



Article 140

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Pollution Prevention for Auto Recyclers

Auto recycler facilities are important sources of pollutants entering stormwater. Swamikannu (1994) shows how the use of stormwater management practices and pollution protection techniques can decrease the concentration of pollutants present in stormwater runoff from these facilities. An auto recycler facility or scrapyards is one where old and wrecked cars are collected, stripped of their parts, and transported so that metals—and to a lesser extent, plastics, fluids, and other materials—can be recycled. There are more than 20,000 such facilities in the United States, with an average size of 7.4 acres, each processing a mean of 439 vehicles per year.

Auto recycling facilities have the potential to be hotspots of stormwater pollutants for several reasons. First, industry surveys indicate that over two-thirds of the sites store vehicles outside, where they are exposed to rainfall. Second, less than 20% of all facilities drain fluids from vehicles before they are stored. This is critical, as each can contain nearly four gallons of automotive fluids (waste oil, antifreeze, and hydraulic fluid), as well as other pollution sources (filters, tires, and brakes), few of which are reclaimed or recycled (Table 1). Lastly, very few scrapyards are equipped with practices for containing stormwater runoff before it exits the site.

Swamikannu investigated the quality of stormwater runoff at a 17-acre auto recycling facility in Los Angeles, CA, that processes over 16,000 vehicles each year. Composite samples were collected for over 40 storm events for various parameters (Table 2). Clearly, auto recycling facilities do represent a hotspot in the urban landscape, as they typically can have higher concentrations of oil/grease, phenols, BOD, metals, and some priority pollutants compared to other sources (Table 3).

The key question is whether the elevated concentrations are toxic to aquatic life. Swamikannu used bioassays of fathead minnows (*Pimephales promelas*) to test for acute toxicity in stormwater from 49 storm events at the Los Angeles facility. Prior to implementation of stormwater practices at the site, most of the bioassays indicated that runoff was indeed acutely toxic (defined here as 20% or more mortality of the minnows when exposed to stormwater). Statistical analysis suggested that three pollutants were responsible for much of the toxicity: copper, lead, and phenols.

The 10-year monitoring effort allowed Swamikannu to investigate the influence of structural and non-structural practices on controlling stormwater runoff at the site. The primary non-structural stormwater practice involved draining vehicle fluids prior to stripping. An early structural stormwater practice directed wastewater from a dismantling area through a multi-chambered oil-water (OW) separator. During the seventh year of the study additional structural modifications were made to the facility: a roof was constructed over the dismantling area, and the OW storage tank capacity was expanded. Following implementation of the stormwater practices, acute toxicity declined from 100% during the first year of the study to 14% during the final year. In addition, other pollutant concentrations, most notably oil and grease, declined (Figure 1).

A second auto recycler in Riverside County, CA, has implemented even more stormwater practices. Workers drain fluids into storage tanks before dismantling vehicles, and OW separators as well as an aeration-flocculation (AF) treatment system are used. The OW separators collect water from areas used for dismantling, storage, and display. The AF system, consisting of an equalization tank, a coagulating mixer, a settling tank, and an aerator, collects water from the vehicle storage area. Since it is somewhat smaller than the Los

Table 1: The Anatomy of a Scrapped Vehicle (Swamikannu, 1994)

Component	Unit	Reclaimed/ Recycled
Tires	5	SELDOM
Batteries	1	SELDOM
Antifreeze	1.9 gal.	SELDOM
Waste Oil	0.75 gal.	LESS THAN 40%
Hydraulic Fluid	1.1 gal.	LESS THAN 40%
Filters	4	NO
Brake Pads	1 lb.	NO
Steel	1,620 lbs.	YES
Iron	420 lbs.	YES
Glass	80 lbs.	SELDOM
Plastic	200 lbs.	SELDOM
CFCs	0.5 lbs.	SELDOM