



# RIVERSIDE COUNTY

## WATERSHED PROTECTION



# 2018 Holy Fire Post-Fire Stormwater Monitoring (2018-2019 Storm Season)

LE/CL TAC Meeting  
October 23, 2019

Presented by:  
Riverside County Flood Control and Water Conservation District  
and  
Alta Environmental an NV5 Company



# Overview



# Monitoring Design



- Assess the potential impacts of the Holy Fire
- Not part of Permittee's required compliance monitoring
- Expedited process to capture 'first flush'
- Contracting/mobilization/equipment
- Followed SMC Post-Fire Water Quality Monitoring Plan

"Effects of Post-fire Runoff on Surface Water Quality: Development of a Southern California Regional Monitoring Program with Management Questions and Implementation Recommendations" (SCCWRP, 2009).



# *SMC Post-Fire Water Quality Monitoring Plan Priority*

## *Management Questions:*

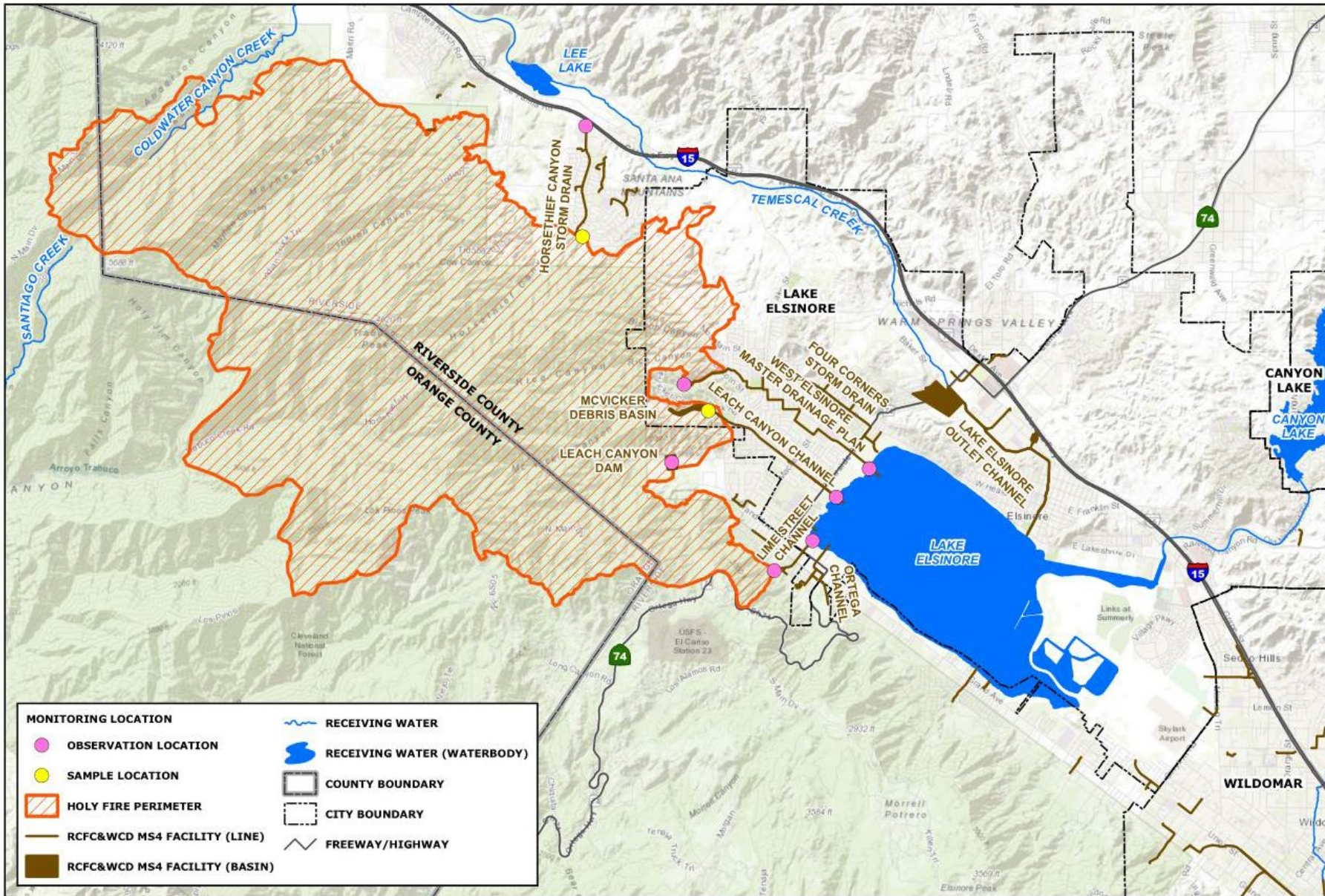
1. How does post-fire runoff affect contaminant flux?

2. What is the effect of post-fire runoff on downstream receiving waters?

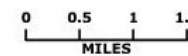
3. What are the factors that influence how long post-fire runoff effects persist?

- Sample post-fire runoff from the terminal end of burned catchments
  - Downstream of District's debris basins
- Compare the data to reference or control sites
- Assess the effects of the Holy Fire:
  - Hydrologic response
  - Sediment and pollutant loads

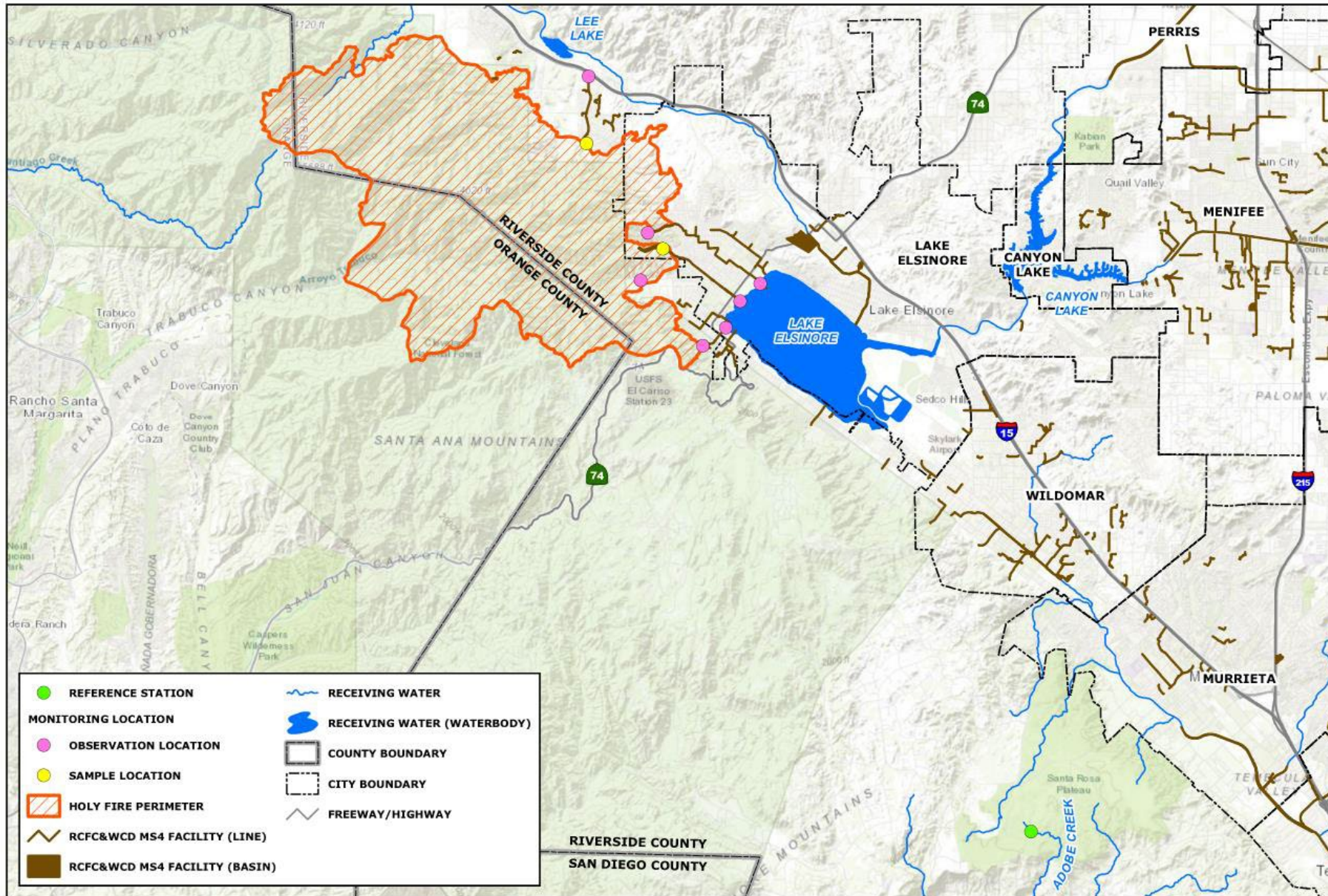




## HOLY FIRE PERIMETER AND DRAINAGE POSTFIRE MONITORING LOCATIONS FY18-19

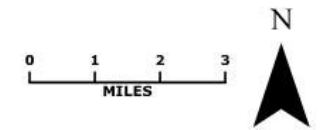


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	REFERENCE STATION		RECEIVING WATER
	OBSERVATION LOCATION		RECEIVING WATER (WATERBODY)
	SAMPLE LOCATION		COUNTY BOUNDARY
	HOLY FIRE PERIMETER		CITY BOUNDARY
	RCFC&WCD MS4 FACILITY (LINE)		FREWAY/HIGHWAY
	RCFC&WCD MS4 FACILITY (BASIN)		

**HOLY FIRE PERIMETER AND DRAINAGE  
POSTFIRE MONITORING LOCATIONS FY18-19**



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# Storm Events

## Event #1

11/29/2018

'First Flush'

McVicker

Horsethief

Adobe Reference

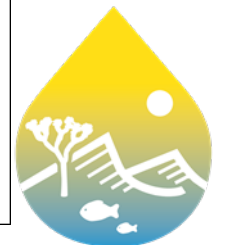
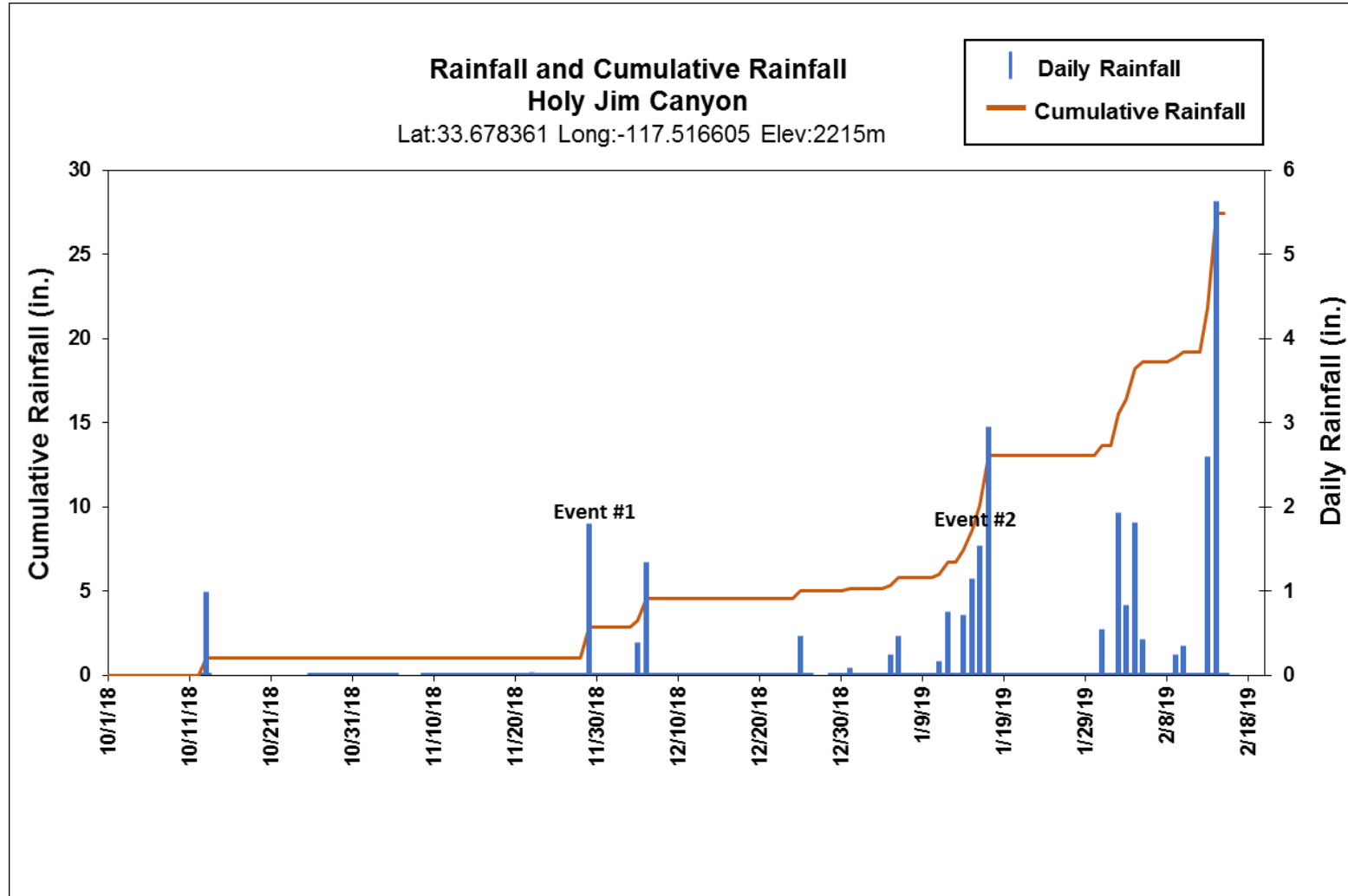
## Event #2

1/14/2019

McVicker

1/17/2019

Horsethief



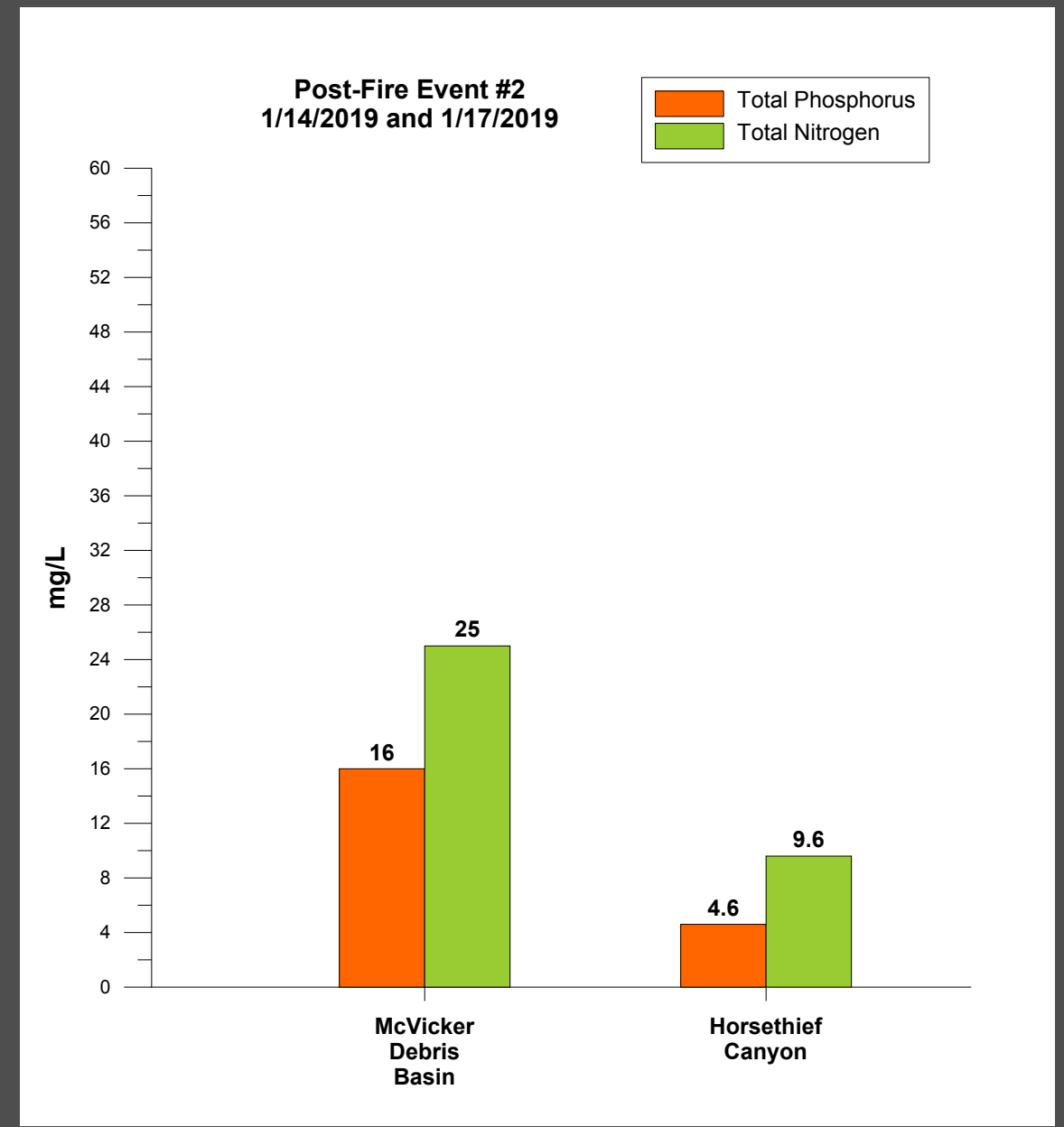
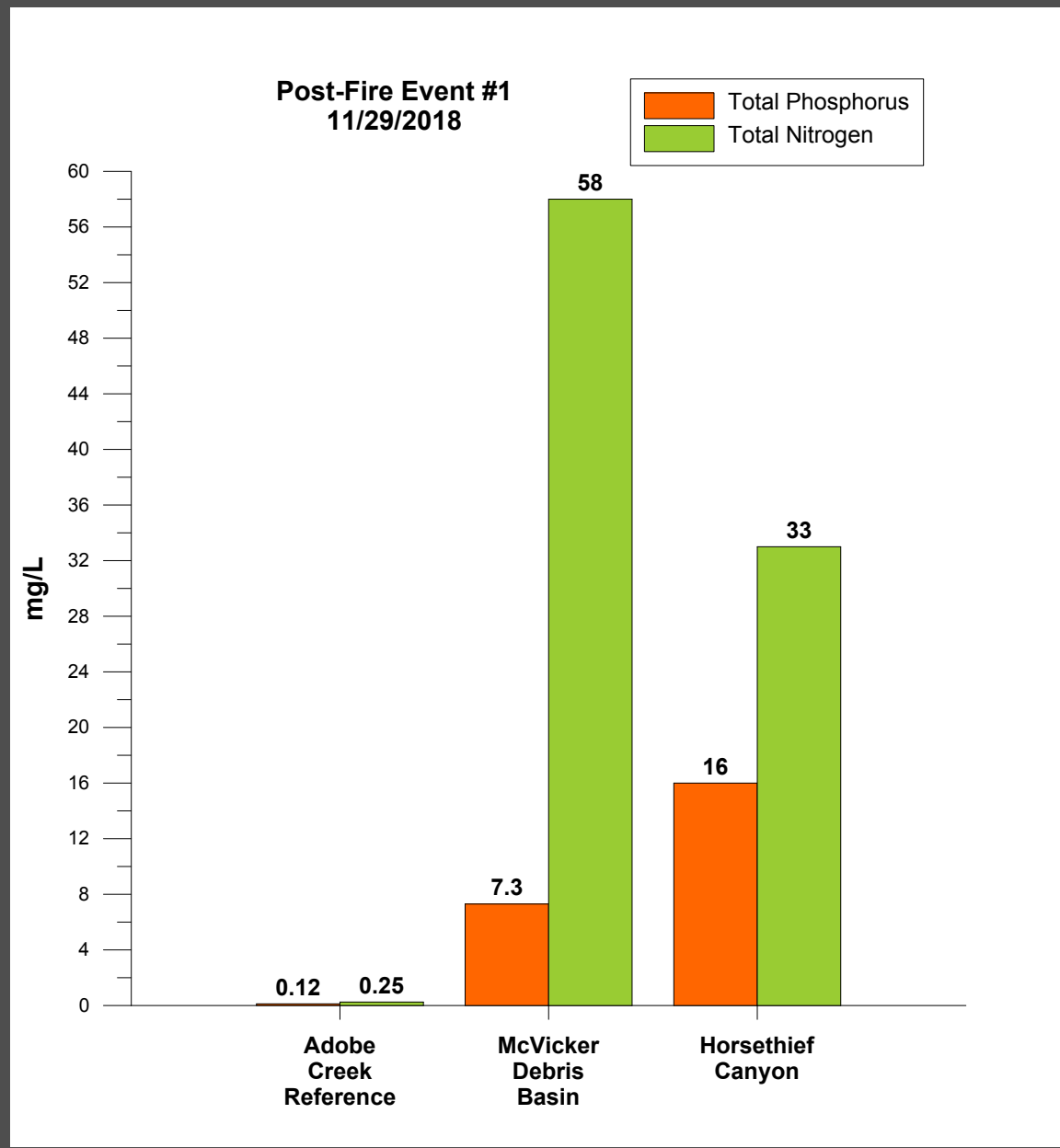
# Results

## Contaminant Concentrations And Contaminant Flux

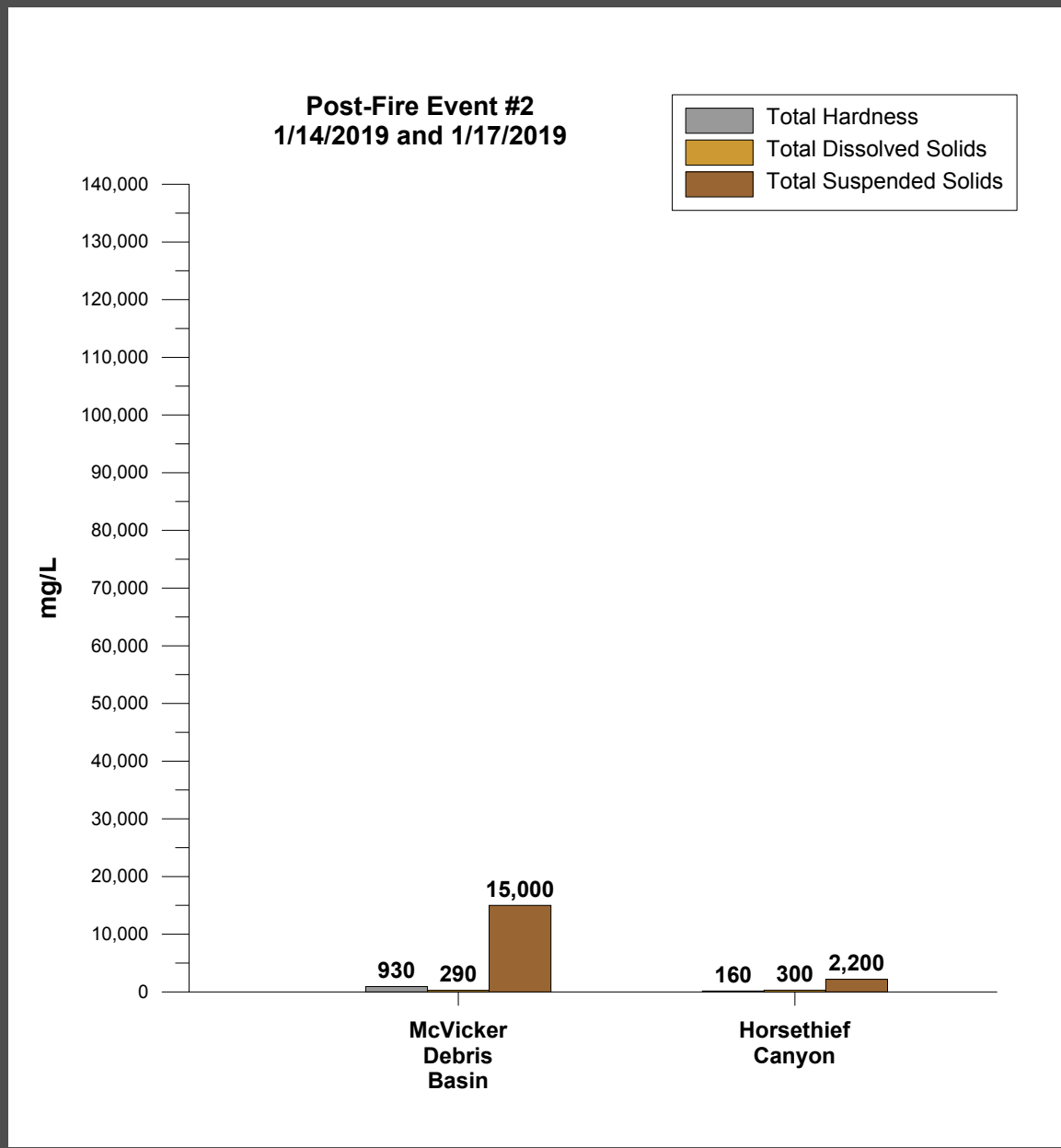
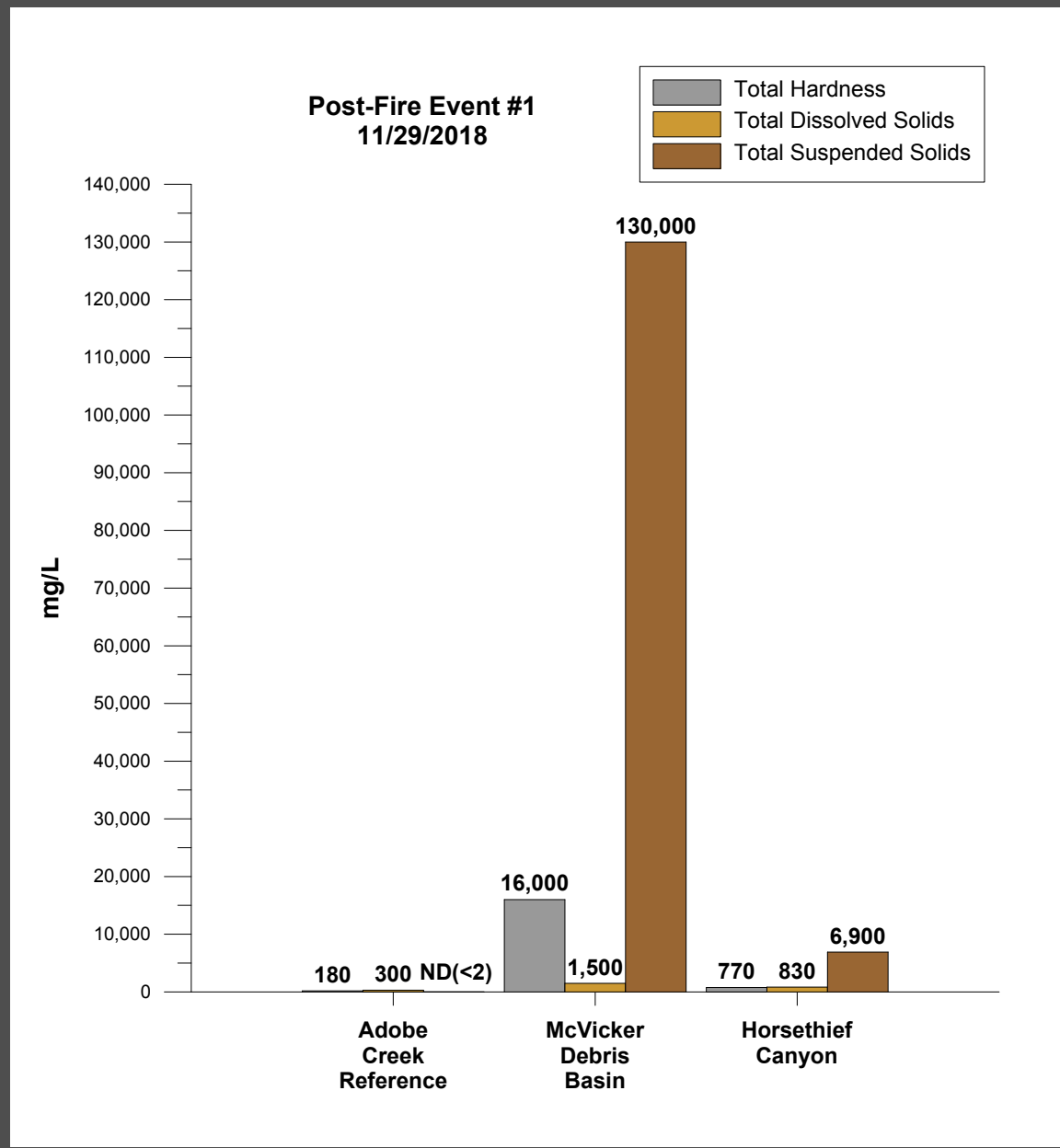




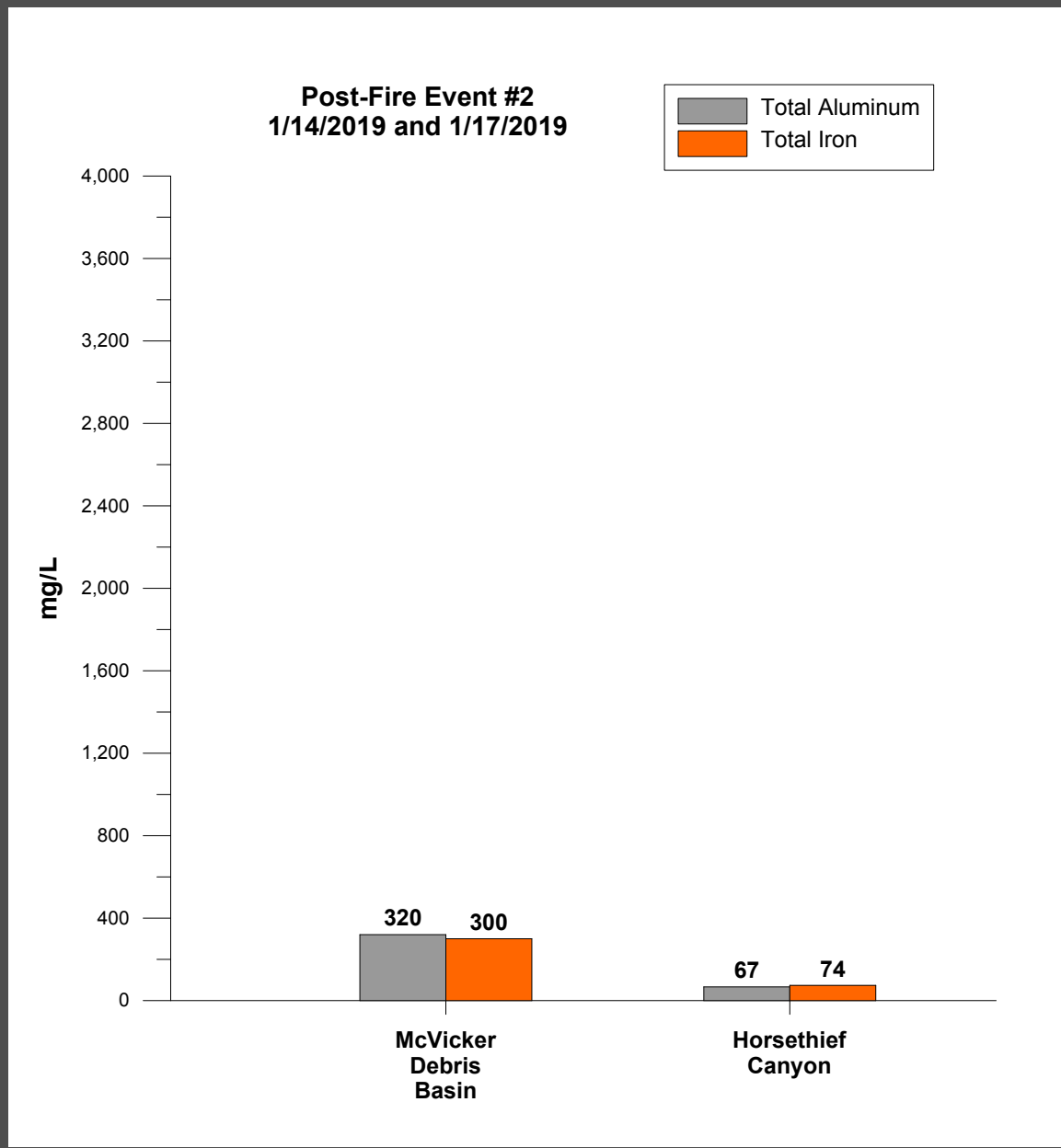
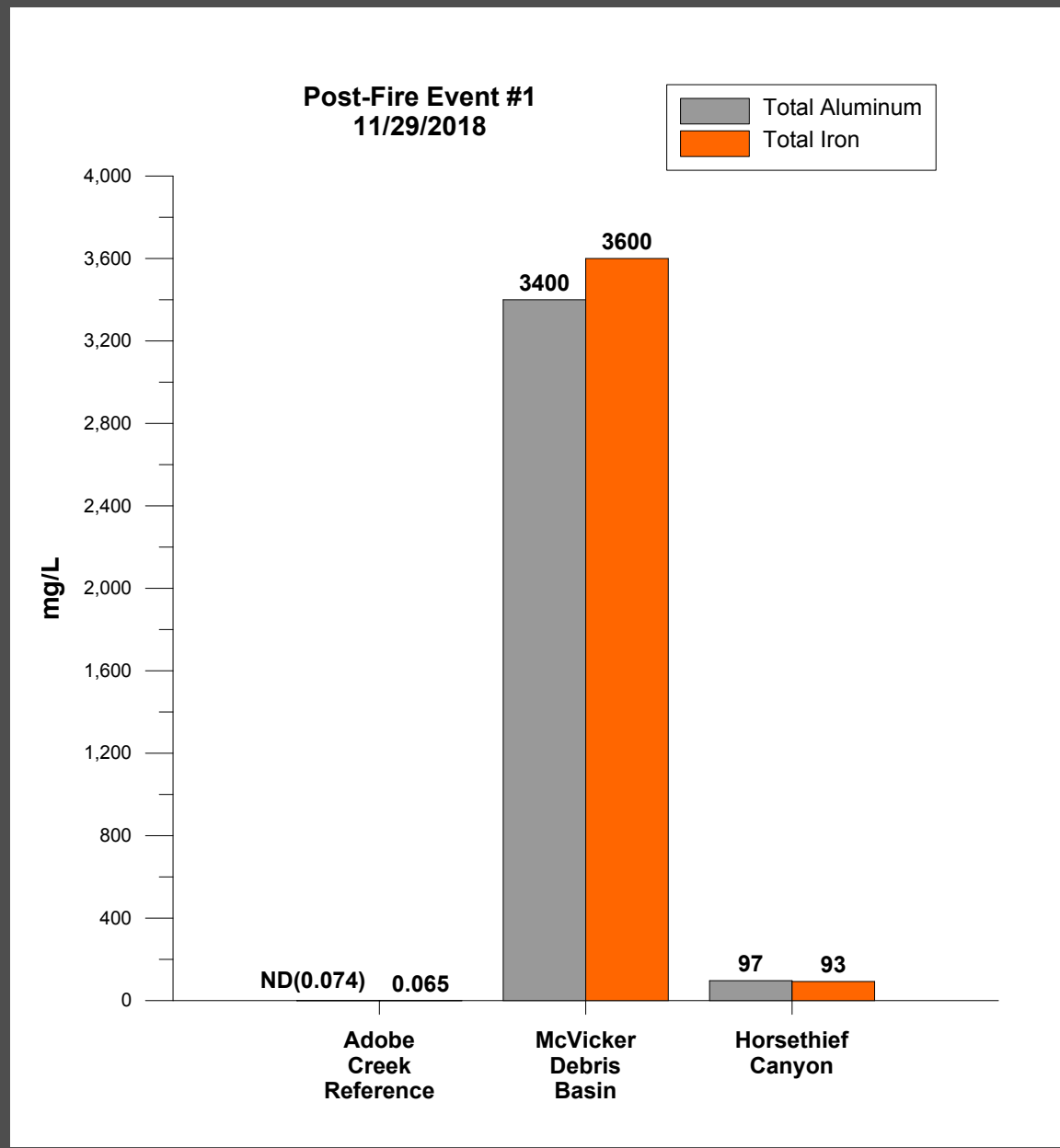
# CONTAMINANT CONCENTRATIONS



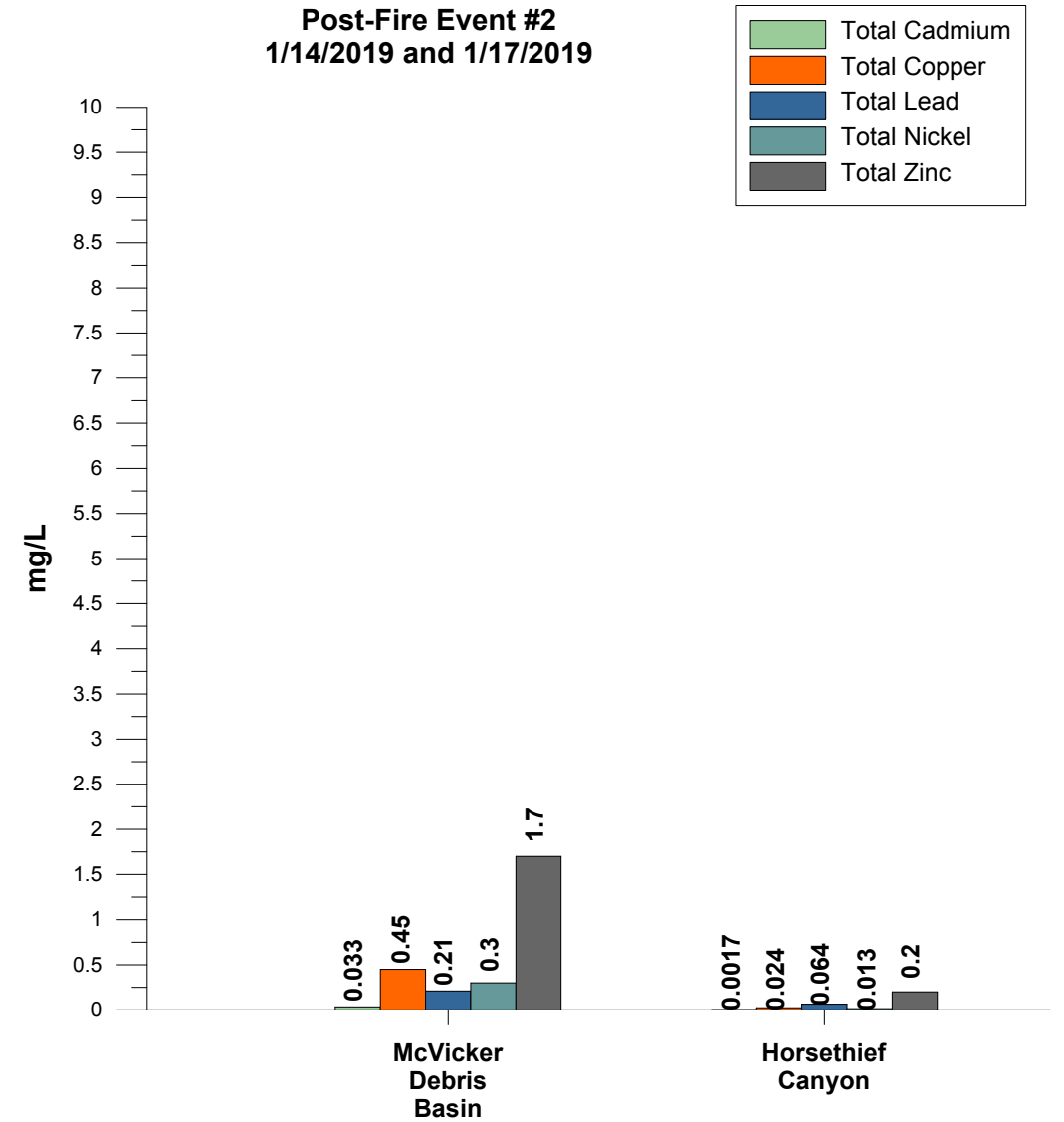
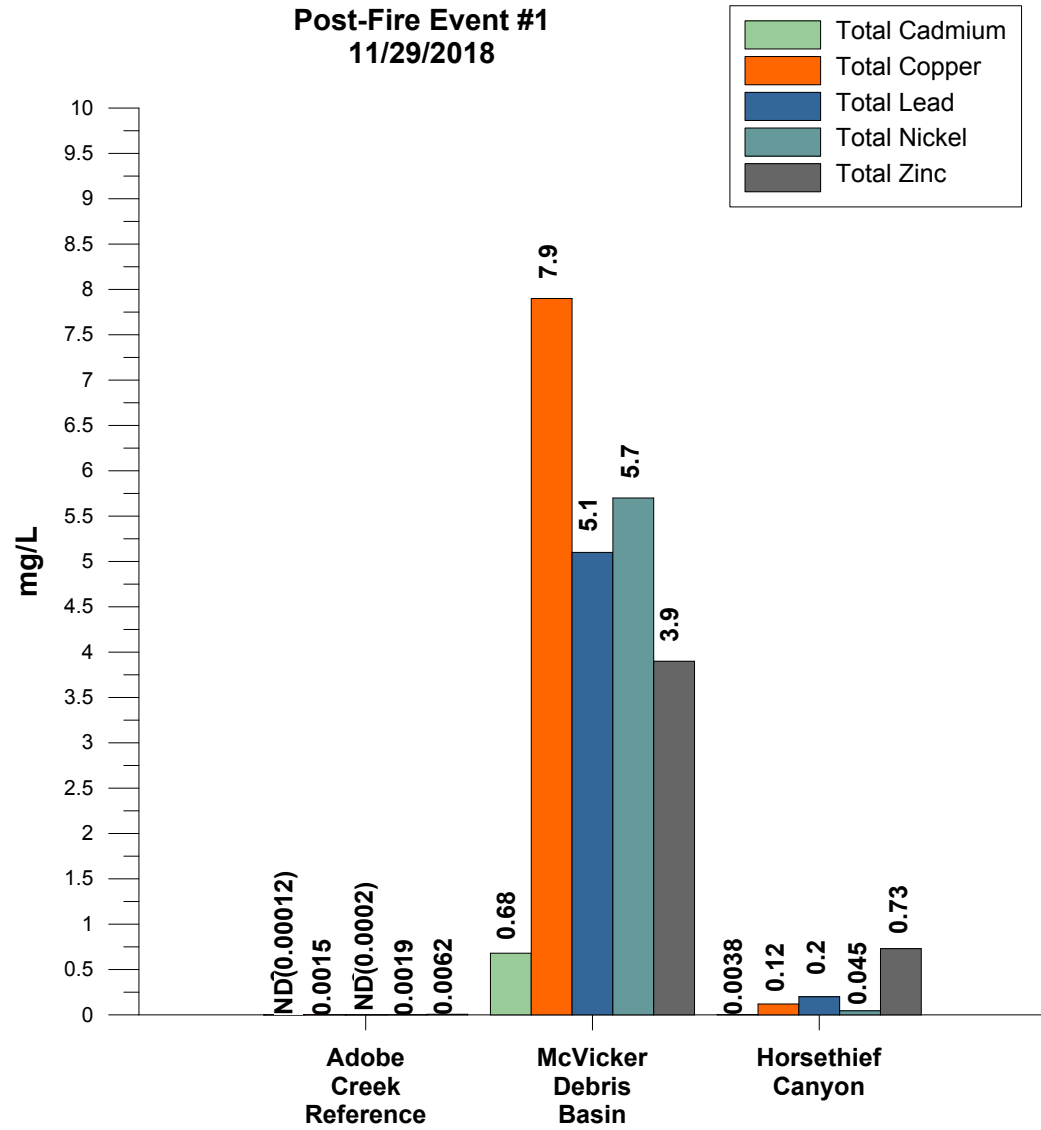
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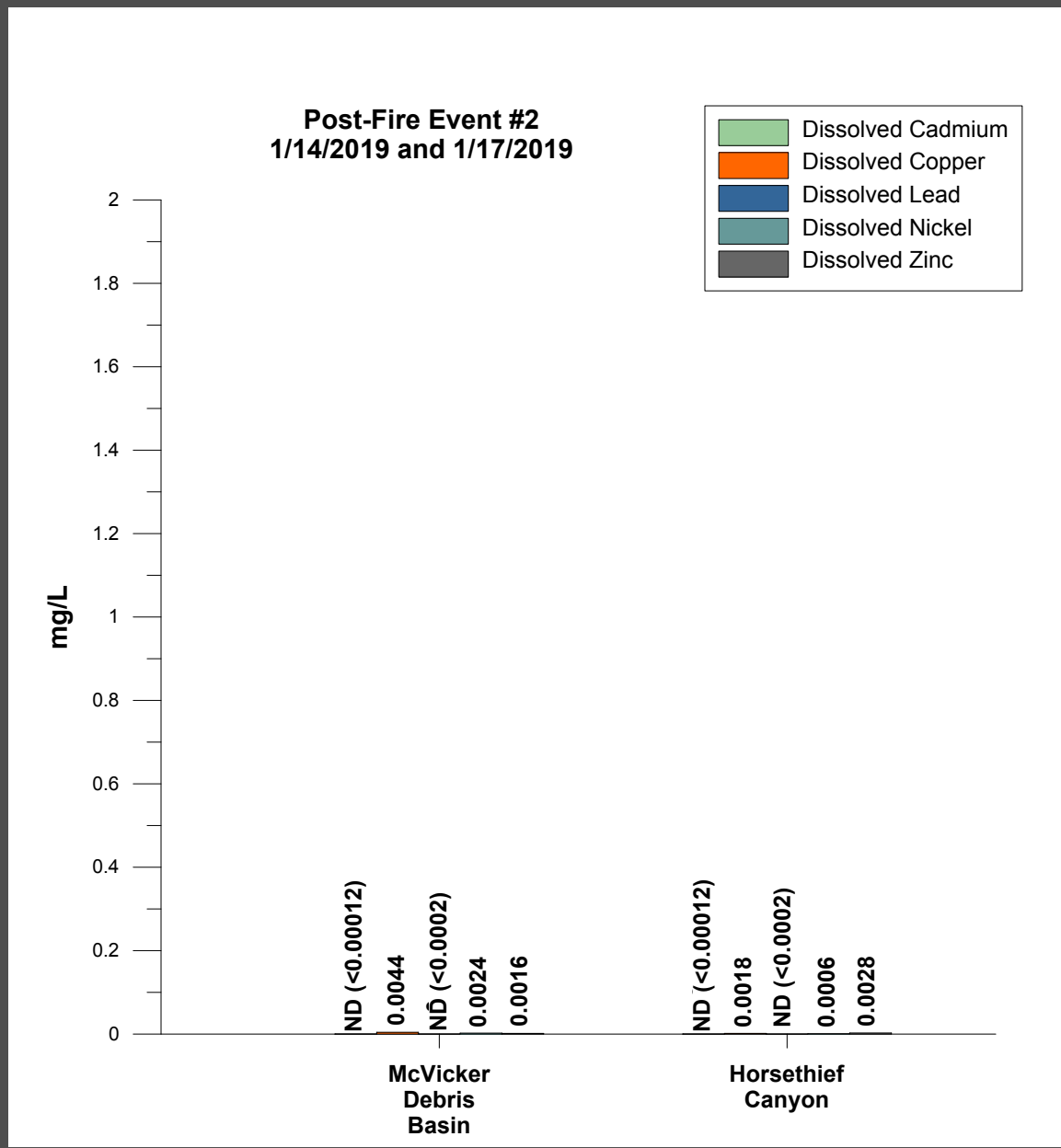
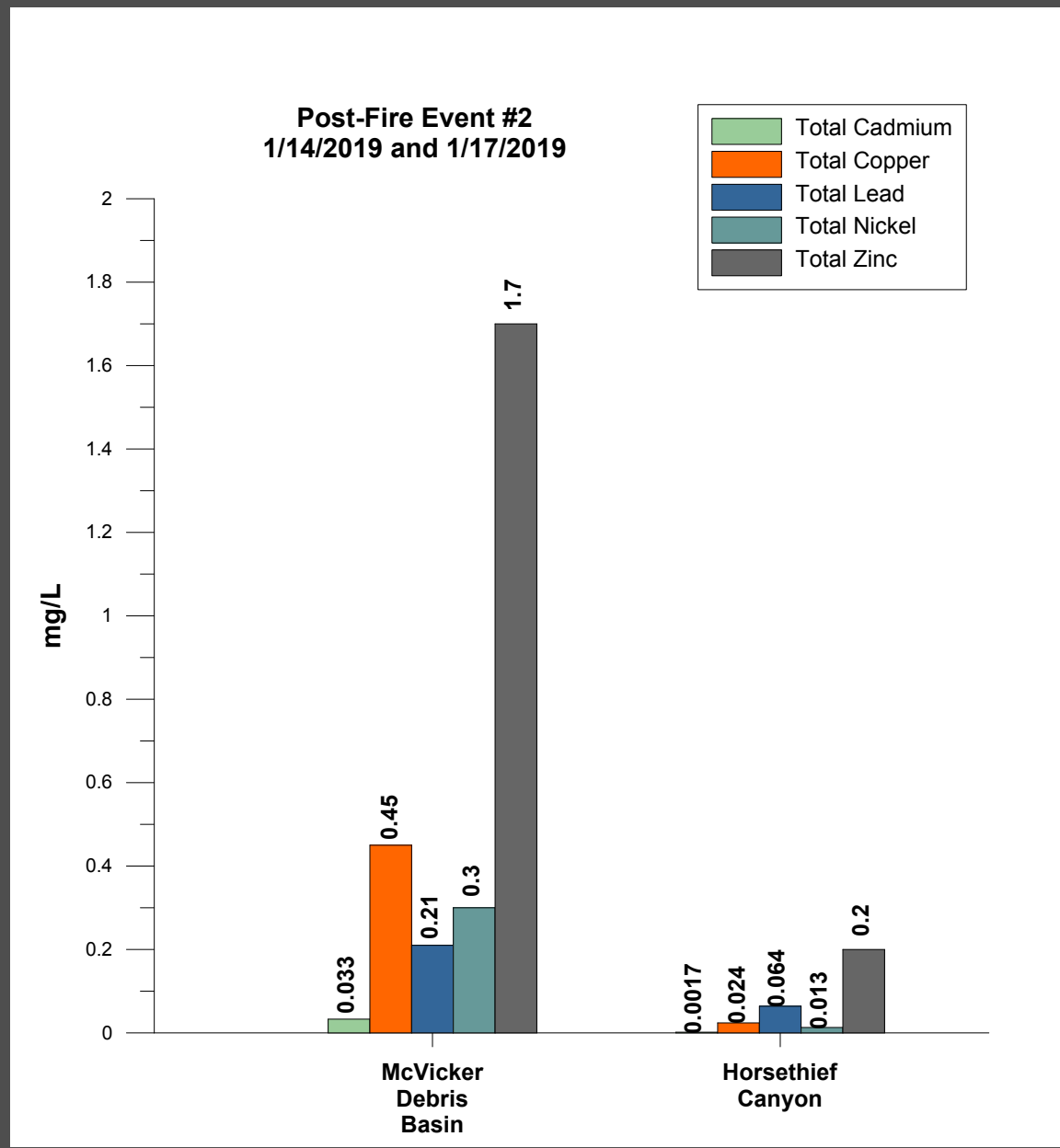
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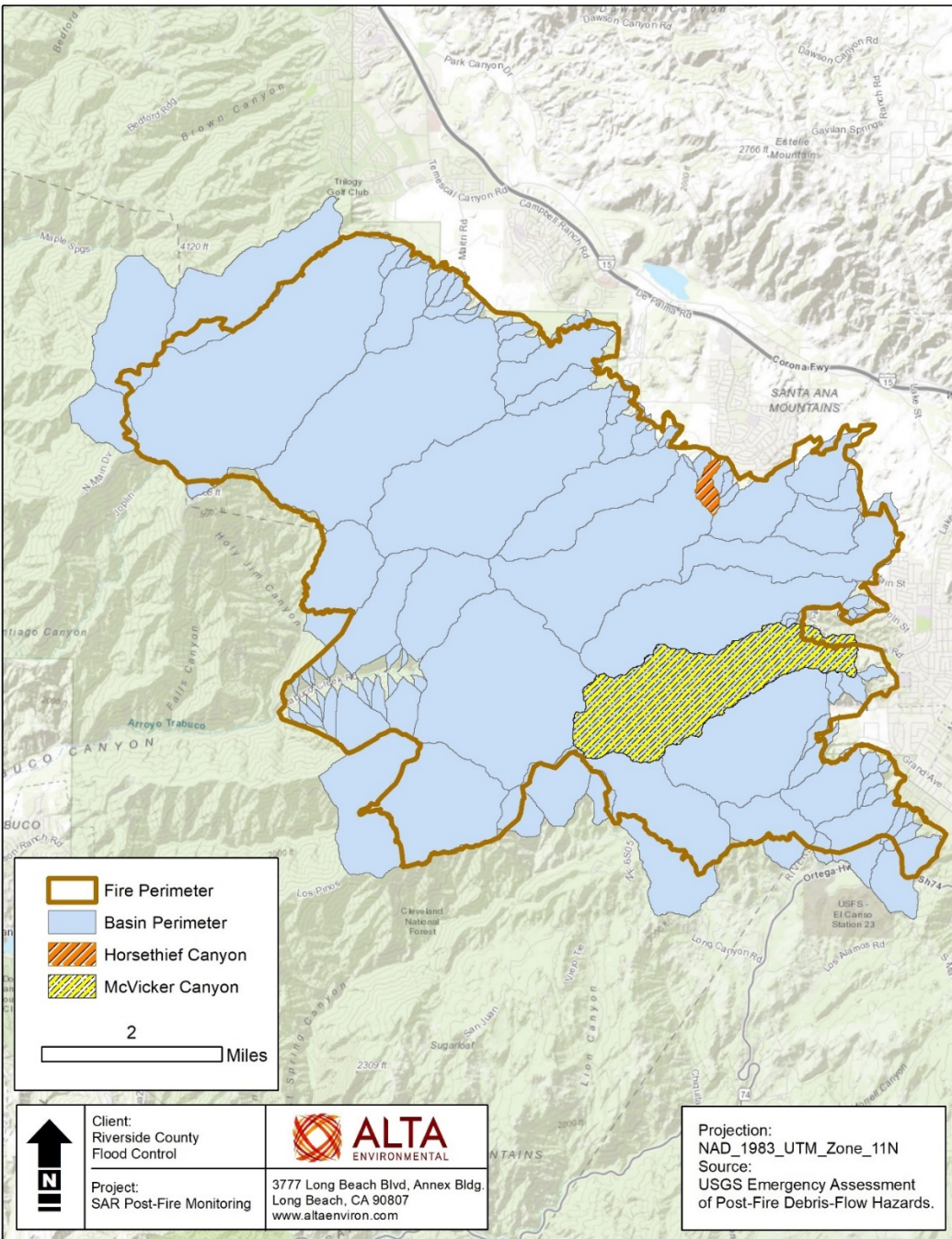


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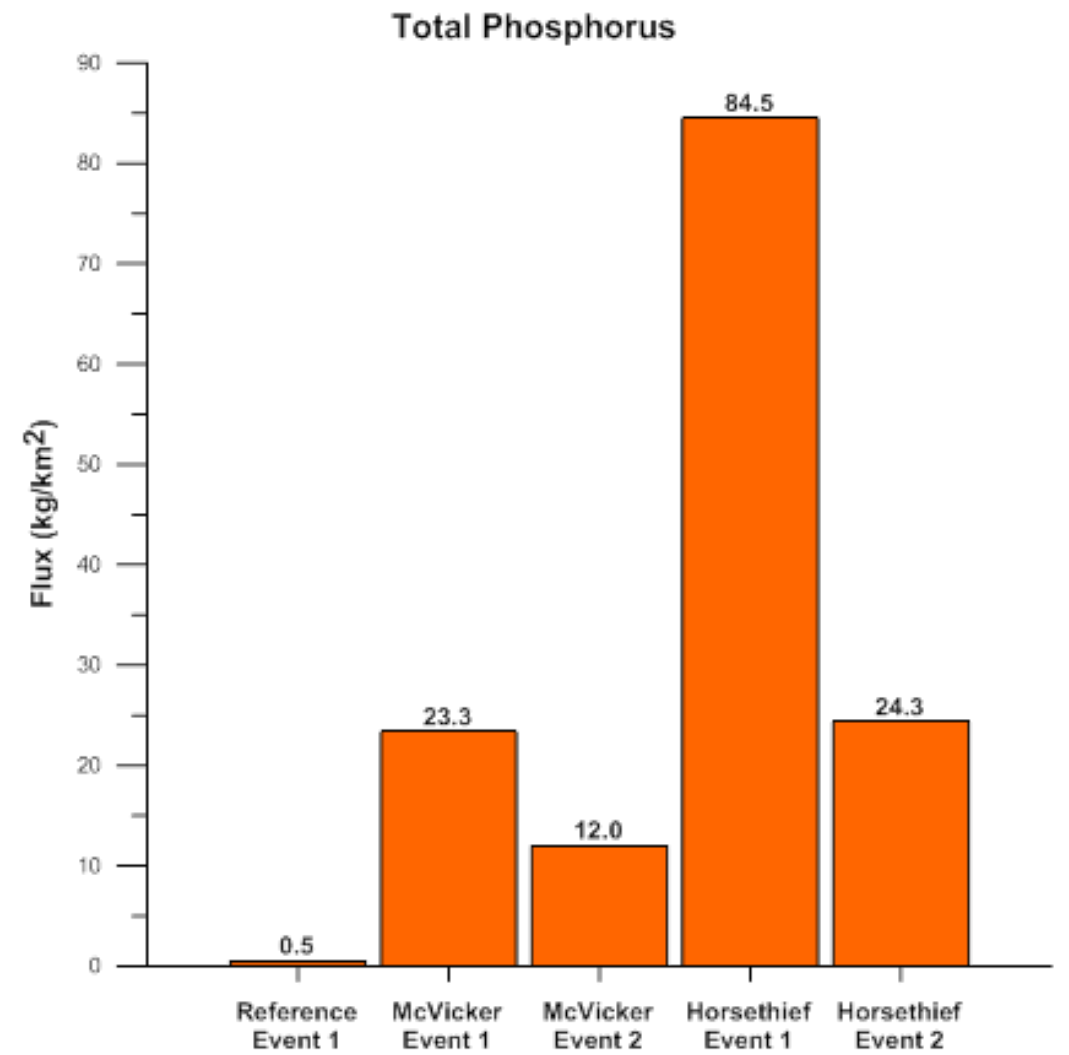
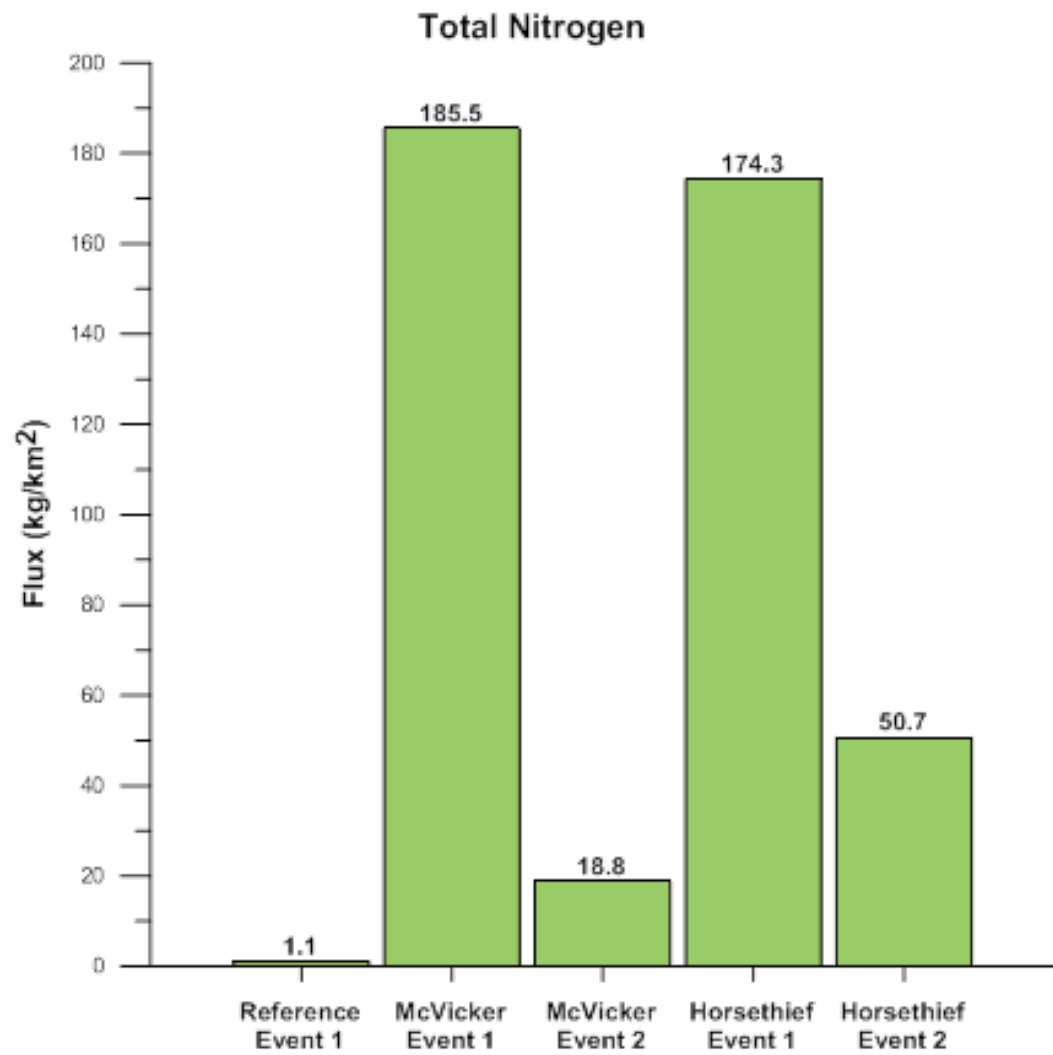


# Contaminant Flux

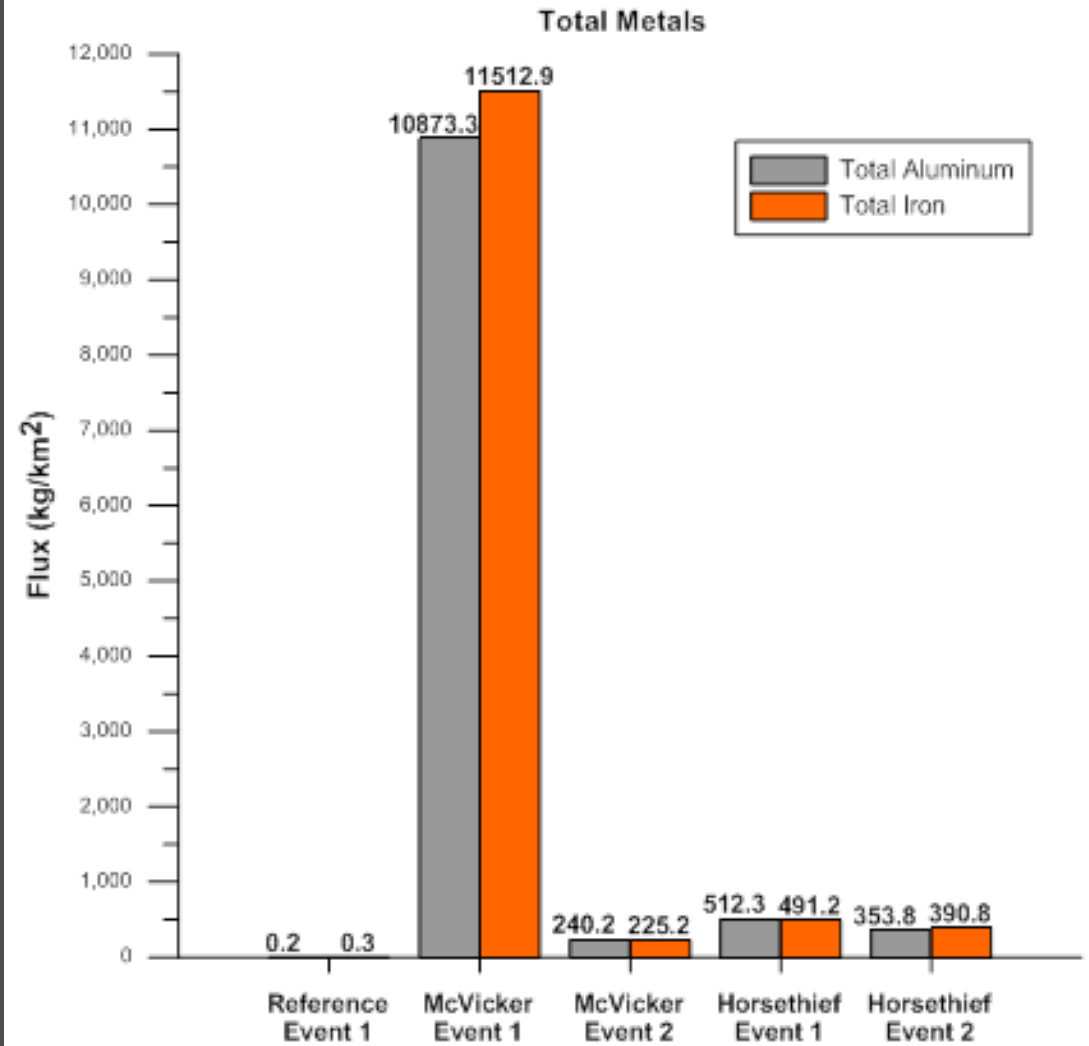
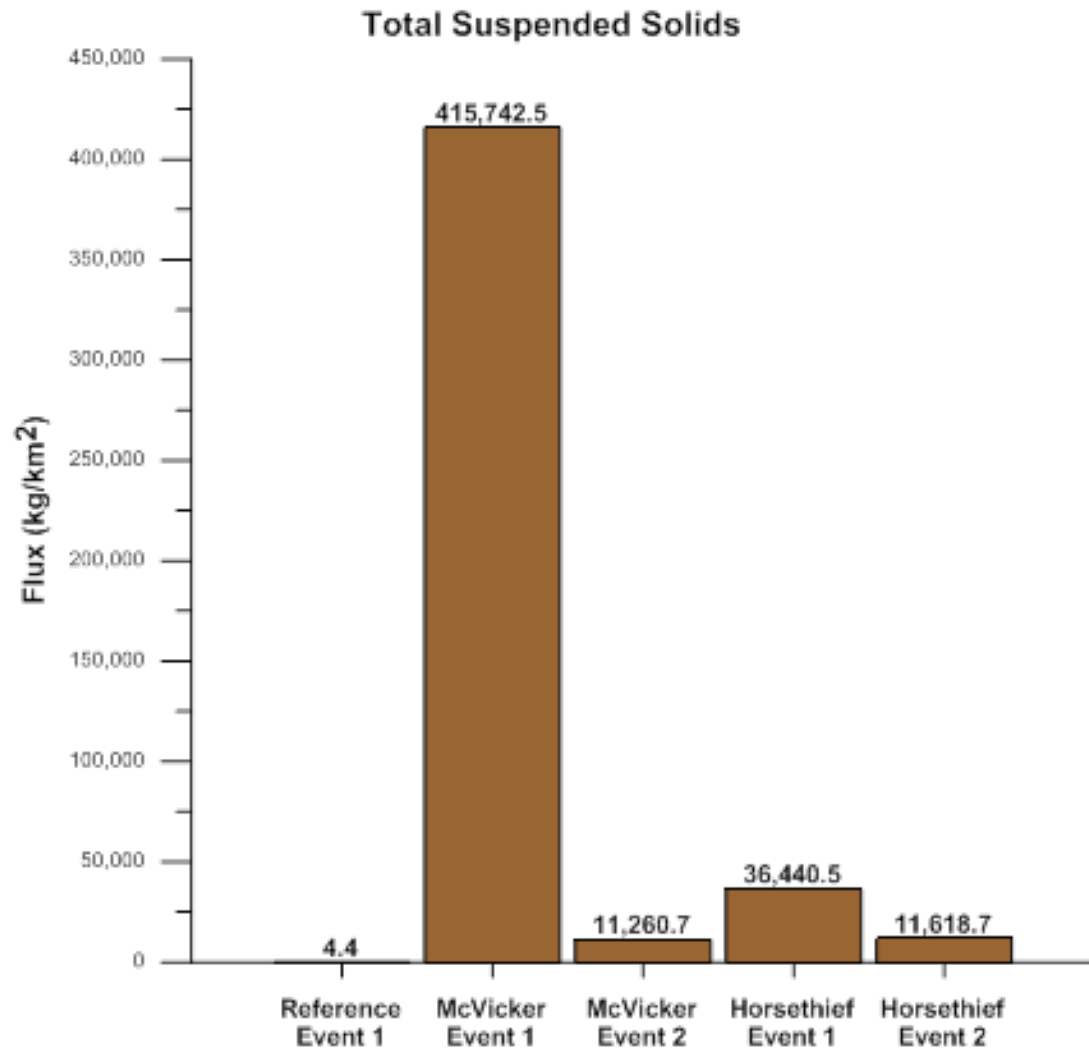
- Compare data from burned catchments and reference sites of different sizes.
- Ratio of the mass loading in kg and the contributing catchment area in km<sup>2</sup> for each storm monitoring event



# CONTAMINANT FLUX

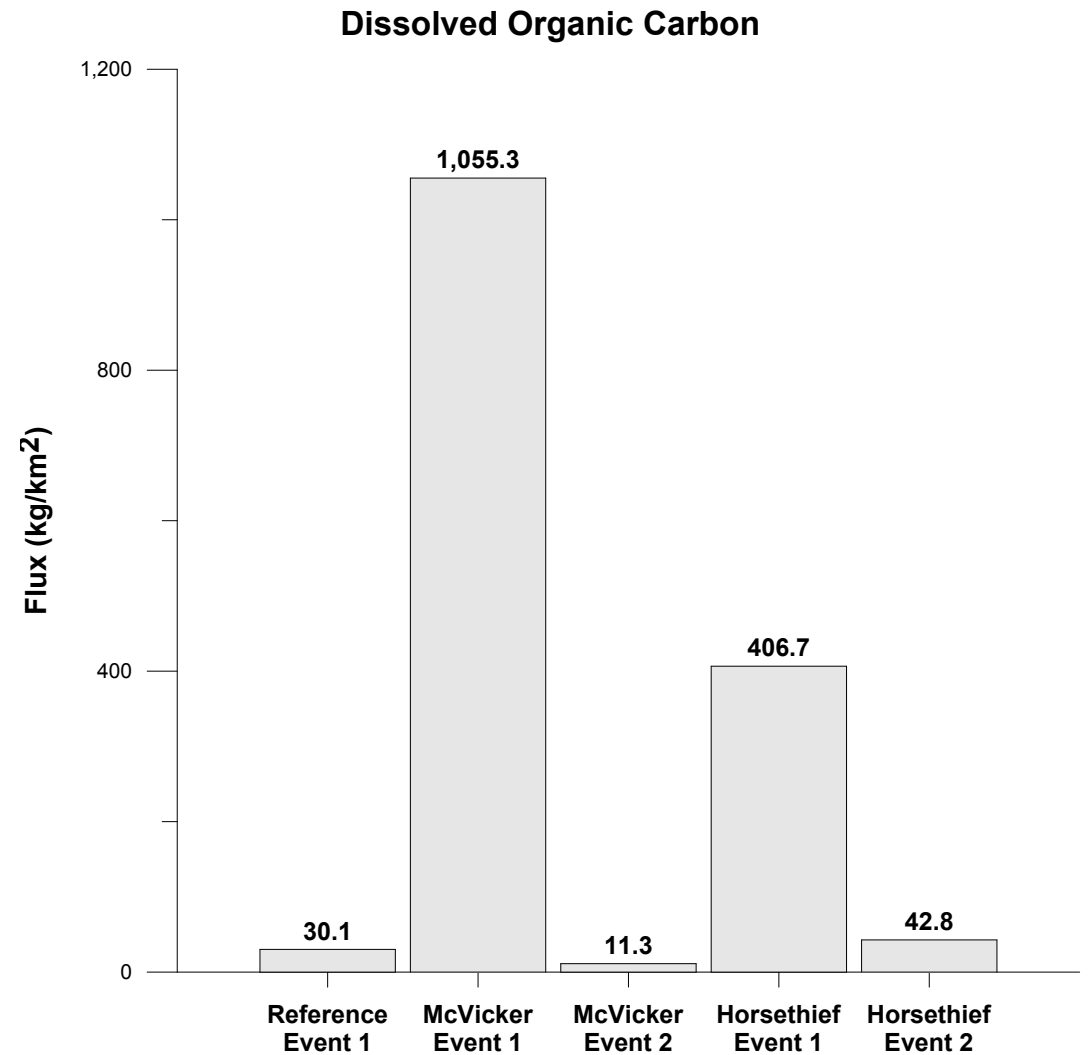
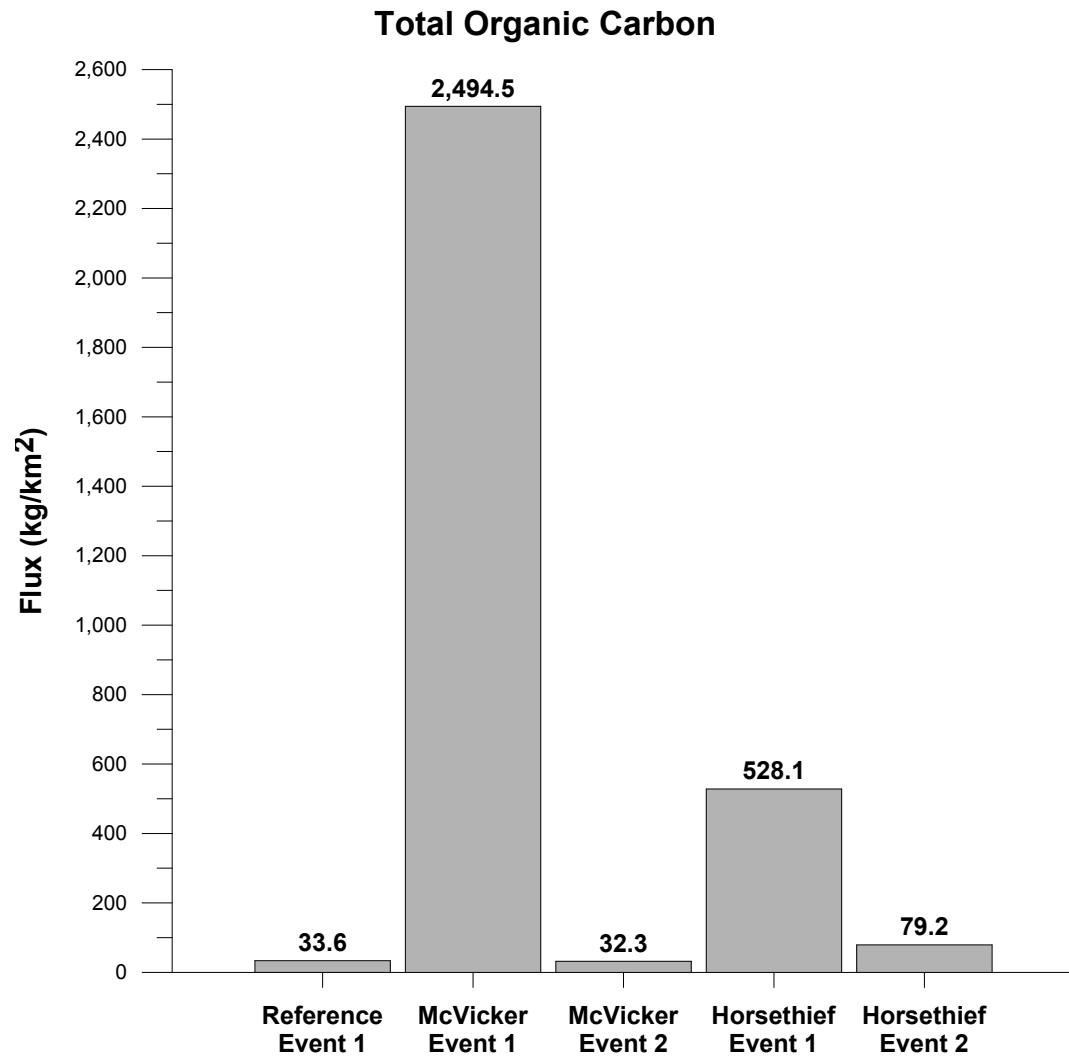


# CONTAMINANT FLUX

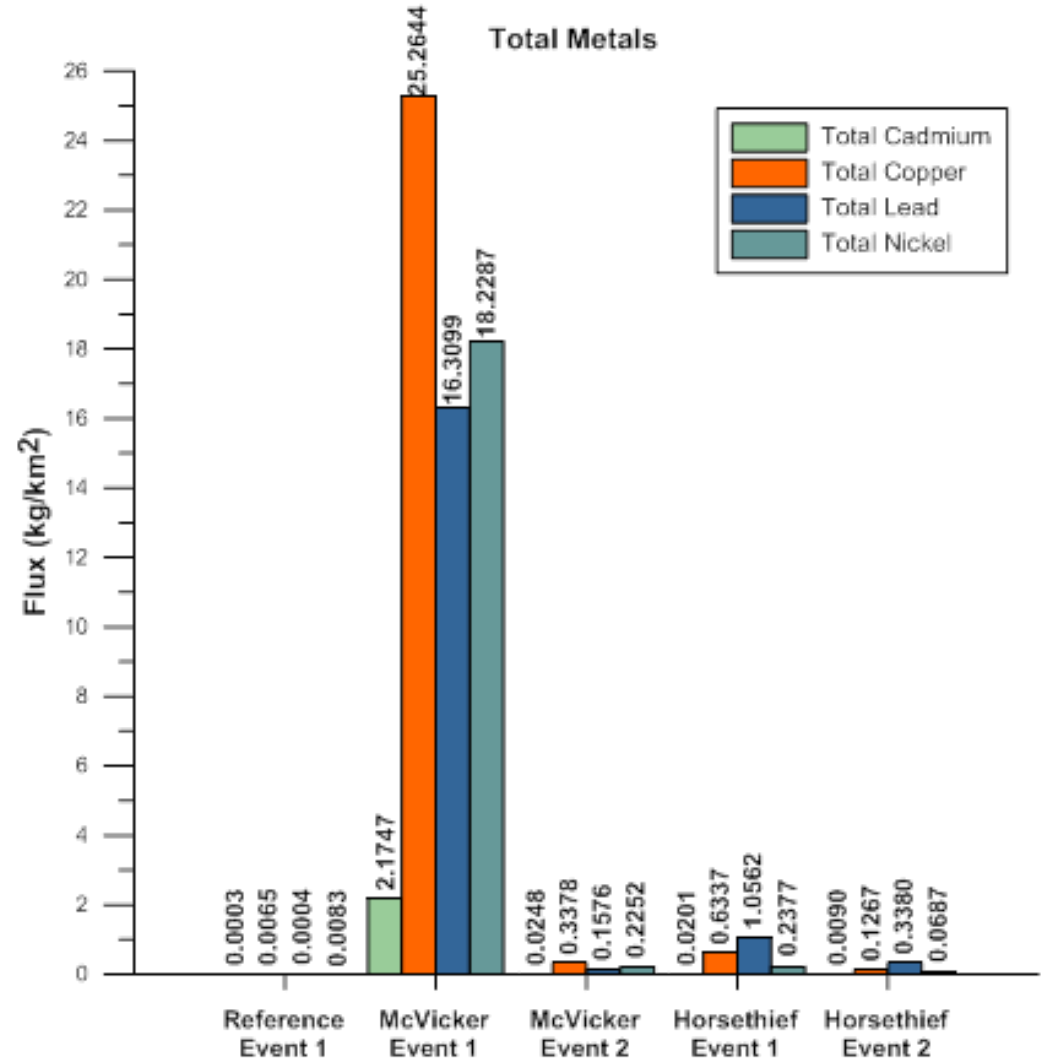
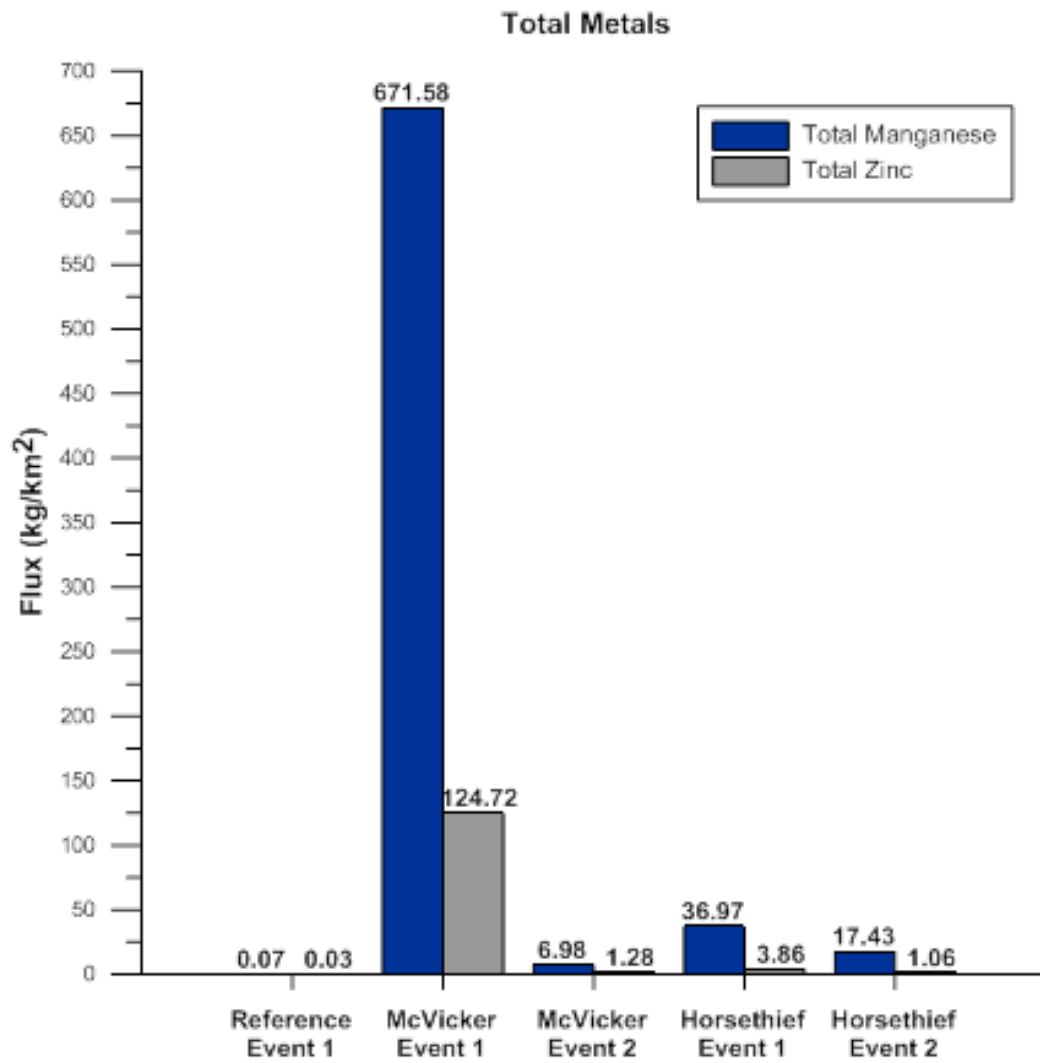




# CONTAMINANT FLUX



# CONTAMINANT FLUX



# Conclusions



- Above average rainfall and high intensity events in 2018-2019
- 'First Flush' observed significant post-fire sediment and debris flows
- Post-fire flows continued through wet season
- High concentrations and contaminant flux of sediment, nutrients, and metals
  - Significantly higher than reference data
  - Concentrations and flux lower in Event #2
  - Total metals significantly higher than dissolved
  - Metals primarily in particulate state
- Debris basins reduced downstream impacts



# Questions

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