

EMISSION INVENTORY

CATEGORIES # 1157 & 1158

OTHER INDUSTRIAL/COMMERCIAL - PROCESSES/FACILITIES WASTE MANAGEMENT - LANDFILLS, POINT & AREA

1999 EMISSIONS

Introduction

These two categories account for landfill emissions from point sources (Category 1157) and area sources (Category 1158). Landfill emissions are unique in that it reflects another waste disposal technique (backyard burning) that was used under the District's 'old' Regulation 1, which allowed burning with regard to one- and two-family dwellings.

Landfill gas production rates and compositions vary greatly, even within a single landfill. There are no comprehensive data leading to the development of generalized emission factors for the Bay Area. Biodegradation takes place over an extended period of time, therefore, waste generated in prior years must be considered for emissions calculations. It is assumed it takes 15 years for maximum biodegradation to take place. However, biodegradation occurs 30 years and beyond (to a lesser extent). Prior to 1970, it was assumed that 60% of the waste was buried in landfills and 40% of the waste was burned on-site. After 1970, it was assumed the burned waste was diverted to the landfills.

Methodology

It is assumed all active landfills within the District are permitted sources. Inactive landfills less than 30 years old and have greater than one million tons of refuse in place are also considered permitted. These permitted landfills are considered to be point sources; their throughput and emission information has been inventoried in the District's database since the early 1980's. For these point sources, it is assumed 25% of the landfill gases escape as fugitive emissions and 75% are collected and are either destroyed by flaring (98% destruction efficiency of TOG), or burned in an internal combustion engine (97% destruction efficiency of TOG).

Area sources consist of inactive landfills that had less than 1 million ton of refuse in place. (Generally, these sources do not require a permit, however, there are several permitted by the District and are point sources.) It was assumed 10% of the total of the total point source decomposable waste (as found in the District's database) was attributed to area sources. The area source emission factor was derived from the appropriate point sources in Category 1158. TOG emissions were calculated by multiplying this throughput value by the emission factor.

Monthly Variation

Estimated daily emissions are assumed to be uniform for all months of the year. This is due to burial/insulation of the refuse that reduces impact of ambient temperature changes, allowing somewhat uniform biodegradation throughout the year.

County Distribution

All Bay Area counties except San Francisco are assumed to have their refuse deposited within their boundaries. It is assumed that throughout the years, Alameda, San Mateo, and Santa Clara Counties have received San Francisco County's refuse. For Solano and Sonoma Counties, only the portions of refuse generated by the fractions of their populations in the District jurisdiction are assumed to be deposited within their areas in the District. The fact that these two counties and Napa County were not part of the BAAQMD until the 1970's was not considered in this report. There may have been a longer period of time for them to use "backyard burning" before joining the District, however, due to smaller populations, their emission contributions to this category are lower.

TRENDS

History

Prior to 1970, it was assumed 60% of waste was deposited in landfills with the remaining 40% incinerated on-site. Obviously, after this practice of burning on-site stopped, more waste was diverted to landfills which leads to more cumulative waste generated. The emission factor (for area sources) was assumed to remain constant. The point source emission factors, which are in the District's databank, are frequently based on source tests. Emissions from these categories have increased over the years since their direct relationship to population growth.

Growth

The projected growth to 2030 was based on ABAG's Population data for each of the counties. In addition, the State of California passed a mandate (Assembly Bill 939) which requires waste generation be reduced by 25% from 1990 levels by 1995, and by 50% from 1990 levels by 2000. (However, it was assumed the 50% reduction would occur by 2002.) These mandate requirements were factored into the growth profile.

Control

Currently, Regulation 8, Rule 34 requires that certain landfills process landfill gases through a gas collection and emission control system such that:

1. There are no leaks that exceed 1000 PPM by volume measured as methane at any component or connector of the landfill gas collection system; and
2. The collected gases are process in an enclosed ground type flare with a TOG destruction efficiency of at least 98% by weight; or
3. The collected gases are processed in an energy recovery device or emission control system that reduces the amount of TOG by 97% by weight.

Given the above requirements, it was estimated the overall control for point source landfills (Category 1157) in 1999 was approximately 56%.