

### **Airport Environment Strategy Objective (2004)**

*“Northern Territory Airports PL objective is to prevent or minimise water pollution at all times and comply with legislative standards”*

### **Program Description**

Darwin International Airport (DIA) is committed to protecting Rapid Creek and other receiving waterways from pollution from airport operations. As part of this commitment, DIA ensures that all airport tenants and operators comply with Best Practice Management when using products that could lead to pollution.

The Surface Water Quality Monitoring Program was established in 2000 to “keep an eye” on surface waters flowing from airport operational areas into Rapid Creek and Ludmilla Creek. The monitoring program includes water sampling/analysis, photopoint monitoring and physical observations of specifically chosen monitoring sites within DIA and Rapid Creek. All results are compared against investigation limits set by Schedule 2 of the *Airports (Environmental Protection) Regulations 1997* – which is legislation that all federally leased airports are required to comply with. This allows DIA to identify pollution early in development so appropriate management actions can be undertaken before the environment and/or human health are impact upon.

### **Monitoring Methodology**

DIA have a Standard Operating Procedure for surface water collection and also have a detailed Surface Water Quality Management Plan, which states all legislative requirements, monitoring procedures, site descriptions and justifications for the program.

The following describes the main tasks undertaken at each monitoring site:

- Water sampling using procedures that comply with ANZECC guidelines for collection of freshwater and stream samples. Each site is tested for a range of parameters (refer to Map 1 for list) by a nationally accredited analytical laboratory;
- Record field testing of water temperature, pH, conductivity, turbidity, dissolved oxygen;
- Note any general observations/changes at the site; and
- Take several photos of relevant observations, including a standard photopoint.

## Monitoring Frequency

The monitoring program consists of four sampling rounds per year – three in the wet season and one in the dry season. The wet season monitoring rounds occur at least 3-4 weeks apart and always follow a significant flush event (i.e. enough rainfall to create enough surface runoff to activate stormwater drains within the airport operational area). The dry season monitoring round focuses on sites within Rapid Creek (as sites located in stormwater drains are dry and therefore inactive). Figure 1 provides an approximate plan for surface water monitoring for a typical year, and includes sites currently sampled during each round.

Additional samples are also taken during the dry season if rainfall events are large enough to activate the stormwater drains.

Additional sampling is also undertaken in the case of any incidents (e.g. spills or product entering the drainage system) or if the regular monitoring rounds detect pollutants over regulation limits (i.e. this is known as follow-up monitoring).



WET SEASON MONITORING					DRY SEASON MONITORING							
												
Round 1		Round 2		Round 3	Round 4							
S I T E	SWQ2	SWQ2	SWQ2	Dry Season Surface Water Sampling focuses on Rapid Creek				SWQ2	Additional sampling may also occur if high rainfall or incidents occur in the dry season			
	SWQ4	SWQ4	SWQ4					SWQ8				
	SWQ8	SWQ8	SWQ8					SWQ9				
	SWQ11	SWQ11	SWQ11					SWQ13				
SWQ13	SWQ13	SWQ13										
NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	

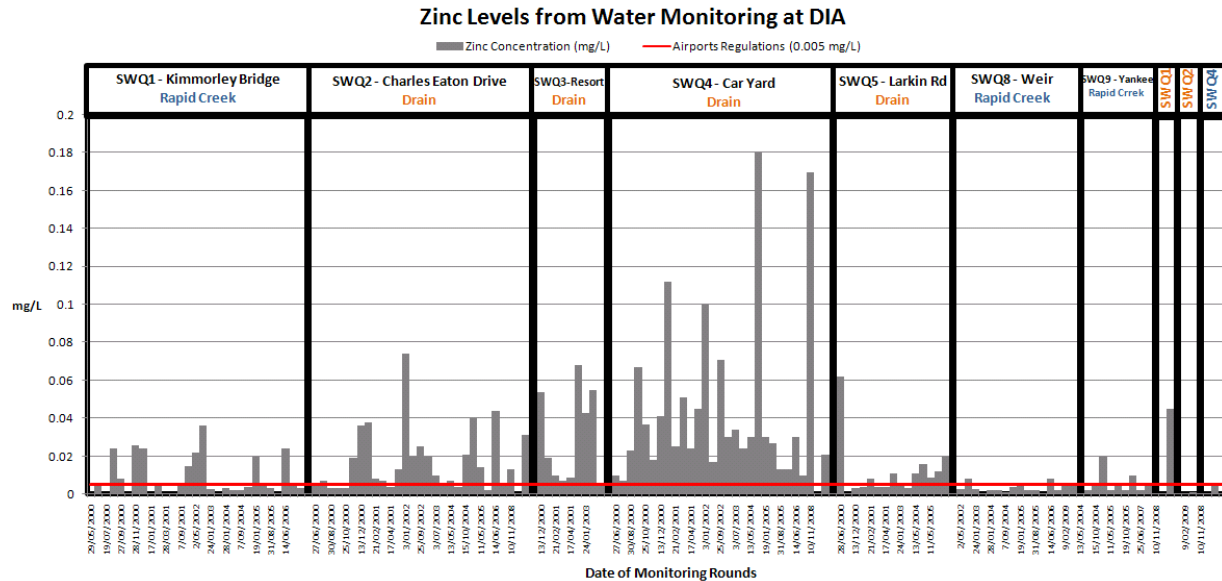
Figure 1: Surface Water Monitoring Frequency at DIA

## Results from Surface Water Analysis

Results after each monitoring round are entered into a database and compared to investigation limits stated in Schedule 2 of the *Airports (Environmental Protection) Regulations 1997*. This database includes monitoring results since the establishment of the program in 2000. Results are also graphically presented to clearly identify any issues or trends overtime (refer to Figures 2 and 3 for examples of these graphs).

Figure 2 shows that zinc is commonly elevated in sites located in stormwater drains linked to catchments with high traffic, workshops and aircraft maintenance and that these elevated levels do not create a significant impact within Rapid Creek water chemistry. Common sources

of zinc include corrosion from galvanized iron roofs/materials, pipes, metal works, wear from tyres/brakepads and combustion of lubricating oils. To reduce chance of zinc impacting on Rapid Creek the drains are cleaned, roofing is maintained and scrap metals are removed to appropriate locations.

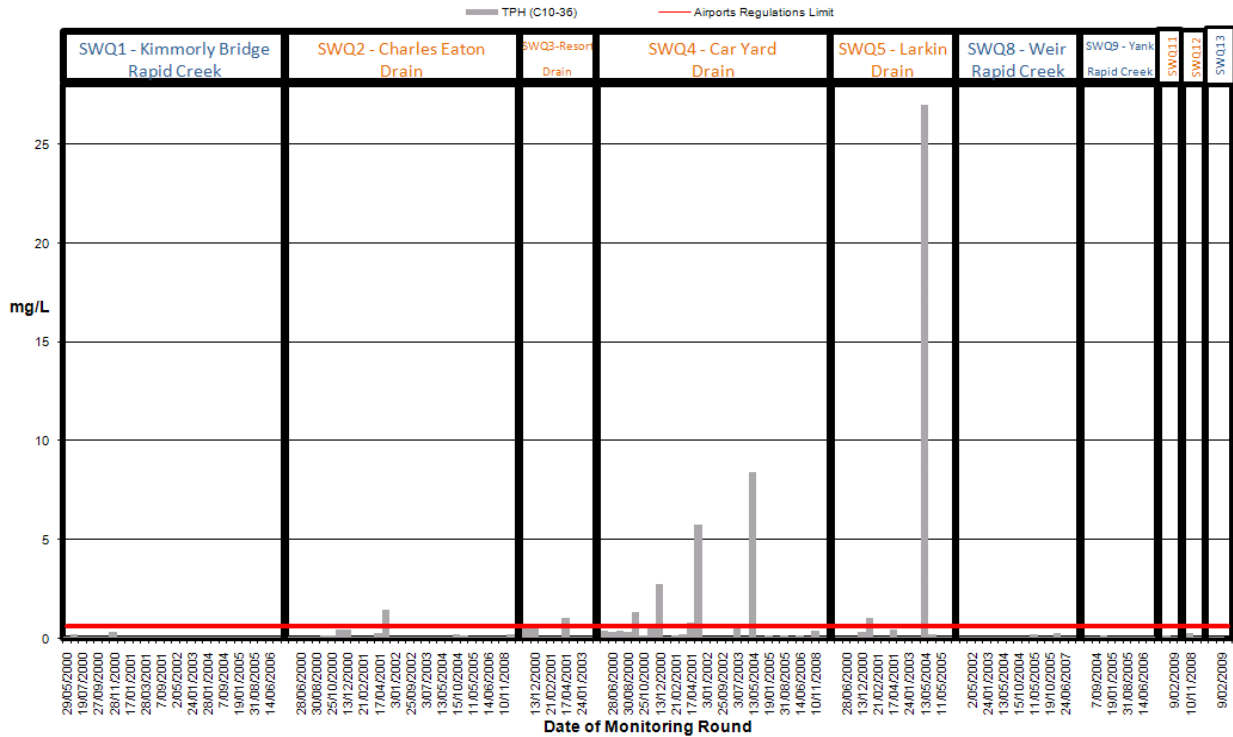


**Figure 2: Zinc Concentrations from Surface Water Monitoring at DIA since 2000.**

Sites are listed across the top and are separated by black borders. Sites in Rapid Creek are denoted by blue text and sites that are denoted by orange text are within stormwater drains. Map 1 shows all monitoring site locations.

Figure 3 indicates that Total Petroleum Hydrocarbons (TPH) are well managed with DIA. Total Petroleum Hydrocarbons is a term used for crude oil compounds that are used in the production of petroleum, including Jet A-1 fuels used in aircraft (which often have carbon chains from C10-C36). As large volumes of these fuels are stored/transferred/burnt within DIA, there are strict management policies associated with fuel handling, storage and usage that all operators are obliged to comply with. In the case of accidental spills or other incidents, professionally trained spill control staff will attend the scene immediately. Monitoring results presented in Figure 3 show that there are no instances where TPH values have breached airport guidelines within Rapid Creek. When elevated TPH levels were detected in stormwater drains SWQ4 and SWQ5 in 2004 efforts towards spill control management occurred in operational areas and hydrocarbon absorption materials were placed within the drains to prevent any possible contamination of Rapid Creek. Hydrocarbon absorption socks are located and maintained within all relevant drains that lead into Rapid Creek.

## Total Petroleum Hydrocarbons (TPH) at DIA - C10 to C36



**Figure 3: Total Petroleum Hydrocarbons concentrations from Surface Water Monitoring at DIA.**

Sites are listed across the top and are separated by black borders. Sites in Rapid Creek are denoted by blue text and sites that are denoted by orange text are within stormwater drains. Map 1 shows all monitoring site locations.

### Management Response and Actions

Management responses and actions only occur if monitoring indicates that airport regulations have been breached. The level of response depends on the type of pollutant, the location of the sample and the concentration detected. For example, if hydrocarbons (fuels and oils) are detected at high levels in water samples this suggests that a spill or leak has occurred within the catchment of the monitoring site. This triggers DIA to implement the Spill Response and Cleanup Procedures which aim to immediately cleanup the area and prevent further pollution.

### Other Water Monitoring Activities

Monthly visual and physical water/drain quality monitoring is also undertaken across all monitoring locations. Procedures for this involves photographs, general observations and field tests of turbidity, dissolved oxygen, acidity, conductivity and temperature. Biological observations are also noted (i.e. fish, macro-invertebrates, bird, green algae etc).

Groundwater Monitoring also occurs at Monitoring Wells that were established to detect contamination from old land fill sites in the past (a legacy adopted by DIA).