Franklin Township Stormwater Basin Retrofit Projects Phase I

New Jersey Water Supply Authority

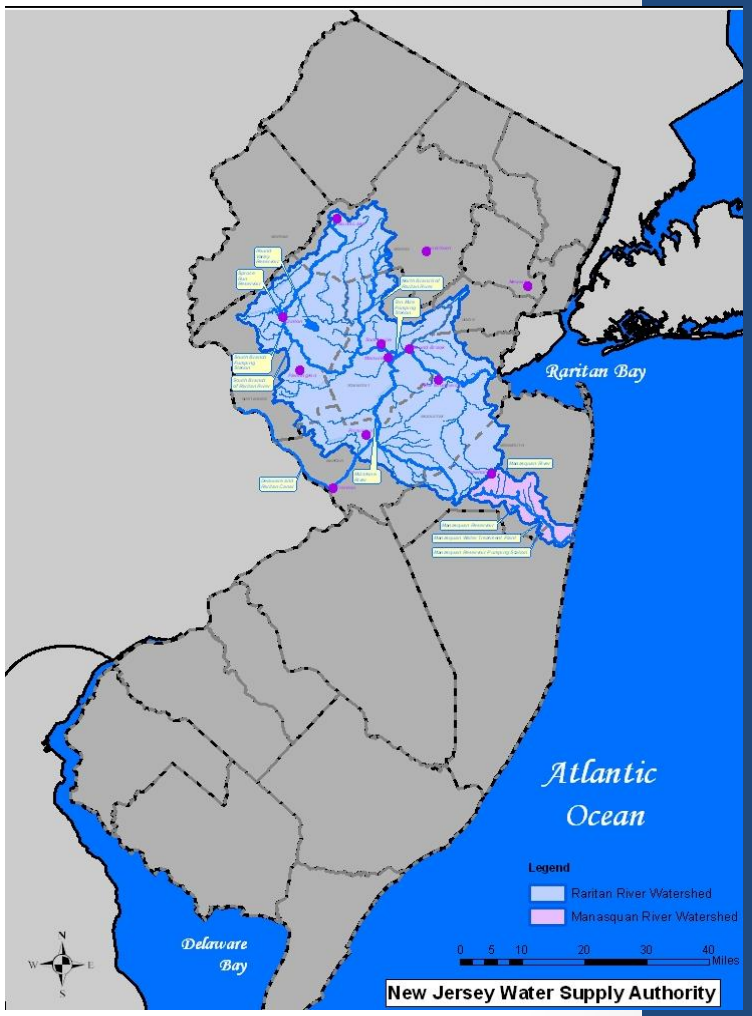
Independent state authority operating state owned water supply facilities:

- Spruce Run Reservoir - natural stream flow - 11BG
- Round Valley Reservoir - pumped storage - 55BG
- Delaware & Raritan Canal -100MG/day

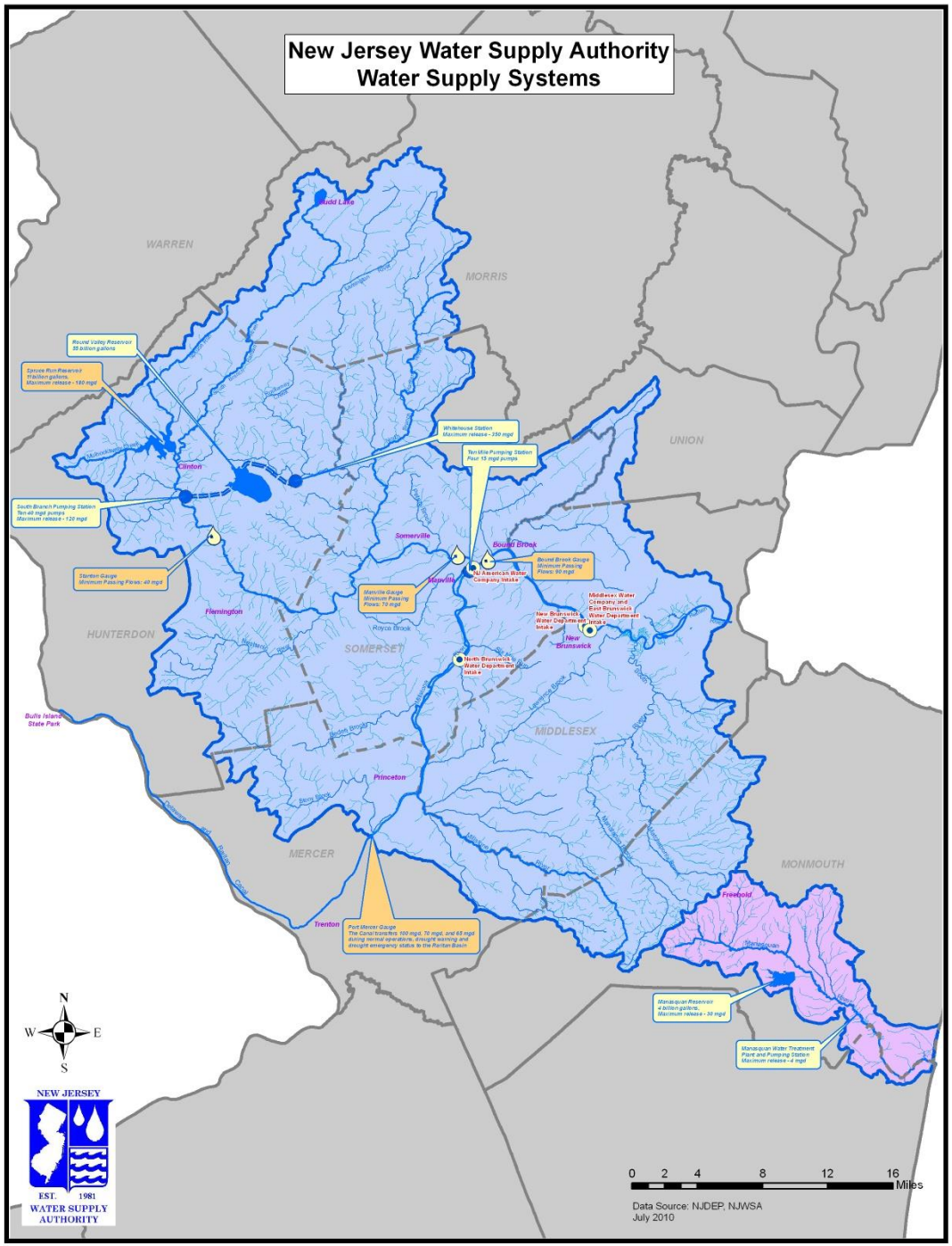
Delaware & Raritan System serves 1.8+ million people in central New Jersey

- Manasquan Reservoir - pumped storage - 4BG

Manasquan System serves 300,000 people in Monmouth County



NEW JERSEY
EST. 1981
WATER SUPPLY AUTHORITY

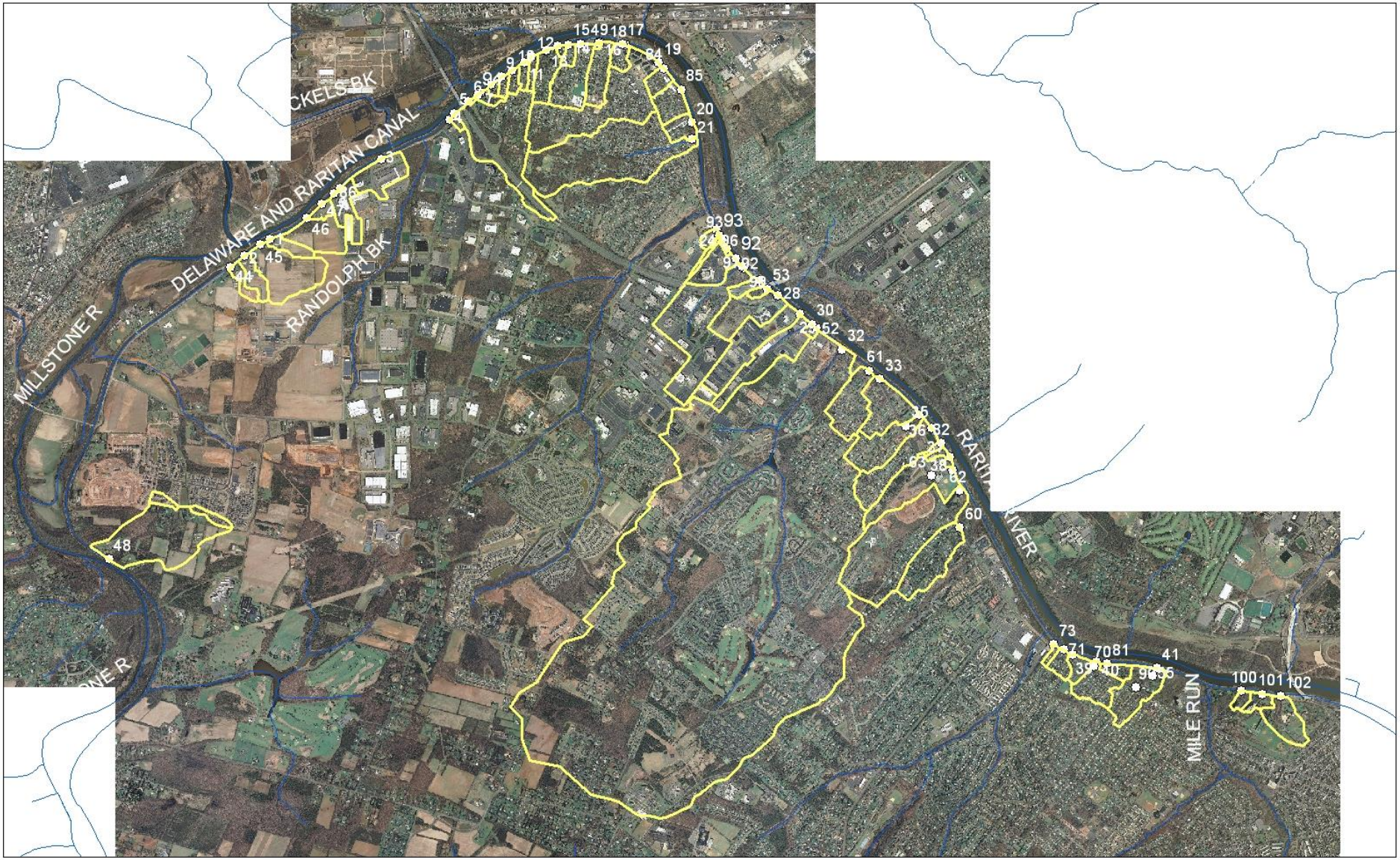

New Jersey Water Supply Authority
Water Supply Systems
WARREN
MORRIS
UNION
HUNTERDON
SOMERSET
MIDDLESEX
MERCER
MONMOUTH
Budd Lake
Round Valley Reservoir
55 billion gallons
Spruce Run Reservoir
3 billion gallons
Maximum release - 180 mgd
Clinton
Whitehouse Station
Maximum release - 250 mgd
Ten-Mile Pumping Station
Four 15 mgd pumps
South Branch Pumping Station
Ten 40 mgd pumps
Maximum release - 120 mgd
Somerville
Bound Brook
Bound Brook Gauge
Minimum Passing
Flows: 90 mgd
Stanton Gauge
Minimum Passing Flows: 40 mgd
Manville
Manville Gauge
Minimum Passing
Flows: 70 mgd
Flemington
Royce Brook
American Water
Company Intake
Middlesex Water
Company and
East Brunswick
Water Department
Intake
New Brunswick
Water Department
Intake
New
Brunswick
North Brunswick
Water Department
Intake
Bulls Island
State Park
Princeton
Trenton
Port Mercer Gauge
The Canal transfers 100 mgd, 70 mgd, and 65 mgd
during normal operations, drought warning and
drought emergency status to the Raritan Basin
Freehold
Manasquan Reservoir
4 billion gallons
Maximum release - 30 mgd
Manasquan Water Treatment
Plant and Pumping Station
Maximum release - 4 mgd
N
W
E
S
NEW JERSEY
EST. 1981
WATER SUPPLY
AUTHORITY
0 2 4 8 12 16
Miles
Data Source: NJDEP, NJWSA
July 2010

Project History

- Studies indicated that sediments do not decrease between 10-Mile Lock & Landing Lane because of stormwater discharges
- Why is increased sediment a problem?
  - Requires additional water treatment by water purveyors – additional chemical cost, additional sludge disposal
- SFY2002 319(h): Delaware and Raritan Canal Tributary Assessment and Nonpoint Source Pollution Management Project
- Focus: final 11 miles of Canal, Amwell Road to Landing Lane
- SFY2006/2007 and 2018 watershed restoration grant funding: Implementation

D&R Canal Restoration Plan

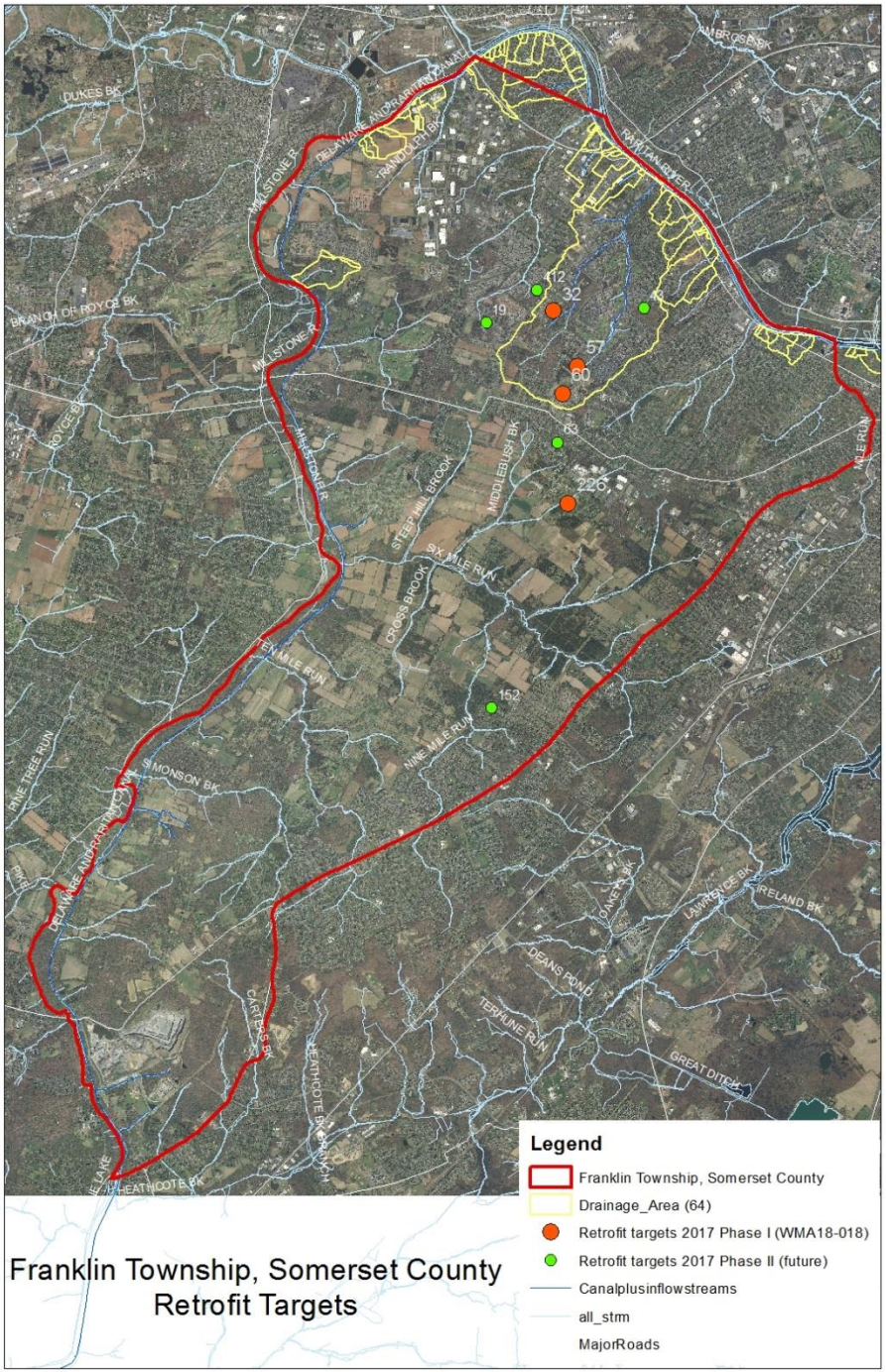
- ✓ Identified 72 infalls
- ✓ Only includes infalls that discharge to the Canal, many others go under Canal and discharge to Millstone River
- ✓ Delineated area draining to each infall, estimated sediment load, prioritized projects
- ✓ 15 infalls contribute 75% of sediment to Canal in project area
- ✓ Watershed restoration plan approved 2006



Delaware & Raritan Canal Nonpoint Source Management Project Infalls & Drainage Areas

Implementation So Far

- Landing Lane monitoring station
- Rain barrel workshops with Franklin Twp. and South Bound Brook Boro
- Schematic designs and conceptual recommendations for Infalls 5, 28, 60/62
- Installed 5 Filterra units and Suntree baffle box in south Bound Brook
- Basin retrofit at Rutgers Prep completed
- Construction documents completed for Dellwood Lane Basin; construction targeted Spring 2021
- Schematic designs and conceptual recommendations for 8 basins in Franklin Township
  - Construction beginning at 4 of those basins Spring 2020


Franklin Township, Somerset County
Retrofit Targets
Legend
Franklin Township, Somerset County
Drainage_Area (64)
Retrofit targets 2017 Phase I (WMA18-018)
Retrofit targets 2017 Phase II (future)
Canalplusinflowstreams
all_strm
MajorRoads
DUKES BK
BRANCH OF ROYCE BK
ROYCE BK
MILLSTONE R
DELAWARE AND RARITAN CANAL
TRANQUIL PT BK
RARITAN RIVER
AMBROSE BK
MILE RUN
MIDDLEBUSH BK
STEEPHILL BROOK
CROSS BROOK
SIX MILE RUN
TEN MILE RUN
NINE MILE RUN
PINE TREE RUN
MONSON BK
OAKE BK
LAWRENCE BK
IRELAND BK
DEANS POND
TERHUNE RUN
GREAT DITCH
CARTERS BK
HEATHCOTE BK
BRANCH
LAKE
12
32
19
57
60
69
226
152

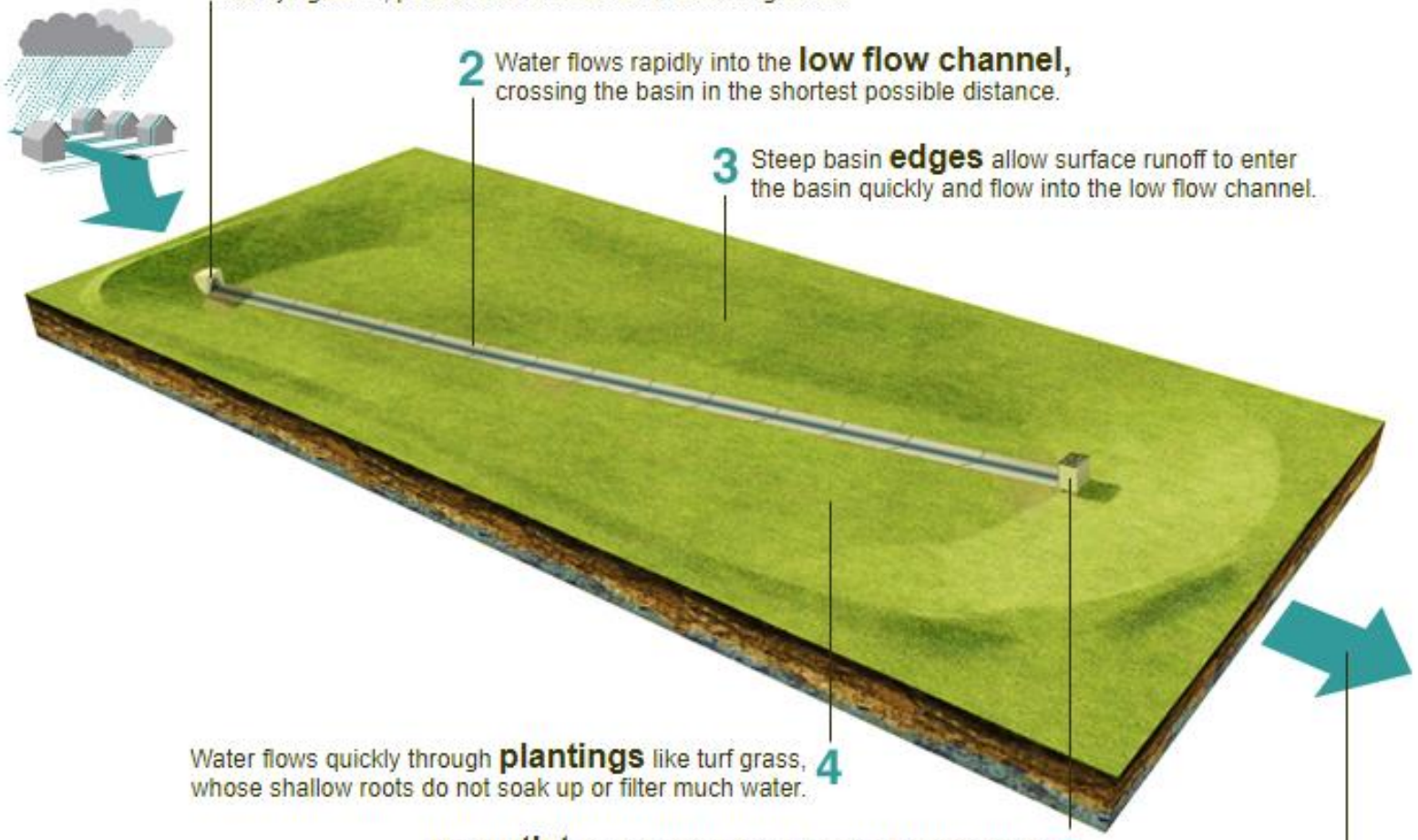
Problems with traditional stormwater basins

- Minimal water quality treatment – runoff flows through without treatment
- Sediment accumulation
- Clogged low-flow channels and outlet structures
- Standing water or wet soils
- Encourages nuisance species such as geese
- High maintenance costs

Why retrofit stormwater basins?

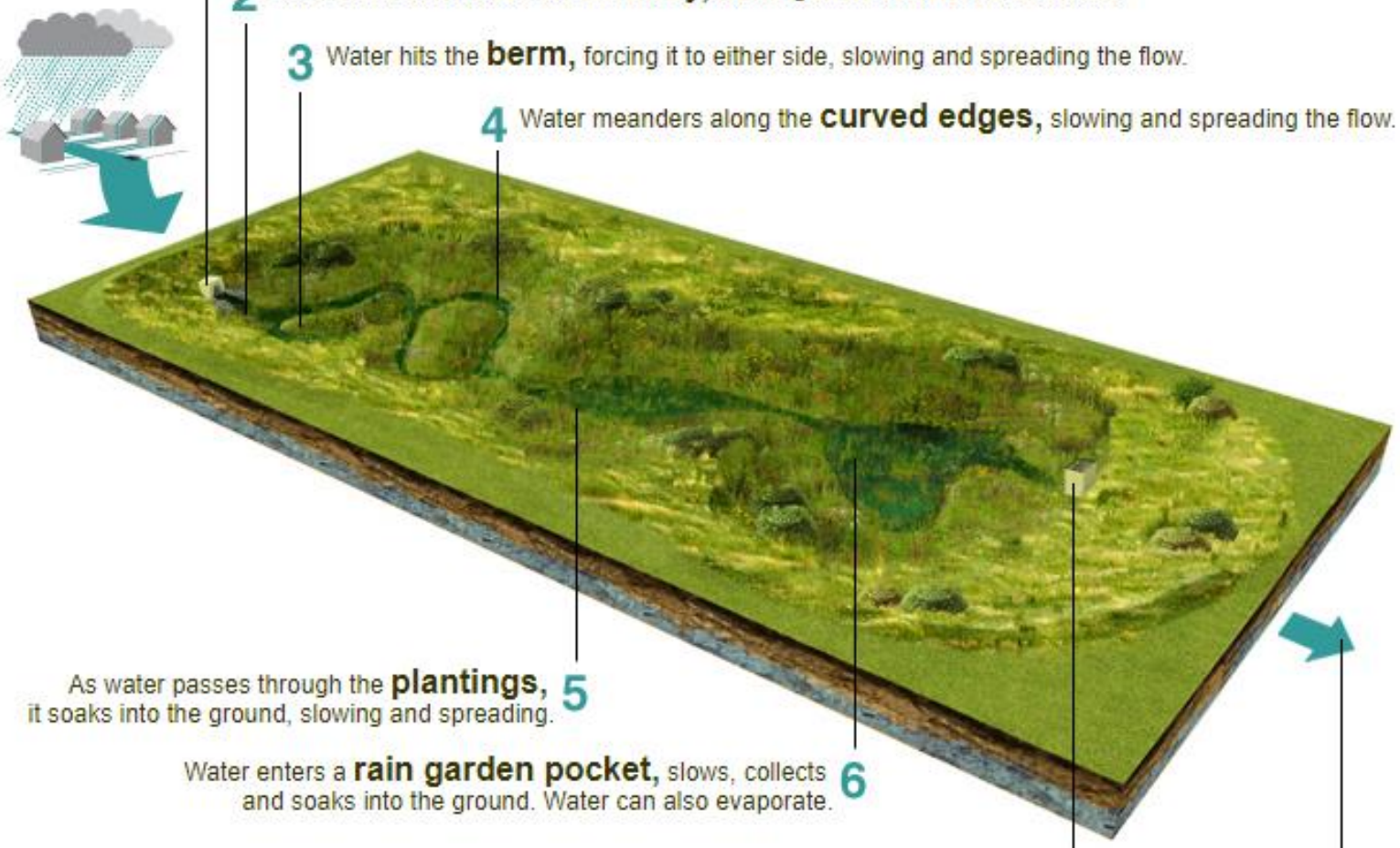
- Improve water quality
- Reduce maintenance costs
- Improve wildlife habitat

What Happens to Stormwater in a *Typical* Detention Basin?



http://www.stormwaterpa.org/basin_retrofit/existing.html

What Happens to Stormwater in a *Retrofitted* Detention Basin?



http://www.stormwaterpa.org/basin_retrofit/retrofitted.html

FT #32/Renoir Way

Approximately 3 acres, Receives ~25 acres of residential runoff

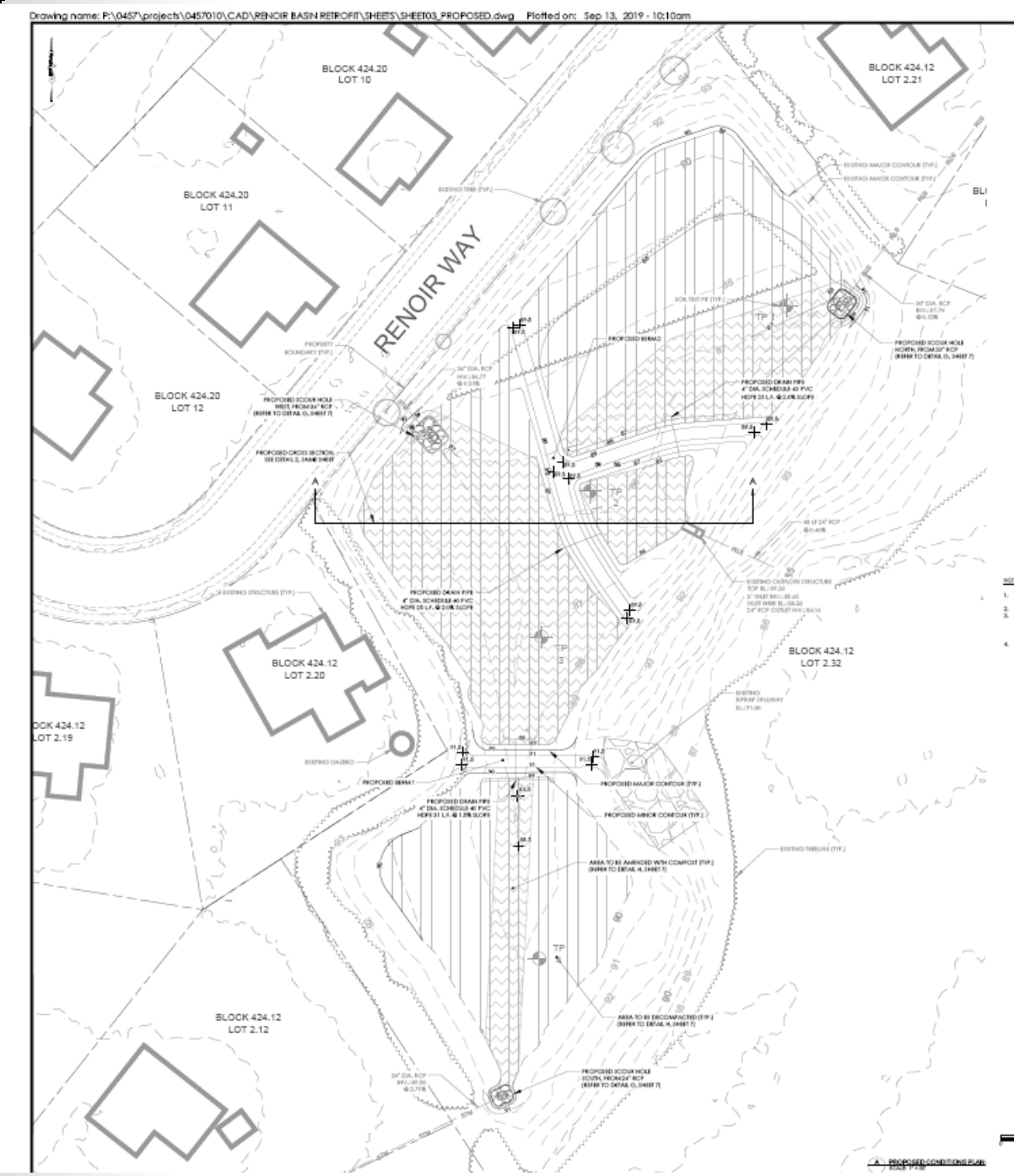
FT #32/Renoir Way

Goals:

- extend the detention time
- increase pollutant removal

Actions:

- remove the concrete low flow channels
- replace mowed grass with native meadow vegetation
- regrade the basin to lengthen the retention time for water quality


Drawing name: P:\0457\projects\0457010\CAD\RENOIR BASIN RETROFIT\SHEETS\SHEET03_PROPOSED.dwg Plotted on: Sep 13, 2019 - 10:10am
BLOCK 424.20
LOT 10
BLOCK 424.12
LOT 2.21
BLOCK 424.20
LOT 11
RENOIR WAY
BLOCK 424.20
LOT 12
BLOCK 424.12
LOT 2.20
BLOCK 424.12
LOT 2.32
BLOCK 424.12
LOT 2.19
BLOCK 424.12
LOT 2.12
A
A
TP
PROPOSED BERM3
PROPOSED BERM1
PROPOSED MAJOR CONTOUR (TYP.)
PROPOSED MINOR CONTOUR (TYP.)
AREA TO BE AMENDED WITH COMPOST (TYP.)
AREA TO BE DECOMPACTED (TYP.)
A PROPOSED CONDITIONS PLAN

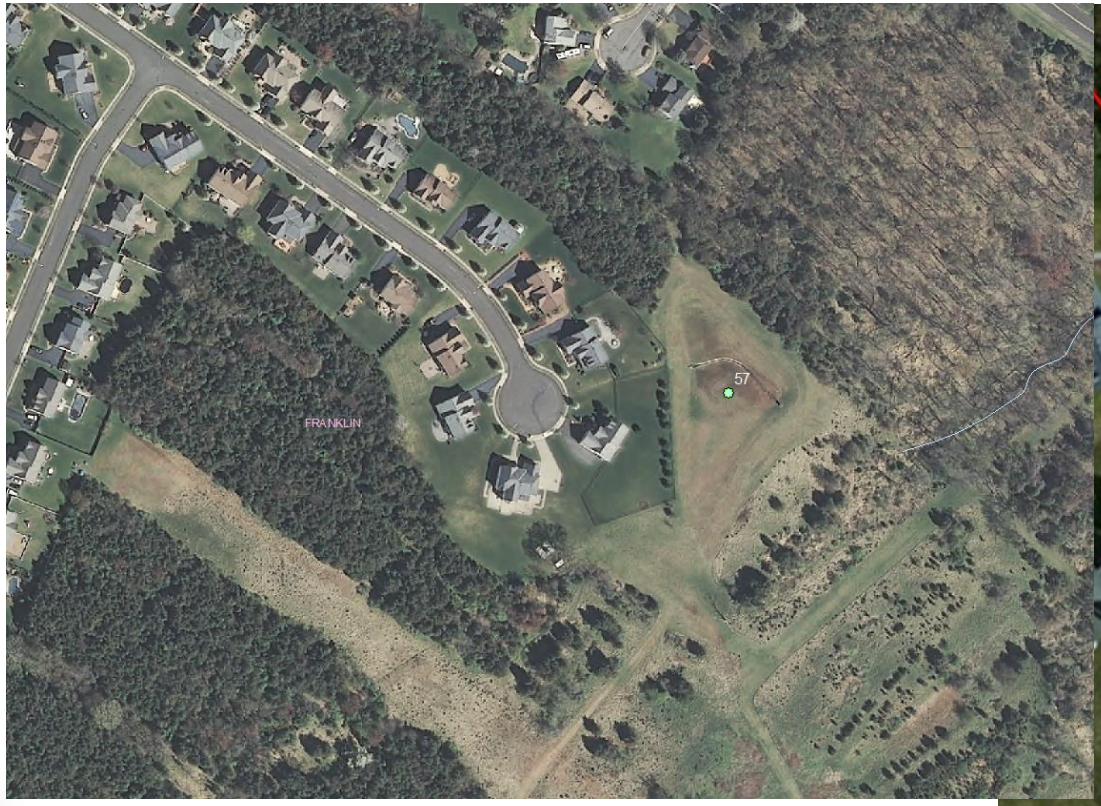
Renoir Way

FT #57/Gauguin Way

Approximately 2 acres

Connected to Middlebush Park stormwater system

Receives ~19 acres of primarily residential runoff



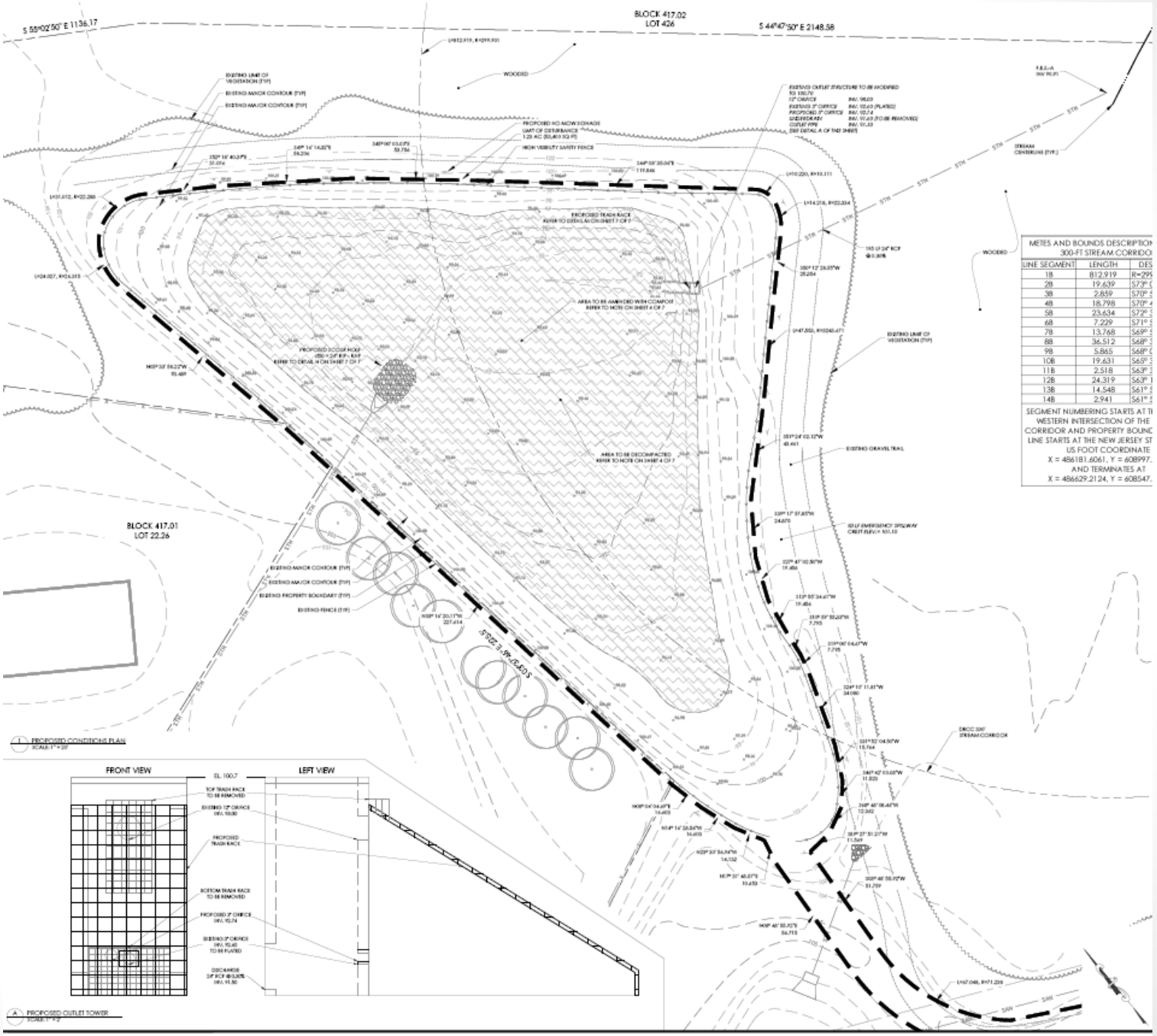
FT #57/Gauguin Way

Goals:

- extend the detention time
- increase pollutant removal

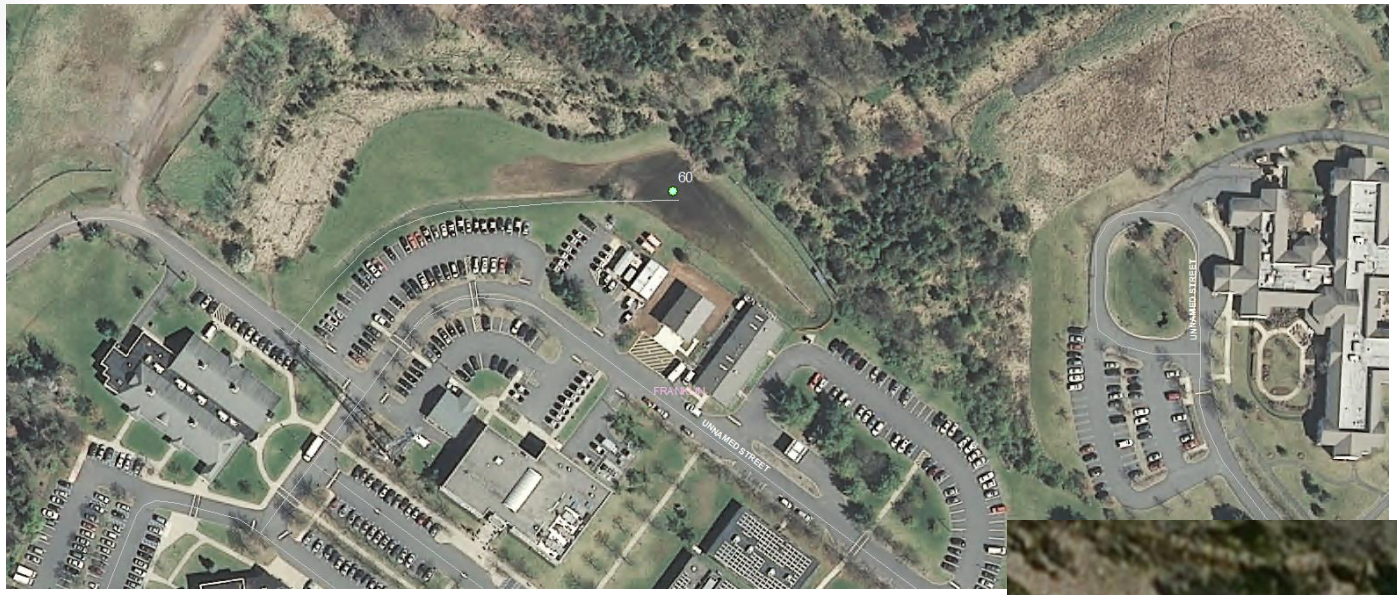
Actions:

- remove concrete low flow channels
- replace mowed grass with native meadow vegetation
- modify outlet orifice to increase detention time
- regrading to remove preferential flow path


S 55°02'50" E 1136.17
BLOCK 417.02
LOT 426
S 44°47'50" E 2148.58
WOODED
BLOCK 417.01
LOT 22.26
METES AND BOUNDS DESCRIPTION
300-FT STREAM CORRIDO
LINE SEGMENT
LENGTH
1B 812.919
2B 19.639
3B 2.859
4B 18.798
5B 23.634
6B 7.229
7B 13.768
8B 36.512
9B 5.865
10B 19.631
11B 2.518
12B 24.319
13B 14.548
14B 2.941
SEGMENT NUMBERING STARTS AT TI
WESTERN INTERSECTION OF THE
CORRIDOR AND PROPERTY BOUNC
LINE STARTS AT THE NEW JERSEY ST
US FOOT COORDINATE
X = 486181.6061, Y = 608997.
AND TERMINATES AT
X = 486629.2124, Y = 608547.
1 PROPOSED CONDITIONS PLAN
FRONT VIEW
EL. 100.7
LEFT VIEW
TOP TRASH RACK TO BE REMOVED
EXISTING 12" ORIFICE
PROPOSED TRASH RACE
BOTTOM TRASH RACE TO BE REMOVED
PROPOSED 3" ORIFICE
EXISTING 3" ORIFICE TO BE PLATED
DISCHARGE
A PROPOSED OUTLET TOWER

FT #60/Municipal Complex

Approximately 1.5 acres, Receives ~10 acres of institutional runoff



Franklin Township Municipal Complex Stormwater Basin/FT #60

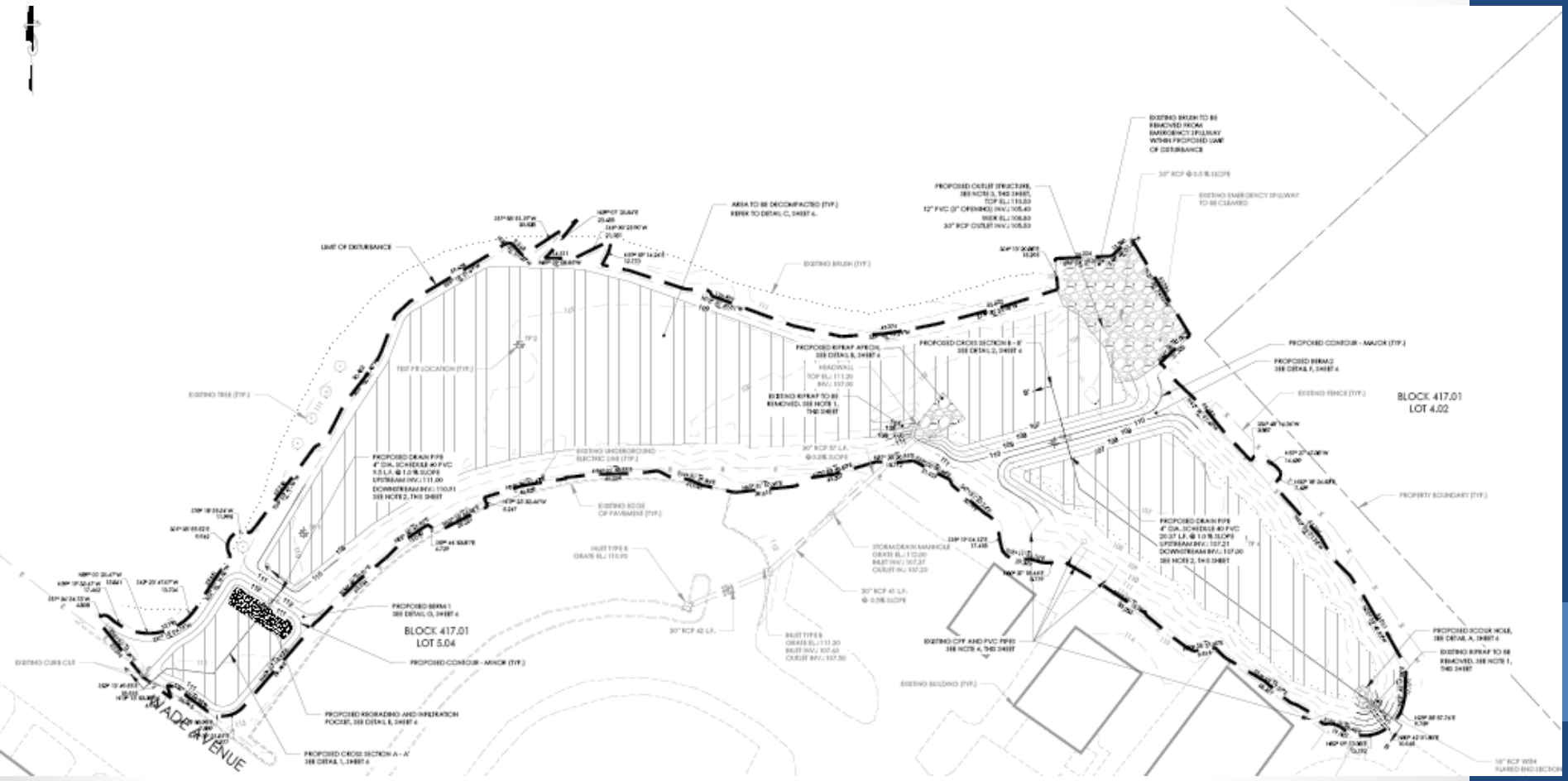
Goals:

- lengthen the flowpath through the basin
- increase the overall detention time for runoff

Actions include:

- remove concrete low flow channels,
- replace mowed grass with native meadow vegetation
- regrade the basin and add berms to increase retention time
- modify outlet structure

Municipal Complex



FT #226/ Laird Terrace

Approximately 4 acres, Receives ~62 acres of residential runoff

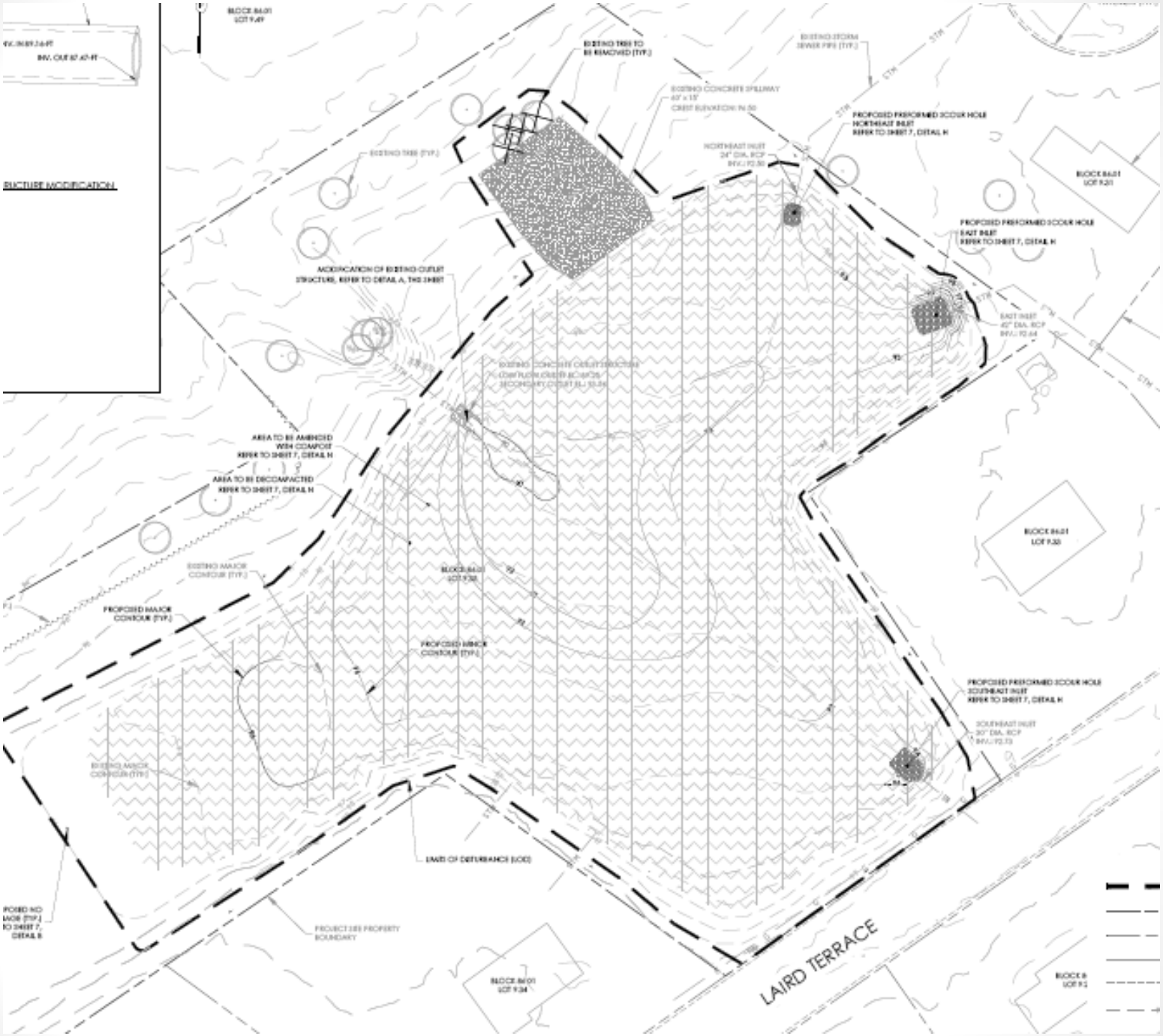
FT #226/ Laird Terrace

Goals:

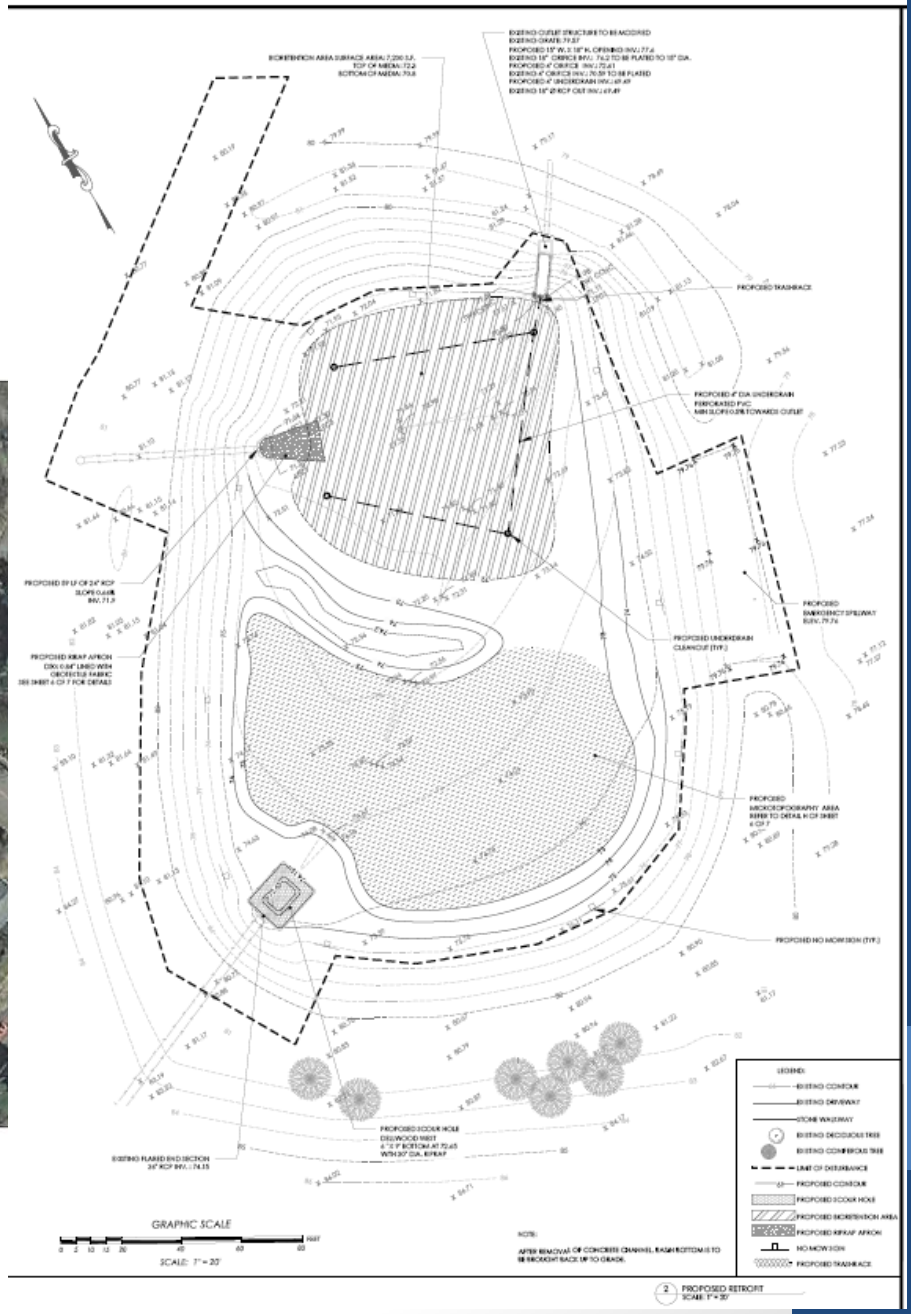
- extend the detention time for runoff
- increase pollutant removal

Actions:

- remove concrete low flow channels
- replace mowed grass with native meadow vegetation
- regrade the basin to remove the preferential flow path
- modify the outlet structure


EXISTING TREE TO BE REMOVED (TYP.)
EXISTING CONCRETE SPILLWAY
PROPOSED PREFORMED SCOUR HOLE NORTHEAST INLET
REFER TO SHEET 7, DETAIL H
NORTHEAST INLET
24" DIA. RCP
PROPOSED PREFORMED SCOUR HOLE EAST INLET
REFER TO SHEET 7, DETAIL H
MODIFICATION OF EXISTING OUTLET STRUCTURE, REFER TO DETAIL A, THIS SHEET
EAST INLET
42" DIA. RCP
AREA TO BE AMENDED WITH COMPOST
REFER TO SHEET 7, DETAIL H
AREA TO BE DECOMPACTED
REFER TO SHEET 7, DETAIL H
EXISTING MAJOR CONTOUR (TYP.)
PROPOSED MAJOR CONTOUR (TYP.)
PROPOSED PREFORMED SCOUR HOLE SOUTHEAST INLET
REFER TO SHEET 7, DETAIL H
SOUTHEAST INLET
30" DIA. RCP
LIMIT OF DISTURBANCE (LOD)
PROJECT SITE PROPERTY BOUNDARY
LAIRD TERRACE

Next project? Dellwood Lane Basin



Readington Middle School

Readington Middle School

Typical Construction Sequence

CONSTRUCTION SEQUENCE

1. ALL EARTH DISTURBANCE ACTIVITIES SHALL PROCEED IN ACCORDANCE WITH THE FOLLOWING SEQUENCE. EACH STAGE SHALL BE COMPLETED AND IMMEDIATELY STABILIZED BEFORE ANY FOLLOWING STAGE IS INITIATED. CLEARING, GRUBBING AND TOPSOIL STRIPPING SHALL BE LIMITED ONLY TO THOSE AREAS DESCRIBED IN EACH STAGE.
2. IMMEDIATELY UPON DISCOVERING UNFORESEEN CIRCUMSTANCES POSING THE POTENTIAL FOR ACCELERATED EROSION AND/OR SEDIMENT POLLUTION, THE OPERATOR SHALL IMPLEMENT APPROPRIATE BEST MANAGEMENT PRACTICES TO ELIMINATE THE POTENTIAL FOR ACCELERATED EROSION AND/OR SEDIMENT POLLUTION.
3. DEWATERING SHALL BE PERFORMED AS THE CONTRACTOR DETERMINES NECESSARY TO PERFORM PROJECT SCOPE. ALL PUMPING OF SEDIMENT LADEN WATER SHALL BE THROUGH A SEDIMENT CONTROL BMP, SUCH AS PUMPED WATER FILTER BAG OR EQUIVALENT SEDIMENT REMOVAL FACILITY, OVER UNDISTURBED VEGETATED AREAS.
4. CONTACT NJ ONE CALL. SCHEDULE ON SITE MEETING ONE WEEK IN ADVANCE OF SITE DISTURBANCE ACTIVITIES WITH THE SOMERSET SOIL CONSERVATION DISTRICT, LAND OWNER, PROJECT ENGINEER, AND INSPECTOR PROVIDING OVERSIGHT OF CONSTRUCTION ACTIVITIES.
5. INSTALL TEMPORARY CONSTRUCTION ENTRANCE WITH ACCOMPANYING SILT FENCING.
6. INSTALL SILT FENCE AS SHOWN ON THE PLANS OR AS INDICTED BY THE ON SITE ENGINEER, AND AS NECESSARY.
7. REMOVE EXISTING CONCRETE LOW FLOW CHANNEL.
8. INSTALL SCOUR HOLD OUTLET PROTECTION.
9. MODIFY EXISTING OUTLET STRUCTURE AS PER DESIGN.
10. PREPARE SOIL PLANTING BED AS PER DESIGN, INCORPORATE LEAF COMPOST USING DEEP TILL TECHNIQUE.
11. PLANT PLUGS AND SPREAD SEED ACCORDING TO THE PLANTING PLAN.
12. IMMEDIATELY SEED AND MULCH ALL DISTURBED AREAS ONCE FINAL GRADE IS ACHIEVED.
13. COMPLETE SITE STABILIZATION AND REMOVE OF ALL TEMPORARY SOIL EROSION AND SEDIMENT CONTROL MEASURES.
14. DISPOSE OF ANY EXCESS FILL MATERIALS AND DEMOBILIZE.

ANTICIPATED PROJECT DURATION: 10 - 15 DAYS

Maintenance

- Franklin Township responsibility
- Frequent inspections
- Mowing once per year
- Removal of sediment and trash as needed

River Friendly Programs
Partnerships to improve water quality

- Golf Course
- Business
- Farm
- Resident
- Schools

Better management of existing land uses:

- Water Quality Management
- Water Conservation Techniques
- Wildlife and Habitat Enhancement
- Education & Outreach

Questions?

Native grass restoration area, NJWSA Administration Facility – Spruce Run Reservoir

New Jersey Water Supply Authority

- Kathy Hale
- Angela Mostwill
- Kyle Clonan
- Aimer Garcia

khale@raritanbasin.org

(908) 730-0270 x228

Princeton Hydro (design engineers)

- Amy McNamara

SumCo Construction

- Construction contractor