

FIRES IN THE MATERIALS MANAGEMENT SECTOR

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EXECUTIVE SUMMARY

Fires have always been a concern at materials management facilities, but in recent years, evidence suggests the risk has intensified. While data exists on the number of fires at these facilities, there is limited information on the causes, what management practices are used, and the overall impact of these incidents. This report aims to address these gaps by analyzing survey data collected from material recovery facilities (MRFs), transfer stations, and metals recycling facilities. Respondents provided information on the frequency and scale of fires, suspected causes, fire prevention strategies, and estimated damages.

Overall, the survey results showed the occurrence of fires in the materials management sector are increasing. Between 2019 and 2020, 75% of facilities reported at least one fire, and between 2014 and 2020, 89% of facilities reported at least one fire. The fact that nearly as many fires occurred in a single year as over the previous five years suggests a rising trend in fire incidents. MRFs were more likely to experience fires over metals recyclers or transfer stations. Roughly 44% of fires reported by respondents required an external response from the fire department to extinguish the fire. This suggests that while fires are frequent, around half of these incidents were small enough (incipient phase) to be extinguished using onsite fire management methods.

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All the surveyed facilities had at least one type of fire suppression strategy in place at their facility, although most (89%) relied on a combination of two or more strategies. Ninety-eight percent of facilities had portable fire extinguishers, with other on-site equipment such as 24-hour remote monitoring, smoke detection and automatic sprinkler systems also commonly deployed. Facilities also developed formal fire safety and employee training plans, with 99% of facilities reporting these activities are used to reduce fires and their impacts.

When fires did occur at facilities, most occurred on the tipping floor (27%), although they were reported at a total 68 different locations including at the baler, in a trailer, in customer yard, etc. However, identifying the actual cause of fires was challenging, with 36% of reported fires having unknown causes. Of the identifiable causes, small, discarded batteries were the greatest cause, responsible for 13% of fires – 77% of which were due to small rechargeable lithium-ion batteries. Lithium-ion batteries have become increasingly problematic for the materials management industry. As their use grows so does the risk of improper disposal and the potential for facility fires. This study supports concerns over lithium-ion battery disposal, showing that they pose a relatively higher fire risk compared to other potential causes.

Survey results indicated that while most fires resulted in minimal financial impacts, averaging \$4,829, the potential for significant losses exists with a maximum reported loss of \$450,000, although these values do not include the two complete losses reported as values were not provided for those facilities. Comparisons with other sources on fire-related costs highlight the significant variability in potential financial losses. Given this wide range, these estimates should be interpreted with caution and not used as absolute values.

This report offers unique, direct facility data on fires in the materials management sector that include, in particular, information regarding incipient stage fires which are rarely covered, setting it apart from other industry resources. While the results confirm that fire incidents are increasing at MRFs, transfer stations, and metals recyclers, it also indicates most are likely incipient fires which are managed quickly without needing an external response. The results show that while catastrophic fires occur, they are rarer. However, fires remain a significant cause for concern within the industry and additional work to identify ways to prevent improper disposal of batteries could reduce some fire risk. Ongoing advancements in education, technology, and policy will play a crucial role in continuing to address this high priority issue.