Summary of Water Quality MONITORING of two streams draining the Dickerson Yard Trim Compost Facility

1999-2024

Update through Nov. 2024

June 2025

DEPARTMENT OF
ENVIRONMENTAL
PROTECTION
MONTGOMERY COUNTY • MARYLAND

OBJECTIVES

Assess water quality of two streams draining the Dickerson Yard Trim Compost facility as compared to a nearby reference stream not draining facility

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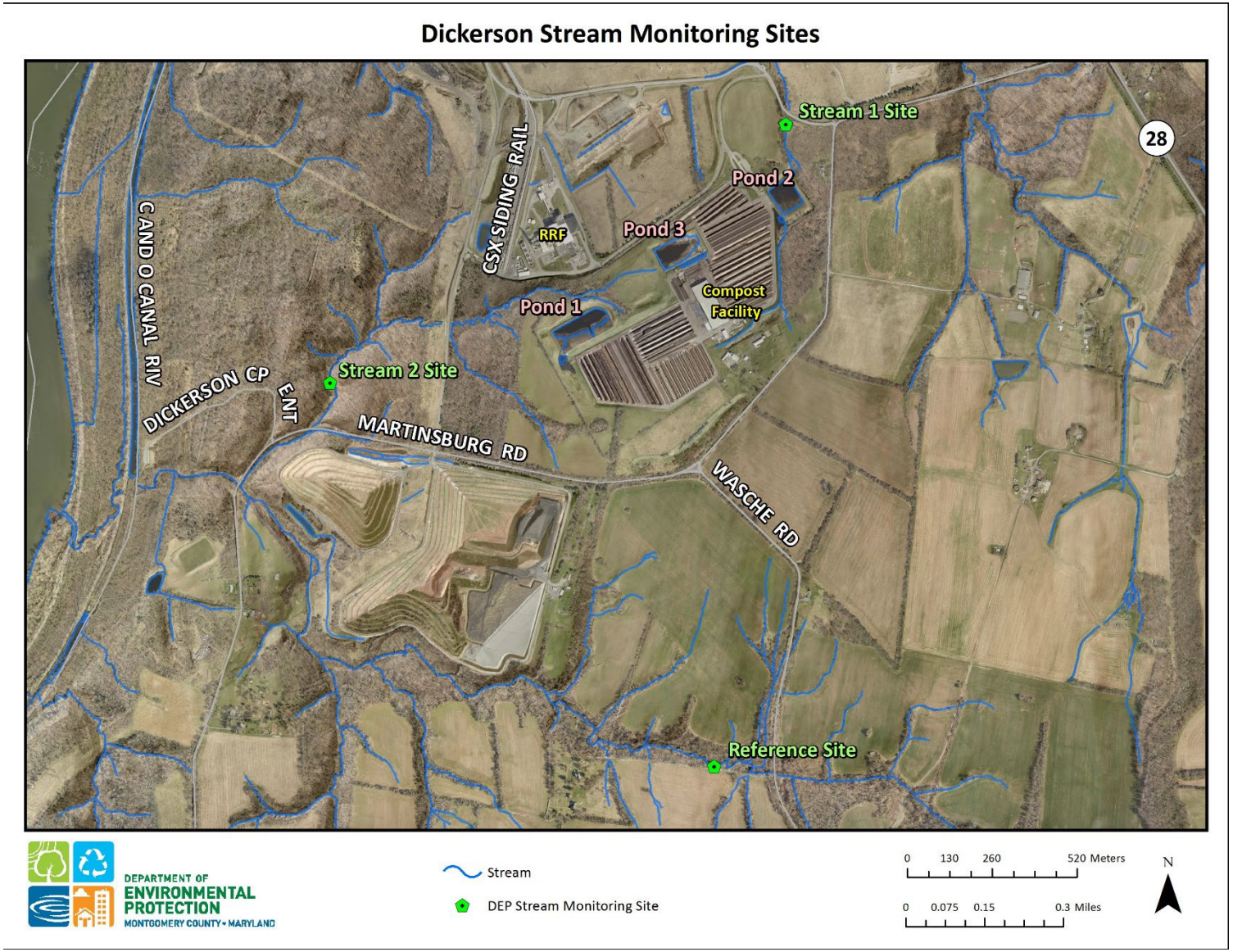
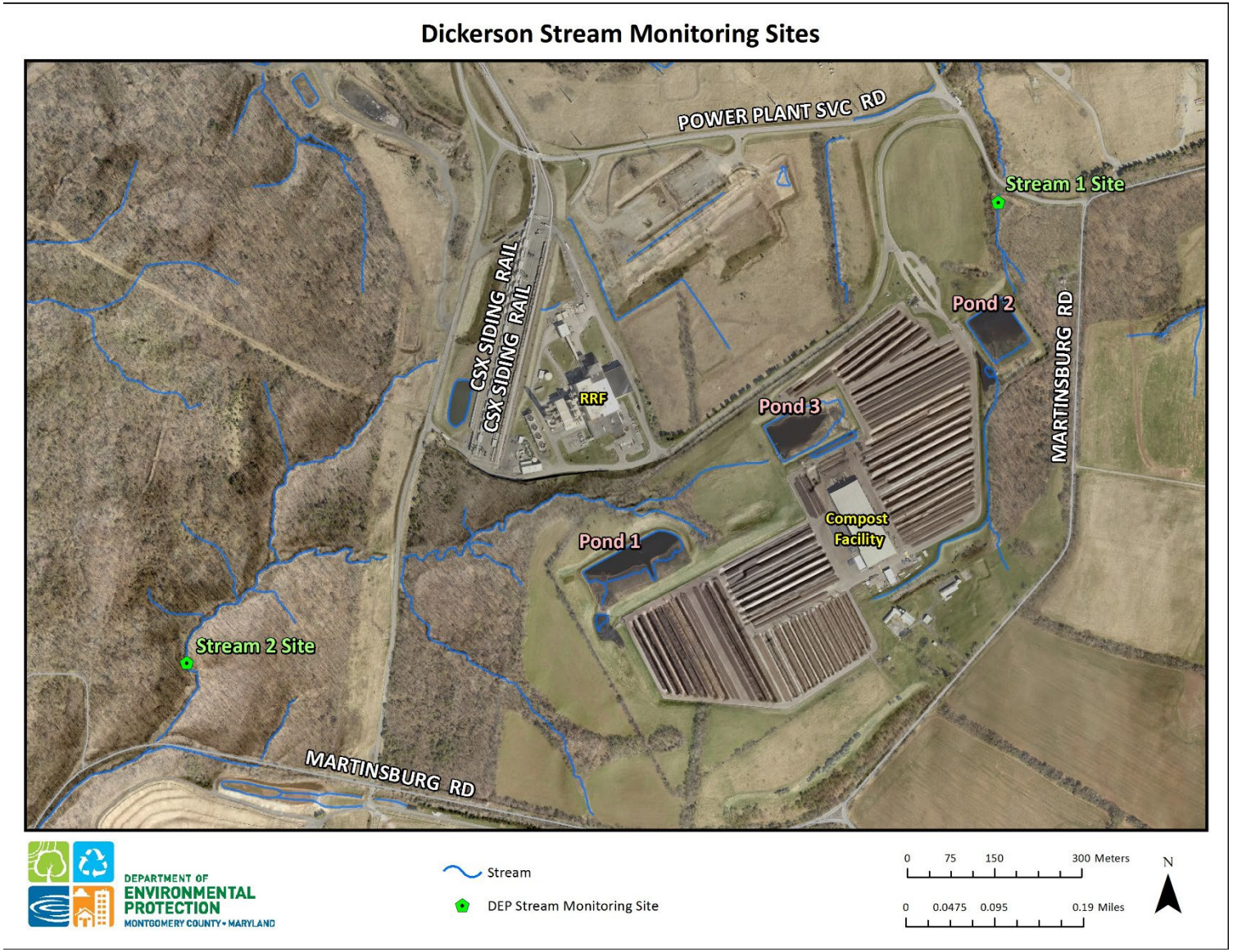
Benthic macroinvertebrate community analyses (spring & fall)

(1999 - 2024)

Overall Stream monitoring Locations



Stream 1 & 2 Stream monitoring Locations



Stream 1 *(FPOM predominate)*
Stream 2 *(CPOM Predominate)*

CPOM = Course Particulate Organic Matter

FPOM = Fine Particulate Organic Matter

Stream 1 (usually rates as POOR)

Headwater stream, no tributaries

- -discharge from outfall primary source of water
- -flushing rate low due to low volume & gradient

Stream 2 (usually rates as FAIR or GOOD)

Not a headwater stream, tributaries

- -discharge from outfall not predominant water source
- -flushing rate greater; greater volume & gradient

Best Management Practices (filter socks) to **reduce loadings of FPOM** into both receiving streams

- Excessive FPOM implicated as stressor to benthic macroinvertebrate community
- Stream 1 small stream, low gradient
  - *(more likely to retain FPOM)*
- Filter sock booms to keep detrital fines from flowing **into** retaining ponds and subsequent discharge to streams
- Initial installation – Fall 2016 (*placed at pond entrance*)

REDUCING FPOM LOADINGS

Filter Socks

- Initially, used to reduce FPOM entering pond
  (since fall 2016)

- Initial installation September 20, 2016
  - Treat Pond 1 (Stream 2) – larger stream
  - Treat Pond 2 (Stream 1) – small stream

- Added filter sock treatment to reduce FPOM leaving the pond (i.e., at outfall) – *began 2025*

Compost blockage at Pond #2 (drains to Stream 1) limit FPOM entering Pond

Discharge at outfall from Pond #2
Further limit FPOM from entering Stream

Build-up of sediments in Stream 1 Additional filtration at outfall to reduce loadings such as this

DO logger at ref stream

Dissolved oxygen comparison among the streams; 2017 - 2024

Mean **BIBI** & dissolved oxygen values

Stream	Pond	Score	Narrative	Num. sessions	Diss. Oxygen* (mg/l)	Percent Saturation
1	2	17.5	Poor	16	6.5	63
2	1 & 3	26.2	Good	16	10.5	94
Ref	NA	30.1	Good	16	10.1	90

*single value, discrete point in time measurement

BIBI = Benthic macroinvertebrate Index of Biotic Integrity

Excessive FPOM loadings lead to low DO stressing benthic communities

"Red flag" observations for dissolved oxygen (i.e., percent saturation < 60%)

Stream	Score	Narrative	Num. sessions	Diss. Oxygen* (mg/l)	Percent Saturation	Year(s)	Season(s) *
1	17	Poor	4	**3.8**	**37**	2022-2024	S (3), F (1)
2	24	Fair	0	NA	NA	NA	NA
Ref	28	Good	2	6.1	54	2023, 2024	Fall

*S = spring, F = fall

NOTE: Maryland water quality standards; DO > 5.0 mg/L in flowing water

Continuous Measurement of DO levels that were initiated in 2024 (hourly intervals)

- Phase 1 (May – December 2024)
- Problems with monitoring at Stream 1
- *(logger stop recording due to clogging with FPOM/sediment)*
- Prior to logger failure at Stream 1, DO levels observed to fluctuate drastically and reached hypoxic/anoxic conditions at night

  (lower DO expected at night)
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- Phase 2 (April 29, 2025 – Present)
- 2025 DO monitoring to continue and compare with BIBI score and enhanced management of reducing FPOM loadings

Recent DO monitoring sessions at outfalls from the ponds (discrete)

March 28, 2025

Stream or Pond	Diss. Oxygen (mg/l)	Diss. Oxygen Saturation (%)
Reference	11.02	98
Stream 2	9.83	89
Pond 3	7.15	70
Stream 1	6.55	60
Pond 2	6.62	67

April 3, 2025

Stream or Pond	Diss. Oxygen (mg/l)	Diss. Oxygen Saturation (%)
Reference	10.94	101
Stream 2	9.32	89
Pond 3	5.49	55
Channel*	6.44	65
Stream 1	6.48	64
Pond 2	2.35	23
Channel*	4.67	47

Two spring 2025 discrete observations at the ponds, outfalls, and receiving streams indicated

March – DO levels at all ponds, outfalls, and receiving streams not hypoxic

April – DO levels at pond & outfall low DO; receiving stream DO adequate

March – no filter socks at outfall observed, water churning in receiving container prior to discharging (enhancing DO concentrations)

April – filter socks observed at outfalls, less turbulence

Conclusions

- FPOM loadings need to be further reduced to enhance water quality at Stream 1
- Filter socks at outfall supplemented by filter socks at forebays should reduce FPOM loadings
- DO enhanced in receiving stream with periodic flushing (weather dependent) – ponds are generally not drained during dry periods

Future investigations

- Spring 2025 benthic macroinvertebrate samples have yet to be analyzed
- Evaluate how benthic community has responded to management changes that were recently initiated to reduce FPOM loadings
- Quantify discharge regime over time and compare with how the benthic macroinvertebrate community responds
- Investigate feasibility of other BMP methodologies
  - Changes in site operations with minimal expense
  - Artificial wetlands/bioretention