22	14.80	15.60	18.5	0.80	3385.10	3370.30	3369.50	0.00	16.64	OUT	0.00	3368.54	--	3351.90	15.30	16.90	21.64	1.60	3368.54	3353.24	3351.64
10/25/22	14.80	15.60	18.5	0.80	3385.10	3370.30	3369.50	0.00	16.64	OUT	0.00	3368.54	--	3351.90	15.30	16.90	21.64	1.60	3368.54	3353.24	3351.64
11/1/22	14.80	15.60	18.5	0.80	3385.10	3370.30	3369.50	0.00	16.64	OUT	0.00	3368.54	--	3351.90	15.30	16.90	21.64	1.60	3368.54	3353.24	3351.64
11/7/22	14.30	15.10	18.5	0.80	3385.10	3370.80	3370.00	0.00	20.60	OUT	0.00	3368.54	--	3347.94	19.25	--	21.64	--	3368.54	3349.29	--
11																					

Appendix E.2 - Recovery System Gauging Data
 2022 Annual Groundwater Monitoring Report
 HF Sinclair Navajo Refining LLC, Artesia Refinery, Artesia, NM

Well	RW-14R							RW-15							RW-19						
Date:	Depth to PSH (feet btoc)	Depth to Water (feet btoc)	Product Pump (feet btoc)	PSH Thickness (feet)	TOC Elevation (feet)	PSH Elevation (feet)	Water Elevation (feet)	Depth to PSH (feet btoc)	Depth to Water (feet btoc)	Product Pump (feet btoc)	PSH Thickness (feet)	TOC Elevation (feet)	PSH Elevation (feet)	Water Elevation (feet)	Depth to PSH (feet btoc)	Depth to Water (feet btoc)	Product Pump (feet btoc)	PSH Thickness (feet)	TOC Elevation (feet)	PSH Elevation (feet)	Water Elevation (feet)
12/14/21	19.41	19.48	19.92	0.07	3366.37	3346.96	3346.89	16.80	16.81	OUT	0.01	3382.30	3365.50	3365.49	25.55	27.40	32	1.85	3386.11	3360.56	3358.71
1/3/22	20.15	20.19	19.92	0.04	3366.37	3346.22	3346.18	16.80	16.81	OUT	0.01	3382.30	3365.50	3365.49	25.50	27.62	32	2.12	3386.11	3360.61	3358.49
1/18/22	20.55	20.61	22.95	0.06	3366.37	3345.82	3345.76	N/A	N/A	--	N/A	3382.30	--	--	25.73	27.65	32	1.92	3386.11	3360.38	3358.46
1/24/22	20.66	20.97	22.95	0.31	3366.37	3345.71	3345.40	N/A	N/A	OUT	N/A	3382.30	--	--	25.79	27.60	32	1.81	3386.11	3360.32	3358.51
2/1/22	20.90	21.22	22.95	0.32	3366.37	3345.47	3345.15	0.00	0.00	OUT	N/A	3382.30	--	--	25.85	27.70	32	1.85	3386.11	3360.26	3358.41
2/8/22	21.05	21.52	22.95	0.47	3366.37	3345.32	3344.85	0.00	0.00	OUT	N/A	3382.30	--	--	25.80	27.80	32	2.00	3386.11	3360.31	3358.31
2/14/22	21.10	21.97	22.95	0.87	3366.37	3345.27	3344.40	0.00	0.00	OUT	N/A	3382.30	--	--	25.99	27.82	32	1.83	3386.11	3360.12	3358.29
2/21/22	21.18	22.39	22.95	1.21	3366.37	3345.19	3343.98	0.00	0.00	OUT	N/A	3382.30	--	--	26.00	27.83	32	1.83	3386.11	3360.11	3358.28
2/28/22	21.30	23.15	22.95	1.85	3366.37	3345.07	3343.22	0.00	0.00	OUT	N/A	3382.30	--	--	26.33	26.85	32	0.52	3386.11	3359.78	3359.26
3/8/22	21.40	23.30	19.92	1.90	3366.37	3344.97	3343.07	16.80	16.81	OUT	0.01	3382.30	3365.50	3365.49	39.69	40.25	32	0.56	3386.11	3346.42	3345.86
3/15/22	21.50	23.75	22.95	2.25	3366.37	3344.87	3342.62	0.00	0.00	OUT	N/A	3382.30	--	--	39.44	41.40	32	1.96	3386.11	3346.67	3344.71
3/23/22	21.60	24.08	22.95	2.48	3366.37	3344.77	3342.29	0.00	0.00	OUT	N/A	3382.30	--	--	N/A	N/A	32	--	3386.11	--	--
3/28/22	21.70	24.20	22.95	2.50	3366.37	3344.67	3342.17	0.00	0.00	OUT	N/A	3382.30	--	--	N/A	N/A	32	--	3386.11	--	--
4/4/22	21.85	24.57	22.95	2.72	3366.37	3344.52	3341.80	0.00	0.00	OUT	N/A	3382.30	--	--	26.40	27.70	32	1.30	3386.11	3359.71	3358.41
4/11/22	21.90	24.73	22.95	2.83	3366.37	3344.47	3341.64	0.00	0.00	OUT	N/A	3382.30	--	--	26.35	27.65	32	1.30	3386.11	3359.76	3358.46
4/18/22	22.03	25.10	22.95	3.07	3366.37	3344.34	3341.27	0.00	0.00	OUT	N/A	3382.30	--	--	26.40	27.70	32	1.30	3386.11	3359.71	3358.41
4/25/22	21.55	21.94	22.95	0.39	3366.37	3344.82	3344.43	0.00	0.00	OUT	N/A	3382.30	--	--	26.45	27.78	32	1.33	3386.11	3359.66	3358.33
5/2/22	20.42	21.10	22.95	0.68	3366.37	3345.95	3345.27	0.00	0.00	OUT	N/A	3382.30	--	--	26.35	27.68	32	1.33	3386.11	3359.76	3358.43
5/10/22	19.63	27.45	22.95	7.82	3366.37	3346.74	3338.92	0.00	0.00	OUT	N/A	3382.30	--	--	26.70	28.05	32	1.35	3386.11	3359.41	3358.06
5/16/22	20.13	27.45	22.95	7.32	3366.37	3346.24	3338.92	0.00	0.00	OUT	N/A	3382.30	--	--	26.82	28.23	32	1.41	3386.11	3359.29	3357.88
5/31/22	22.47	30.80	22.95	8.33	3366.37	3343.90	3335.57	0.00	0.00	OUT	N/A	3382.30	--	--	27.00	28.35	32	1.35	3386.11	3359.11	3357.76
6/6/22	19.88	30.80	22.95	10.92	3366.37	3346.49	3335.57	0.00	0.00	OUT	N/A	3382.30	--	--	27.04	28.45	32	1.41	3386.11	3359.07	3357.66
6/14/22	19.88	30.80	22.95	10.92	3366.37	3346.49	3335.57	0.00	0.00	OUT	N/A	3382.30	--	--	27.04	28.45	32	1.41	3386.11	3359.07	3357.66
6/20/22	19.05	20.57	22.95	1.52	3366.37	3347.32	3345.80	0.00	0.00	OUT	N/A	3382.30	--	--	27.08	28.45	32	1.37	3386.11	3359.03	3357.66
6/27/22	19.69	21.08	22.95	1.39	3366.37	3346.68	3345.29	0.00	0.00	OUT	N/A	3382.30	--	--	27.10	28.40	32	1.30	3386.11	3359.01	3357.71
7/5/22	21.10	21.25	22.95	0.15	3366.37	3345.27	3345.12	0.00	0.00	OUT	N/A	3382.30	--	--	27.00	28.37	32	1.37	3386.11	3359.11	3357.74
7/11/22	24.23	30.19	22.95	5.96	3366.37	3342.14	3336.18	0.00	0.00	OUT	N/A	3382.30	--	--	27.00	28.30	32	1.30	3386.11	3359.11	3357.81
7/18/22	0.00	20.25	22.95	0.00	3366.37	--	3346.12	0.00	0.00	OUT	N/A	3382.30	--	--	26.95	28.29	32	1.34	3386.11	3359.16	3357.82
7/25/22	20.25	20.80	22.95	0.55	3366.37	3346.12	3345.57	0.00	0.00	OUT	N/A	3382.30	--	--	26.90	28.33	32	1.43	3386.11	3359.21	3357.78
8/1/22	18.50	20.10	22.95	1.60	3366.37	3347.87	3346.27	0.00	0.00	OUT	N/A	3382.30	--	--	26.93	28.28	32	1.35	3386.11	3359.18	3357.83
8/8/22	18.50	20.10	22.95	1.60	3366.37	3347.87	3346.27	0.00	0.00	OUT	N/A	3382.30	--	--	26.93	28.28	32	1.35	3386.11	3359.18	3357.83
8/16/22	17.85	18.57	22.95	0.72	3366.37	3348.52	3347.80	0.00	0.00	OUT	N/A	3382.30	--	--	26.80	28.10	32	1.30	3386.11	3359.31	3358.01
8/23/22	17.85	18.57	22.95	0.72	3366.37	3348.52	3347.80	0.00	0.00	OUT	N/A	3382.30	--	--	26.80	28.10	32	1.30	3386.11	3359.31	3358.01
8/29/22	17.06	17.45	22.95	0.39	3366.37	3349.31	3348.92	0.00	0.00	OUT	N/A	3382.30	--	--	26.65	27.45	32	0.80	3386.11	3359.46	3358.66
9/6/22	16.95	17.36	22.95	0.41	3366.37	3349.42	3349.01	0.00	0.00	OUT	N/A	3382.30	--	--	26.55	27.45	32	0.90	3386.11	3359.56	3358.66
9/12/22	16.95	17.36	22.95	0.41	3366.37	3349.42	3349.01	0.00	0.00	OUT	N/A	3382.30	--	--	26.55	27.45	32	0.90	3386.11	3359.56	3358.66
9/19/22	16.45	16.53	22.95	0.08	3366.37	3349.92	3349.84	0.00	0.00	OUT	N/A	3382.30	--	--	26.55	27.75	32	1.20	3386.11	3359.56	3358.36
9/26/22	16.05	16.60	22.95	0.55	3366.37	3350.32	3349.77	0.00	0.00	OUT	N/A	3382.30	--	--	26.50	30.90	32	4.40	3386.11	3359.61	3355.21
10/3/22	13.50	14.05	22.95	0.55	3366.37	3352.87	3352.32	0.00	0.00	OUT	N/A	3382.30	--	--	27.00	27.80	32	0.80	3386.11	3359.11	3358.31
10/11/22	13.95	14.00	22.95	0.05	3366.37	3352.42	3352.37	0.00	0.00	OUT	N/A	3382.30	--	--	26.00	27.60	32	1.60	3386.11	3360.11	3358.51
10/17/22	13.50	14.75	22.95	1.25	3366.37	3352.87	3351.62	0.00	0.00	OUT	N/A	3382.30	--	--	25.35	27.59	32	2.24	3386.11	3360.76	3358.52
10/25/22	13.50	14.75	22.95	1.25	3366.37	3352.87	3351.62	0.00	0.00	OUT	N/A	3382.30	--	--	25.35	27.59	32	2.24	3386.11	3360.76	3358.52
11/1/22	13.50	14.75	22.95	1.25	3366.37	3352.87	3351.62	0.00	0.00	OUT	N/A	3382.30	--	--	25.35	27.59	32	2.24	3386.11	3360.76	3358.52
11/7/22	17.00	17.28	22.95	0.28	3366.37	3349.37	3349.09	0.00	0.00	OUT	N/A	3382.30	--	--	25.80	27.10	32	1.30	3386.11	3360.31	3359.01
11/14/22	17.40	17.78	22.95	0.38	3366.37	3348.97	3348.59	0.00	0.00	OUT	N/A	3382.30	--	--	25.05	27.05	32	2.00	3386.11	3361.06	3359.06
11/21/22	17.40	17.78	22.95	0.38	3366.37	3348.97	3348.59	0.00	0.00	OUT	N/A	3382.30	--	--	25.05	27.05	32	2.00	3386.11	3361.06	3359.06
11/29/22	0.00	20.60	22.95	0.00	3366.37	--	3345.77	0.00	0.00	OUT	N/A	3382.30	--	--	25.45	26.90	32	1.45	3386.11	3360.66	3359.21
12/6/22	0.00	20.60	22.95	0.00	3366.37	--	3345.77	0.00	0.00	OUT	N/A	3382.30	--	--	25.45	26.90	32	1.45	3386.11	3360.66	3359.21
12/12/22	0.00	23.68	22.95	0.00	3366.37	--	3342.69	0.00	0.00	OUT	N/A	3382.30	--	--	25.30	26.50	32	1.20	3386.11	3360.81	3359.61
12/19/22	0.00	25.10	22.95	0.00	3366.37	--	3341.27	0.00	0.00	OUT	N/A	3382.30	--	--	27.10	27.50	32	0.40	3386.11	3359.01	3

Appendix E.2 - Recovery System Gauging Data
 2022 Annual Groundwater Monitoring Report
 HF Sinclair Navajo Refining LLC, Artesia Refinery, Artesia, NM

Well	RW-20							RW-22						
Date:	Depth to PSH (feet btoc)	Depth to Water (feet btoc)	Product Pump (feet btoc)	PSH Thickness (feet)	TOC Elevation (feet)	PSH Elevation (feet)	Water Elevation (feet)	Depth to PSH (feet btoc)	Depth to Water (feet btoc)	Product Pump (feet btoc)	PSH Thickness (feet)	TOC Elevation (feet)	PSH Elevation (feet)	Water Elevation (feet)
12/14/21	0.00	19.25	16	0.00	3365.44	--	3346.19	22.75	22.80	19.6	0.05	3366.21	3343.46	3343.41
1/3/22	0.00	21.50	16	0.00	3365.44	--	3343.94	24.00	24.10	19.6	0.10	3366.21	3342.21	3342.11
1/18/22	0.00	N/A	32	N/A	3365.44	--	--	24.69	24.75	19.6	0.06	3366.21	3341.52	3341.46
1/24/22	0.00	N/A	32	N/A	3365.44	--	--	24.90	25.00	19.6	0.10	3366.21	3341.31	3341.21
2/1/22	0.00	0.00	32	N/A	3365.44	--	--	25.25	25.35	19.6	0.10	3366.21	3340.96	3340.86
2/8/22	0.00	0.00	32	N/A	3365.44	--	--	25.48	25.60	19.6	0.12	3366.21	3340.73	3340.61
2/14/22	0.00	0.00	32	N/A	3365.44	--	--	25.58	26.20	19.6	0.62	3366.21	3340.63	3340.01
2/21/22	0.00	0.00	32	N/A	3365.44	--	--	26.85	28.53	19.6	1.68	3366.21	3339.36	3337.68
2/28/22	0.00	0.00	32	N/A	3365.44	--	--	25.65	27.88	19.6	2.23	3366.21	3340.56	3338.33
3/8/22	0.00	0.00	16	0.00	3365.44	--	3365.44	25.78	28.30	19.6	2.52	3366.21	3340.43	3337.91
3/15/22	0.00	0.00	32	N/A	3365.44	--	--	25.95	28.45	19.6	2.50	3366.21	3340.26	3337.76
3/23/22	0.00	0.00	32	N/A	3365.44	--	--	26.15	28.57	19.6	2.42	3366.21	3340.06	3337.64
3/28/22	0.00	0.00	32	N/A	3365.44	--	--	26.25	28.67	19.6	2.42	3366.21	3339.96	3337.54
4/4/22	0.00	0.00	32	N/A	3365.44	--	--	26.45	28.72	19.6	2.27	3366.21	3339.76	3337.49
4/11/22	0.00	0.00	32	N/A	3365.44	--	--	26.55	28.70	19.6	2.15	3366.21	3339.66	3337.51
4/18/22	0.00	0.00	32	N/A	3365.44	--	--	26.70	28.79	19.6	2.09	3366.21	3339.51	3337.42
4/25/22	0.00	0.00	32	N/A	3365.44	--	--	26.48	27.89	19.6	1.41	3366.21	3339.73	3338.32
5/2/22	0.00	0.00	32	N/A	3365.44	--	--	25.05	25.85	19.6	0.80	3366.21	3341.16	3340.36
5/10/22	0.00	19.20	32	N/A	3365.44	--	--	17.28	31.47	19.6	14.19	3366.21	3348.93	3334.74
5/16/22	0.00	19.00	32	N/A	3365.44	--	--	20.35	33.82	19.6	13.47	3366.21	3345.86	3332.39
5/31/22	0.00	0.00	32	N/A	3365.44	--	--	24.13	33.65	19.6	9.52	3366.21	3342.08	3332.56
6/6/22	0.00	0.00	32	N/A	3365.44	--	--	17.54	26.12	19.6	8.58	3366.21	3348.67	3340.09
6/14/22	0.00	0.00	32	0.00	3365.44	--	--	17.54	26.12	19.6	8.58	3366.21	3348.67	3340.09
6/20/22	0.00	0.00	32	0.00	3365.44	--	--	0.00	0.00	19.6	0.00	3366.21	--	3366.21
6/27/22	0.00	0.00	32	0.00	3365.44	--	--	0.00	0.00	19.6	0.00	3366.21	--	3366.21
7/5/22	0.00	19.85	32	0.00	3365.44	--	--	19.85	28.45	19.6	8.60	3366.21	3346.36	3337.76
7/11/22	0.00	20.00	32	0.00	3365.44	--	--	23.00	31.85	19.6	8.85	3366.21	3343.21	3334.36
7/18/22	0.00	18.30	32	0.00	3365.44	--	--	19.60	25.80	19.6	6.20	3366.21	3346.61	3340.41
7/25/22	0.00	18.40	32	0.00	3365.44	--	--	18.72	26.85	19.6	8.13	3366.21	3347.49	3339.36
8/1/22	0.00	18.85	32	0.00	3365.44	--	--	16.00	24.70	19.6	8.70	3366.21	3350.21	3341.51
8/8/22	0.00	18.85	32	0.00	3365.44	--	--	16.00	24.70	19.6	8.70	3366.21	3350.21	3341.51
8/16/22	0.00	18.70	32	0.00	3365.44	--	--	16.09	18.51	19.6	2.42	3366.21	3350.12	3347.70
8/23/22	0.00	18.70	32	0.00	3365.44	--	--	16.09	18.51	19.6	2.42	3366.21	3350.12	3347.70
8/29/22	0.00	17.30	32	0.00	3365.44	--	--	18.80	19.70	19.6	0.90	3366.21	3347.41	3346.51
9/6/22	0.00	17.30	32	0.00	3365.44	--	--	19.97	20.15	19.6	0.18	3366.21	3346.24	3346.06
9/12/22	0.00	17.30	32	0.00	3365.44	--	--	19.97	20.15	19.6	0.18	3366.21	3346.24	3346.06
9/19/22	0.00	17.25	32	0.00	3365.44	--	--	19.30	19.49	19.6	0.19	3366.21	3346.91	3346.72
9/26/22	0.00	17.20	32	0.00	3365.44	--	--	17.70	18.05	19.6	0.35	3366.21	3348.51	3348.16
10/3/22	0.00	9.00	32	0.00	3365.44	--	--	0.00	0.00	0	0.00	3366.21	--	3366.21
10/11/22	0.00	9.15	32	0.00	3365.44	--	--	11.18	11.33	19.6	0.15	3366.21	3355.03	3354.88
10/17/22	0.00	10.75	32	0.00	3365.44	--	--	12.86	13.29	19.6	0.43	3366.21	3353.35	3352.92
10/25/22	0.00	10.75	32	0.00	3365.44	--	--	12.86	13.29	19.6	0.43	3366.21	3353.35	3352.92
11/1/22	0.00	10.75	32	0.00	3365.44	--	--	12.86	13.29	19.6	0.43	3366.21	3353.35	3352.92
11/7/22	0.00	15.00	32	0.00	3365.44	--	--	17.40	18.00	19.6	0.60	3366.21	3348.81	3348.21
11/14/22	0.00	15.85	32	0.00	3365.44	--	--	18.42	18.99	19.6	0.57	3366.21	3347.79	3347.22
11/21/22	0.00	15.85	32	0.00	3365.44	--	--	18.42	18.99	19.6	0.57	3366.21	3347.79	3347.22
11/29/22	0.00	16.25	32	0.00	3365.44	--	--	25.00	25.75	19.6	0.75	3366.21	3341.21	3340.46
12/6/22	0.00	16.25	32	0.00	3365.44	--	--	25.00	25.75	19.6	0.75	3366.21	3341.21	3340.46
12/12/22	0.00	21.00	32	0.00	3365.44	--	--	25.75	26.87	19.6	1.12	3366.21	3340.46	3339.34
12/19/22	0.00	20.00	32	0.00	3365.44	--	--	25.33	26.80	19.6	1.47	3366.21	3340.88	3339.41
12/27/22	0.00	20.50	32	0.00	3365.44	--	--	25.25	26.30	19.6	1.05	3366.21	3340.96	3339.91

District I
1625 N. French Dr., Hobbs, NM 88240
Phone:(575) 393-6161 Fax:(575) 393-0720
District II
811 S. First St., Artesia, NM 88210
Phone:(575) 748-1283 Fax:(575) 748-9720
District III
1000 Rio Brazos Rd., Aztec, NM 87410
Phone:(505) 334-6178 Fax:(505) 334-6170
District IV
1220 S. St Francis Dr., Santa Fe, NM 87505
Phone:(505) 476-3470 Fax:(505) 476-3462

State of New Mexico
Energy, Minerals and Natural Resources
Oil Conservation Division
1220 S. St Francis Dr.
Santa Fe, NM 87505

CONDITIONS

Action 227942

CONDITIONS

Operator: HF Sinclair Navajo Refining LLC ATTN: GENERAL COUNSEL Dallas, TX 75201	OGRID: 15694
	Action Number: 227942
	Action Type: [UF-DP] Discharge Permit (DISCHARGE PERMIT)

CONDITIONS

Created By	Condition	Condition Date
Ibarr	None	10/3/2023