runoff depending on their makeup and origin.

Runoff related to storage and handling of coal and coke can contribute suspended solids, metals, as well as oil and grease to runoff. These can be released from piles, hoppers, or bins through handling or wind-blown losses. Significant losses can also occur during handling with conveyors, trucks, or while preparing charges for the furnace or sintering operations.

Fluxes such as limestone may be stored in piles, bins, or hoppers outside or become exposed to precipitation during unloading and handling activities. Limestone can increase the pH of storm water. Fluxes can also contribute to loadings of suspended solids (TSS) or have other effects depending on their makeup.

A variety of acids and solvents may be stored in drums or tanks for use in metal treating and cleaning operations. Leaks and spills from tanks and drums or during handling can result in discharges with storm water. These materials can affect pH of storm water and may be toxic.

*b. Process Activities.* Many processes can contribute pollutants to storm water discharges. These can include all types of furnaces, metal finishing activities, as well as material handling equipment.

Furnaces of all types can generate particulate emissions. The quantity and character of these emissions can vary greatly depending on the type of furnace, the material being melted, the fuel used, and any pollution control equipment that may be in place. In general, large coke-fired and electric arc furnaces capable of handling fairly dirty charge products will have higher emissions, but are also more likely to have sophisticated pollution control such as wet scrubbers, baghouses, and electrostatic precipitators. Smaller gas fired or electric induction furnaces generally require a fairly clean charge and have less emissions, but might also have less sophisticated controls. Settling of these emissions on roofs and plant yards are very likely to be washed away in storm water runoff. These particulates can contain a wide range of constituents which can contribute metals and suspended solids to discharges.

Material handling equipment such as conveyors, trucks, and forklifts can all contribute drippings of oil and grease as well as hydraulic fluids. This equipment may also generate or release particulate matter related to the materials being handled. Pallets, hoppers, drums, and storage bins may all contain residual materials which may become exposed to storm water.

Metal finishing operations can be divided in two general types. Mechanical operations such as grinding, blasting, boring, chipping, cutting, and descaling can all produce metal fines, chips, and turnings which may contribute metals and suspended solids to discharges. Residuals of oil or other materials on the finished goods or waste products can also contribute pollutants. Other finishing operations include acid pickling, solvent cleaning, and all types of heat treating activities. Materials that have been treated or finished may have residual chemicals on them such as pickling baths, oil or liquid salt quench media, or solvents. Exposure of these materials could contribute to pH, metals, or oil and grease in storm water discharges.

Stationary process equipment may also produce a substantial amount of residual particulate material that tends to accumulate on and around the equipment. Many materials used for primary metals production are conducive to this type of buildup. This will typically occur around rotating machinery, moving parts, bearings, conveyors and at the output of the equipment, e.g., storage containers. Particulate material that accumulates can become a source of contamination if it comes in contact with either precipitation or storm water runoff.

*c. Waste Material Storage, Handling, and Disposal.* Waste materials are generated in large volume from many of the facilities in this industry. These wastes can include used sand, cores and butts, refractories, slag and dross, baghouse or cyclone dusts, scrubber dusts and sludges, machining wastes, and obsolete equipment. There is potential for pollution from many of these sources if not properly stored, handled, and disposed of.

Used sands, cores, butts, and refractory rubble are all potential sources of TSS. Due to the large volumes potentially generated and their generally benign nature, these materials are often stored outside. The exposure of these materials to molten metal also presents the possibility of contamination with metals which may also get washed away with storm water.

Wastes related to pollution control equipment are particularly susceptible to being discharged with storm water if not properly controlled. These wastes could originate from baghouses, cyclones, electrostatic precipitators or scrubbers. These may be in place to control emissions from a large variety of ovens and furnaces, as well as mechanical or chemical metal finishing operations. These dusts and sludges typically contain an assortment of metals, metal oxides, and other particulate matter. The size of particulates that are able to be captured will vary from one type of equipment to the next and will depend on proper operation and maintenance.

Machining and finishing waste which is not collected as described above may also be generated in significant quantities. This material is typically metallic fines and particulate matter but may contain cutting oil or other materials as well. If stored outside in piles, drums, hoppers, or other containers these materials can contribute metals, TSS, or oil to precipitation and storm water runoff.

d. Erosion and Sediment Loss. Erosion from plant yards is another potential source of storm water contamination from primary metals facilities. Areas of vehicle traffic related to material handling, loading, unloading, material storage areas etc. may all have exposed soils with the potential for erosion. These soils can contribute to TSS loadings in storm water discharges. Exposed surfaces also limit the potential for housekeeping measures such as sweeping, making spills of other materials (particulate or liquid) harder to clean up and more likely to be washed away with storm water. The large size of many primary metals facilities makes this a concern. For example: one group application consists of 5 facilities with a total land area of 623 acres. Of this, approximately 105 acres (16.9 percent) were impervious surfaces (buildings, paved areas), leaving 83 percent of the total area potentially susceptible to erosion. Vehicle traffic, material handling, and storage activities taking place in unstabilized areas can all lead to erosion.

e. Group Application Monitoring Data. Based on the wide variety of industrial activities and significant materials at the facilities included in this sector, EPA believes it is appropriate to divide the primary metals industry into subsectors to properly analyze sampling data and determine monitoring requirements. As a result, this sector has been divided into the following subsectors: steel works, blast furnaces, and mills (SIC 331); iron and steel foundries (SIC 332); primary smelting and refining of nonferrous metals (SIC 333); secondary smelting and refining of nonferrous metals (SIC 334); nonferrous rolling and drawing (SIC 335); nonferrous foundries (SIC 336); and miscellaneous primary metals products (SIC 339). Tables F-2, F-3, F-4, and F–5 below include data for the eight pollutants that all facilities were required to monitor for under Form 2F.