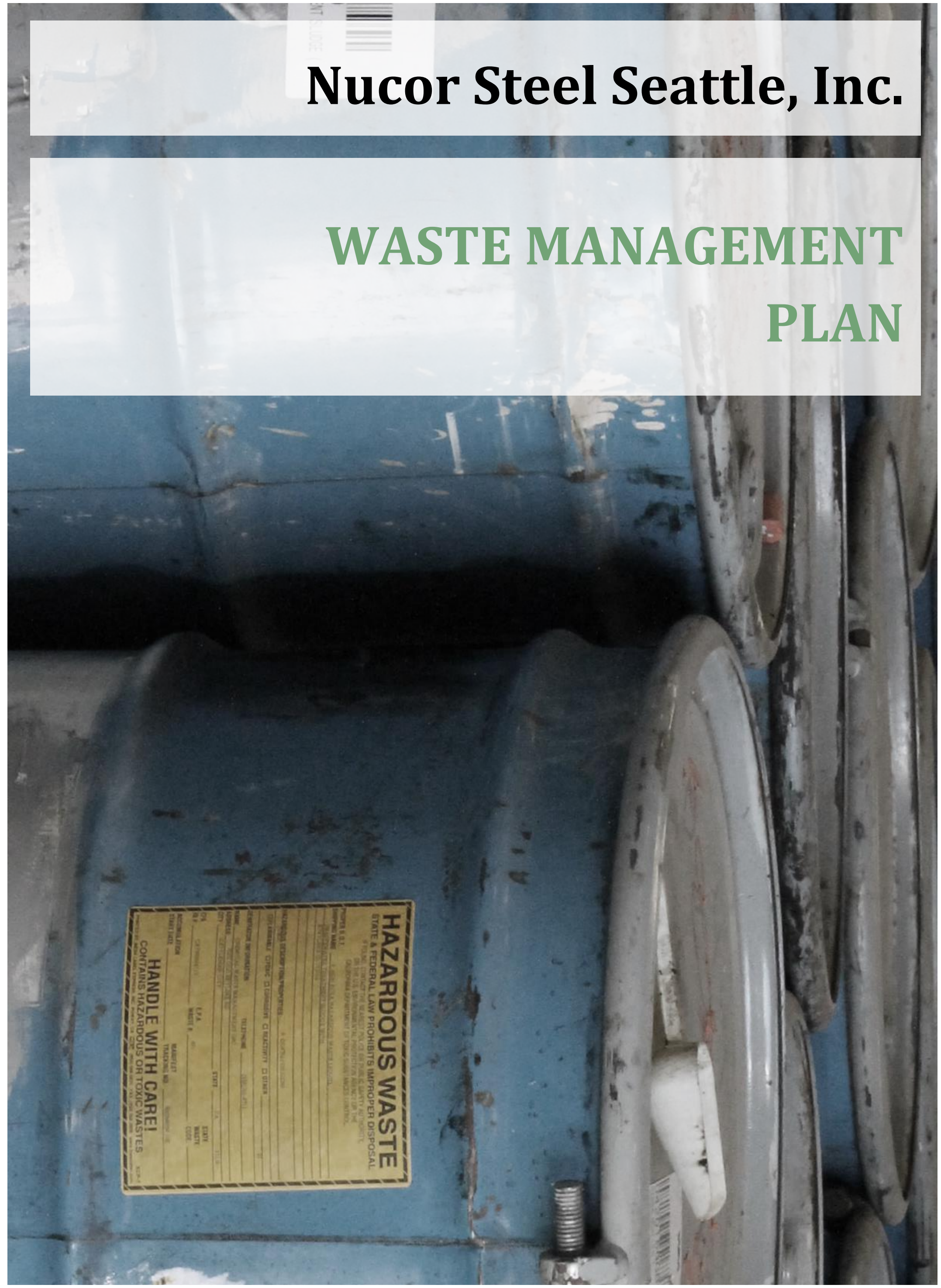
Nucor Steel Seattle, Inc.

WASTE MANAGEMENT PLAN



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GENERAL INFORMATION

INTRODUCTION

This Waste Management Plan (Plan) is prepared for the Nucor Steel Seattle mill located in Seattle, Washington. The facility recycles scrap steel and has been owned and operated by Nucor Steel Seattle (Nucor) since 2002. The facility is located on an approximate 50-acre inland parcel of land, in the filled tideland industrial area directly south of Elliott Bay (Figure 1). This plan is designed to meet the requirements of several different regulatory requirements.

Because the facility reports the generation of an excess of 2,640 pounds of hazardous waste per year, it is subject to the pollution prevention planning requirements of WAC 173-307-030. Additionally, because Nucor generates dangerous wastes, this plan also includes the required elements from WAC 173-303-330. This revision of the plan will serve as a 5-year update and is prepared in accordance with guidance specified in these regulations.

Because the mismanagement of solid waste generated by the facility could pollute waters of the state, Nucor is required to develop an SWCP under the Washington Department of Ecology (Ecology) Water Quality Program as stated in Condition S6.C in the facility's NPDES permit. This Plan also includes Nucor's Waste Minimization Plan (WMP) and Solid Waste Control Plan (SCWP). The WMP will be reviewed and revised as needed to reflect the existing conditions of the site and continued conformance with the Environmental Protection Agency (EPA) guidance published in the May 28, 1993 Federal Register.

PLAN ORGANIZATION

Subsequent sections of this Plan address the required elements of: a pollution prevention plan as described under parts 1 through 4 of WAC 173-307-030, a dangerous waste personnel training plan described in WAC 173-303-330, a waste minimization plan as described in the EPA May 28,1993 Federal Register, and a solid waste control plan as described by Ecology. These elements include:

Part 1 Plan Requirements

- Corporate Policy;
- Scope and Objectives;
- Facility Description;
- Overview of Facility Processes;
- Dangerous Wastes Generated and SARA Title III Toxic Releases; and
- Reduction, Recycling, and Treatment Activities.

Part 2 Plan Requirements

- Identification of Hazardous Substances and Hazardous Wastes;
- Identification of Processes Subject to Minimization Planning;
- Minimization Evaluation of Melting and Casting of Scrap Steel; and

- Implementation of Selected Opportunities and Schedule.

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- Employee Participation and
- Dangerous Waste Personnel Training Plan.

Part 5 Waste Minimization Plan Requirements

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- Periodic Waste Minimization Assessments;
- Cost Allocation System;
- Encourage Technology Transfer; and
- Program Implementation & Evaluation.

Part 6 Solid Waste Control Plan Requirements

- Facility Description;
- Solid Waste Permits;
- Solid Waste Generation;
- Contingency Plans; and
- Disposal Facilities.

PART 1 – WAC 173-307-030(1)

(1)(A) – NUCOR STEEL SEATTLE POLICY

Nucor is committed to a role of leadership in protecting the environment. In keeping with this commitment, Nucor strives to reduce waste, emissions, and use of toxic substances as well as adverse impact on the air, water, and land. By successful reduction, Nucor can achieve cost savings, increase operation efficiencies, improve the quality of our products and services, and maintain a safe and healthy work place for our employees.

Nucor's environmental guidelines include the following corporate Environment, Safety, and Health (ES&H) Commitment statements:

- As a key to our success and for our respect for the employees of Nucor and the appropriate public individuals and facilities, the Company is committed to the pursuit of excellence in environmental, safety, and health (ES&H) matters.
- Protecting the employees of Nucor, our most valuable assets, is our most critical goal. We will achieve this goal by providing a safe place to work and assuming individual responsibility for our own safe behavior. Safety must never yield to shortcuts - no job is so important that it cannot be done safely.
- We will meet our environmental responsibilities by proactively complying with all applicable environmental regulations and ensuring our environmental performance meets established standards.
- We will also provide every employee a healthy area in which to work. We will require all employees to wear proper protective clothing/equipment as defined by facility guidelines, and monitor them and their workstations to ensure they are fully protected from harmful exposures.

In pursuit of continuous ES&H improvement, all of our operations will:

- Design, operate and manage each facility to protect the health and safety of our employees and the public, and to protect the environment in which we operate.
- Ensure all employees are well trained in ES&H regulations and their individual responsibilities, and are committed to improving ES&H performance.
- Regularly assess our operations to identify and correct potential hazards and to verify compliance with legal requirements.
- Investigate accidents/incidents and share lessons learned.
- Discuss and emphasize ES&H during plant business meetings.
- Set measurable ES&H goals and report progress toward achieving them.
- Expect all parties working for us or with us to meet our ES&H standards.
- Work constructively with government agencies, customers, suppliers and the public to promote sound ES&H policies.
- Allocate sufficient resources to implement this commitment.

In the course of implementing its waste minimization policy, Nucor has committed to reducing quantities of hazardous and other wastes generated.

(1)(B) – SCOPE AND OBJECTIVES

SCOPE OF PLAN

The scope of this Plan is focused on identifying additional opportunities to minimize the toxic substances used and waste products generated at the Nucor facility. In summary these materials encompass:

- More than 95 percent (by weight) of all dangerous wastes present at the Nucor facility. Dangerous Wastes are defined by Washington State Dangerous Waste Regulations, Cha333pter 173-303 WAC.
- Products, with the exception of office and janitorial supplies that contain SARA Title III (Section 313) chemical constituents in excess of threshold levels. Threshold levels were established using the percentage approached detailed in WAC 173-307-030 (2)(a)(iv).

OBJECTIVES OF PLAN

Nucor identified objectives for this Plan consistent with the fundamental goal of "achieving the greatest possible reduction economically and technically practical for this facility." This strategy involves a continued process of evaluating opportunities to further minimize waste generation and the use of toxic materials, rather than establishing numerical goals for reduction. The following are Nucor's objectives for this updated Plan:

- Update a baseline of regulated waste generation and toxic use practices;
- Document past minimization activities conducted by Nucor;
- Identify potential improvements to existing waste generation and toxic use practices; and
- Provide a schedule to implement the identified improvements.

This Plan is intended to guide toxic materials usage and waste minimization efforts by Nucor for the 5-year period between 2015 and 2020. Nucor is undergoing frequent capital and operational changes to its existing facility. Therefore, processes, material usage practices, and volumes of waste generation may change. The objectives of this Plan will be modified as necessary to reflect these changes and related modifications to Nucor's pollution prevention strategy.

This updated Plan will be re-evaluated on a yearly basis, with Annual Pollution Prevention Reports submitted to the Washington State Department of Ecology (Ecology) in accordance with WAC 173-307-080 via the online Secure Access Washington and TurboPlan V2. Copies of the submitted report shall also be kept locally electronically on the Nucor's internal servers.

(1)(C) – FACILITY DESCRIPTION

FACILITY NAME AND ADDRESS

Nucor Steel Seattle

2424 SW Andover Street

Seattle, Washington 98106

FACILITY OWNER

Nucor Steel Seattle

2424 SW Andover Street

Seattle, Washington 98106

FACILITY CONTACT FOR MINIMIZATION ACTIVITIES

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FACILITY DESCRIPTION

A Vicinity Map is presented on Figure 1 located at the end of this Plan. Nucor has occupied the site since 2002. The property consists of approximately 50 acres of land immediately south of SW Spokane Street.

The property contains buildings, cranes, raw materials, and equipment utilized in the production of steel. Steel manufactured at the site is generated from the recycling of scrap steel. In 2015, Nucor Seattle cast 670,824 tons of steel.

(1)(D) – OVERVIEW OF FACILITY PROCESSES

The Nucor facility recycles scrap steel into quality steel billets and other finished products. Recycling occurs through the melting, alloying, and casting of used and otherwise discarded steel. A Site Plan of the facility is provided on Figure 2.

The steel production process begins with the delivery, unloading, and temporary stockpiling of scrap steel. Scrap is checked for quality, sorted, and loaded into an electric arc furnace (EAF) for melting. During melting, alloys are added to raise the quality of the scrap steel to acceptable levels. Melting operations generate dust, which are collected by a baghouse emission control system, and slag. The baghouse dust is designated in state Dangerous Waste regulations (Chapter 173-303 WAC) as a K061 dangerous waste by source (emission control dust/sludge from the primary production of steel in electrical furnaces). The slag is a product sold for commercial use. Once melted, steel is poured into a continuous caster which is cooled via a closed circuit water system. The cast steel is cut and rolled to various products for load-out and shipment.

A small mechanical maintenance shop is operated to support site railroad locomotives, heavy equipment, and hydraulics required to handle scrap steel and finished products.

(1)(E) – DANGEROUS WASTES GENERATED AND SARA TITLE III TOXIC RELEASES

In 2015, Nucor generated 10,381 tons of baghouse dust listed as K061 dust, a dangerous and hazardous waste. One hundred percent of this material is sent off-site to be recycled for metals recovery. This baghouse dust quantity is dependent on the overall production rate but has generally decreased per ton since 2002. Nucor also generated an additional 17 tons of dangerous wastes, resulting in 10,397 total tons of dangerous waste. The dangerous wastes reported in Nucor's 2015 Dangerous Waste Annual Report are shown in Table 1.

Under SARA Title III, 1,782 pounds of reportable materials were released to the air from the baghouse dust collection system, 484 pounds released to the air as fugitive dust, and 0.74 pounds released to surface water through authorized NPDES discharges in 2015. The reportable releases included chromium, copper, lead, manganese, mercury, nickel, and zinc as air emissions during steel manufacture, and copper released in the wastewater effluent. There were no other reportable releases under SARA Title III.

(1)(F) – REDUCTION, RECYCLING, AND TREATMENT ACTIVITIES

Reduction, recycling, and treatment activities for K061 dust and SARA Title III materials are included with the discussion of Part 2 requirements, below. All other dangerous wastes are sent to a waste management company, to be reused, recycled, stabilized, incinerated, or landfilled. Specific disposal methods for each dangerous waste are shown in Table 1.

These wastes are from many different processes and areas of the steel mill, which makes it difficult to create a mill-wide solution. Smaller solutions targeting specific materials and/or waste will be looked into. Nucor will evaluate opportunities to minimize the use of materials that create these dangerous wastes on an annual basis.

MUNICIPAL SOLID WASTE

Nucor manages their municipal solid waste with dumpsters placed strategically around the site. Where appropriate, these dumpsters have lids that are kept closed while not in use. An independent contractor is responsible for the disposal of municipal solid waste, recyclables, and compost from the dumpsters. To the extent practicable, Nucor separates any waste stream with recycle or compost value. For example, wood pallets are recycled via a segregated wood dumpster while food and yard waste is collected in the compost bins.

PART 2 – WAC 173-307-030(2)

(2)(A) – IDENTIFICATION OF HAZARDOUS SUBSTANCES AND HAZARDOUS WASTES

In accordance with Part 2 of the regulation, this Plan identifies the specific dangerous wastes and hazardous substance subject to evaluation.

HAZARDOUS WASTES

To identify hazardous wastes subject to planning requirements, materials designated as dangerous wastes under state regulations (Chapter 173-303 WAC) were inventoried following submittal of the Form 4, Dangerous Waste Annual Report to Ecology for 2015. Then, the total quantity of dangerous wastes generated by Nucor was calculated. Based on this total quantity, more than 95 percent of the dangerous waste present at the Nucor facility were accounted for in accordance with the "percent" provisions of WAC 173-307-030(2)(a)(iv)(B). By far the largest routine dangerous waste currently generated at Nucor is K061-listed baghouse dust and this is expected to remain true in the future. In accordance with requirements of the regulation, all waste streams identified within the percent provision are subject to pollution prevention planning.

Baghouse dust is the only material currently expected to contribute at the 95 percent level of reportable wastes in the future. Although extremely hazardous wastes must also be included in the inventory, previous sources have now been eliminated, and no new sources are envisioned. Additional discussion is provided in subsequent sections regarding the baghouse dust recycling and other waste minimization alternatives considered.

PRODUCTS CONTAINING HAZARDOUS SUBSTANCES

To identify products used by Nucor which are subject to planning requirements, Nucor reviewed safety data sheets (SDSs) for chemical products used by Nucor. These materials were then evaluated according to the “percentage” approach. In accordance with the “percentage approach,” all products containing a SARA Section 313 Toxic Chemical were identified, and the annual usage rate estimated. Materials that contributed to 95 percent of the total usage were further evaluated for waste management and minimization planning purposes.

Table 2 lists the materials used by Nucor containing SARA toxic substances that are subject to pollution prevention planning. These materials include alloys and refractories containing manganese, nickel, chromium, copper, aluminum oxide, or phosphoric acid. These materials have the highest concentrations of hazardous substances and contribute to over 95 percent of all products used during the melting and casting of steel that contain hazardous substances. The estimated concentrations and usage in 2015 are also provided in Table 2. Additional discussion is provided in subsequent sections regarding these materials and product substitution/minimization alternatives considered.

It is also noted that chemical products in use at the facility for routine maintenance, degreasing, etc. make up a small fraction of on-site toxic materials and do not exceed threshold quantities for pollution prevention planning. Use of such materials have been reduced or eliminated as part of Nucor’s Management of Change policy, as further described below for Part 4 Employee Participation activities.

(2)(B) – IDENTIFICATION OF PROCESSES SUBJECT TO MINIMIZATION PLANNING

Nucor conducted minimization planning for processes that use hazardous materials or generate hazardous wastes. Melting and casting of steel were identified as the only processes that currently use or generate material or wastes subject to planning requirements for pollution prevention.

(2)(C-G) – MINIMIZATION EVALUATION OF MELTING AND CASTING OF SCRAP STEEL

Hazardous Waste Requiring Minimization Planning:

- K061 Baghouse Dust.

Toxic Products Requiring Minimization Planning:

- Alloys with manganese, nickel, or chromium; and,
- Refractories with nickel, chromium, copper, aluminum oxide, or phosphoric acid.

In accordance with WAC 173-307(2)(f), it is Nucor's policy that implementation of selected waste minimization options will not shift risks from one part of a (waste generating or management) process, environmental medium, or product, whenever technically and economically feasible. This policy applies to existing waste management practices and new options that may be identified in the future.

EAF STEEL PRODUCTION PROCESS DESCRIPTION

Melting of scrap steel is the major process at the facility and is depicted on Figure 3. Melting is conducted via EAF as described below. General steps include lining the internal walls of the furnace with refractory material, charging the furnace with steel scrap, melting the scrap to form molten steel, casting the steel into billets, and forming the billets into various finished steel products.

The process begins by lining the internal surface of the EAF with refractory material, a tough, temperature/wear-resistant coating. The furnace is typically lined on a regular basis and repaired as necessary between melting cycles as refractory material is consumed.

Scrap steel is then charged into the EAF by bottom dump charge buckets suspended from an overhead crane. To enable this, the roof of the EAF is mechanically raised and swung to the side, allowing access for the charge buckets. During all charging, melting, tapping, refining, and casting operations, emissions are collected by a dust collection system.

The heat generated by the EAF melts the scrap steel charge. As melting progresses, the scrap is transformed into its molten form and flows downward, into a pool at the bottom of the refractory-lined furnace shell. Alloys containing manganese, chromium, and nickel are added for strength and to achieve desired mechanical characteristics. Additionally, lime is added to remove impurities from the steel. When an adequate supply of molten steel is accumulated in the bottom of the furnace, the steel is chemically analyzed. Following analysis, the steel is tapped to ladles for further mixing with alloys and transport to the continuous caster.

Casting operations are conducted using a continuous, four-strand, vertical billet caster. Prior to use, the caster's tundish (which is used to control and stabilize the flow of molten steel through the mold) is lined with refractory. Once lined, molten steel is slowly poured from the ladle into the tundish. The tundish releases steel at a slow, continuous rate into molds. As the molds fill with steel, the steel contacting the mold surface is chilled by the water-cooled surface of the mold, forming the billet. The cast billet is sprayed with water to accelerate cooling. After cooling, the billet is cut to prescribed lengths, allowed to cool further, and prepared for shipment, or conveyance to the on-site rolling mill.

K061 EAF DUST – EVALUATION OF WASTE MINIMIZATION OPPORTUNITIES

GENERATION PROCESS. Dust is generated from the many individual processes associated with melting scrap steel in the EAF. As summarized above, these processes include charging, melting, tapping, and casting operations. Baghouse dust primarily results from the vaporization of metal impurities contained in the scrap steel and the continuous deterioration of refractory material lining the EAF. The quantity and chemical makeup of the baghouse dust depends on the chemical makeup of scrap steel, but average roughly 30 to 40 pounds per ton of steel produced and 50% recoverable metallic content (including zinc and iron).

The dust is extracted through a series of ducts and collected in a baghouse system. The dust is then transferred from the baghouse to closed rail hopper cars for transport off-site.

CHEMICAL CHARACTERIZATION. EAF dust is classified as a K061 RCRA-listed waste. The primary concern is the presence of cadmium, lead, zinc, mercury, and other metals that are potentially leachable. As a result, land disposal treatment requirements and other waste handling and disposal standards have been established by the Environmental Protection Agency (EPA). Available sampling and analysis data from the Nucor facility indicate that some, but not all baghouse dust generated contains concentrations of leachable metals that exceed Toxicity Characteristic Leaching Procedure (TCLP) threshold concentrations listed in Chapter 173-303 WAC.

WASTE MINIMIZATION OPPORTUNITIES FOR K061 EAF DUST

Table 3 summarizes results of a previous evaluation of current off-site recycling practices and other waste minimization opportunities for K061 EAF dust. Nucor considered several key benefits and potential impediments to alternative waste minimization options. Nucor also evaluated potential risks associated with other alternatives to ensure that implementation of such alternatives would not shift risk from one part of a process, environmental medium, or product to another. Waste minimization alternatives are described in more detail below.

In summary, the evaluation conducted determined that the current recycling option (using the EPA-approved High Temperature Metals Recovery (HTMR) process) continues to provide the most environmentally responsible method of reducing hazardous wastes. Recycling has reduced K061 dust that would otherwise require treatment and landfill disposal (or alternate disposal method) by 100 percent. No other waste minimization alternatives are economically viable at the present time.

Nucor will continue to investigate the environmental effectiveness, feasibility, and economics of source reduction, and alternate recycling alternatives.

CURRENT RECYCLING PRACTICE. EAF dust currently accumulates in the baghouse at the Nucor facility and is then loaded into railcars. The dust is manifested as a hazardous waste and is currently shipped for recycling at Horsehead Corporation in Chicago, Illinois. Metallic components of the dust are recycled for pharmaceutical or industrial grade oxides or metal ingots.

OFF-SITE TREATMENT AND LANDFILL. K061 dust can be chemically stabilized to meet RCRA land disposal requirements prior to landfill disposal. Nucor has successfully implemented this option in the past at Envirosource's Idaho facility, using the EPA-approved "Super Detox" process for treatment. The treated material was then placed in a RCRA Subtitle C landfill disposal cell at the facility. The “Super Detox” process renders the resulting material non-hazardous, and the process has earned a delisting certification from the EPA. This treatment and disposal alternative is not currently in use.

POTENTIAL SOURCE REDUCTION – STEEL PRODUCTION RATE. The quantity of EAF dust generated is a function of the annual quantity of finished steel that is produced. This quantity fluctuates from year to year based on a variety of market and economic factors that influence the demand for finished steel products. The quantity of dust generated (30 to 40 pounds) per ton of steel produced is within the typical range for steel mills. This dust quantity is representative of what is practically achievable given current steel production and dust capture technologies. The quantity of dust in pounds per ton of steel produced has decreased over the past 10 years. This may be linked to lower contamination levels in the scrap steel used in the manufacturing process, but this is cannot be proved conclusively. It is expected that this rate of dust generation will continue in the future, although the overall quantity of dust will depend on the annual steel production rate.

POTENTIAL SOURCE REDUCTION – BAGHOUSE MODIFICATIONS. In 2006 upgrades were made to the existing baghouse control systems to improve overall efficiency and control. The modifications included new automation and alarms to provide better control of the dust collection and emissions systems and to provide earlier indication of potential system malfunctions. Other potential baghouse modifications include the use of Gortex bags, and conversion of the baghouse from the current “shaker” style to a “reverse air style.” These modifications would decrease the quantity of live dust emitted to the atmosphere, thereby decreasing emissions of SARA Title III constituents. As a consequence, these measures could marginally increase recovery of dust collected for metals recovery. Currently the cost of these options is economically prohibitive, and the improvements are not planned to be considered further.

POTENTIAL ON-SITE RECYCLING. As an alternative to land disposal, tests were conducted [1] to evaluate the feasibility of pelletizing the dust collected from the baghouse and recycling the pellets back into the EAF during charging operations. The study showed that zinc content of the EAF dust increased, and the quality and yield of the steel were not adversely affected. However, consumption of coke, lime, and electrode materials increased and the capital and operating costs for the pelletizing system were infeasible for mills the size of Nucor’s Seattle facility. Nucor continues to evaluate on-site options for recycling EAF dust, but to date such options have not been cost-effective relative to off-site recycling for metals recovery, or (historically) treatment and landfill disposal.

POTENTIAL VITRIFICATION AND USE AS FILL. On-site vitrification can be used to render the K061 dust a non-hazardous, inert, glass-like material. Once vitrified, the material can be used as a general-purpose fill. Vitrification is currently not a cost-effective option relative to off-site recycling for metals recovery, however.

HAZARDOUS SUBSTANCES USE – EVALUATION OF WASTE MINIMIZATION OPPORTUNITIES

[1] HWC 1986. Methods for Recycling Electric Arc Furnace Shows Promise, Hazardous Waste Consultant, 4 (3) pp 1-16, 1986.

Hazardous substances that require pollution prevention planning include SARA Title III toxic materials. Applicable materials in use at Nucor are summarized in Table 2. These are dominated by silica manganese used as an alloy material during steel manufacture. Other nickel- and chromium-based alloys or refractory materials comprise the remaining fraction of reportable materials.

SILICA MANGANESE AND OTHER ALLOYS

Silica manganese alloy use represents roughly 87 percent of the total hazardous substances at the Nucor facility, or about 21,843,811 pounds in 2015. This material is intrinsic to the steel making process and will continue to be an essential component in the future. As such, opportunities for reduction or substitution are currently unavailable, and future opportunities are expected to remain limited. Further, manganese contributions to K061 bag house dust are miniscule, and quantities are insufficient for recovery during the HTMR process. This compound is included in pollution prevention planning as a SARA Title III constituent, but represents virtually no environmental or human health risk (other than possible worker health and safety considerations during handling of feedstock material). Pollution prevention planning has limited applicability in this context.

Other alloy materials contain nickel and chromium, but these represent 4 percent of the SARA Title III hazardous substances at the facility. Similar conclusions apply to these materials as for the silica manganese alloy, with limited applicability for pollution prevention planning.

REFRACTORY MATERIALS

Refractory materials consist of mortar, pastes, sands, and bricks that are used to line vessels and equipment for containing and handling molten steel. At Nucor, these vessels primarily consist of the EAF and the continuous caster tundish. During steel production, refractory is eroded and deteriorated by heat and physical contact. As a result, much of the refractory is removed as dust and captured in the EAF dust-collection system. The remaining refractory is removed with the slag material derived from melting and cooling operations.

Nickel provides high strength and resistance in refractory materials subjected to the intense heat encountered in melting steel. Refractory materials are consumed during the steel fabrication process, with residual wastes generated as dust collected in the baghouse.

PAST REDUCTIONS. Historically, chrome-based refractory was used in almost all situations. In recent years, effective substitutes have been developed which perform the same function, but with less cost and environmental risk. As a result, Nucor has been able to eliminate the use of chrome in almost all its applications for refractory since the early 1990s. As an example, EAF surfaces previously were lined with chrome bricks. Now Nucor lines these surfaces with magnesium oxide-based refractory material containing no chrome or other hazardous substances. Nickel, chromium, copper, aluminum oxide, and phosphoric acid in refractory materials comprise of less than one percent of all SARA Title III constituents at the Nucor facility. Similarly, effective products without nickel or other SARA Title III toxic materials are currently being explored for usage at Nucor.

Starting in 2006, Nucor eliminated use of the chromium-based Sureflow refractory material. Nucor expanded this to the replacement of the chromium-based Tuncast refractory material lining of the tundish within the past five years. Whereas Tuncast previously accounted for approximately 10 percent of the chromium refractory material in use at Nucor, it is now not used at all and has been replaced by Dossolite refractory material at under 1 percent nickel content. Nucor plans to expand this effort to include all SARA Title III toxic materials in refractory.

Furthermore, the copper alloy molds used during the casting process are not disposed of via landfill or other traditional waste disposal methods. Instead, Nucor recycles 90% of the copper molds, and reuses the other 10% in the process of making steel. In this way, copper molds may be repurposed as a commodity.

WASTE MINIMIZATION OPPORTUNITIES FOR REFRACTORY

Table 4 presents reduction and substitution opportunities evaluated for refractory materials discussed above. In summary, this evaluation indicated product substitutions should continue to be considered to reduce the amount of SARA Title III toxic materials consumed. At present, Nucor is using the most cost-effective refractory materials available.

POTENTIAL PRODUCT SUBSTITUTION. To further reduce the use of refractory with toxic materials, alternative formulations of refractory are continuing to be considered for substitution. These alternative formulations consist of various combinations of oxides, silica, alumina, and other non-hazardous materials combined with non-toxic stabilizing resins. Some viable alternatives to the nickel based tundish spray coating (Dossolite) from the literature are silica/fireclay-based or high alumina-based spray mixes which have insulating properties, but which do not contain hydrocarbons. However, not all grades of steel and practices can tolerate this material, so magnesite-based sprays are preferred.[2] The alternatives all have various physical properties and costs, and are continuing to be considered.

Also, the quantity of refractory used depends on its durability during steel manufacture. Reduction in the quantity of toxic materials used could result by using (toxic-based) refractory materials with better wear characteristics.

Nucor will continue to pursue the replacement of the toxic-based refractory material. Details of further reductions in the use of nickel and other SARA Title III toxic materials based refractory materials will be included in subsequent annual reports as required by WAC 173-307-080.

ELIMINATION OF NEED. Because the volume of refractory used also depends on the surface area of vessels and equipment that requires protection, on-going technical advances in capital equipment could further minimize the amount of refractory required.

(2)(H) – IMPLEMENTATION OF SELECTED OPPORTUNITIES AND SCHEDULE

Nucor will continue to evaluate opportunities to minimize baghouse dust generation and refractory consumption on an annual basis. This evaluation will also include a survey of the technologies for recycling of baghouse dust. An implementation schedule is provided in Table 5.

[2] Brown, W.K., Gavran, R.E., and Lewis, T.W., Inventors. (1994). Lined ladles, linings therefor, and method of forming the same. US 5318277 A. Retrieved https://www.google.ch/patents/US5318277

PART 3 – WAC 173-307-030(3)

FINANCIAL DESCRIPTION OF THE PLAN

The following sections summarize results of cost/benefit analyses to be performed by Nucor for waste and toxic substances minimization alternatives.

WASTE MINIMIZATION

Nucor's on-going evaluation of waste minimization activities for the K061 dust has determined that off-site recycling via HTMR is currently the most cost-effective and environmentally responsible approach. The HTMR recycling process is currently the least expensive option that achieves Nucor's corporate objectives for management and treatment of the K061 waste. A related benefit is that HTMR recycling, as an EPA-approved process, is considered to carry less environmental liability relative to landfill disposal or other alternatives. These cost benefits are difficult to quantify, however. Relative costs for administration, on-site management/storage, etc. for various recycling and disposal options are comparable, and do not significantly affect that cost/benefit analysis.

In addition, complex pollution control equipment is required to collect and store K061 EAF waste. These pollution control measures provide significant environmental and safety benefits, such as dust removal to comply with OSHA worker safety and air toxics standards. In 2006, $604,116 of upgrades was made to the baghouse control systems. In 2014, a further $1.4 million of upgrades was made to improve the motor efficiency and reduce the operational costs of the baghouses. In 2015, even further upgrades were made to automate the furnace control system, improving furnace efficiency via the addition of a new off-gas analyzer. These upgrades provide increased automation of the system components and will provide earlier indication of system malfunction, which could result in unsafe worker conditions or increased emissions releases. The cost benefits resulting from these measures (e.g., environmental protection, lower medical compensation claims, etc.) are not practical to estimate, however, and are best considered when future facility renovation or pollution control upgrades are implemented. Nucor will continue to evaluate the cost-benefit of this and other on-site and off-site recycling alternatives. Nucor will estimate costs for on-site recycling of K061 EAF dust on an annual basis to identify possible cost savings over off-site recycling. Nucor recognizes that currently 100 percent recycling of K061 dust has also achieved a significant positive economic impact on the profitability of its operations. No other waste minimization alternatives are currently identified as technically feasible or economically viable.

TOXIC USE MINIMIZATION

Evaluation of minimization opportunities for toxic-based refractory materials identified potential product upgrades and/or substitutions that could reduce the quantity of SARA Title III chemicals used. Elimination of the chromium-based Sureflow refractory material in 2006 and Tuncast refractory material in 2013 further reduced the releases from the facility. If these improvements can be broadened to more toxic materials in refractory, Nucor will move closer to its goals of eliminating the use of all SARA Title III chemicals wherever possible.

Cost and availability of materials will probably continue to be the main factors that determine the feasibility of product substitution. Relative costs for product storage, use, and administration for substitute products are expected to remain comparable to toxic-based products that are currently in use at the Nucor facility. Refractory is either vaporized and collected in the baghouse dust, or removed with the slag product. Except for baghouse dust, no other waste is generated from refractory consumption. The volume of K061 dust or slag generated is relatively high in comparison to the volume of refractory used have little effect on chemical composition or volume of K061 waste produced.

COST ACCOUNTING SYSTEM

Nucor currently tracks costs associated with the generation of K061 hazardous waste based on disposal and transport. These factors are evaluated to determine the overall performance of the current HTMR recycling alternative.

As part of the evaluation of potential product substitutions for chromium-based refractory, Nucor continues to evaluate how to assign costs associated with the expected effectiveness and consumption rates of various substitution products. This system will continue to be updated using data from the MSDS tracking and purchasing system in-place at the facility.

PART 4 – WAC 173-307-030(4) AND WAC 173-303-330

EMPLOYEE PARTICIPATION

For previous versions of this Plan, Nucor performed site-wide reviews of its hazardous waste production and toxic material use, including employee interviews. As a result of these reviews, Nucor implemented several key waste minimization practices. These practices effectively eliminated many hazardous waste and toxic products from the site. A summary of on-going employee participation activities follows.

Nucor has implemented a policy known as Management of Change. Under this policy, employees are required to submit a request to the Environmental and Safety Office prior to purchasing new materials. Requests are screened to ensure environmentally friendly substitutes are used when available for new hazardous materials to be used at Nucor. Nucor has implemented an ISO 14001 certified Environmental Management System (EMS) that allows and encourages employees' involvement.

Maintenance operations, such as painting and heavy engine repair, are contracted to outside contractors who are better equipped to manage their own use of toxic substances and minimize waste streams on the Nucor facility.

During previous updates of this Plan, Nucor detailed substitutions of chlorinated-based solvents to non-hazardous solvents in parts washers. This eliminated an entire hazardous waste stream.

In addition, Nucor design engineers continue to investigate methods to improve the efficiency of steel recycling and reduce generation of K061 baghouse dust.

DANGEROUS WASTE PERSONNEL TRAINING PLAN

POSITION TITLE: MANAGER - ENVIRONMENTAL

Employee(s) in the position: Patrick Jablonski

Description of Job Duties (including: required skills, education, other qualifications, & duties): Manage all aspects of the environmental program at this site including: oversee waste designations, waste packaging and manifests, disposal facility and method selection, and training determination and administration.

BS degree in environmental, mechanical, chemical, civil engineering or 10 years equivalent experience.

Type & Amount of Each Required Training: See Training Matrix

Training Records: See Intelex

POSITION TITLE: ENVIRONMENTAL - ENGINEER I AND II

Employee(s) in the position: Jeffrey Eis, Chris Norman

Description of Job Duties (including: required skills, education, other qualifications, & duties): Support management of the environmental program including: coordinating and conducting waste designations, reveiw of 3rd party profiles, overseeing and facilitating waste packaging, responsible for shipping paper review for accuracy, completeness and signature, managing disposal contractors and reporting, and administration or coordination of training, responsible for coordinating spill response efforts.

BS degree in environmental, mechanical, chemical, civil engineering or 10 years equivalent experience.

Type & Amount of Each Required Training: See Training Matrix

Training Records: See Intelex

POSITION TITLE: ENVIRIONMENTAL - LEAD

Employee(s) in the position: Steve Dillon

Description of Job Duties (including: required skills, education, other qualifications, & duties): Add/remove waste from containers, transfer of waste from satellite collection to 90-day accumulation, preparation and packaging of waste for transportation and disposal, conduct routine inspections, assist in maintenance of waste handling systems and environmental operations, coordinating and conducting waste designations, waste profiling for disposal, responsible for shipping paper review for accuracy and completeness and signature, responsible for assisting in spill response activity.

High school diploma and six months progressive on the job training on operations/maintenance of pollution control systems. Progressive increasing knowledge and command of State and federal waste regulations and DOT hazardous materials handling, packaging, and shipping.

Type & Amount of Each Required Training: See Training Matrix

POSITION TITLE: ENVIRONMENTAL - BAGHOUSE ENV TECH

Employee(s) in the position: Jerry Carnahan and Terry Harris

Description of Job Duties (including: required skills, education, other qualifications, & duties): Add/remove waste from containers, transfer of waste from satellite collection to 90-day accumulation, preparation and packaging of waste for transportation and disposal, conduct routine inspections, assist in maintenance of waste handling systems and environmental operations, coordinating and conducting waste designations, waste profiling for disposal, responsible for shipping paper review for accuracy and completeness and signature, responsible for assisting in spill response activity.

High school diploma and six months progressive on the job training on operations/maintenance of pollution control systems. Progressive increasing knowledge and command of State and federal waste regulations and DOT hazardous materials handling, packaging, and shipping.

Type & Amount of Each Required Training: See Training Matrix

Training Records: See Intelex.

POSITION TITLE: TRANSPORTATION SUPERVISOR

Employee(s) in the position: Edward Shilley

Description of Job Duties (including: required skills, education, other qualifications, & duties): Responsible for completing required shipping papers, including manifest, for signature and coordinating shipment of K061 dust railcars.

Type & Amount of Each Required Training: See Training Matrix

Training Records: See Intelex

POSITION TITLE: TRANSPORTATION COORDINATOR

Employee(s) in the position: Rachel Edlund

Description of Job Duties (including: required skills, education, other qualifications, & duties): Responsible for completing required shipping papers, including manifest, for signature and coordinating shipment of K061 dust railcars.

Revision #: **Revision Date:**

Type & Amount of Each Required Training: See Training Matrix

Training Records: See Intelex.

TRAINING MATRIX

RECOMMENDED REVISIONS	Env Manager	Env Engr I	Env Engr II	Env Lead	Env Op	BH Tech	Trans. Supr	Trans. Coor.
DOT HM181	X	X	X	X	X	X	X	X
RCRA Certification	1 time	X	1 time	X	X	1 time		
RCRA Annual (1hr)	X	X	X	X	X	X	X	X
Emergency Response	X	X	X	X	X	X	X	X
Spill Response	X	X	X	X	X	X	X	X
Waste Minimization	X	X	X	X	X	X		
HAZWOPER	X	X	X	X	X	X		

PART 5 – WASTE MINIMIZATION PLAN

This WMP was developed to conform to the Environmental Protection Agency guidance published in the May 28, 1993 Federal Register in minimizing industrial pollutants and waste generation. The May 1993 guidance lays out 5 elements that a Waste Minimization Program should have: Top Management Support, Characterization of Waste Generation, Periodic Waste Minimization Assessments, Cost Allocation System, Encourage Technology Transfer, and Program Implementation & Evaluation. The current Environment Management System meets these requirements. The following sections summarize existing operations and practices that meet these requirements.

TOP MANAGEMENT SUPPORT

The 1993 guidance allows for – “make waste minimization a part of the organization policy” and “set explicit goals for reducing the volume and toxicity of waste streams” as methods of showing top management support. The Nucor policy as described in Part 1 (A) and (B) of this document showcase the direct involvement and support of the top management team for waste minimization.

CHARACTERIZATION OF WASTE GENERATION AND WASTE MANAGEMENT COSTS

The 1993 guidance recommends maintaining a waste accounting system to track the types and amounts of wastes, as well as the amounts of hazardous constituents. Nucor hazardous wastes are characterized in Part 2 (A) and Table 1 of this document.

All waste streams are characterized to determine waste type and proper handling/disposal processes. Nucor has developed a Waste Characterization and Disposal Database that includes the waste name, generation process, method of characterization (i.e. sampling, generator knowledge, SDS), sampling date, disposal company, waste profile number (if applicable), waste and disposal codes, and expiration status of the profile and characterization. This tracks both hazardous and non-hazardous wastes generated throughout the plant.

Other waste streams generated at the facility consist of: sweep-out ferrous dirt, landfill debris, used oil, electronic waste, batteries and lightbulbs, and non-ferrous metals. Separate waste management companies handle the disposal of these waste streams. Table 6 gives a high-level list of Nucor Seattle waste streams, the disposal company, average annual generation, and annual cost associated with it. Each year, Nucor generates approximately 23,600 tons of waste, costing $1.1 million annually. Landfill debris constitutes 48% of the tons of waste generated, indicating an opportunity for minimization to be explored annually. The second largest contributor to the waste stream is K061 dust, which is discussed in Part 2. More detailed information on historical waste disposal is included in the Nucor Materials Movements Database which is updated annually.

In addition, all new processes, process changes, or new chemicals are evaluated for waste stream generation or change as part of the Management System during the Management of Change process.

PERIODIC WASTE MINIMIZATION ASSESSMENTS

Minimization assessments of hazardous wastes are completed in Part 2 (C-G) and Part 3 of this document.

In general, each year Nucor will assess its waste generation by analyzing the Nucor Materials Movement Database and determining areas of improvement. This database logs the weight and cost of disposing of all waste streams. The benefits of such a system have already been realized. Nucor switched from Waste Management to Republic Services to dispose of its general plant waste in 2016 because of the lower overall cost. Although cost-related, these savings indicate the potential of using historical information to recognize opportunities to minimize waste in the future.

COST ALLOCATION SYSTEM

Costs associated with hazardous wastes are discussed in Part 3.

Through the use of our accounting program waste material disposal costs are captured in a subcategory that can generate waste cost reports for any time period we determine appropriate. Both cost and waste volume are periodically reviewed to determine possible target and objective development within the management system.

Along with the characterization database, the Nucor Materials Movement Database tracks the disposal of waste streams and associates the true cost to include processing fees as well as any overhead costs to Nucor such as transportation, labor, equipment, and supplies. Types, amounts, and costs are obtained from either the accounting department or the disposal facility to which the waste stream is transported.

ENCOURAGE TECHNOLOGY TRANSFER

Technology transfer is an ongoing effort promoted during each corporate-hosted environmental managers and engineers meeting. Additionally, all environmental engineers attend a monthly conference call to discussion upcoming and newly-proven technologies.

PROGRAM IMPLEMENTATION & EVALUATION

Implementation of selected hazardous waste minimization opportunities are discussed in Part 2 (H). Furthermore, the core management system processes are reviewed for implementation and effectiveness during routine system audits.

Waste minimization opportunities will be evaluated annually through the review and upkeep of the Nucor Materials Movement Database.

PART 6 – SOLID WASTE CONTROL PLAN

This Solid Waste Control Plan (SWCP) addresses all solid waste generated by the Nucor facility, except those wastes properly designated and managed under Washington State's Dangerous Waste Regulations in WAC 173-303. Nucor is committed to the safe and legal management of solid waste resulting from its industrial activities. Any proposed modifications to the SWCP will be submitted to Ecology's Water Quality permit writer at least 30 days prior to the proposed date of implementation, as required in Condition S5.C in Nucor's NPDES permit.

FACILITY DESCRIPTION

The name and address of the facility, as well as the name, phone number, and title for the facility's primary contact person, are listed in Part 1 (C) of this document. The wastewater discharge permit number is listed below, as required in Condition S5.C of the NPDES permit.

WASTEWATER DISCHARGE PERMIT NUMBER

4012-04

SOLID WASTE GENERATION

A description of each type of solid waste generated by the facility is listed in Table 7. This includes the waste name, annual generation estimation, and method of treatment/handling/disposal. Total non-hazardous solid waste generation for Nucor approximates to 33,000 tons each year, 91% of which is landfill debris. All solid waste streams are properly disposed of, as discussed in the Disposal Facilities Section and delineated in Table 7.

SOLID WASTE PERMITS

All solid waste is sent off-site for treatment, reuse, or disposal; therefore, Nucor is not required to have a list of solid waste permits issued for on-site management of solid waste.

CONTINGENCY PLANS FOR SOLID WASTE HANDLING

Nucor has many possible vendors available for alternative waste disposal in case of an incident. For the largest waste streams specifically, K061 dust can be handled by U.S. Ecology, and landfill debris can be handled by either Waste Management or Republic Services.

DISPOSAL FACILITIES

The following facilities are used to dispose of all waste streams at the Nucor Seattle mill. Table 6 denotes which waste streams are sent to each facility.

Waste Management
Columbia Ridge Landfill
18177 Cedar Springs Ln
Arlington, OR
(Landfill Debris)

Burlington Environmental LLC
1701 E Alexander Ave.
Tacoma, WA 98421-4106
(K061 PPE and debris)

Clean Harbors El Dorado LLC
309 American Circle
El Dorado, AR 71730
(Aerosols, Lab Reagents)

Horsehead/AZR Corp
900 Delaware Ave
Palmerton, PA 18071
(EAF dust)

American Zinc Recycling Corp
2701 E 114th St
Chicago, IL 60617
(EAF dust)

Clean Harbors ENV Services Inc
2247 S Hwy 71
Kimball, NE 69145
(Aerosols, Lab Packs)

***U.S. Ecology**
20400 Lemley Rd
Grand View, ID 83624
(208) 834-2275

3R Technologies
5511 1st Ave S
Seattle, WA 98108
(Electronic Recycling)

Emerald Services Inc
1825 Alexander Ave
Tacoma, WA 98421
(Spent Skysol)

ONYX Environmental Svc, LLC (aka Veolia)
9131 E. 96th Ave
Henderson, CO 80640
(3D Filter Canisters)

21st Century EMI
2095 E. Newlands Drive
Fernley, NV 89408
(Pharna Waste)

Clean Harbors Deer Park LP
2027 Battleground Road
LaPorte, TX 77571
(Lab Packs)

Clean Harbors Argonite, LLC
11600 N. Aptus Road
Grantsville, UT 84029
(3D Metals, Lab Reagents)

Clean Harbors Grassy Mountain
Grantsville, UT 84029
(K061 PPE and Debris, Oily Debris, Greasy Debris, MS Crane Air Filter Media)

Emerald Services Inc
1825 Alexander Ave
Tacoma, WA 98421
(Spent Skysol)

*This facility is listed only as a contingency plan for Horsehead Holding Corporation in case an alternate location is needed to dispose of K061 dust

APPENDIX A – TABLES

TABLE 1 – DANGEROUS WASTES GENERATED AT NUCOR SEATTLE FACILITY

Waste Name	EPA Codes	State Codes	Disposal	Pounds
Emission Dust for Primary Manufacture of Steel	K061		Metals Recovery	20,000,000
PPE and Debris Contaminated with K061 Dust	K061		Incineration	20,000
Waste Aerosol Containers	D001 D005 D006 D007 D008 D035		Incineration	3,500
Spend Skysol		WT02	Fuel Blending	3,000
3D Filter Canisters	D001 D003		Stabilization and Land Fill	600
MS Crane Air Filter Media		WT02	Stabilization and Land Fill	250
Born Basic Hand Sanitizer	D001		Fuel Blending	70
Waste Medicine	D001 D005 D007 D022 D024 D026			30
LABPACK	D001	WT02	H040, Incineration	20

TABLE 2 – SARA TITLE III HAZARDOUS SUBSTANCES IN USE AT THE NUCOR SEATTLE FACILITY

Type	Product	Usage Rate (lb/yr)	SARA Toxic Chemical Content[a]											
			Manganese 7439-96-5		Nickel 7440-02-0		Chromium 7440-47-3		Copper 7440-50-8		Aluminum Oxide 1344-28-1		Phosphoric Acid 7664-38-2	
			lbs	%[b]	lbs	%[b]	lbs	%[b]	lbs	%[b]	lbs	%[b]	lbs	%[b]
Silicon Manganese Alloy	Silicomanganese	8,517,290	5,110,374	60 %										
	Silicomanganese chips	4,370,120	2,622,072	60 %										
	HG SiMn Chips - P 35%	5,740,000	3,444,000	60 %										
Ferro-silicon Alloy	Ferro Silicon	0		3 %	3,324	0.5 %								
	Ferro Silicon 75% Cont	712,929	21,388	3 %	3,565	0.5 %								
Ferro-chrome Alloy	High Carbon Ferro Chrome	0					0	48 %						
Ferro-aluminum Alloy	Ferro Aluminum 30%	71,112	711	1 %										
	Shredded Aluminum	12,506	125	1 %										
Tundish Spray (Refractory)	Dossolite	0			0	1%								
Taphole Sand (Refractory)	EBT Sand	1,297,473			1,297	0.1 %	3,892	0.3 %						
Copper Alloy Mold (Refractory)	Copper Molds	7,400							7,030	95 %				

Tundish (Refractory)	Faskast 80										0	70 %		
Refractory Mortar	Econoram 90P												0	1 %
Refractory Mortar	LR Ram Cr-Tr												0	1 %
Totals		**20,728,830**	**11,198,670**		**8,186**		**3,892**		**7,030**		**0**		**0**	

[a] "SARA Toxic Chemicals" refers to the SARA Section 313 listing of chemical subject to release reporting.

[b]SARA Chemical Weight percent of product

TABLE 3 – EVALUATION OF K061 EAF DUST RECYCLING AND DISPOSAL ALTERNATIVES

Opportunity	Minimization Priority [a]	Adverse Quality Effects	Relative Cost	Technical Practicality	Safety Considerations	Environmental Concerns	Accept/Reject
Off-Site HTMR Recycling (Current Practice)	2	None	Lowest current cost	Currently in use	Moderate	None Identified	Retained as Current Method
Off-Site Treatment/ Stabilization and Landfill	3	None	Low to Moderate	Feasible	None	Potential long-term environmental liability	Retained as feasible alternative to off-site HTMR recycling
Pelletization and On-Site Recycling	2	None reported	High	Increased volume of chemical additives required to maintain steel quality	More chemical additives required may increase worker exposures	Possible increased air emissions	Retained for continued evaluation
Vitrification for On- or Off-Site Fill	3	None	High	Feasible, but would require off-site vitrification vendor or on-site treatment plant	Extremely high temperature process-worker safety	Increased power requirements and air emissions	Rejected because of comparatively high cost and logistical considerations
Off-Site Solvent Extraction for Zinc Recovery and Recycling	2	None	Medium to High	Complex process operation	Potential worker exposure	Chemical process could increase worker exposure	Retained for continued evaluation.
Baghouse Modifications	1	None	High	Feasible	None	Improved air quality	Rejected because of high cost.

[a] 173-307-303(2)(e)(i) ranks reduction (1), over recycling (2), over treatment (3) when considering minimization opportunities.

TABLE 4 – EVALUATION OF REFRACTORY USE ALTERNATIVES

Opportunity	Priority [a]	Adverse Quality Effects	Relative Cost	Technical Practicality	Safety Considerations	Environmental Concerns	Accept/Reject
Product Substitution: Reduced Toxic Components	1	None	Medium	Alternative identified but need to be evaluated for feasibility	Potential reduced worker exposure	None identified	Retained for continued evaluation
Product Substitution: More Durable Materials	1	None	Medium to High	Alternative products not currently identified	Less worker exposure because of longer wear	Chemical additives may be required to improve wear	Retained for continued evaluation
Equipment Redesign: Less Refractory	1	None	High	Facility impacts currently unacceptable	Less worker exposure because of longer wear	Unknown	Rejected short term. Retain for long-term considered for facility upgrades.

[a]173-307-303(2)(e)(i) ranks reduction (1), over recycling (2), over treatment (3) when considering minimization opportunities. Note: This evaluation applies to remaining toxic-based refractory materials currently in use by Nucor.

TABLE 5 – SCHEDULE OF IMPLEMENTATION

Opportunity	Schedule	Interim Plans	Measurement Milestones
Reevaluate K061 On-Site and Off-Site EAF Dust Recycling Alternatives	Complete annually to coincide with submittal of annual Dangerous Waste Report	Continue off-site recycling via HTMR	Continued target objective of 100 percent recycling of EAF dust, as technically and economically feasible. Update Table 2 annually.
Refractory Product Substitution	Research product alternatives that include fewer or no listed SARA Title III materials	Begin use of alternative refractory materials	Elimination of a toxic component in refractory via product substitution. Update Table 4 annually.

TABLE 6 –NUCOR SEATTLE WASTE STREAMS

Waste Stream	Disposal Company	Annual Quantity (lbs)	Annual Cost
Landfill Debris	Waste Management	22,000,000	$ 950,000
K061 Dust	American Zinc Recyclers	20,000,000	$ 650,000
Used Oil	Ecolube	25,000	$ 1,000
Electronic Waste	3R Technologies	2,500	$ 1,000
Batteries/Lightbulbs	3R Technologies / Clean Harbors ENV	800	$ 1,000
Plant WM Bins	Waste Management	N/A	$ 70,000
General Mill Hazardous & Non-Hazardous Waste	Clean Harbors ENV / Stericycle	200,000	$ 85,000
Non-Ferrous Metals	Seattle Iron & Metal Pacific Iron & Metal Richmond Steel Recycling	50,000	$ (60,000)
Total		**42,287,300**	$ 1,698,000

TABLE 7 – SOLID WASTES GENERATED AT NUCOR SEATTLE FACILITY

Waste Profile Name	Process	Disposal Company	Disposal Method	Annual Generation (lbs)
Oily Debris	Spill catch/clean up	Clean Harbors / Clean Earth	Landfill	40,000
Grease and Greasy Debris	Equipment maintenance	Clean Harbors / Clean Earth	Landfill	6,500
Lead Acid Batteries	Damaged lead acid batteries	All Battery	Recycle	600
Used Oil	Equipment maintenance	Ecolube	Recycle	25,000
Oil Filters, Drained and Non Crushed	Equipment maintenance	Clean Harbors / Clean Earth	Landfill	1,100
Fluorescent Bulb	Facility maintenance	Clean Harbors / Clean Earth	Landfill	500
Electronic Recycling	Electrical / IT maintenance	3R Technologies	Recycle	2,500
Landfill Debris	Solid waste from facility maintenance, i.e. sweepings, sedimentation/fugitive dust control, etc.	Waste Management	Daily cover	22,000,000

APPENDIX B – FIGURES

FIGURE 1 – VICINITY MAP

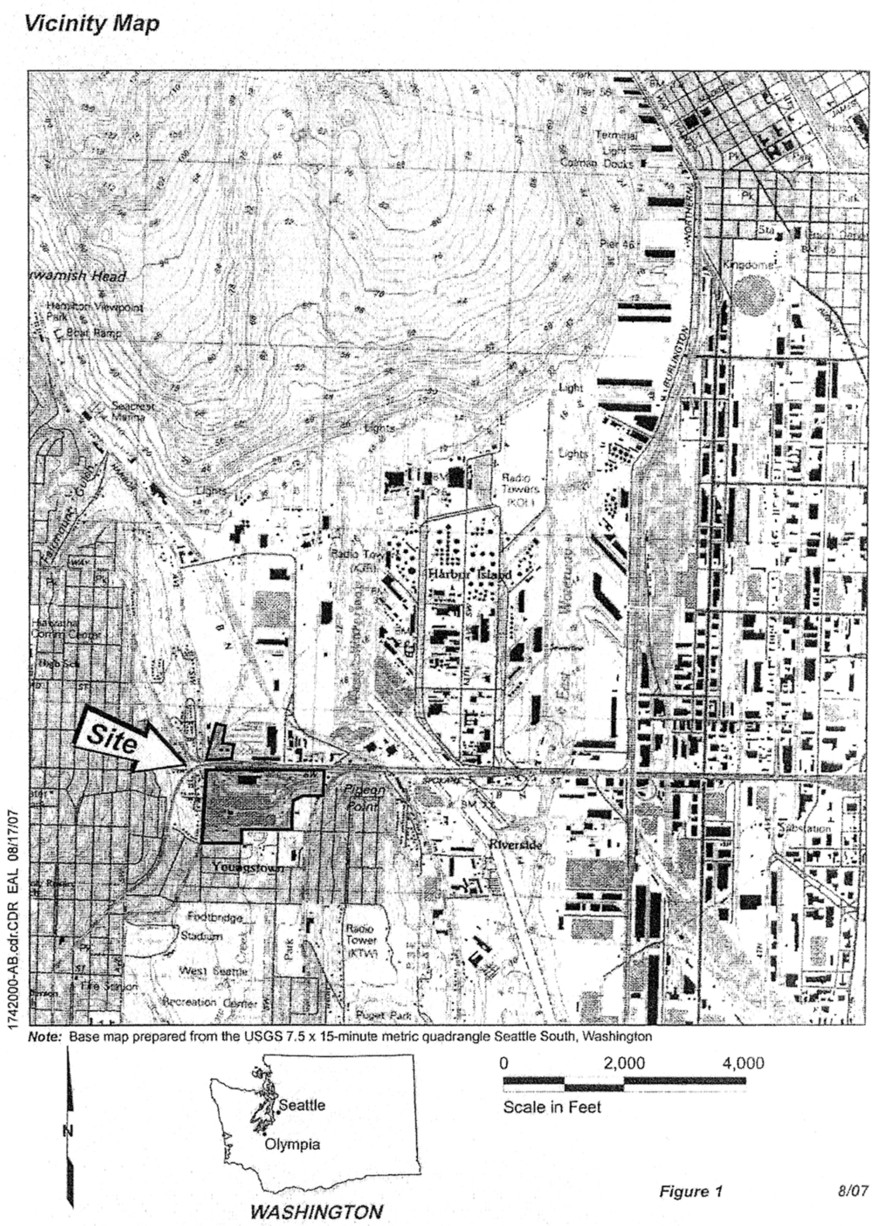


FIGURE 2 – SITE PLAN

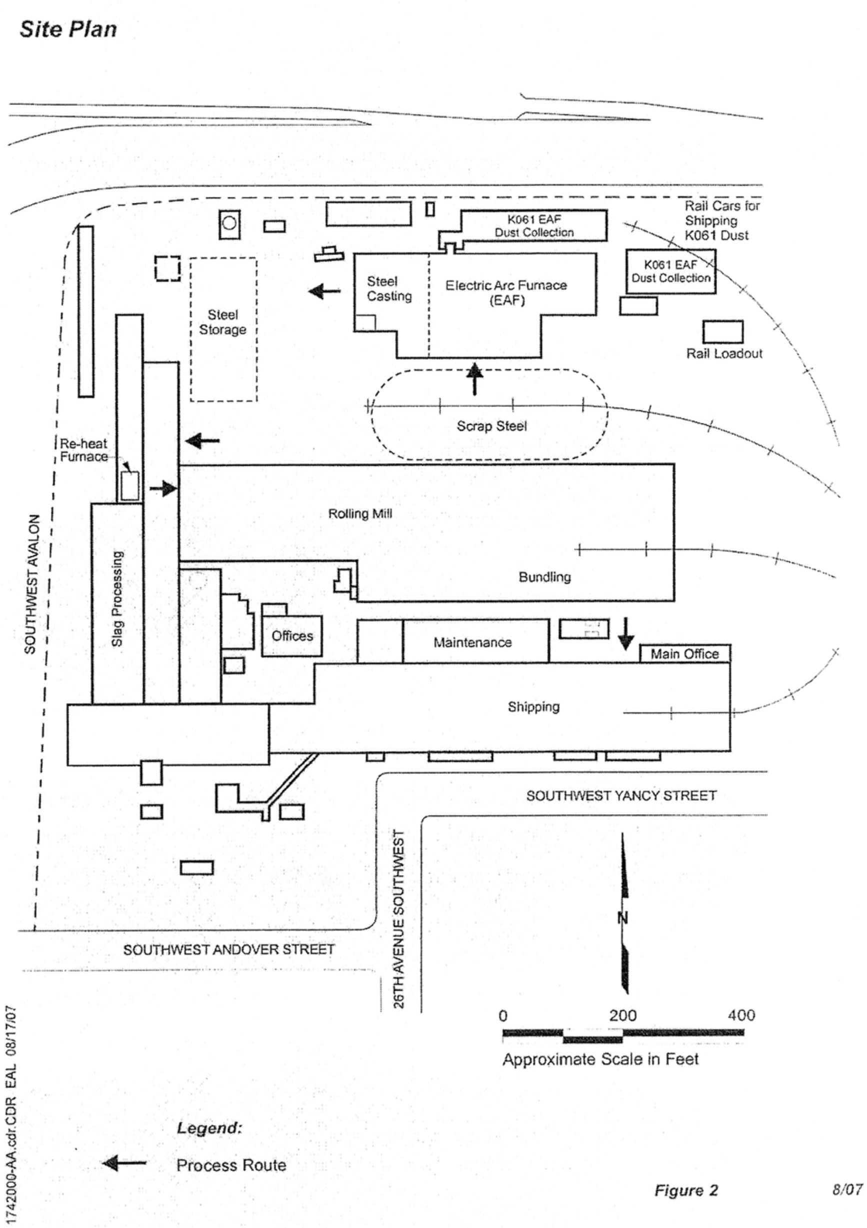
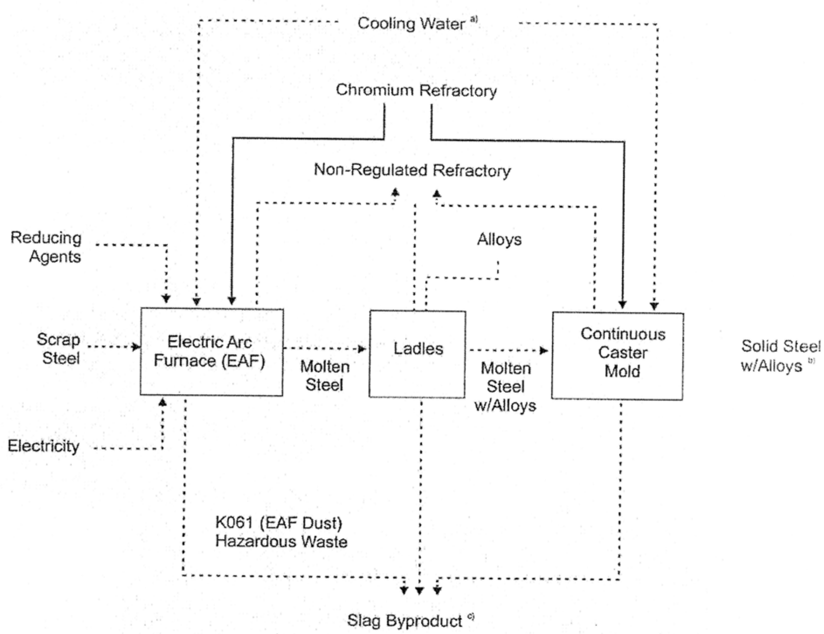


FIGURE 3 – SCHEMATIC OF MELTING AND CASTING OF SCRAP METAL

Schematic of Melting and Casting of Scrap Metal



Notes:

a) Cooling water is recirculated and reused as a means to eliminate all liquid discharges.
b) No Regulated Toxic Substances or Hazardous Wastes are used or generated in downstream processing.
c) Approximately 4% by weight of inert slag is produced per ton of steel. This slag is sold as a by-product for use in road bed construction and other fill applications.

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Figure 3 *8/07*