Performance of the Run-on and Run-off Control Systems
Drumheller Regional Landfill

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Drumheller Regional Landfill

1. Surface Water Definitions
2. Topography and Setting
3. Approval Requirements
4. Sampling and Analytical Data
5. Conclusions
6. Next Steps

Definitions: Run-on Control Facilities

Run-on control facilities collect and redirect the surface waters away from the facility and disposal areas.

Definitions: Run-on Control Facilities Continued

Definitions: Run-off Control Facilities

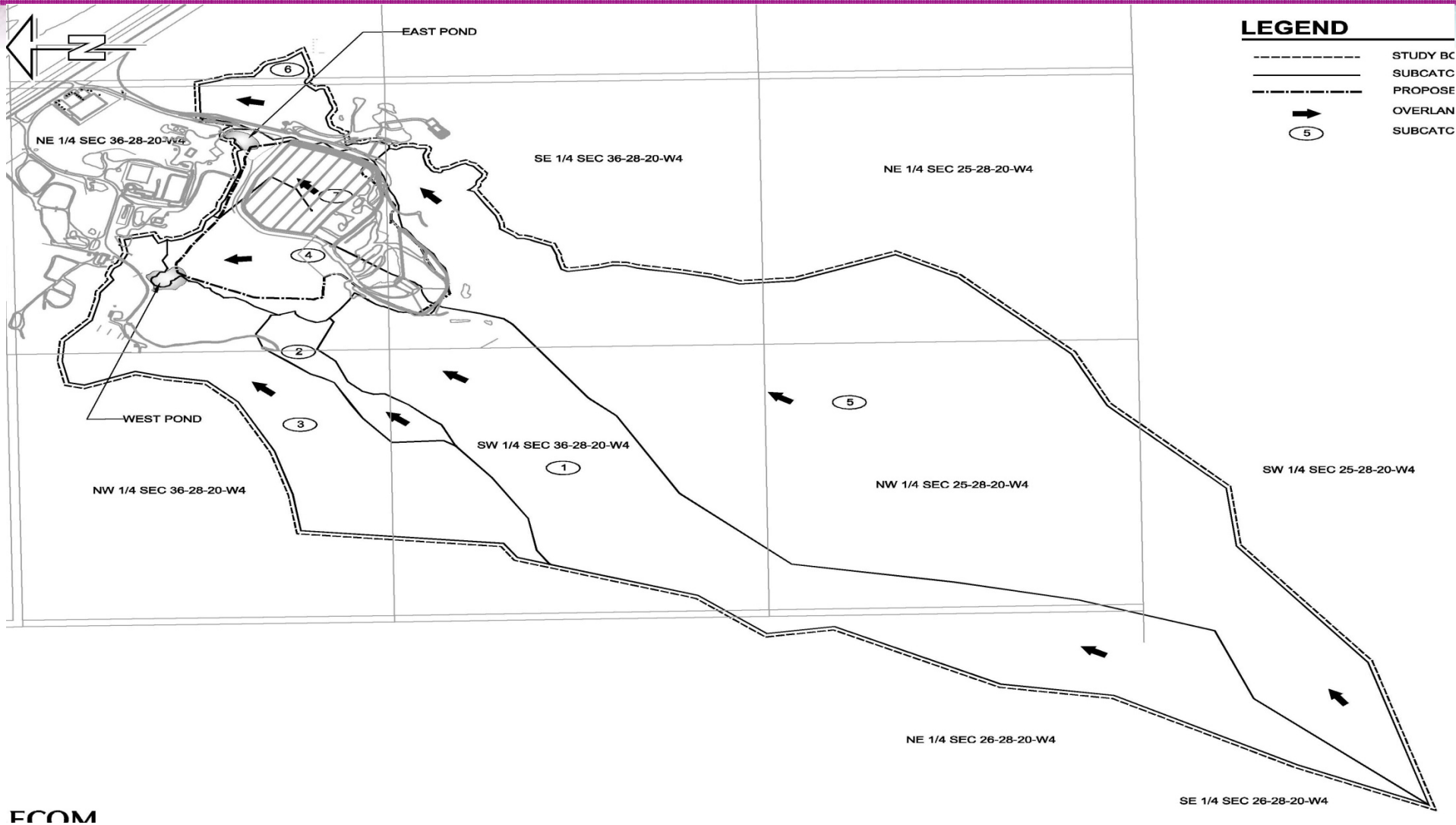
Run-off control facilities collect and control run-off from the active portion of the landfill which may have contacted waste materials.

Run-off structures are also used to protect the final cover by collecting and controlling run-off from the closed portion of the landfill.

Definitions: Run-off Control Facilities Continued

Definitions: Run-off Control Facilities Continued

Drumheller Regional Landfill Catchment Boundaries



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Topography and Setting

The regional landfill was located within the badlands near the Town of Drumheller

- In an area with sharp relief
- With steep incised coulees
- Erodible bedrock materials

Topography and Setting Continued

The run-on and run-off control systems had to accommodate:

- Steep natural gradients
- Very high sediment loadings (total suspended solids concentrations greater than 30,000 mg/l; COD greater than 500 mg/l)
- Limited areas for detention and storage

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AENV Approval Requirements

Run-on control systems – to divert the peak discharge from a 24-hour, 1:25-year storm

Run-off control systems - to collect and control at least the water volume resulting from a 24-hour, 1:25 year storm

Meet DFO Requirements

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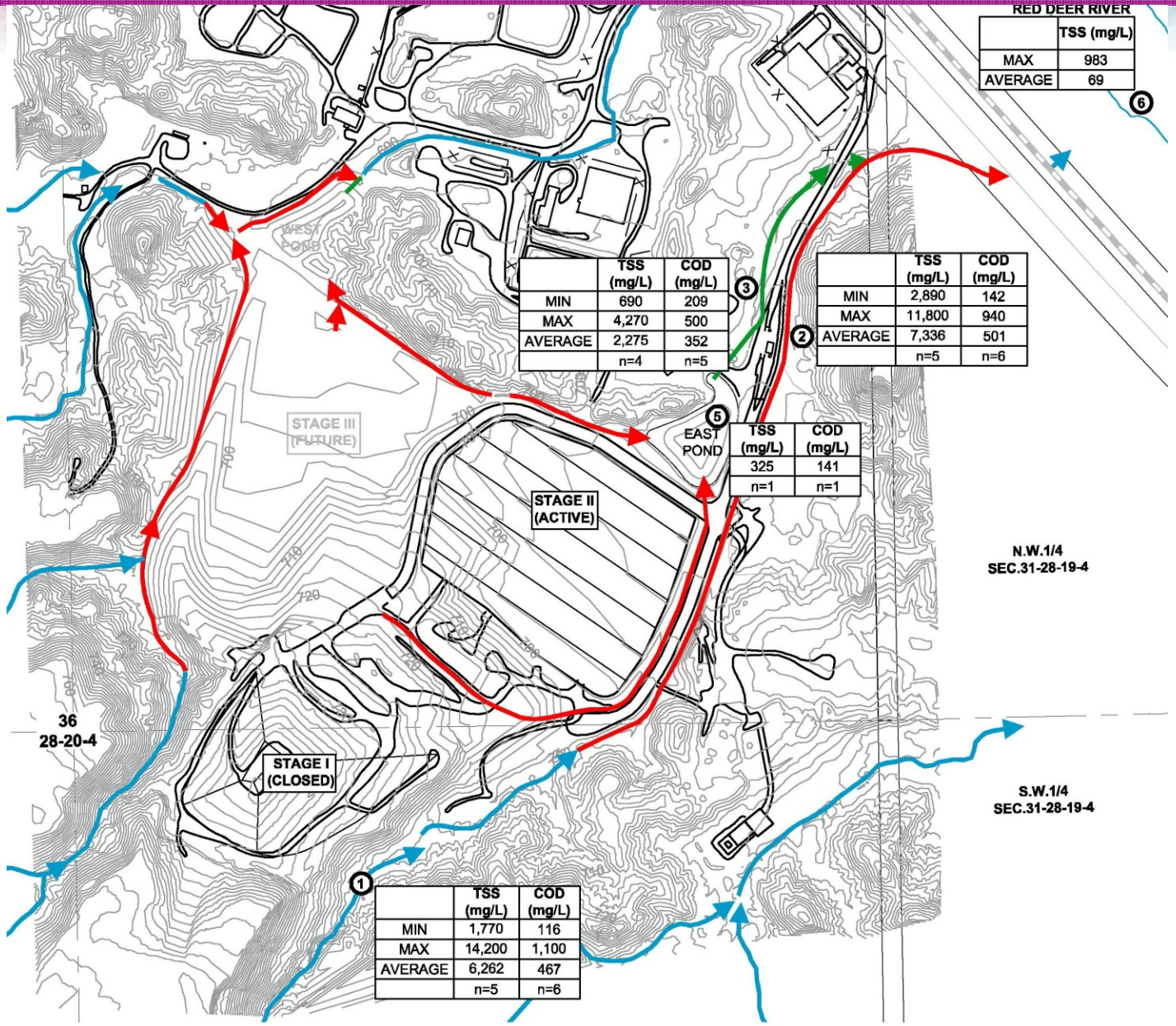
Sampling Locations



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Run-on Control System - Analytical Data

Parameter	Max allowable concentration before release	US East (Station 1)	DS East (Station 2)	DS West (Station 3)	Offsite (Station 4)
pH	6.0 - 9.5	8.17	8.25	8.20	8.08
Total Dissolved Solids	2,500	375	555	813	310
Ammonia (total)	5	2.0	0.4	0.72	0.6
Chloride	250	65	27	100	10
Sodium	200	122	123	242	110
Sulphate	500	98	123	274	73
Chemical Oxygen Demand	50	1,100	940	500	1,220

Analytical Data – Off Site "*Natural Run-off*"

Location	TSS (mg/L)	COD (mg/L)	Comments
Red Deer River	5,400	84	Raw water intake, opposite site
Rosebud River	3,040	98	3 km east of site
West Bypass Channel	12,500	421	Run-off from landfill expansion, natural landscape
West Pond Inlet	34,100	295	Run-off from landfill expansion, amended landscape

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Run-off Control System - Analytical Data

Sampling Location	TSS (mg/L)	COD (mg/L)
Discharge Criteria	25	50
Active Landfill Operations		
Upgradient East – Station 1	1,770 - 14,200	116 - 1,100
Downgradient East – Station 2	2,890 - 11,800	142 - 940
Downgradient West – Station 3	690 - 4,270	209 - 500
Amended Landscape - Phase III (no waste present)		
West Bypass Channel	12,500	421
West Pond Inlet	34,100	295
Background		
Off-site – Station 4	2,160 - 5,490	157 - 1,220

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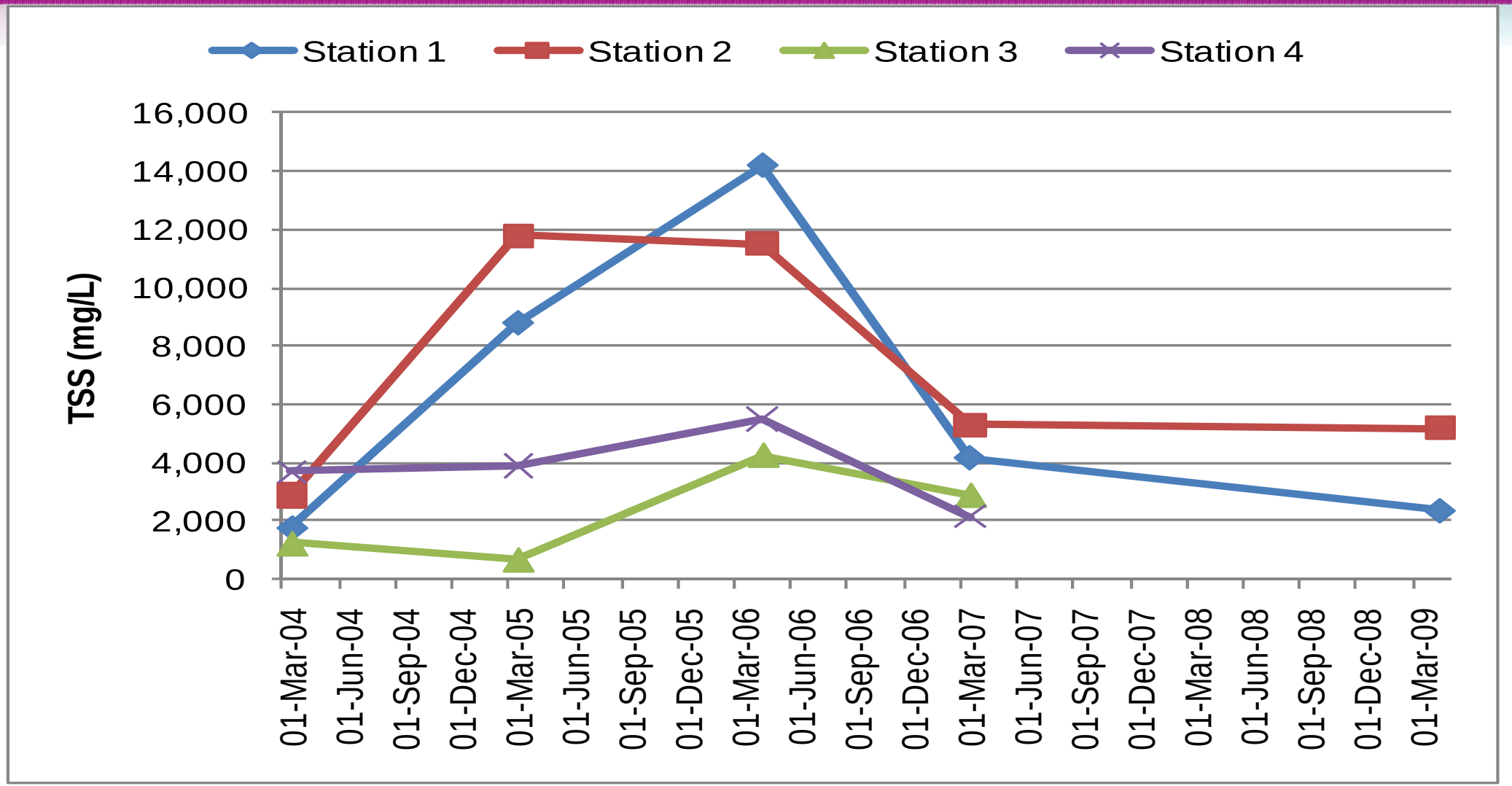
Run-on Control System - Analytical Data



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Note: Inflow into East Pond (Day 0) was also analyzed for BTEX, F2, CHC, and Total oil & grease. All sample results were non detect.

Run-off Control System - Analytical Data

Sampling Location	TSS (mg/L)	COD (mg/L)	Dissolved COD (mg/L)
Discharge Criteria	25	50	-
Inflow into East Pond (Day 0)	48,600	511	-
East Pond (Day 2)	2,450	-	-
East Pond (Day 4)	3,240	524	50
East Pond (Day 7)	3,580	409	55
East Pond (Day 10)	3,620	466	47

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Erosion Control Measures

Erosion control measures for run-on/run-off structures include:

- Vegetation
- Hay bale check dams
- Stone check dams
- Riprap
- Erosion control blankets

Erosion Control Measures Continued

Erosion Control Measures Continued

Erosion Control Measures Maintenance Continued

Maintenance

A good maintenance program is of equal importance with proper design and construction of structures. Maintenance includes:

- repairing erosion damage
- mowing vegetation
- removing any sediment or debris deposited in the structures

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Erosion Control Measures Maintenance Continued

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Conclusions

Run-on control system

- Diversion of 24-hour 1:25 year storm event

Run-off control system

- Collecting and controlling runoff from the 24-hour 1:25 year storm event (storage plus) plus average July precipitation
- Lined detention pond
- Monitoring of East Pond (developed landfill)
- Operation of West Pond (undeveloped landfill)
- TSS and COD monitoring

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Next Steps

AENV Approval Amendment

Spill Prevention, Monitoring Remedial Action Plan Proposal

- Operations/maintenance/ pollution prevention

Runoff Water Quality Assessment

- Proposal for replacement parameter for COD
- Proposed guideline limits

Thank You | Questions??

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