Acrylonitrile Expected and Human Health Effects Analysis

Based on EPA Technical Support Services Group input

Executive Summary

- Acrylonitrile is not appreciatively bio-accumulative and movement up the food chain is not expected to pose an appreciable risk.
- Acrylonitrile is not expected to bind heavily with sediments and should not remain in the ecosystem for extended periods. The primary means of dissipation will likely be dilution and volatilization.
- Levels exceeding approximately 7,000 ug/L will likely lead to lethal/adverse effects to the aquatic life in the creek after just hours to a day or two of exposure.
- Levels below 707 ug/L are unlikely to have adverse effects to the aquatic life in the creek during a short term release/exposure.
- Levels below 78 ug/L should pose no threat to aquatic life over long term exposure.

Table of Applicable or Relevant Values

Human Health Values		
Source	**Basis/Meaning**	**Acrylonitrile Value (ug/L)**
EPA Removal Management Level	Tap water (Drinking water)	5
Recreational Surface Water Exposure Risk Analysis #1	Human health risk screening value based on swimming in surface water for 2hrs/day, 90days/year for 26 years below which adverse effect are not expected.	982
Recreational Surface Water Exposure Risk Analysis #2	Human health risk screening value based on swimming in surface water for 2hrs/day, 60days/year for 26 years below which adverse effect are not expected.	1470
Ecological Risk Values		
Region 4 Screening Level – Chronic	Chronic exposure of aquatic life, below which no adverse effects are expected	78
Region 4 Screening Level - Acute	Acute (short term - days) exposure at or below this concentration should not cause significant adverse effects to aquatic organisms	650
EC50/LC50 – Fish	Lowest lethal concentration to 50% of fish exposed to this concentration in toxicity tests	8,400
EC50/LC50 – Aquatic Invertebrates	Lowest lethal concentration to 50% of aquatic invertebrates exposed to this concentration in toxicity tests	7,380
Approximate concentration causing probable significant adverse effects to aquatic organisms after acute exposure	Based on LC50s for fish and aquatic invertebrates, concentrations near or above this could be expected to cause significant adverse effects to aquatic organisms after even short term exposure (a few hours to days)	Approx. 7,000
Ohio EPA – Chronic MATC	Chronic MATC (Maximum Allowable Toxicant Concentration)	707
Soil Action Levels		
EPA RML	Industrial Soil	100 mg/kg
Sediment Values		
EPA Region 4	EPA Region 4 sediment screening value	6.6 ug/kg dry wt