U.S. ARMY CORPS OF ENGINEERS
HUNTSVILLE DIVISION

TRIAL BURN PLAN

DEACTIVATION FURNACE

SENECA ARMY DEPOT
ROMULUS, NEW YORK

VOLUME I OF 2

PREPARED FOR

U.S. ARMY CORPS OF ENGINEERS
HUNTSVILLE, ALABAMA

PREPARED BY

MAIN
1893

ATTACHMENT 1

RESPONSE TO EPA REGION II COMMENTS DATED MARCH 31, 1992

SENECA ARMY DEPOT (SEAD)
EPA ID #NY0213820830
TRIAL BURN PLAN
COMMENT RESPONSES

Comment #1 §2.3.5: All practical steps must be taken to prevent the opening of the baghouse bypass. The steps should include redundant thermocouples. For example, all waste feed must be stopped and air to coolers increased before the bag house is bypassed. Please include a section describing the actions to prevent this bypass. Please be advised that any time that the baghouse is by passed or the furnace is not within the permitted operating windows while there is waste in the kiln will be considered violations of the permit.

Response #1 *All practical steps will be taken to prevent the opening of the baghouse by-pass. The only time the baghouse will be bypassed is if there is a system failure which causes a fire in the baghouse. If thermocouples indicate a temperature increase above 600°F the air flowrate will be increased to the air coolers and the waste feed to the deactivation furnace will be shut off. If for any reason the baghouse is bypassed the AWFSO System stops all waste feed. During start up the baghouse is bypassed, but only prior to the feeding of waste.*

Comment #2 Table 4-2: What munitions contain hexachlorobenzene? Unless a Class 1 POHC is included in the trial burn, no munitions containing Class 1 POHCs will be permitted in the furnace.

Response #2 *Munitions Nos. 201 and 202 contain hexachlorobenzene (HCB). HCB which is a class 1 substance will be burned as a POHC during the trial burn.*

Comment #3 §6.2.3: The most recent version of the metals train in the BIF regulations. This method is acceptable for lead.

Response #3 *The most recent version of the metals train (is) in the BIF regulations will be used. (Section 6.2.3 is now 7.2.3)*

Comment #4 Page 7-5: The AWFSO for kiln pressure should be checked at - 0.08, not positive pressure.

Response #4 *The text has been corrected accordingly. (Page 7-5 is now 8-5)*

Comment #5 Table 8-1: December and January are not great months to do stack testing. Please try to accelerate the testing or take appropriate steps to protect sampling equipment for the cold temperatures.

Response #5 *Table 8-1 has been revised and is now Table 9-1. It is expected that the Trial Burn will begin no earlier than March of 1993. If required, precautions will be taken to protect sampling equipment from inclement weather.*

Comment #6 Page F-7: This approval was given for nitroglycerin and only approved for dinitrotoluene to eliminate the need for two sampling trains. Since Seneca Army Depot will be measuring these two materials in separate tests, MM5 train should be used for dinitrotoluene.

Response #6 *Page F-7. The MM5 train will be used for dinitrotoluene (DNT).*

Comment #7 Page M-19, Response 54: It is never to late to correct mistakes.

Response #7 *Mistakes will be corrected.*

Comment #8 Page M-21, Response 60: Toluene is not mentioned on page F-3, nor is there a Section (4) in Appendix F.

Response #8 *Toluene is no longer a POHC for the trial burn. All references to toluene have been removed.*

Comment #9 Chemists review comments on QA Plans by Seneca Army Depot (Romulus) for Applicability to Seneca's Upcoming Trial Burn.

Response #9 *The QA/QC Plan for the Trial Burn was completely rewritten. All of EPA's concerns as put forward in the comments have been addressed in the new document.*

ATTACHMENT 2

RESPONSE TO DRAFT NYSDEC COMMENTS DATED FEBRUARY 3, 1991

SENECA ARMY DEPOT (SEAD)
EPA ID# NY0213820830
TRIAL BURN PLAN
COMMENT RESPONSES

1.0 INTRODUCTION

Comment #1 Page 1-1, second paragraph: the regulations and EPA and NYSDEC guidance require certain performance requirements in addition to those standards described on page 1-1. The Trial Burn (TB) must demonstrate that emissions of HCl, metals, and products of incomplete combustion (PICS) do not exceed acceptable limits. In order to demonstrate compliance with all applicable regulations and guidance, SEAD must revise the list of performance standards to include testing for HCl emissions, a complete metal analysis, and a full scale priority pollutant scan to analyze all organic and inorganic priority pollutants. Enclosure III contains a listing of metals of major concern required to be analyzed (others may be required) and Enclosure IV lists the 129 priority pollutants that are part of the EPA priority pollutant analytical scan.

Response #1 *The Trial Burn Plan has been completely rewritten to demonstrate compliance with all State and Federal ambient air quality standards and guidance. SEAD followed State (Air Guide-1) and Federal guidance (Volume IV of the incineration series entitled, "Guidance on Metals and Hydrogen Chloride Controls for Hazardous Waste Incinerator") in setting waste feed rates, so that metals and potentially hazardous organic compounds will be controlled.*

Comment #2 In addition, in light of the chlorine content in many of the waste streams, SEAD must also add dioxin/furan testing as part of the TB performance requirements. Please revise Page 1-1.

Response #2 *Dioxin and furans have been added to the list of parameters to be tested in a trial burn. Performance requirements for dioxin and furans will be met. The text has been revised to reflect this.*

Comment #3 SEAD must revise the application to provide up-to-date engineering drawings, making sure all drawings represent the furnace at SEAD. It is the responsibility of the applicant to provide all necessary details required to demonstrate compliance.

Response #3 *Engineering drawings of the deactivation furnace were provided in the Hazardous Waste Management Facilities RCRA Part B permit application. In some cases the drawings are labeled Toelle Army Depot. The Deactivation Furance located at Toelle is identical to that at Seneca Army Depot in every respect but one. The unit at SEAD is composed of the exact same components in the exact same arrangement, except that the SEAD unit is a mirror image of that located at Toelle. This has no bearing on the system's performance or the ability to of an operator to tell where a valve, controller, etc. is. In all cases the most accurate up to date drawings and figures have been presented.*

Drawings not previously available for the cyclone and the baghouse have been included in the Trial Burn Plan (see map pockets 1 and 2).

2.0 ENGINEERING DESCRIPTION

2.2 Description of Major Components

Comment #4 Throughout the application, SEAD has maintained that fugitive emissions will be controlled by keeping the kiln pressure below atmospheric. This does not appear to be the case. The model 1236 APE Rotary Kiln Incinerator is commonly referred to as a "popping furnace" namely because of the popping sound that occurs periodically due to sudden explosions of munitions within the kiln. This in turn causes a sudden increase in pressure inside the kiln above atmospheric pressure. Fugitive emissions from the combustion zone must be controlled by keeping the combustion zone totally sealed against fugitive emissions (which is virtually impossible), maintaining a combustion zone pressure lower than that of atmospheric, or by some equivalent alternate means of control. If SEAD still maintains that fugitive emissions will be controlled through negative pressure, describe how, where, and with what instrument that this pressure will be measured. This pressure should be measured at the worst case location (i.e. the location of highest pressure). This may require measurement at several locations. Operation of the kiln above-0.08 in. wc (below atmosphere) with munitions in the combustion chamber will not be permitted. In addition, please provide information on how the shroud will work to prevent fugitive emissions from the discharge end of the conveyor (i.e., shrouding). This area must be enclosed with the exhaust emissions from the enclosure entering an appropriate air pollution control unit prior to discharge to the environment.

Response #4

The kiln pressure is controlled by a pressure control loop (P-1201) as shown on SK 88-07 and described in the text.

The rotating kiln is enclosed by a sealed shroud which is kept at negative pressure. The kiln is also maintained under negative pressure in most circumstances. It is likely that when munitions explode in the kiln, positive pressure is created and fugitive emissions may be generated. If fugitive emissions were released from flanged sections of the kiln they would be captured by the surrounding shroud. There is also a shroud above the feed conveyor.

SEAD proposes to test for fugitive particulate emissions during the trial burn. If they are found to be a problem then operational or physical changes will be implemented and described in the deactivation furnace permit application.

Comment #5

The last paragraph regarding the Automatic Waste Feed Monitoring System (AWFMS) must reference the map from the application labelled SK89-09-01. Figure 2.2 does not provide the necessary details. In addition, map SK89-09-01 references several other maps corresponding to the same series (i.e., SK89-09-02, SK89-09-03, etc...). None of these maps were found. Please include them with the revised application.

Response #5 *The paragraph has been revised to reference SK89-09-01. SK89-09-01 through 20 were included in the 6 NYCRR Part 373 Permit Application.*

Comment #6 Annex A consists of a series of maps showing engineering drawing details pertaining to the APE 1236 Rotary Kiln Incinerator. The maps are reduced copies of the original engineering drawing provided and are, for the most part, no longer readable. In addition, some represent the deactivation furnace at Toele Army Depot (TEAD). Please omit Annex A from the TBP and present all engineering details by referencing the original maps provided with the application. Be sure to revise this throughout the entire TBP.

Response #6 *Annex A was deleted. Most appropriate drawings that relate to the trial burn were included in the 6 NYCRR Part 373 Permit Application. Additional drawings are included in this submittal.*

Comment #7 The full size engineering drawing ACT-377-200 as for the burner and blower assembly was not provided with the application. The reduced drawing in Annex A is unclear. Please provide the full size drawing with the revised application.

Response #7 *A full size drawing were provided as part of the NYCRR Part 373 permit application.*

Comment #8 The minimum kiln temperature is stated to be 300 degrees Fahrenheit on page 2-6 of the Trial Burn Plan. Several munitions listed in Table 3-1 give the minimum kiln temperature to be 250 degrees Fahrenheit. Please revise where appropriate.

Response #8 *Table 3-1 (now Table 4-1) has been revised and no longer contains minimum kiln temperature data. Kiln operational data is now included in Appendix N. The reference to temperature on page 2-6 (now page 2-8) has been changed to 250^{o}F.*

Comment #9 Page 2-7; The information provided on the kiln speed versus the kiln residence time is based upon testing conducted at TEAD. Are the dimensions of the rotary kiln at SEAD exactly the same as the rotary kiln at Toele? Please revise this information to omit reference to TEAD and making any necessary changes to the table provided to correspond to the rotary kiln incinerator at SEAD.

Response #9 *TEAD's deactivation furnace is identical to SEAD's. The reference has been revised to note this similarity.*

Comment #10 Details of the afterburner are shown on the Southern Technologies drawing 11268-10-3, not 11268-10-1. Please revise.

Response #10 *Details of the afterburner are shown on 11268-10-1 not 11268-10-3. 10-3 shows elevations not details. Both drawings were included in the 6 NYCRR Part 373 Permit Application.*

Comment #11 Describe in the text of this section the purpose of the FSG panel. What do the letters "FSG" stand for?

Response #11 *FSG stands for Flame Safeguard Panel. A description of the function of the FSG is now included in the text (see page 2-11).*

Comment #12 Please indicate how and where the high temperature and low temperature gas cooler exit temperatures will be measured.

Response #12 *High and low temperature gas cooler temperature will be measured at the control panel. The thermocouples and control loops are described in Section 2. The locations of the thermocouples are shown in drawing SK89-02-02, which is located in Map Pocket 5 of Appendix O.*

Comment #13 Please provide the engineering drawing showing the design details of the cyclone.

Response #13 *The engineering drawing showing the design details of the cyclone are shown in drawing No. BC86-510-1, which is located in map pocket 1 of Appendix O.*

Comment #14 Please provide the engineering drawing showing the design details of the baghouse.

Response #14 *The engineering drawing showing the design details of the baghouse are shown in drawing No. N741382, which is located in map pocket 2 of Appendix O.*

Comment #15 Describe at what differential pressure the jet-pulse cleaning system in the baghouse would begin to operate.

Response #15 *The jet pulse cleaning system operates with variable timer and duration controls and is not based on differential pressure (dp). Differential pressure, however is monitored and alarmed. Baghouse dp is maintained between 2" and 6" of water. Less than 2" would indicate a broken bag condition while greater than 6" indicates excessive fouling. This is described in Section 2.1.7.*

Comment #16 Describe at what temperature at the baghouse exit would the control panel alarm sound.

Response #16 *The baghouse high temperature alarm is set for 600°F, a fire condition. The temperature of the baghouse is controlled by the low temperature gas cooler, which maintains a gas exit temperature of 350°F. This results in a Baghouse temperature of approximately 300°F. If the gas temperature leaving the low temperature heat exchanger exceeds 350°F the alarm will sound.*

Comment #17 Page 2-14; top of page: "...waste feed can not be fed if baghouse is bypassed? How is this compatible with the "c" which says baghouse will be bypassed during start-up? Is non-hazardous fuel fed during start-up? Please address.

Response #17 *Section 2.4 describes start-up procedures. The baghouse is only bypassed prior to waste feed. During startup, No. 2 fuel oil is used until the deactivation furnace reaches its operations temperature, at* *that point the baghouse is brought on-line, and then and only then, is waste feed to the furnace.*

2.3 Instrumentation

Comment #18

The continuous emissions monitoring system (CEMS) must be installed and operational prior to conducting the trial burn. Verification of operational status should include completion of the manufacturer's written requirements and recommendations for installation, operation, and calibration of the device. In addition, include as part of the Trial Burn Plan the protocol for the 168 hour Performance Specification Test (PST) for the CO and O_2 monitors. The PST requires relative accuracy (RA) tests, calibration error (EC) tests, calibration drift (CD) tests, and response time (RT) tests to be conducted to determine conformance of the CEMs with the specification. These procedures are outlined in Appendices B and F respectively of 40 CFR 60. Please indicate on the test schedule when these performance tests are planned. A protocol for the PST must be submitted as a component of the TBP at least 60 days before the scheduled date of monitor performance testing. The CEMS must meet all the requirements stated in the Methods Manual for Compliance with the BIF Regulations, EPA/530-SW-91-010 (NTIS No. PB-91-120-006) dated December 1990. Be sure to list these activities on the Trial Burn schedule in Table 8.1. Keep in mind the tests are to be complete 2 weeks prior to the trial burn with a written result of the results prepared and submitted to the persons listed below for written approval prior to the trial burn.

Mrs. Ann Zowner
USEPA
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Ms. Denise Gurtler
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Albany, New York 12233-7275

Mr. Robert Kerr
NYSDEC
Division of Air Resources
50 Wolf Road
Albany, New York 12233-3257

Response #18 *The PST is included in Appendix I.*

Comment #19 Include a QA/QC Plan for the operation of the continuous emission monitors during the trial burn period. It is the responsibility of the owner/operator to assure proper calibration, maintenance, and operation of the CEM on a continual basis. Include guidelines on daily calibration of monitors, in addition to guidelines on the daily inspection of calibration data, the recording system, the central panel warning lights, and sample transport/interface systems (e.g., flowmeters, filters, etc...), as appropriate.

Response #19 *A complete QA/QC Plan is included in Appendix G.*

Comment #20 Page 2-16: The CO monitor must have dual ranges, 0-500 ppm and 0-3000 ppm. This will ensure that spikes up to 3000 ppm are included in the rolling average. Please include the range information in the TBP.

Response #20 *The CO monitor is a dual range device with a 0-200 ppm and a 0-3000 ppm range. The text has been revised accordingly (see page 2-17).*

Comment #21 Page 2-17, Paragraph 2; Reference engineering drawing SK88-07 in the description of the process controllers.

Response #21 *The reference has been included (see paragraph 3 of page 2-18).*

Comment #22 For clarity, the subsection regarding the AWFMS should be labelled 2.3.3 instead of 2.3.2. Please correct.

Response #22 *The text has been revised accordingly. The section is now 2.2.3.*

Comment #23 Page 2-20, Table 2.1: The maximum kiln pressure must be changed to -0.08 in. wc (below atmospheric).

Response #23 *The table has been revised accordingly.*

Comment #24 Page 2-20, Table 2.1, Note 1: The maximum value for the rolling average of CO corrected for O_2 on a dry basis will not necessarily be 100 ppm. The limit set in the permit will be based upon the result of the TB. Please revise Table 2.1 noting that the maximum value for CO regarding Automatic Waste Feed Shut Off (AWFSO) will be a permit limit. In addition, revise Note 1 to read "Waste is shut-off when the rolling average value of corrected CO is above the limit set in the permit. The waste feed can only be restarted when the rolling average drops below the permit level value."

Response #24 *The table has been revised accordingly.*

Comment #25 Page 2-21, Table 2.2: The status of the Baghouse Bypass must be recorded.

Response #25 *The baghouse status (on-line versus standby) is recorded in the internal memory of computer control system. This information is not normally printed but can be easily retrieved if required.*

2.4 Operating Procedures

Comment #26 Page 2-23, Section 2.4.3: A separate section must be included for the emergency AWFSO procedures. This section seems to imply that the procedures listed here happen simultaneously if the AWFSO systems trips the waste feed. This should not be the case as, at a minimum, kiln and afterburner temperature must be maintained until all waste is out of the kiln. When waste feed is to be restarted, it must always be restarted by the operator, not automatically. In another separate section, those events that will cause the opening of the baghouse bypass must be discussed.

Response #26 *Section 2.3.3 has been revised to clarify shutdown procedures. A new separate section which discusses baghouse bypass scenarios is included in the TBP (see section 2.3.5).*

Comment #27 Please provide details on the inspection of the scrap metal and residue from the demilitarization operation used to determine whether or not reprocessing is required. Discuss the conditions under which reprocessing will occur. SEAD should evaluate and report on the "effectiveness" of the process for the TB and may need to consider changes in operating procedures such as an increase in combustion chamber temperature or greater residence time.

Response #27 *For the purpose of the trial burn, scrap metal, residue, ash from the baghouse, ash from the gas coolers and all other waste solids will be treated as a hazardous waste. Please see Section C of the RCRA Part B Subpart X report for additional information. Feedrates will be adjusted to maximize "effectiveness."*

3.0 WASTE CHARACTERIZATION

Comment #28 Please reference Table 3.4, Appendix B of the Storage/Incinerator portion of the application in this section.

Munitions that are not characterized can not be incinerated. This includes munitions for which the composition, ash content, chlorine content, metal content, and feedrate has not yet been determined. It would be in SEAD's best interest to determine this information prior to the TB in order for appropriate limits to be established. On the other hand, SEAD could design the TB to have a broad enough scope to handle a variety of waste munition streams. Keep this information in mind when considering the affect of any future waste streams. In addition, it may also be necessary to revise the feed rates (i.e. how many of each will be burned per unit time) established in Table 3.4, Appendix B of the Storage/Incinerator portion of the application.

Response #28 *SEAD will not burn any waste which is not characterized. Tables 3-1, 3-2, and 3-3 have been revised to remove uncharacterized wastes.*

These tables have been combined and are now represented by Table 4-5. Table 3.4, Appendix B of the Storage/Incinerator portion of the application will be updated after the trial burn establishes allowable feedrates.

Comment #29

Table 3-1; The chlorine content per pound of munition M66A2 is incorrect. Please correct table.

Response #29

The table has been revised accordingly. As described previously Table 3-1 is now Table 4-5.

Comment #30

Table 3-1; The Department has the authority to establish permit requirements necessary to protect human health and the environment. This includes controls on metal emissions and HCl not to exceed health-based levels consistent with EPA "Guidance on Metals and HCl Controls for Hazardous Waste Incinerators", August 1989. SEAD must provide the Department with metal feed rate data (e.g., lb metal/lb munition feed) in order to demonstrate compliance with all NYS hazardous waste and air regulations, State Air Guide-1 (proposed 1991 edition), as well as all applicable state and EPA guidance. Please revise Table C-1 to reflect this change. Keep in mind that determination of compliance with both the metal and HCl standards considers such factors as stack height and other release specifications, as well as the effect of variability in meteorology and terrain (updated USGS map required). Include this information in the appropriate sections of the TBP.

Response #30

It should be noted that the trial burn plan has been completely rewritten. The trial burn plan now reflects the guidance of EPA's Volume IV of the incineration guidance series and NYSDEC's Air Guide-1. Seneca Army Depot performed site specific air modeling and reduced waste feed rates to meet the most stringent State and Federal standards and guidance. SEAD also performed Tier I/II and Tier III analysis. Please see sections 3,4,5, and 6 of the report as well as Appendices J and M. A topographic site map locating the deactivation furnace is located in map pocket 3 of Appendix O. The four 7.5 minute USGS topo maps which depict the area in the vicinity of the *furnace are located in map pocket 4 of Appendix O. Metal feed rates are included in Appendix C-1 and have been summarized in Table 4-5.*

Comment #31 Table C-1 in Annex C of the TBP contains a listing of the composition of the various munitions incinerated as SEAD. The data (i.e., munition name, numbers of munition, etc..) presented do not correspond to the data presented in Tables A-1, A-2, and A-3 of Appendix A of the incinerator/storage portion of the application. Please explain and revise accordingly.

Response #31 *Appendix A of the incinerator/storage portion of the application and Appendix C of the trial burn will be revised to correlate. Annex C is now Appendix C.*

Comment #32 Table 3-4 lists munitions components that SEAD has proposed to occasionally burn. SEAD must provide information on feed rates, ash, chlorine, and metal content for those materials that were not included in Annex C. SEAD must also revise the list to eliminate the use of trade names.

Response #32 *Table 3-4 has been deleted. No uncharacterized munitions will be destroyed in the deactivation furnace.*

Comment #33 It appears several of the waste streams would be potential producers of high metals, ash, and/or chlorine emissions, and these cases are not necessarily covered by the proposed trial burn. Lead compounds and other metals pose problems, as well as chlorine compounds, such as hexachlorobenzene, polyvinylchloride, chlorates and perchlorates. In addition, sulfur and nitrogen present in the waste pose problems. How will the sulfur dioxide emissions be managed in the case of aluminum or antimony trisulfide, for example, and for sulfur? How will nitrogen dioxide emissions be managed in light of significant amounts of nitrated compounds in the waste? These cases are not adequately covered in the trial burn plan. Please revise.

Response #33 *As stated previously, the trial burn has been completely rewritten to address State and Federal requirements. Since the deactivation* *furnace has no APC equipment capable of removing SO_x or NO_x, waste feed rates have been reduced to limit emissions to that which is allowable (see Section 4.0). Waste feed rates to the incinerator have been reduced in all cases to meet ambient air quality requirements. NO_x emissions will be measured during each of the test conducted as part of the trial burn.*

4.0 TRIAL BURN WASTE SELECTION

Page 4-1, Section 4.1 should reflect the concerns described in comments 1.0 and 3.0, comments 4 and 7 regarding HCl and metal emissions.

4.2 POHC and Waste Feed Item Selection

Comment #34 SEAD has selected two Principle Organic Hazardous Constituents (POHCs) to be measured during the Trial Burn in the determination of the Destruction and Removal Efficiency (DRE) based solely upon heats of combustion. The two compounds [nitroglycerine (NG) and dinitrotoluene (DNT)] have lower heats of combustion compared to the other available candidates, but relatively high heats of combustion in terms of the Appendix 23 constituents listed in Part 373-1. Based upon experimental data conducted at the University of Dayton Research Institute (UDRI) regarding the development of an appropriate ranking system the selection of just NG and DNT as the most difficult to incinerate based solely on heats of combustion may not be appropriate. The selection of the POHC's should encompass both heat of combustion and low oxygen thermal stability hierarchies. Therefore, SEAD should select a POHC from the thermal stability at low oxygen ($TSLoO_2$) index presented in EPA "Guidance on Setting Permit Conditions and Reporting Trial Burn Results", January 1989. One of the compounds found in the munitions, hexachlorobenzene, is rated as one of the compounds most difficult to destroy, Class 1. If Seneca Army Depot desires to treat wastes in this class, or any class, then SEAD must demonstrate during the trial burn the incinerator's ability to destroy a constituent contained in that particular class or higher.

Response #34 *SEAD utilized both the low heat of combustion method and the Dayton method in selecting POHCs for the trial burn.*

Comment #35 Metals emissions must be determined. During the trial burn, the kiln and afterburner must be operated in separate runs at both their minimum and maximum temperatures. A minimum to be established for the organics and a maximum to be established for metals. In addition, the waste feed must contain the maximum amounts of POHCs, metals and maximum organo-metallics.

Response #35 *The trial burn protocol has been revised so that metals are included. The deactivation furnace will be tested under worst case conditions (i.e. max temperature for metals and low temperature for organics).*

Comment #36 Will any of the munitions contain radioactive materials?

Response #36 *No munition that will be treated in the deactivation furnace are radioactive.*

Comments #37 Page 4-2: Current EPA guidance concerning metals emissions requires special monitoring of organo-metallic compounds. Organo-metallics will need to be addressed in the trial burn.

Response #37 *Trial burn No. 7 (see Table 6-1 of the TBP) tests the ability of the deactivation furnace's APC equipment to remove lead from the exit gas stream. A significant portion of the lead in the waste feed is present as lead styphnate. By monitoring lead emission SEAD will verify the removal of lead in all of its forms.*

4.3 Particulate Feed Item Selection

Comments #38 The particulate size distribution of the metals involved should be determined in order to estimate the performance of the cyclone and the Nomex filter media in the air pollution control equipment. The presence of gaseous metallic compounds and their control should also be discussed.

Response #38 *SEAD has used conservative methods to estimate particulate removal by the cyclone and the baghouse, taking values primarily from Volume IV of the Incineration Guidance series, and from data provided by other facilities which operate deactivation furnaces. Because the furnace operates at relatively low temperatures gaseous metals will not be a problem. Section 5 discusses the vapor pressure of metals under various conditions. In order to verify that gaseous metals are not a problem, metallic wastes will be burned under worst case conditions (relatively high temperature in the presence of large amounts of chlorine).*

4.4 HCL Considerations

Comment #39 See 3.0, Comment 3. In addition, munitions M26 and M81 contain potential chlorine feed rates close to the 4 lb/hr limit. The slightest error in feeding these wishes could put the facility out of compliance.

Response #39 *The feed rates of all munitions will be reduced so that the nominal chlorine feed rate does not exceed 3 lb/hr.*

5.0 TRIAL BURN PROTOCOL

Comment #40 Section 2.2.7 states that the baghouse has a mechanism to periodically clean the bags using a jet-pulse cleaning system. If this is going to occur while burning hazardous waste, SEAD must include this as a separate test run during the TB. Explain how the baghouse will perform its duty during this process. Will it function properly? If not, hazardous waste can not be fed.

Response #40 *In order to demonstrate that the normal in line baghouse cleaning cycle does not result in an exceedance of particulate emissions, the trial burn will be conducted so that a timed baghouse cleaning occurs during the test. The text has been altered to reflect this (see Section 5.3).*

Comment #41 Page 5-1: Please discuss why tests 2 and 3 cannot be combined into one test.

Response #41

The trial burn protocol has been revised in its entirety. Where ever possible tests have been combined.

Comment #42

SEAD has proposed to run the three separate trials using three types of munitions at different temperatures. Using this approach will make it difficult to categorize each type of munition to be burned into each specific set of operating conditions. SEAD must explain how this will be done. Is it necessary to run at three different temperatures? Can certain munitions not be run at the higher temperatures? Will the lower temperatures be high enough? A minimum temperature limit must be established for the organics and a maximum for the metals. In addition, what impact will munitions in larger casings have? Please explain.

Response #42

The trial burn protocol has been revised in its entirety. In the revised Sections 5 and 6, the items mentioned above have been discussed in greater detail than was presented in the previous submittal.

Comment #43

Page 5-2, Table 5.2: Please discuss the waste feed rate in greater detail, including the size of individual units to be introduced, and the frequency.

Response #43

The trial burn protocol has been revised in its entirety. In the revised Sections 5 and 6 the items mentioned above have been discussed in greater detail than was presented in the previous submittal.

Comment #44

Table 5-2; The feed rates of each munition to be burned during the trial burn was not included in the operations summary table. Please revise the table to include a listing of each munition and their potential feed rates.

Response #44

The revised table includes the feed rate of all the munitions selected (see Table 6-2).

Comment #45

Annex D - Calculations. Explain why the DNT component feed rate is 19.2 lbs DNT/hr per 240 lbs of munition M1 in Annex D and 28.8 lbs DNT/hr per 240 lbs of munition M1 in Table 3-1. Please revise where appropriate.

Response #45 *This calculation has been revised.*

Comment #46 Table 5-2; Please state in the "Trial Burn Operations Summary" that for each test case to be performed, three runs will be held.

Response #46 *The revised table includes three runs for each test performed.*

6.0 SAMPLING AND ANALYSIS PLAN

6.1 Overview

Comment #47 Page 6-2, Table 6.1: Testing for chlorine, HCl, metals, PICs and possibly dioxins/furans in emissions and discharges using worst case waste feeds must be added as explained in comments 1.0, 3.0 comments 3 and 6, and 4.2 comment 2. It should also be made clear that samples from different runs are not composited.

Response #47 *Metals, PIC's, and dioxins/furans will be addressed in the trial burn. Testing for chlorine and HCl is not required since the feed rates are less than 3 lb/hr.*

Comment #48 *Page 6-2: NO_x must be measured for all tests.*

Response #48 *NO_x will be measured for all tests.*

Comment #49 In the TBP, SEAD must provide sampling locations and transverse points to be approved prior to testing.

Response #49 *Sampling locations are be shown in the sampling and analysis plan.*

6.2 Sampling Procedures

Comment #50 Page 6-3: The normal procedure for semivolatile POHC sampling (SW-846, 3rd edition, page 0010-11) requires a minimum 105.9 dscf (3 dscm) for DRE determination. Sample volume calculations are given in

Annex D for collection of only 30 dscf (0.85 dscm). Please submit performance data that shows how the actual detection limits (0.025 ug) were determined in past tests. Include all the details of the data and calculations and all performance audit results. Were the determinations done on each of the five individual sections? How was the spiking done? Please include all the details needed for recalculating the results.

Response #50 *A sample volume of only 30 dscf is required due to the high mass of materials when measuring DNT and NG. The calculations in Appendix D in fact show that this sample volume is adequate.*

Comment #51 SEAD has proposed waste feed sampling for the M1 and M7 propellants. Please describe what laboratory tests will be performed on these waste streams and what type of lab is capable of handling these types of materials. The Army has emphasized the high degree of quality control maintained in manufacturing munitions and the dangers of analysis related to the waste. Describe how the analysis of these propellants is different from other munitions.

Response #51 *Neither M1 or M7 have been selected for the trial burn.*

6.3 Sample Recoveries and Analytical Procedures

The Sampling and Analysis Plan has been completely rewritten and addresses comments 52 through 66.

6.4 Quality Assurance

The QA/QC Plan has been completely rewritten and addresses comments 67 through 75.

6.5 Process Monitoring

Comment #76 If the expected CO level in the stack gas exceeds the 100 ppm rolling hourly average corrected to 7% O_2 and dry, total hydrocarbons (THC) measurement will be required to evaluate the risks from products of incomplete combustion (PICs). To avoid having to perform a repeat of the Trial Burn, SEAD should provide for THC measurements during the proposed burn. Please include details on this parameter in the TBP. Include monitoring methods and frequencies, in addition to the procedures to be followed to ensure no unacceptable risk from PICs.

Response #76 *The trial burn plan has been modified to measure PICs for all tests.*

7.0 AUTOMATIC WASTE FEED SHUT OFF PROCEDURES

Comment #77 Page 7-1: Change "periodically tested" to "tested weekly".

Response #77 *The text has been revised accordingly. Page 7-1 is now page 8-1.*

Comment #78 Page 7-2: The stack gas carbon monoxide AWFSO check is not adequate. It must include the rolling average and must not reset until the rolling average is below 100 ppm.

Response #78 *The text has been revised accordingly.*

8.0 TRIAL BURN TEST SCHEDULE

Comment #79 Tentative dates for the Trial Burn should be listed in this section, and if subject to change, should be revised accordingly.

Response #79 *A general schedule for the trial burn is included in Figure 9-1. A daily schedule is included in the Sampling and Analysis Plan.*

Comment #80 Page 8-1, Table 8.1: The schedule may not be allowing enough time to performance test the field laboratory once set up. Please revise accordingly.

Response #80 *The schedule has been revised. Table 8-1 is now Table 9-1.*

Comment #81 Page 8-1: Please provide a schedule showing the necessity for 3 days for each test condition.

Response #81 *Three days have been allotted for each test condition.*

Comment #82 Also, holding samples until day 15 before submitting for analysis requires justification. The trial burn plan must contain a summary of sample handling, preservation and holding times for each parameter of analysis. It must comply, at a minimum, with Sections 2.1.7 and Chapter 3 of the above reference.

Response #82 *Sampling and analytical procedures will conform to requirements.*

MISCELLANEOUS

Comment #83 The demilitarization furnace at Seneca Army Depot (SEAD) must be operated by expert personnel who are trained and knowledgeable in the burning of hazardous waste. Supervision during the operation of the unit must be by technically qualified individuals. SEAD must submit as part of the Part 373 Permit Application, an outline of the training program to familiarize facility personnel with the recent design and operational changes to the Ammunition Peculiar Equipment (APE) 1236 Deactivation Furnace. In addition, SEAD must include a listing of all personnel working in this hazardous waste management area and their qualifications.

Response #83 *This information was provided in the Part 373 Permit Application.*

TRIAL BURN PLAN
FOR THE
SENECA ARMY DEPOT

CONTENTS

CONTENTS
(Cont.)

CONTENTS
(Cont.)

LIST OF APPENDICES

LIST OF TABLES

LIST OF FIGURES

ACRONYMS AND ABBREVIATIONS

acfm	Actual cubic feet per minute
ACGIH	American Conference of Governmental Industrial Hygenists
AG-1	Air Guide - 1
AGC	Annual Guideline Concentration
APC	Air Pollution Control
APE	Ammunition Peculiar Equipment
ASTM	American Society of Testing Materials
AWFMS	Automatic Waste Feed Monitoring System
AWFSO	Automatic Waste Feed Shut-off
BIF	Boiler and Industrial Furnace
Btu	British thermal unit
CD	Calibration Drift
CCRIS	Chemical Carciongenesis Research Information Service
CD	Calibration Drift
CEM	Continuous Emmissions Monitoring
cfm	Cubic Feet Minute
CFR	Code of Federal Regulations
CO	Carbon Monoxide
DART	Developmental and Reproductive Toxicology Bibliographical Database
DAS	Data Aquisition System
DBP	Di Butylphthalate
DF	Deactivation Furnace
DNT	Dinitrotoluene
DPA	Diphenylamine
DRE	Destruction and Removal Efficiency
dscf	dry standard cubic foot
DP	Differential Pressure
EC	Calibrator Error
EPA	Environmental Protection Agency
ES	Engineering-Science
FM	Factory Mutual
FSG	Flame Safeguard Panel
GFC	Gas Filter Correlation
HCB	Hexachlorobenezene
hp	horsepower
HPLC	High Performance Liquid Chromatograpy
hr	hour

ACRONYMS AND ABBREVIATIONS
(Con't)

HSDB	Hazardous Substance Data Base
HT	High Temperature
ID	Induced Draft
IR	Infrared
IRIS	Integrated Risk Information Service
ISC	Industrial Source Complex
i/o	Input/output
LDL	Lower Detectable Limit
LD_{50}	Lethal Dose - 50
LT	Low Temperature
MEI	Most Exposed Individual
NG	Nitroglycerin
NDIR	Non Dispersive Infrared
NIOSH	National Institute of Occupational Safety and Health
PAI	Predicted Annual Impact
PCDD	Dioxins
PCDF	Furans
PCOS	Personal Computer Operatives Station
PEP	Propellant/explosive/pyrotechnic
PIC	Product of Incomplete Combustion
PLC	Programmable Logic Controller
POHC	Principal Organic Hazardous Constituent
ppm	Parts per million
PSM	Point Source Method
PST	Performance Specification Test
PV	Process Variable
PVC	Polyvinyl chloride
QAC	Quality Assurance Coordinator
QA/QC	Quality Assurance/Quality Control
RA	Relative Accuracy
RAC	Reference Air Concentrators
RCRA	Resource Conservation and Recovery Act
REC	Recommended Exposure Limit
RFD	Reference Dose
RPM	Revolutions Per Minute

ACRONYMS AND ABBREVIATIONS
(Con't)

RSD	Risk Specific Doses
RT	Response Time
RTECS	Registry of Toxic Effects of Chemical Substances
scfm	Standard cubic feet per minute
SEAD	Seneca Army Depot
SGC	Short Term Guideline Concentration
SOP	Standing Operating Procedures
SP	Set Point
STEM	Sampling Train For Energetic Materials
TB	Trial Burn
TBP	Trial Burn Plan
TCE	Trichloro Ethylene
THC	Total Hydrocarbons
TLV	Threshold Limit Value
$TSLoO_2$	Thermal Stability Low Oxygen
TSI	Thremal Stability Index
TWA	Time Weighted Average
UDRI	University of Dayton Research Institute
UHP	Ultra High Purity
USATHAMA	
USGS	United States Geographic Service

SECTION 1

INTRODUCTION

A US Army Ammunition Peculiar Equipment (APE) 1236 incineration system, located at Seneca Army Depot (SEAD) will serve the purpose of deactivating obsolete munitions and explosive waste from an Army wide inventory. The obsolete munitions are made harmless through controlled detonation within a heated rotary kiln. Gasses produced during detonation are swept from the rotary kiln and incinerated in an afterburner. Metal components are recovered from the rotary kiln and sold as scrap.

This trial burn plan describes the tests that will be conducted to demonstrate the performance of the APE 1236 incineration system, in accordance with the requirements of 40 CFR 270.62. It also will show that the operation of the APE 1236 systems conforms to RCRA regulations for the incineration of hazardous waste. The following performance requirements will be demonstrated during the trial burn:

- The incinerator will achieve a Destruction and Removal Efficiency (DRE) of 99.99% for each Principle Organic Hazardous Constituent (POHC) selected for the demonstration.

- The incinerator will not emit particulate matter in excess of 0.08 grains per dry standard cubic foot (dscf), corrected to 7% oxygen in the stack gas.

- The incinerator will achieve a 99% removal of hydrochloric acid (HCl) or will not emit more than 4 lb/hr HCl, whichever is greater.

- The carbon monoxide concentration in the stack gas (corrected to 7% oxygen) will be less than 100 ppmv, based on a 1 hour rolling average.

- The incinerator operation will not result in excessive fugitive emissions.

- The incinerator's Automatic Waste Feed Shutoff (AWFSO) system will be fully functional.

In addition to those requirements delineated in 40 CFR 270.62, to insure the public health and welfare, and to comply with Federal and State regulations and the guidance of the EPA and NYSDEC, the following additional performance requirements will be demonstrated during the trial burn:

- Metal Emissions emission standards in accordance with 40 CFR Subpart H, with Volume IV of the hazardous waste incinerator guidance series entitled "Guidance on Metals and Hydrogen Chloride Controls for Hazardous Waste Incinerators" Dated August 1989, and with New York State's Air Guide-1. Specifically it will be demonstrated through emissions monitoring, emissions modeling and a risk assessment if necessary that the exposure to all carcinogenic metals of concern be limited such that the sum of the excess risks attributable to ambient concentrations of these metals not exceed an additional lifetime individual risk to the potential exposed individual (MEI) of 1×10^{-6}.

- Dioxins and Furan Emissions emission standards in accordance with 40 CFR Subpart H with an EPA Publication entitled "Interim Procedures of Estimating Risks Associated with Exposures to Mixtures of Chlorinated D. Benzo-P-Dioxins and D. Benzofurans (CDDs and CDFs) and 1989 Update" (EPA 625/3-89/016) Dated March 1989. Specifically dioxin and furans emissions will be monitored during the trial burn and a risk assessment be performed based on the results, if required.

- Products on incomplete combustion (PICs) emission standards in accordance with Volume V of the hazardous waste incinerator guidance series entitled "Guidance on PIC Controls for Hazardous Waste Incinerators" Dated April 1989. Specifically it will be demonstrated through continuous emissions monitoring (CEM) that the de-minmis CO limit of 100 ppm on an hourly rolling average is not exceeded and the total hydrocarbon (THC) levels do no exceed a good operating practice-based level of 20 ppmv.

- NO_x emissions emission standards in accordance with the Clean Air Act.

- SO_x emissions emission standards in accordance with the Clean Air Act.

To present the information in a logical manner, the Trial Burn Plan (TBP) is organized into individual sections. These sections are briefly described below.

Section 2, Engineering Description: Provides a detailed description of the major components and instrumentation used in the deactivation and incineration system. Operating procedures for waste destruction are also included.

Section 3, Waste Characterization: Gives the composition of the waste (munitions) to be destroyed in the deactivation and incineration system.

Section 4, Trial Burn Munition Feed Rates: Chemical and physical data for the different waste components are provided. The appropriate ambient air quality standards and guidance are identified. Allowable emission rates and feedrates are calculated.

Section 5, Trial Burn Waste Selection: Provides rationale for the POHCs selected for the DRE demonstration tests and the waste items selected for the particulate, metals and other demonstration tests.

Section 6, Trial Burn Protocol: Gives operating parameters for the different demonstration tests. Heat and mass balance information are included.

Section 7, Sampling and Analytical Plan: Details the sampling and analytical procedures used for the different demonstration tests. The QA/QC procedures for sampling and analysis are covered. This section also lists the process conditions that will be monitored during the demonstration tests and outlines the trial burn report to be submitted to the regulatory agencies.

Section 8, AWFSO Test Procedures: Provides procedures that test and demonstrate the operation of the system which automatically shuts off waste to the deactivation and incineration system when certain process conditions are not met.

Section 9, Trial Burn Schedule: Gives a schedule of events during the trial burn.

SECTION 2

ENGINEERING DESCRIPTION

This section provides a detailed engineering description of the APE 1236 deactivation system, as required by CFR 270.62. The APE 1236 is a rotary kiln incinerator which has been upgraded to include an afterburner and additional instrumentation. The US Army employs the APE 1236 at SEAD to deactivate munitions.

The engineering description section is divided into the following subsections:

- Description of major components
- Description of instrumentation
- Operating procedures

Equipment layout, elevation drawings and a functional control process diagram **(SK 88-07)** for the incineration system are located in map pockets in Volume 3 of the RCRA Part B Permit Submittal. A list of the drawings, which can be found in the RCRA Part B Submittal, is included as Appendix A to this TBP. (Note that many of the drawings refer to the Tooele Army Depot. The APE 1236 incinerator system at Tooele is identical to the one located at SEAD. In order to avoid duplication of effort, the Tooele drawings are submitted.) An isometric of the incinerator system is shown in **Figure 2-1**.

2.1 Description of Major Components

2.1.1 Fuel and Waste Feed Systems

No. 2 fuel oil is used to fire the burners in both the kiln and afterburner, and propane is used as pilot fuel for the afterburner burner. The propane storage, fuel oil storage and pumping areas are shown on drawing **AC SK-88-55-02 sheet 1 of 3**. The propane and fuel oil piping from the storage and pumping area to the incinerator area is installed in a concrete ditch for leak containment.

The propane storage tank is a 1000 gallon horizontal drum mounted on a concrete pad. The appropriate valves, fittings, regulators, and piping are installed for propane pressure reduction and transportation to the afterburner burner pilot train.

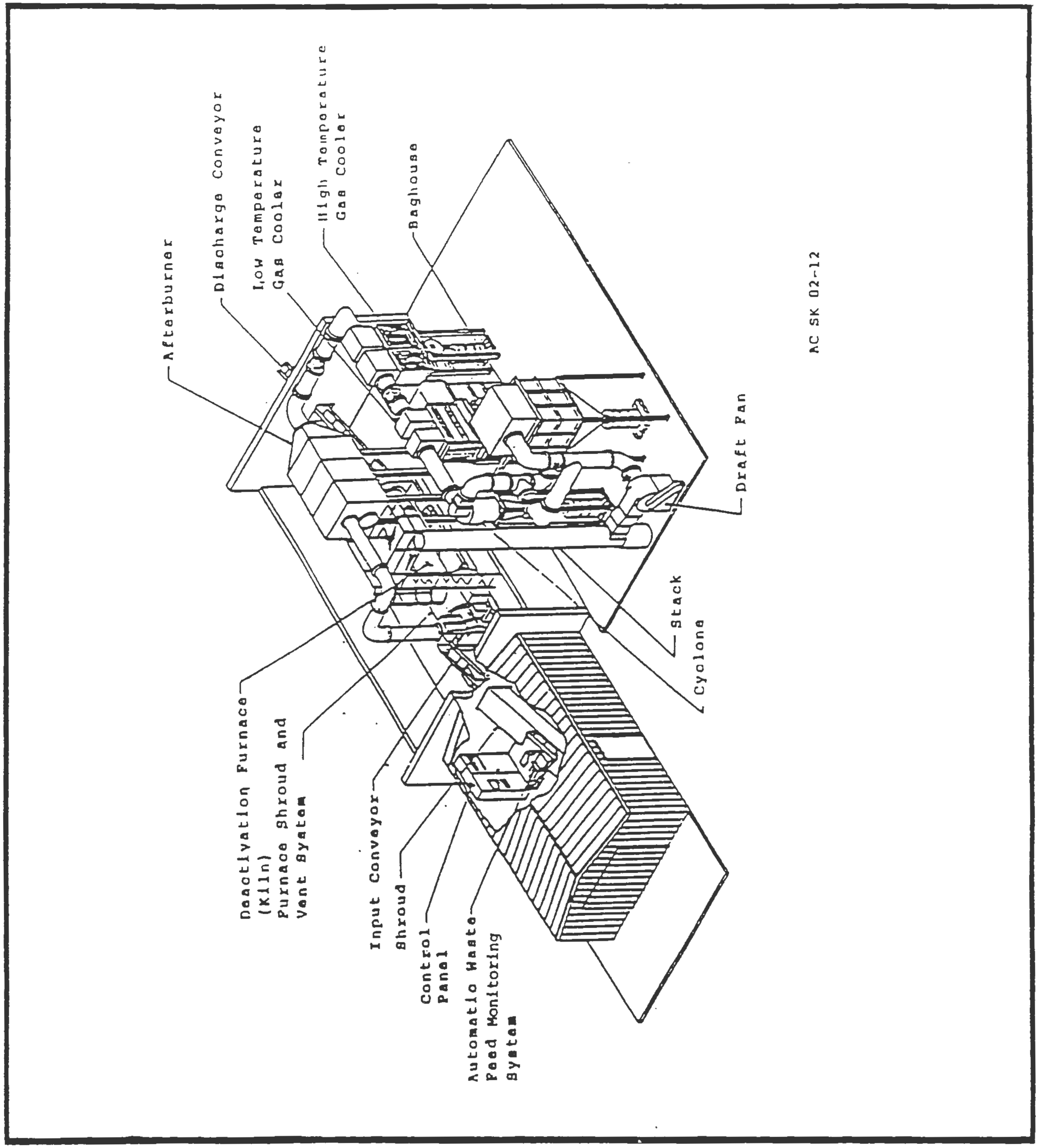


Figure 2-1 APE 1236 - Isometric View

The fuel oil storage tank is a 4000 gallon drum mounted on a 24'-4" by 14'-4" concrete pad. The fuel oil storage tank pad has a 30"- high wall on all sides for secondary containment. A pump, with the required valves and piping, is used to transport the fuel oil to the incinerator area.

The waste feed system consists of two conveyors, the waste loading conveyor and the kiln feed conveyor. Munitions are loaded onto the waste loading conveyor in the feed room by the automatic waste feed monitoring system (AWFMS). The waste loading conveyor transports the munitions through the concrete kiln barrier wall to the kiln feed conveyor located inside the kiln area. The conveyor arrangement is shown in **Figure 2-2.**

The waste loading conveyor is 18'-6" long and 8 inches wide with flights spaced 18 inches apart. The conveyor is covered by a shroud. To prevent loading of munitions other than through the weighing system, the conveyor has a positive gear drive which is driven by an electric motor. The Automatic Waste Feed Shut Off (AWFSO) system (described in **Section 2.3.3**) can disable the waste loading conveyor by terminating power to the drive motor.

The kiln feed conveyor is located within the kiln barrier walls. This conveyor transports munitions from the waste loading conveyor to the kiln feed chute. If the AWFSO system is activated, the waste loading conveyor stops but the kiln feed conveyor continues to run. This safety feature ensures that munitions will be loaded into the kiln once they reach the proximity of the kiln feed chute. Otherwise, the munitions could overheat and explode at the entrance to the kiln feed chute.

The kiln feed conveyor is 6 feet long and 8 inches wide with flights spaced 18 inches apart. The conveyor has a positive gear drive which is driven by an electric motor.

The AWFMS consists of a frame, weigh scale, electrical enclosures, push-off system and connection cables to the control system. The frame is made of carbon steel and is designed to fit over the waste loading conveyor and house the scale, push-off system and one electrical enclosure. The frame protects the electrical components and is part of the system which prevents exceeding the feed rate for a munition. The weigh scale is an explosion proof scale which can weigh accurately to 1/1000 of 1 pound. It weighs the munitions each time before they are loaded on the conveyor and prevents loading excess feed onto the conveyor.

The push-off system is a box mounted over the scale which is powered by an air cylinder. It pushes the munitions off the scale onto the conveyor. It is triggered automatically when the door is shut. It will not move if the munitions on the scale exceed the allowable weight limit for that item. The first electric enclosure houses the sensors, transmitters and power supply for the scale. The sensors and transmitters provide signals to the control systems which are used by the Programmable Logic Controller (PLC) which controls logic decisions and activates feed operations. The second electric

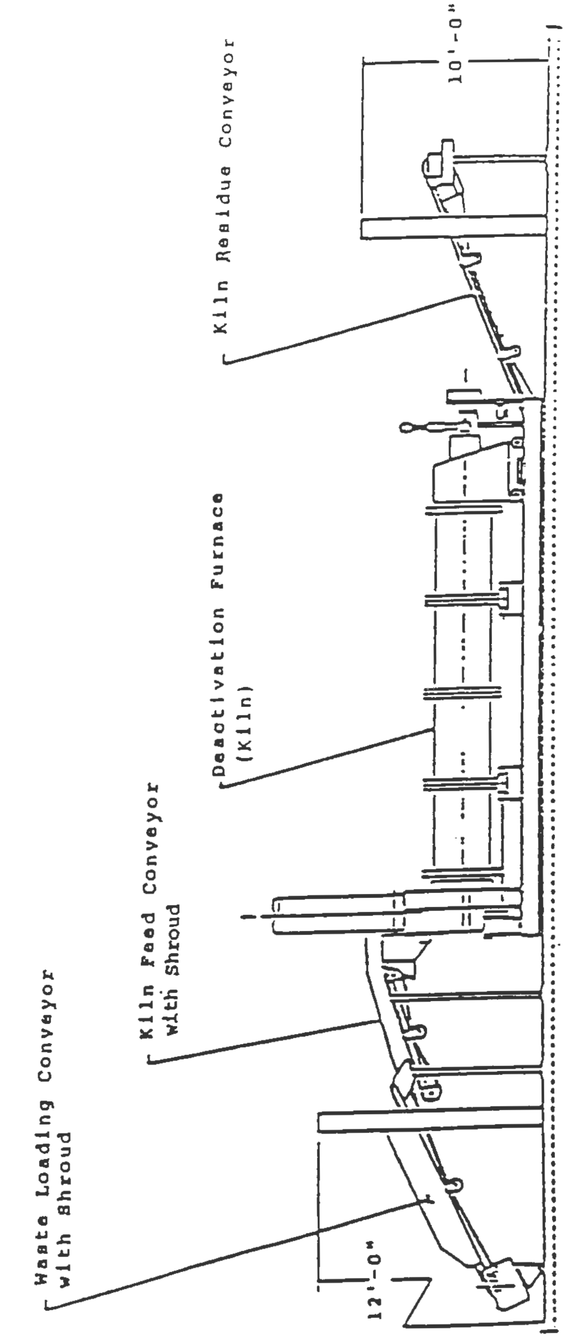


Figure 2-2 Input Conveyor Concept

enclosure houses the air valves which operate the air cylinders that move the push off box and lock the door during each cycle. The cables transmit data to the computer which compares the weight on the scale with the weight which is stored in the memory of the computer. If the weight on the scale is less than the limit allowed, the computer signals the PLC to load to the conveyor. The AWFMS is shown in **Figure 2-3** and on **SK 89-09-01**. (Drawing **SK 89-02-2** through **SK 89-09-20** are also provided.)

2.1.2 Rotary Kiln (Deactivation Furnace)

The rotary kiln is designed to ignite the munitions and effectively burn out reactive components from the metal shells. The heat to ignite the munitions is initially provided by fuel oil firing countercurrent to the movement of munitions. Combustion gases and entrained ash exit the kiln adjacent to the munitions feed chute. Non-entrained ash and the metal components of the munitions are discharged at the burner end of the kiln. The kiln is shown on **Figure 2-4**.

The munitions are propelled through the kiln toward the flame at the burner end by means of spiral flights which are an integral part of the kiln casting. As the munitions approach the flame and become heated, they either detonate or burn freely, depending upon the munition configuration and characteristics. High order detonations are contained by the thick cast steel kiln walls. The spiral flights provide physical separation of munitions or groups of munitions, discouraging sympathetic propagation of detonations and containing fragments generated by detonations. Munition feed rates, residence time within the furnace (determined by speed of revolution of the kiln) and operating temperatures have been established for each munition by controlled testing prior to the production operation. Munitions-specific operating conditions are discussed in **Section 3.0**.

The kiln is 20 feet long with an average internal diameter of 30.5 inches. It is made of four 5 foot long sections that are bolted together. The two center sections have a wall thickness of 3.25 inches and the two end sections have a wall thickness of 2.25 inches. The kiln is constructed of ASTM A217 chromium molybdenum steel for high strength and ductility at elevated temperatures. For additional personnel safety, the kiln is surrounded by barricade walls.

The kiln is equipped with a Hauck 783 proportioning burner installed in the breaching at the residue discharge end of the kiln. This is a distillate oil fired burner with a capacity of 3 million BTU/hr and a nominal turndown ratio of 4:1. **Appendix B** contains information on the Hauck 783 burner. Both atomizing air and combustion air are provided by a Hauck 5 hp centrifugal blower, the burner and blower assembly is shown on drawing ACT-377-200-12. (See **Appendix A**).

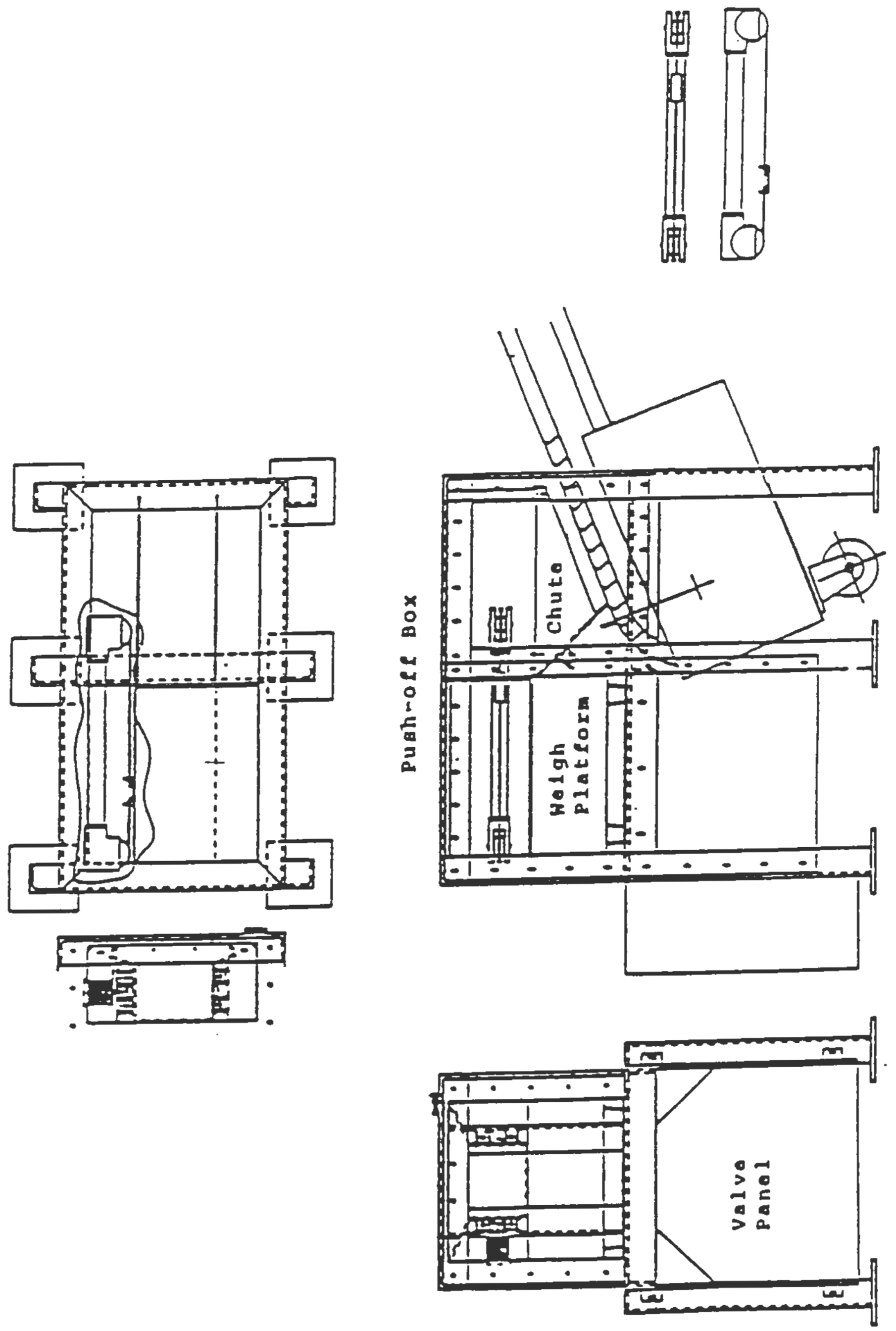


Figure 2-3 Automatic Waste Feed Monitoring System

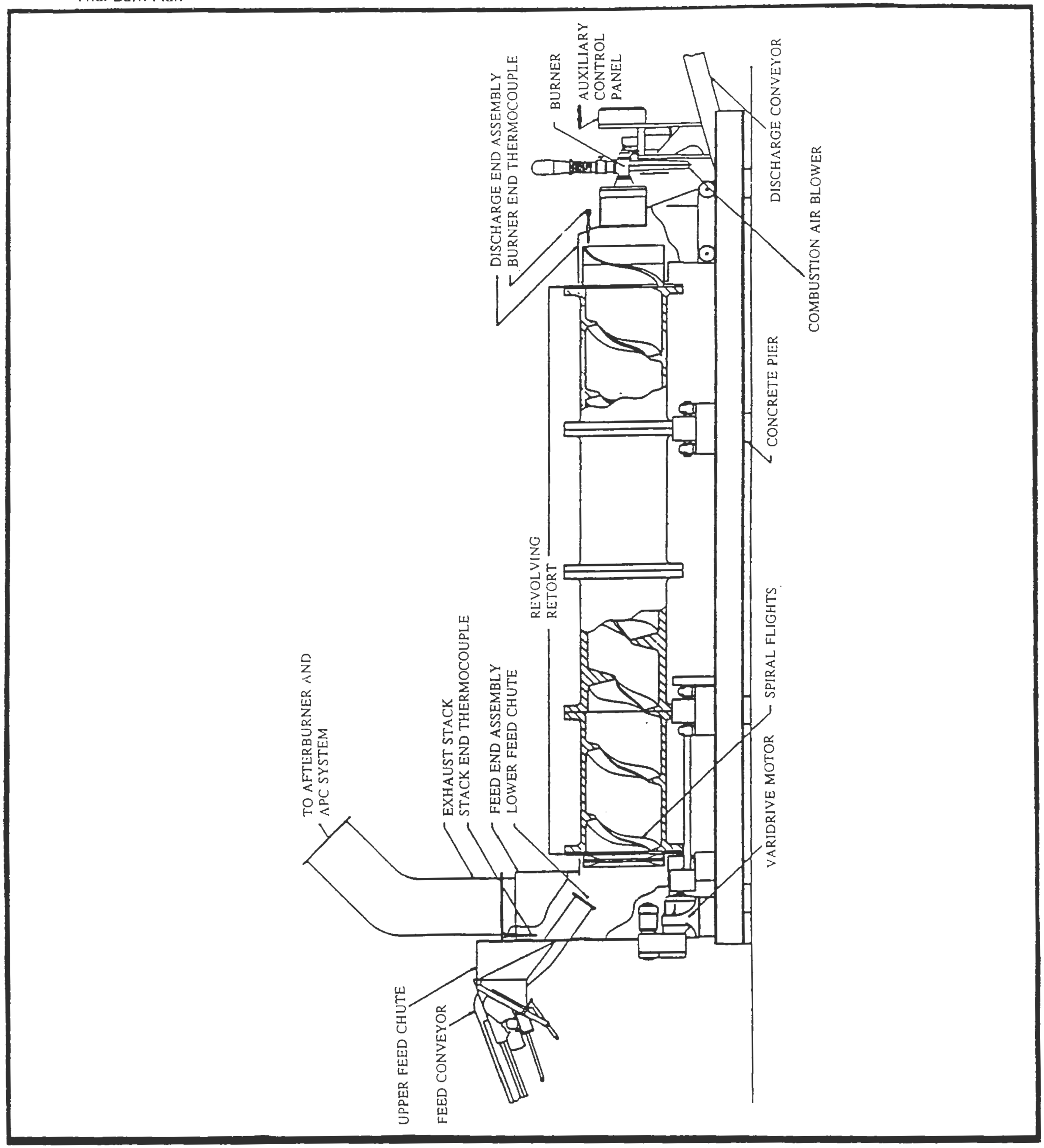


Figure 2-4 Deactivation Furnace

Fuel oil and combustion air are ratioed by links and levers connecting the fuel and air control valves. The control valves are operated by an actuator which receives a signal from the kiln exit temperature controller. The controller set point is determined by the munitions being burned and may range from 250°F to 900°F. The input to the controller is provided by a thermocouple located in the kiln exit duct.

The combustion control supervisory system is a Factory Mutual (FM) approved flame safety system which includes the proper safety shut-off valves, pressure switches, pressure regulators, flame detector, and burner controller. (This is shown as the Flame Safeguard Panel, FSG on the drawing.) The burner must be ignited for waste to be fed to the incinerator.

The kiln is operated under a slight negative pressure (vacuum) to control fugitive emissions. Typically, this pressure is -0.15 to -0.25 in. water column. The vacuum is produced by an Induced Draft (ID) fan located between the baghouse and the exhaust stack. The negative pressure in the kiln is determined by the gas flowrate and pressure drop through the air pollution control system and ID fan. A damper installed in the duct upstream of the ID fan is opened and closed by an electric actuator to control the gas flow rate and maintain the appropriate negative pressure. The kiln vacuum is an input to the AWFSO system. The input to the damper actuator is provided by the kiln pressure controller. The input to the pressure controller is a pressure (draft) transmitter measuring the kiln discharge pressure. This control loop is P-1201 on the Functional Process Control Diagram **(SK 88-07)**. **(See Appendix A)**.

Fugitive emissions from the kiln are controlled by a metal shroud which covers the entire kiln assembly including the feed chute and end plates. Ducts connect the shroud to the inlet of the combustion air blower for the kiln burner. The combustion air blower creates a negative pressure inside the shroud which pulls any fugitive emissions through the blower and discharges them into the kiln via the kiln burner. The shroud is fabricated from 11 gauge, A36 carbon steel. **Figure 2-5** on the following page is a concept of the fugitive emissions control system. This shroud does not extend over the discharge end of the kiln and is not required to do so. (Operating experience has shown that fugitive emissions are not a problem for the discharge end.)

The kiln is trunnion driven by an electric motor. The kiln must be turning for the AWFSO interlocks to clear, allowing waste to be fed into the incinerator. The drive system can vary the kiln rotation from 0.5 to 4.5 revolutions per minute (rpm). Varying the kiln's rotational speed changes the amount of time required for material to travel through the kiln (kiln residence time). The required kiln residence time is waste specific. The following table shows kiln speed versus kiln residence time. (This table is based on actual testing conducted at Tooele Army Depot. SEAD's deactivation furnace is identical in every respect to Tooele's.)

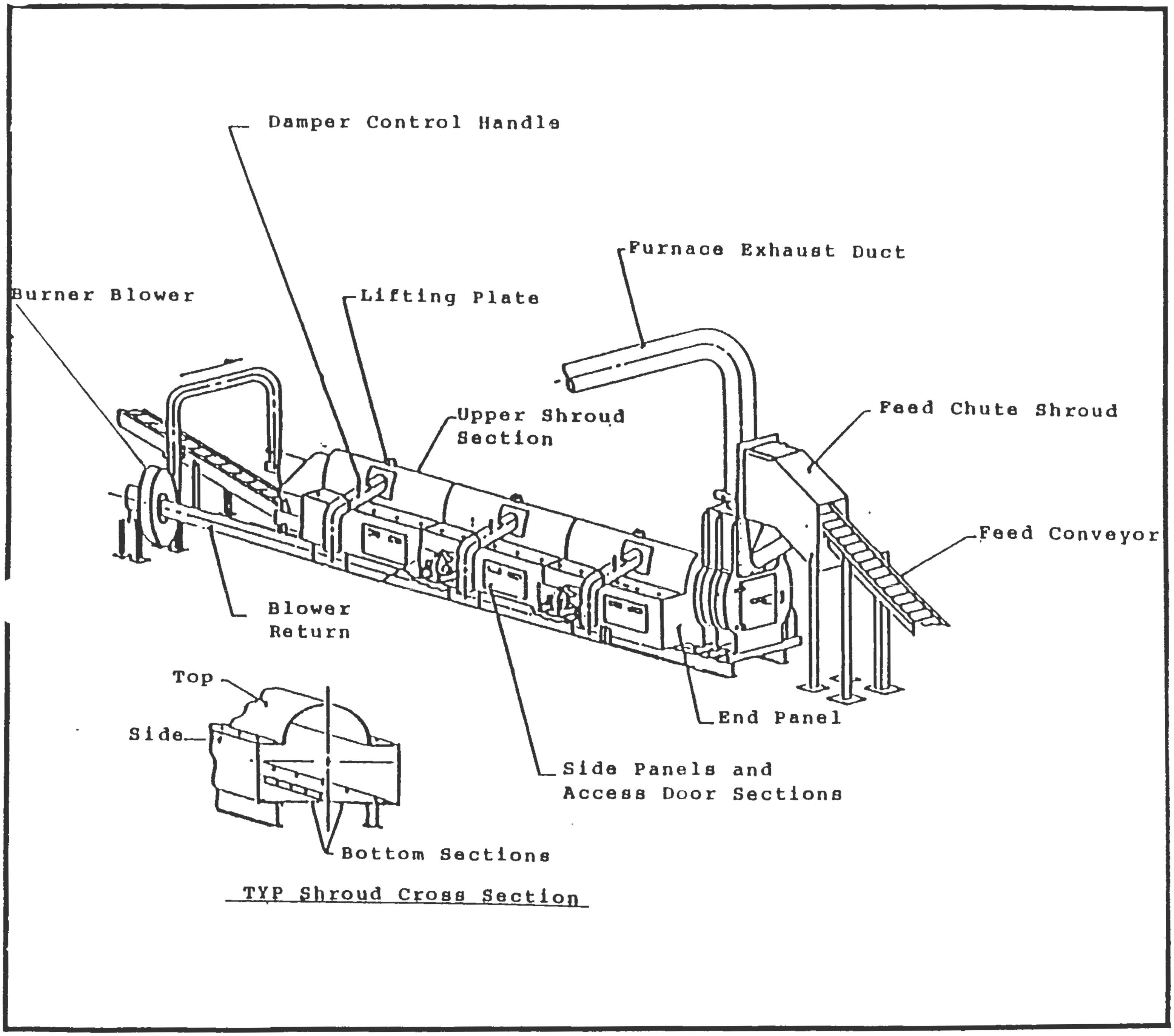


Figure 2-5 Fugitive Emission Control Concept

TABLE 2-1
KILN RESIDENCE TIME

Kiln Speed (rpm)	Inert Material Kiln Residence Time (minutes)
0.5	16.0
1.0	8.0
1.5	5.2
2.0	4.0
2.5	3.2
3.0	2.6
3.5	2.3
4.0	2.0
4.5	1.8

Residue and scrap from the destroyed waste are removed from the kiln by the kiln residue conveyor. The kiln residue conveyor transports the waste from the kiln through the barrier wall to a collection point. The kiln residue conveyor must be operational for the AWFSO interlocks to clear, allowing waste to be incinerated. This will prevent a build-up of munition residues within the kiln.

2.1.3 Afterburner

The kiln combustion gases are transported to the afterburner by a 24-inch-diameter steel duct. Combustion gases enter the afterburner directly above the burner at the upstream end where they are mixed with and heated by gases from fuel oil combustion. The afterburner is designed to heat, 4,000 scfm of combustion gas, from 400-900°F to 1200-1800°F, with a minimum gas residence time of one second. Operational experience has shown that the nominal maximum operating temperature is 1600°F.

The afterburner is rectangular with outer dimensions of 6 feet by 6 feet by 15 feet long with a transition cone at the discharge end. The afterburner is shown on the Southern Technologies drawings **11268-10-1** and **11263-10-3**. (See **Appendix A**).

The afterburner is internally insulated with 8-inch-thick, 12-pound/cubic foot, ceramic fiber modules, individually anchored to the afterburner casing. The ceramic fiber surface is coated with a rigidizer/surface coating which provides surface hardness and erosion resistance. The skin temperature remains below 150°F during normal operation. The inside cross-section of the insulated afterburner is 4'8" X 4'8", with a total internal volume of 390 cubic feet.

The afterburner is equipped with a Hauck WRO-164 Wide Range burner. This burner is oil fired with a nominal capacity of 8 million Btu/hr and a 10:1 turndown ratio. Manufacturer's literature for the burner is provided in **Appendix B.**

Fuel oil and combustion air are ratioed by links and levers connecting the fuel and air control valves. The control valves are operated by an actuator which receives a signal from the afterburner temperature controller. The afterburner temperature controller setpoint ranges from 1200-1800°F. The input to the controller is provided by a thermocouple located in the afterburner exit duct.

The combustion supervisor system is an FM approved flame safety system which includes the proper safety shut-off valves, pressure switches, pressure regulator, flame detector and burner controller. (This is shown as the Flame Safeguard Panel, FSG on the drawing.) The burner must be ignited to enable waste incineration. The air blower is a Cincinnati Fan #HPF-7 capable of providing 1,600 scfm of air for both atomization and combustion.

2.1.4 High Temperature Gas Cooler

High temperature combustion gases exiting the afterburner flow through a 30 inch diameter stainless steel duct to the High Temperature (HT) gas cooler. The HT gas cooler is a gas-to-air, cross-current, forced air heat exchanger that reduces the temperature of the combustion gases to less than 850°F. The HT gas cooler is capable of cooling 4000 scfm of combustion gas from 2200°F to 850°F. If the exit temperature exceeds 850°F, waste to the incinerator is automatically shut off. The HT gas cooler requires 25,400 cfm of 100°F ambient air to cool the combustion gases.

The gas cooler consists of two sections containing 65 plates each. The plates have a height of 39 inches and a width of 20.5 inches. The HT gas cooler is constructed of 310 stainless steel. Combustion gases enter the inlet plenum of the cooler and pass alternately downward and upward through the first and second sections and then exit through the outlet plenum. The heat exchanger plates are spaced so that the combustion gases pass on one side and the ambient cooling air passes on the other. There are a series of plates, a series of exhaust chambers, and a series of cooling chambers. An operating data sheet is located in **Appendix B** and the mechanical design is shown on **Drawing HTGC-1.** (See **Appendix A**).

A 40 hp blower forces cooling air through the HT gas cooler. The blower is capable of providing 26,313 cfm at a static pressure of 5.2 inches water column. The amount of air delivered by the blower is determined by the HT gas cooler exit temperature. As the temperature changes, the output signal of the HT gas cooler temperature controller varies the damper on the blower inlet to control air flow. A thermocouple in the exit duct from the gas cooler provides the input to the HT gas cooler temperature controller. This control loop is T-801 on the functional Process Control Diagram **(SK88-07)**.

The HT gas cooler is equipped with a sonic horn to remove particles from the exchanger plates. The horn emits sound pressure waves with sufficient vibrational energy to shear deposits from the surface of the plates, and it is operated by compressed air. The frequency of the sound waves and the duration of the cleaning cycle are adjustable from a local panel. Adjustments are made based on the temperature differential across the HT gas cooler. The sonic horn is an Envirocare #AH 30.

Particles and residue are removed from the HT gas cooler by a double chamber dumping valve. The valve has two gates that are electric motor driven. Only one gate is open at any time so the vacuum in the HT gas cooler is maintained.

2.1.5 Low Temperature Gas Cooler

Combustion gases exit the HT gas cooler through a 24-inch diameter steel duct and enter the low temperature (LT) gas cooler. The LT gas cooler is a gas-to-air, cross-current, forced air heat exchanger that reduces the combustion gas temperature to less than 350°F. The LT gas cooler is capable of cooling 4000 scfm of combustion gases from 900°F to 250°F. Waste to the incinerator is automatically shut off if the LT gas cooler exit temperature exceeds 350°F. The LT gas cooler requires 16,400 cfm of 100°F ambient air to cool the combustion gases.

The LT gas cooler consists of two sections containing 75 plates each. The plates have a height of 50 inches and a width of 26 inches. The LT gas cooler is constructed of carbon steel. Combustion gases enter the inlet plenum of the cooler and pass alternately downward and upward through the first and second sections and then exit through the outlet plenum. Heat exchanger plates are spaced so that the combustion gases pass on one side and the ambient cooling air passes on the other. There are a series of plates, a series of exhaust chambers, and a series of cooling chambers. An operating data sheet is located in Appendix B and the mechanical design is shown on **Drawing LTGC-1**. (See **Appendix A**).

A 20 hp blower forces cooling air through the LT gas cooler. The blower is capable of providing 17,054 cfm at a static pressure of 3.6 inches water column. The amount of air delivered by the blower is determined by the LT gas cooler exit temperature. As the temperature changes, the output signal of the LT gas cooler temperature controller varies the damper on the blower inlet to control air flow. A thermocouple in the exit duct from the gas cooler provides the input to the LT gas cooler temperature controller. This control loop is T-901 on the Functional Process Control Diagram **(SK 88-07)**.

The LT gas cooler is equipped with a sonic horn to remove particles from the exchanger plates. The horn emits sound pressure waves with sufficient vibrational energy to shear deposits from the surface of the plates, it is operated by compressed air. The frequency of the sound waves and the duration of the cleaning cycle are adjustable from a local panel. Adjustments are made based on the temperature differential across the LT gas cooler. The sonic horn is an Envirocare #AH 30.

Particles and residue are removed from the LT gas cooler by a double chamber dumping valve. The valve has two gates that are electric motor driven. Only one gate is open at any time so the vacuum in the LT gas cooler is maintained.

2.1.6 Cyclone

Combustion gases exit the low temperature gas cooler and enter the cyclone through a 20-inch-diameter steel duct.

The cyclone is a Ducon type VM model 700/150, size 165 with a 20-inch inlet and outlet. The diameter of the cyclone is 43 inches and the inlet area is 1.65 square feet. The cyclone is fabricated from 3/16-inch- thick carbon steel.

Residue is removed from the cyclone collection hopper through an air tight slide gate valve. The slide gate valve is kept closed during operation and manually open for clean-out after shutdown. The gas pressure drop across the cyclone at normal flowrates is 2 to 5 inches water column. Details of the cylcone are shown in **Drawing BC86-510-1**, which is located in **Map Pocket 1 of Appendix O**.

2.1.7 Baghouse

Combustion gases leave the cyclone and enter the baghouse by a 20-inch-diameter steel duct. The baghouse is a rectangular enclosure 6 feet by 6 feet wide and 15 feet tall. It contains 100 bags which are 4.5 inches in diameter and 8 feet long. This results in a total filter area of approximately 950 square feet and an air-to-cloth ratio of 5.0. The bag material is Nomex felt and is silicone treated, heat set, and flameproofed.

The dust laden combustion gas stream enters the baghouse near the bottom of a hopper where it is dispersed evenly along the rows of bags **(Figure 2-6)**. The combustion gas flows up through the filter bags and collects in the clean gas plenum, or exhaust manifold. As particles build up on the bags, the porosity of the bags is reduced creating a higher differential pressure between the dirty side and the clean side of the bags. This increased pressure drop across the bags reduces combustion gas flow through the baghouse.

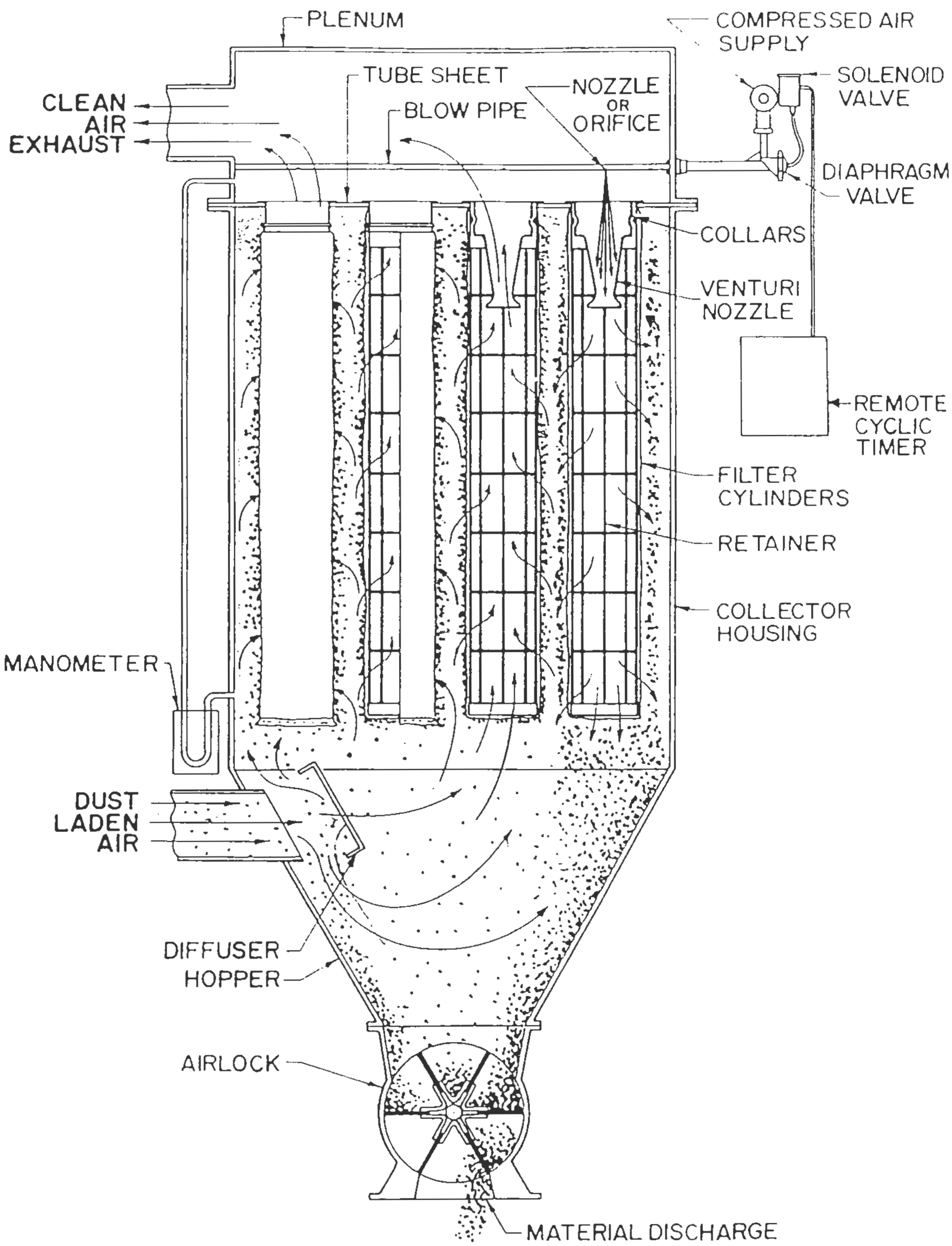


Figure 2-6 Baghouse Operation - Cutaway View

The baghouse pressure drop increase is limited by periodically cleaning the bags. The baghouse has a jet-pulse cleaning system which operates by inducing momentary surges of high pressure air in the reverse direction to normal air flow. This flexes the bags outward and dislodges the dust particles causing them to fall into the hopper below. The bag cleaning is controlled automatically by a timing device which actuates one of a series of valves at a preset interval to clean one row of filter bags at a time.

The discharge temperature of the baghouse is measured by a thermocouple installed in the duct downstream of the baghouse. This temperature is indicated and recorded at the main control panel. Additionally a high temperature thermocouple at the baghouse exit activates an alarm at the main control panel. (This is set at 600°F and indicates a fire situation.)

Differential Pressure (DP) also is monitored across the baghouse with low and high DP alarms set at 2 inches and 6 inches water column, respectively. A DP below 2 inches indicates a ruptured bag, while a DP higher than 6 inches indicates excessive fouling of the bags.

The baghouse is equipped with isolation and bypass valves. The isolation valves are located in the duct immediately upstream and downstream of the baghouse. The bypass valve is located in the baghouse bypass duct. These three valves operate in unison, i.e., when the bypass valve is closed, the isolation valves are open and vise versa. The baghouse is bypassed only under the following conditions: (a) when the exit temperature measurement fails, (b) during high baghouse temperature, and (c) during startup to protect the bags from moisture condensation and corrosion. The bypass is interlocked with the AWFMS so that waste cannot be fed if the baghouse is bypassed. Details of the baghouse are shown in **Map Pocket 2 of Appendix O**.

2.1.8 Induced Draft Fan

Combustion gases are drafted through the entire incineration system by the Induced Draft (ID) fan located downstream from the baghouse. The baghouse and ID fan are connected by a 20-inch-diameter steel duct. Under normal operating conditions, the total system pressure drop is 25 inches water column at 4000 scfm. The ID fan must be operating for the AWFSO interlocks to clear, allowing waste to be incinerated.

The ID fan is belt driven by a 50 hp, 1750 rpm electric motor. The capacity of the ID fan is 6700 acfm at 30 inches water column. The ID fan is designed to operate at 300°F. The ID fan information with performance curves is given in **Appendix B**.

A damper is installed in the duct upstream of the ID fan. This damper controls the amount of combustion gas that the fan pulls through the system. The damper is operated by an electric actuator which receives a signal from the kiln pressure controller. This loop is discussed in paragraph **2.2.2** of this section.

2.1.9 Exhaust Stack

Combustion gas from the ID fan is discharged into the exhaust stack and then to the atmosphere. The stack is 20 inches in diameter and 30 feet high.

The stack has various instrument ports. The ports for continuous gas analyzers and gas velocity are located at approximately 20 feet above grade. The gas analyzer port services the sampling system which supplies the continuous oxygen and carbon monoxide analyzers. These analyzers are used to indicate incinerator performance and are interlocked with the AWFSO. The gas velocity port accommodates probes which measure gas velocity, temperature and pressure in the stack. This information provides an indication of gas residence time in the incinerator and is interlocked with AWFSO.

The stack has other ports at approximately 20 feet above grade. These ports will be used during the trial burn to make measurements and extract stack samples.

2.2 Description of Instrumentation

2.2.1 Measurement Parameters and Methods

The following paragraphs discuss the different incineration process parameters to be measured and the techniques employed to make the measurements.

Temperature is the most common process measurement. Temperatures throughout the incinerator are controlled, recorded, indicated and alarmed. Type K (Chromel-Alumel) thermocouples are used for temperature measurement. Thermocouples are installed in the duct downstream from the major components. The temperature range of the different measurements depend on where in the incinerator the thermocouple is installed.

Pressure and differential pressure (DP) are measured at various locations in the incineration system. The kiln exit pressure measurement is actually a vacuum measurement. The scale is inches of water column and the value represents the number of inches of water column below atmospheric pressure. A pressure transmitter converts the vacuum measurement into an electronic signal that is transmitted to a remote device. DP is also measured in inches of water column. DP measurements are used to indicate the pressure drop across major components in the incineration system. Differential pressure is measured with a local pressure gauge or a pressure transmitter which transmits an electronic signal that is proportional to the differential pressure being measured.

The total fuel oil flow to the incinerator is measured by a flowmeter. The flowmeter is located in the fuel oil piping in the incinerator area, and is installed prior to the piping split to the kiln burner and afterburner burner. The flowmeter is a positive displacement type that transmits an electronic signal to the main control panel for recording.

Stack gas velocity is measured by sensors installed in the exhaust stack. The sensors measure gas velocity and temperature. The velocity sensor is a S-type pitot tube positioned to sense the average gas velocity in the stack. The pitot tube measures the differential pressure between stack static pressure and impact pressure created by the gas velocity. A type K thermocouple is used to measure stack gas temperature. Both sensors are connected to transmitters which transmit signals to a signal conditioning device. This device receives the signals, performs various calculations and produces an output which represents the temperature compensated stack gas velocity. These data are recorded at the main control panel. The stack gas velocity measurement system is manufactured by EMRC. **Appendix B** contains information on this system.

The incinerator is equipped with a Continuous Emissions Monitoring (CEM) package which measures oxygen and Carbon Monoxide (CO) in the stack gas. The CEM package includes a sampling system which continuously pulls a stack gas sample and transports it to the analyzers. The sample extraction point is located in the stack approximately 20 feet above grade. The following components are included in the sampling system:

- Sample extraction probe with continuous opening the length of the probe
- Heat traced sample lines
- Calibration ports
- Refrigerated condenser for water vapor removal
- Sample pump
- Filters
- Flowmeters for each analyzer

The CEM package includes automatic calibration which allows the analyzers to be calibrated periodically without operator intervention. **Appendix B** contains the system description and drawing.

The analyzer used to continuously measure the concentration of oxygen in the stack gas is located in the analyzer panel in the feed room. It is a Rosemount/Beckman 755 oxygen analyzer which utilizes the paramagnetic measurement technique. Additionally, the analyzer includes a 0-25% total Oxygen scale. **Appendix B** contains the description and specifications for this analyzer.

The output signal from the analyzer is recorded at the main control panel and is used by the computer system to correct the CO measurement to 7% oxygen content in the stack gas.

The parts per million (ppm) level of CO in the stack gas is continuously monitored by a CO analyzer located in the analyzer panel. The CO analyzer is a Rosemount/Beckman 880 Non-Dispersive Infrared (NDIR) analyzer. The analyzer is a dual range model which includes a 0-200 ppm and a 0-3000 ppm range. Manufacturer's information with specifications is included in **Appendix B.**

The output signal from the analyzer is corrected to 7% oxygen by the computer system. The corrected CO value is recorded, used for AWFSO interlocking and used to limit feedrate during high CO conditions.

2.2.2 Panel Instrumentation

The panel instrumentation includes the devices located in the main control panel or in local panels throughout the incineration system. Instruments which control, indicate, record and alarm process parameters are considered panel instrumentation. The following paragraphs will describe the equipment employed to perform the various functions listed above.

The incinerator is equipped with process controllers to control process parameters. A process controller receives an analog signal from a transmitter which represents the value of the process parameter or Process Variable (PV) being measured. The process controller compares the PV with the Set Point (SP), which is the desired value of the process variable. If an error between the PV and the SP exists, the process controller generates an output signal which is proportional to the error. The output signal is transmitted to a final control element which adjusts the process by some method to obtain the SP. The final control element may be a control valve, a damper or a variable motor speed drive.

The incinerator uses process controllers to control the kiln temperature (Loop # TIC-601), kiln draft (Loop # PIC-1201), afterburner temperature (Loop # TIC-701), high temperature gas cooler exit (Loop #TIC-801) and low temperature gas cooler exit temperature (Loop # TIC-901). The process controllers also communicate with the computer system which is described later. The control loops which utilize process controllers are shown on the Functional Process Control Diagram **(SK 88-07 - See Appendix A)**. The incinerator uses Honeywell UDC 3000 process controllers which are described in **Appendix B.**

The incinerator is equipped with burner control systems to monitor and control the kiln and afterburner burners. A burner controller is a sequence controller which supervises the pre-ignition air purge, ignition, main flame operation and post operation air purge. The burner controller monitors pre-ignition interlocks such as combustion air availability, fuel oil pressure and ID fan status. The flame status is monitored by a flame detector. Burner controller outputs spark the flame ignitor during ignition, open the pilot valve during ignition and open the fuel oil safety shut-off valves during main flame operation. The burner controller systems are FM approved flame safety systems. Honeywell BC 7000 burner controllers are used. Honeywell information concerning the burner controller is included in **Appendix B**.

A multipoint digital recorder is used to record process parameters. The recorder accepts analog input signals from transmitters which represent the value of the process parameter being measured. The recorder is capable of recording 14 process parameters on an input value versus time scale. The recorder also communicates with the computer system. Information on the recorder, a Honeywell DPR 1500, is included in **Appendix B**. The following is a list of the process parameters that are recorded:

- Total fuel oil flow, Process Loop FR-101
- Kiln temperature, Process Loop FR-601
- Kiln draft, Process Loop PR-1201
- Afterburner temperature, Process Loop TR-701
- High temperature gas cooler exit temperature, Process Loop TR-801
- Low temperature gas cooler exit temperature, Process Loop TR-901
- Baghouse differential pressure, Process Loop PDR-1001
- Baghouse exit temperature, Process Loop TR-1002
- Stack gas velocity, Process Loop FR-1401
- Stack gas oxygen concentration, Process Loop AR-1301
- Stack gas CO concentration, Process Loop AR-1301

The baghouse status (on-line or standby) is not usually recorded, however, this information is stored internally on the computer system and can be accessed as required. Logic control for the incinerator is performed by a programmable logic controller (PLC). The PLC receives both discrete (on/off) inputs from switches and analog inputs from transmitters. The PLC operates motor starters, the AWFSO and other interlocks, and alarms by employing configurable functions of math, counter, sequence, relay and time. The PLC is a Honeywell IPC 620 system complete with discrete and analog I/O and a data communication link so information can be shared with the computer system. Information on the PLC system is supplied in **Appendix B**.

The computer system is a Personal Computer Operating Station (PCOS) which provides centralized and integrated data management, process graphics, operator interface and report generation. Through a serial data link, the PCOS communicates with the process controllers, PLC and recorder. All process parameters and information contained in these devices are available to the PCOS. The PCOS generates reports, logs data, develops historical trends, displays process parameters and alarms process parameters based on information gathered from the process controllers, PLC and recorder. One of the primary functions of the PCOS is to record process data for internal use and regulatory compliance. The PCOS includes the following items: personal computer with keyboard and color graphics monitor, line printer and distributed automation and control software. Information on the PCOS is supplied in **Appendix B.**

Table 2-2 is the functional chart of process conditions which list the functions performed by the panel instrumentation on each process measurement.

2.2.3 Automatic Waste Feed Shut Off (AWFSO) System

Certain process conditions are required before munitions can be fed into the incinerator. The required conditions include minimum and maximum values of some process parameters, status of certain motors, status of burner flames, and operability of certain instruments. If waste is being fed and the incinerator deviates from any of the required conditions, waste is automatically shut off. When waste is automatically shut off, the waste loading conveyor is stopped instantly but the kiln feed conveyor continues to run so that any munitions in the kiln area will be loaded into the kiln. **Table 2-3** on the following page lists the process conditions which automatically shut off waste to the incinerator.

2.3 Operating Procedures

This subsection outlines the procedures used to operate the incineration system. The description presents an overview of the operating procedures and is not intended to be used to operate the incinerator. The incinerator operational manual and the standing operating procedures (SOP) contain more detail and are the official documents used to operate the incinerator.

The different operational items to be performed are listed for each of the various operating procedures. The following procedures are covered:

- Startup
- Operation
- Shutdown
- Scrap and residue handling
- Baghouse bypass

2.3.1 Startup Procedures

- Perform operational inspection and complete pre-startup check list.

TABLE 2-2
FUNCTIONAL CHART OF PROCESS CONDITIONS

Process Conditions	Loop No.	Indicated	Recorded	Controlled	High Alarm	Low Alarm	AWFSO
Oil Flow	F-101		●				
e Feed Rate	W-501	●	●	●			●
Rotational Speed	S-602	●		●			●
Temperature	T-601	●	●	●	●	●	●
Flame	B-601	●			●		●
Residue Conveyor		●			●		●
Pressure	P-1201	●	●	●	●	●	●
rburner Temperature	T-701	●	●	●	●	●	●
rburner Flame	B-1002	●			●		●
Temperature Gas Cooler Exit Temperature	T-801	●	●	●	●	●	●
Temperature Gas Cooler Exit Temperature	T-901	●	●	●	●	●	●
ouse Pressure Drop	PD-1001	●	●		●	●	●
ouse Exit Temperature	T-1002	●	●		●	●	●
ouse Bypass		●					●

TABLE 2-2

FUNCTIONAL CHART OF PROCESS CONDITIONS
(Cont'd)

Process Conditions	Loop No.	Indicated	Recorded	Controlled	High Alarm	Low Alarm	AWFSO
n		●					●
use Stack Gas Velocity	F-1401	●	●		●		●
ust Stack Temperature	T-1401	●	●				
ust Stack Pressure	P-1401	●	●				
Oxygen Concentration	AR-1301	●	●		●		
Carbon Monixide Concentration	AR-1301	●	●		●	●	●

TABLE 2-3

AUTOMATIC WASTE FEED SHUT-OFF CONDITIONS AND VALUES

Condition	Minimum Value	Maximum Value
Carbon Monoxide in Exhause Stack	None	Permit Limit
Afterburner Temperature	1200 °F	1800 °F
Kiln Temperature	250°F (Note 2)	1100 °F
Kiln Pressure	None	-0.08 inches WC
Waste Feed Rate	None	Waste Specific
Gas Velocity in Exhaust Stack	None	50 fps
Pressure drop across Baghouse	2 in. wc	6 in. wc
HT Gas Cooler Exit Temperature	None	850 °F
LT Gas Cooler Exit Temperature	None	350 °F

Additional conditions which engage the AWFSO:

- Kiln Flameout
- Afterburner Flameout
- Bypass Baghouse
- Kiln Rotation Stops
- Kiln Residue Conveyor Stops
- ID Fan Stops
- Oxygen Analyzer Failure
- Carbon Monoxide Analyzer Failure
- Failure of Data Recorder
- Failure of any Temperature Monitoring System
- Failure of the Automatic Waste Feed Monitoring System
- Failure of any Process Controller
- Baghouse Differential Pressure Transmitter Failure

NOTES:

1. The Carbon Monoxide measurement is corrected to 7% Oxygen. Waste feed is shut off when the rolling average of the CO corrected for O_2 on a dry basis is above the limit set in the permit. The waste feed can only be restarted when the rolling average drops below the permitted limit.

2. Munition specific.

The following procedures will be performed automatically upon automatic start-up but would be conducted in this manner if manual start-up were to be undertaken.

- Bypass the baghouse.
- Start the ID fan with the kiln pressure controller in manual.
- Start the gas cooler blowers with the LT gas cooler motor speed controller in manual.
- Start the air compressor.
- Start the fuel oil pump and open the hand valves to the burners.
- Start the afterburner combustion air blower.
- Place the afterburner temperature controller in manual and slightly open the control valve.
- Ignite the afterburner burner.
- Start the kiln rotation.
- Start the kiln combustion air blower.
- Place the kiln temperature controller in manual and slightly open the control valve.
- Ignite the kiln burner.
- Adjust the set points on the process controllers and place the controls in the automatic mode.
- Date and sign the recorder chart. Verify all recorded conditions are being correctly recorded.
- Enter the type of munitions into the computer system.
- Adjust the rotation speed of kiln for the type of munitions to be fed.
- Adjust the kiln temperature set point for the type of munitions to be fed.
- Start the waste loading, waste feed, and residue conveyors.
- Start the baghouse bag cleaning cycle.
- Open the baghouse block valves and close the baghouse bypass valve.
- Start the gas cooler sonic cleaners.
- Close the kiln barrier walls.
- Feed the munitions at specified feedrate.

Note that no waste is fed to the kiln until the baghouse in on-line.

2.3.2 Operation Procedures

These procedures are to be performed while the incinerator is burning munitions.

- Monitor the main control panel closely to
  - Monitor process conditions
  - Verify that correct recording and data logging are being performed

  - Verify that control functions are being performed
  - Handle alarm conditions as required
- Inspect exhaust stack emissions hourly (minimum).
- Check all local indicators on incinerator for proper values.
- Inspect the operation of rotating equipment outside of kiln barrier walls.

2.3.3 Shutdown Procedures

The following procedures will be performed during automatic shutdown (These procedures can be initiated manually or as an automatic response from the AWFSO system):

- Stop waste feed to kiln.
- Maintain all other operating conditions, including kiln and afterburner temperature, for 15 minutes (minimum) or until kiln residue conveyor is empty, whichever is greater.
- Place process controllers in manual.
- Shut off the kiln burner flame but keep combustion air blower on and combustion air valve open.
- Shut off the afterburner burner flame but keep combustion air blower on and combustion air valve open.
- Shutdown fuel oil pump.
- Open ID fan damper fully.
- After kiln temperature is below 400°F and afterburner temperature is below 600°F, the following equipment is shutdown:

  - Kiln combustion air blower
  - Afterburner combustion air blower
  - ID fan
  - Gas cooler blowers
  - Baghouse residue valve
  - Gas cooler residue valves
  - Kiln rotation drive
  - Kiln residue conveyor

Conditions which would initiate an automatic shutdown are discussed in Section 2.2.3 and are shown on Table 2-3. It is important to note that kiln and afterburner conditions are maintained until all the waste is incinerated. This is for safety and to ensure continued destruction of the hazardous waste.

2.3.4 Scrap and Residue Handling

Scrap and residue will not be handled until cooled and the kiln residue conveyor has been observed running empty. After the scrap and residue has completely cooled, samples from each container will be inspected for complete deactivation. The scrap will be reprocessed, if required. Any scrap accumulated after an emergency shutdown will be reprocessed.

When different munitions are fed, a minimum 15-minute waiting period will be necessary and the kiln residue conveyor must run empty before scrap containers can be changed. Scrap containers must be changed to separate classes of scrap.

2.3.5 Baghouse Bypass

If the baghouse is bypassed for any reason waste feed to the furnace is stopped by the AWFSO System. Bypass of the furance will occur only when there is an exit temperature measurement failure, when the high baghouse temperature alarm sounds during a fire condition, and during startup operations prior to the initiation of waste feed.

The bypass is interlocked with the AWFSO system so that waste cannot be fed if the baghouse is bypassed.

SECTION 3

WASTE CHARACTERIZATION

The munition items and bulk explosives that will be demilitarized at the facility are Class A, B and C explosives. These materials include small arms ammunition, propellants, artillery ammunition, rockets, boosters, impulse cartridges, fuzes and numerous components that are used in the assembly of conventional munitions. Aged or obsolete batches of these materials are periodically shipped to the demilitarization facility. When it has been determined that these munitions are no longer in the munition lifecycle as defined in Army Regulation AR 200-1, paragraph 6-7, the munitions become solid waste as defined in 40 CFR 261.2 and a hazardous waste as described in 40 CFR 261.23.

All of these wastes are bulk solids or end-item munitions. They are all fed to the rotary kiln by the conveyor system described in **Section 2**. No liquid wastes are burned in the deactivation furnace.

Two hundred different munitions have been identified as potential candidates for demilitarization at SEAD. It is important to note that only those munitions identified on **Table 4-5** of the following section and completely characterized in **Appendix C** will be demilitarized. No uncharacterized munitions will be accepted at SEAD for demilitarization. A complete list of the chemical compounds present in feed items is presented in **Table 3-1**. The complete chemical characterization of each item is included in **Appendix C, Table C-2.**

TABLE 3-1

WASTE FEED COMPONENT CHEMICAL COMPOSITIONS

Constituent	Chemical Formula
Acetylene Black, Carbon Black, Charcoal, Graphite	C
Aluminum	Al
Aluminum Trisulfide	Al_2S_3
Ammonium Nitrate	NH_4NO_3
Antimony Sulfide, Antimony Trisulfide	Sb_2S_3
Asphaltum	High Molecular Weight Hydrocarbons
Barium Carbonate	$Ba(CO_3)_2$
Barium Chromate	$BaCrO_4$
Barium Nitrate	$Ba(NO_3)_2$
Barium Peroxide	BaO_2
Barium Stearate	$Ba(C_{18}H_{35}O_2)_2$
Boron Powder	B
Black Powder	74% - KNO_3, 10.4% - S, 15.6% C
Calcium Carbonate	$CaCO_3$
Calcium Resinate	$CaC_{40}H_{58}O_4$
Calcium Silicide	$CaSi_2$
Calcium Stearate	$Ca(C_{18}H_{35}O_2)_2$
Carborundum	SiC & Al_2O_3
DDNP	Unknown
Dibutylphthalate	$C_6H_4(COOC_4H_9)_2$
Diphenylphthalate	$C_6H_4(COOC_6H_5)_2$
Dichromated Aluminum Powder	$Al_2(CrO_7)_3$
Dinitrotoluene	$C_6H_3CH_3(NO_2)_2$
Diphenylamine	$(C_6H_5)_2NH$
Ethyl Centralite	$C_{17}H_{20}N_{20}$
Egyptian Lacquer	Nitrocellulose and solvent
Fuze Powder	Unknown
Gum Arabic	Complex Carbohydrates
HCB	C_6CL_6
HMX	$C_4H_8N_8O_8$
Laquer	Nitrocellulose and solvent

TABLE 3-1

WASTE FEED COMPONENT CHEMICAL COMPOSITIONS (Cont.)

Constituent	Chemical Formula
Lead Azide	PbN_6
Lead Dioxide, Lead Peroxide	PbO_2
Lead Styphnate	$PbC_6H_3N_3O_9$
Lead Sulfocyanate, Lead Thiocyanate	$Pb(SCN)_2$
Linseed Oil	Glycerides of fatty acids - $C_{21}H_{38}O_4$ (Typical)
Magnesium, Magnesium Powder	Mg
Magnesium Aluminum Alloy	Mg_2Al
Nickel Powder	Ni
Nitrocellulose	$C_6H_7O_5(NO_2)_3$
Nitroglycerin	$C_3H_5N_3O_9$
Oxamide	$NH_2COCONH_2$
Parlon Chlorinated Rubber	Typically 65% Cl
Perchloropentacyclodecane	$C_{15}H_{19}Cl_{11}$
PETN	$C_5H_8N_4O_{12}$
Polyethylene	$(CH_2)_n$
Poly Vinyl Alcohol	$(C_2H_3OH)_n$
Polyvinyl Chloride	$(C_2H_3Cl)_n$
Potassium Chlorate	$KClO_3$
Potassium Nitrate	KNO_3
Potassium Perchlorate	$KClO_4$
Potassium Sulfate	K_2SO_4
RDX	$C_3H_6N_6O_6$
Red Phosphorus	P
Silicon Carbide	SiC
Sodium Bicarbonate	$NaHCO_3$
Sodium Sulfate	Na_2SO_4
Strontium Nitrate	$Sr(NO_3)_2$
Strontium Oxalate	$SrC_2O_4 \bullet H_2O$
Strontium Peroxide	SrO_2
Sulfur	S

TABLE 3-1

WASTE FEED COMPONENT CHEMICAL COMPOSITIONS
(Cont.)

Constituent	Chemical Formula
Tetracene	$C_2H_8N_{10}O$
Tetryl	$C_7H_5N_5O_8$
Tin Dioxide	SnO_2
Trinitroresorcinol	$C_6H(OH)_2(NO_2)_3$
Trinitrotoluene	$C_6H_2CH_3(NO_2)_3$
Vinyl Alcohol Acetate Resin	$(C_4H_6O_2)_n$
Wax	Long chain alkanes - C_nH_{2n+2}
Yellow Dye	Unknown
Zinc Stearate	$Zn(C_{18}H_{35}O_2)_2$
Zirconium	Zr

SECTION 4

ESTABLISHING MUNITION FEED RATES

4.1 MUNITION FEED RATES

The purpose of this section is to outline the process used to set munition feed rates for the safe operation of the deactivation furnace. Feed rates were initially set after U.S. Army experimentation. This work established the amount of each munition which could be fed without risk of physical damage to the furnace or its surroundings. SEAD plans to operate the deactivation furnace 40 hours a week, 52 weeks per year or a total of 2080 hours per year. In order to simplify munition accounting it was SEAD's goal to reduce the feed rates initially established by the army, so that any munition could be burned for all 2080 hours the deactivation furnace will operate each year and not exceed any ambient air quality guidance or standard. For this reason SEAD has identified the most stringent standard and guidance limit, enforceable or not for each pollutant to be burned, and back calculated allowable munition feed rates from them.

Establishing allowable munition feed rates was accomplished in the four principal steps described below. Details of the processes and rationale used in following these steps are presented in the following sections.

1. Identification of appropriate State and Federal ambient impact and air quality standards and guidelines.

2. Calculation of emission impact on ambient air at the point of highest concentration for a generic 1 lb/hr of pollutant emitted by the deactivation furnace.

3. Back calculation of an allowable emission rate which meets all State and Federal standards and guidance for each pollutant.

4. Back calculation of the allowable feed rate which corresponds to the allowable emission rate for each munition, taking into account metals partitioning and constituent removal in the deactivation furnace's air pollution control equipment.

The appropriateness of the munition feed rates established in **Section 4** will be verified during the trial burn and will be limited by the following criteria:

1. The ash yield rate cannot exceed the highest ash yield rate established in the trial burn.

2. The chlorine feed rate must be less than 3 lb/hr to ensure that the maximum HCl generation rate is less than 4 lb/hr. (The deactivation furnace system does not include air pollution control equipment which can remove HCl).

3. The organic hazardous constituent feed rates cannot exceed the corresponding maximum POHC feed rates established in the trial burn.

4. The feed rate established for each metal cannot exceed the corresponding maximum feed rate established during the trial burn.

5. The maximum waste Propellant/Explosive/Pyrotechnical (PEP) input cannot exceed the corresponding maximum established in the trial burn.

Appropriate feed rates for the trial burn were developed for all metals, including those of low toxicity. Data generated during the trial burn will become the basis for an air permit. Feed rates were also modified to meet HCl, Particulate (PM-10), SO_2, and NO_2 standards and guidance.

Data generated during the trial burn will become the basis for an air permit. Although it is expected that the air pollution control equipment associated with the deactivation furnace will be found to represent best available control technology (BACT), this analysis is not addressed in the trial burn plan. BACT will be addressed during the permit application process.

Guidance for this work came chiefly from New York State Department of Environmental Conservation's (NYSDEC's) Air Guide-1 (AG-1). Additional guidance was taken from Volume IV of the Incineration Guidance Series, "Guidance on Metals and Hydrogen Chloride Controls for Hazardous Waste Incinerators." Technical papers on metals partitioning as well as trial burn data generated by the U.S. Army for other deactivation furnaces was also used.

4.2 IDENTIFICATION OF APPROPRIATE STANDARDS AND GUIDANCE

NYSDEC's Air Guide-1 is the principal guidance followed by New York State regulators. While it has not been promulgated and exists only in draft form, it represents the State's basis for air permitting decisions. Air Guide-1 incorporates Federal standards and State guidance for acceptable concentrations of pollutants in ambient air. Limits from Air Guide-1 for pollutants which will be emitted by the deactivation furnace are recorded below in **Table 4-1**. Values are in micrograms per cubic meter. In most instances the State identifies two values, a Short term Guideline Concentration (SGC) and an Annual Guideline Concentration (AGC). SGCs are designed to protect human health and the environment from acute effects, while AGCs are designed to be protective over the long term. A full description of the development and purpose of SGCs and AGCs is located in **Appendix C** of AG-1.

For pollutants which are less toxic or produced in such small quantity that their risk to public health is thought to be minimal, the State has not yet developed SGC and AGC values. For the cases where values were not published by the State, the State provides methodology for developing "interim values" (see Section IVA of AG-1). Where published occupational exposure limits existed for a pollutant, "interim" values were calculated. It should be noted that these "interim" values are thought to be conservative estimates of the actual safe ambient air concentrations. For this trial burn "interim" values were developed for aluminum and tin. All calculations are located in **Appendix D**.

For pollutants for which values have not been published by the State and for which occupational exposure data is limited, AG-1 defines the use of a "deminimis" value. The concept of the deminimis value was developed to insure that the permitting process would not stop if a source were to emit a pollutant for which the State had not developed an SGC or AGC. Deminimis values were developed by the State for moderate and low toxicity pollutants.

A toxicological review of strontium in the forms expected to be emitted by the deactivation furnace has been performed in order to establish its deminimis allowable impact. This review of existing data supports the classification of strontium and its associated compounds as low toxicity pollutants. The toxicological review is located in **Appendix K**. The derived impacts for strontium are included in **Table 4-1**.

Federal guidance for ambient air quality and allowable impacts from hazardous waste incinerators is located in Volume IV of the incinerator guidance series. This document is used by Federal regulators and is the basis for their air permitting decisions. The ambient air impact guidelines are risk based and have been proposed by the EPA as amendments to the 40 CFR Part 264 Subpart O, hazardous waste incinerator rules. The EPA believes that metal and hydrogen chloride (HCl) from hazardous waste incinerators can pose unreasonable risk, and need to be regulated more stringently than currently required.

The EPA proposes Reference Air Concentrations (RACs) for noncarcinogenic metals and Risk Specific Doses (RSDs) for carcinogenic metals. The RSDs insure that exposure to all carcinogenic metals are limited such that the sum of the excess risks attributable to ambient concentrations of these metals do not exceed an additional lifetime individual risk to the potential Most Exposed Individual (MEI) of 10^{-5}.

Table 4-1

NYSDEC Ambient Air Quality Guidelines

Pollutant	SGC (Hourly Average in ug/m^3)	AGC (Annual Average in ug/m^3)
Aluminum	476 (4)	4.76 (4)
Antimony	120	1.2
Barium	120	0.5
Chrome (VI)	0.1	2×10^{-5}
HCl	150	7
Lead	NA	1.5 (1)
Nickel	1.5	0.02
NO_2	NA	100 (3)
Particulate (PM-10)	150 (2)	50 (3)
SO_2	365 (2)	80 (3)
Strontium	10 (5)	1.0 (5)
Tin	476 (4)	4.76 (4)
Zinc	150	50

1. NAAQS based on a 3 month average
2. NAAQS based on a 24 hour average
3. NAAQS based on an annual average
4. Interim values calculated for moderately toxic metals
5. Deminimis value for a low toxicity metal

NA Not Available

Note: Actual metal emissions from the deactivation furnace will be as oxides. To be conservative metal emissions were assumed to be as elemental metal, which is generally the more toxic form.

SGC values are hourly averages unless otherwise specified.
AGC values are annual averages unless otherwise specified.

The potential MEI risk is the risk at the point where the maximum concentration occurs regardless of the actual population distribution. The EPA is proposing that, using reasonable worst-case assumptions, an incremental lifetime risk to the MEI of less than 10^{-5} (1 cancer case per 100,000 people) is a reasonable acceptable risk. The aggregate risk to the MEI is calculated by predicting the maximum annual average groundlevel concentration for each carcinogenic emission, calculating the estimated risk from that ambient concentration using the unit risk factor, and summing the risk for all carcinogenic compounds. EPA's Carcinogen Assessment Group has estimated carcinogenic potency factors for humans exposed to known and suspected human carcinogens. These factors are the basis for estimating "unit risks" of carcinogens at the low doses associated with typical levels of exposure to airborne carcinogens in the ambient environment (Vol IV-App I-13).

RACs have been developed for HCl and those noncarcinogenic metals listed in Appendix VIII of 40 CFR Part 261 for which the EPA has adequate health effects data. RAC values are based on oral Reference Dose (RfD) data and are designed to represent an estimate of a daily exposure (by ingestion) for the human population that is likely to be without an appreciable risk of deleterious effects even if exposure occurs daily during a lifetime. The RfD for a specific chemical is calculated by dividing the experimentally determined no-observed-adverse-effect-level by the appropriate uncertainty factors (Vol IV-Appendix I).

PEP from munitions fed to the deactivation furnace will contain only one known carcinogenic metal, chromium. In order to be conservative, all chrome fed to the deactivation furnace was assumed to be converted to chrome VI, which is a known carcinogen. Thus, the chromium feed rate was limited so that the RSD is not exceeded and the risk to the MEI is less than 10^{-5}. Using the unit risk factor identified in the Volume IV guidance and the allowable risk to the MEI, the allowable impact for chrome VI was calculated to be 8.3×10^{-4} ug/m^3.

Feed rates for munitions containing noncarcinogenic metals were limited such that each individual RAC will not be exceeded. All RAC values are in micrograms per cubic meter and represent allowable lifetime ambient air impacts. A full explanation of the development of RACs is located in **Appendix I** of Volume IV of the guidance series. RACs for noncarcinogens expected to be emitted by the deactivation furnace are located in **Table 4-2.**

The impacts for carcinogenic and noncarcinogenic metals described above represent air pollutant concentrations, which the MEI can be exposed to over a lifetime without deleterious effects. In order to demonstrate compliance with these guidelines, SEAD has taken a conservative approach by assuming that they are equivalent to annually averaged limits. If annually averaged limits were to be derived from lifetime averaged limits the allowable exposure would be considerably higher. In the preparation of this trial burn plan, SEAD has sought to use conservative assumptions to insure that operation of the deactivation furnace will be protective of human health and the environment.

Table 4-2

Reference Air Concentrations

Metal	RAC (ug/m^3)
Antimony	0.3
Barium	50
Hydrogen Chloride	150 (3 min.) 7 (annual)
Lead	0.09

Note: RACs represent impacts which over a lifetime will cause no adverse effects to the MEI. SEAD has opted to use them as allowable annual impacts.

4.3 CALCULATION OF EMISSION IMPACT

Both NYSDEC and EPA have published guidance for estimating the impact of potential sources of air pollutants on ambient air quality. Both provide regulators with methodologies to evaluate the source initially with simplified procedures. If the source complies with impacts predicted by these methods, then there is no need to pursue more rigorous analysis. If the source does not comply, then NYSDEC and EPA provide more rigorous analytical methods. Each level of analysis requires greater and greater understanding of the source, the source site, and the historic meteorology of the site. As these analyses become more and more complex fewer and fewer conservative default values are used and the closer predicted impacts will be to actual impacts. Because of the time and money required to do in-depth analysis, NYSDEC and EPA have sought to provide stepwise approaches which limit the level of effort required to the complexity of the source to be modeled.

The NYSDEC process begins with the simplified, point source method described in Section III A of AG-1 and progresses to site specific modeling; while the EPA process starts with a three tier analysis (Tier I, Tier II and Tier III) which is described in Volume IV of the guidance series. The most in depth evaluation performed in the EPA process is Tier III, site specific modeling, and at this point both NYSDEC and EPA methodologies basically overlap. SEAD performed the simplified methods described by both agencies. The analyses found that predicted impacts were in excess of allowable limits and that site specific modeling was required.

Initial estimates for ambient impacts were calculated by using Air Guide-1's Standard Point Source Method (PSM). This method predicts an impact at the point of maximum concentration by taking into account: building downwash effects; stack height and diameter; exit gas temperature and velocity; and the effects of plume rise. SEAD used the air dispersion equations provided by PSM for metal constituents, by assuming annual impacts equal to the State's AGC values, and then back calculating the associated emission rates. The maximum short-term impact was then calculated by the second air dispersion equation defined in the method, and compared with the State's SGC. If the calculated value was less than the SGC, then the feed rate met necessary criteria. If the calculated value exceeded the SGC, then the allowable emission rate was reduced until the requirements were met. As described previously, the predicted impacts were very conservative and the source did not meet requirements as calculated by PSM.

SEAD then utilized EPA's Tier I/Tier II analysis. This method which predicts allowable source impacts relies on simplistic default type information, but reduces the complexities of estimating terrain and dispersion effects. Using EPA's procedure SEAD calculated a simplified effective stack height; the land type was found to be rural based on population and the amount of industry in a 3 Km radius around the deactivation furnace; and the terrain was designated as complex (rolling hills) since the land rises more than the physical stack height in a 5 Km radius.

Once this information was established SEAD referred to tables the EPA has compiled for 20 hazardous waste incinerators operating under worst case conditions (Provided in Tab B of Volume IV) and read off worst case feed rates for metals and HCl. This simplistic analysis gave no credit for metals partitioning to furnace bottoms ash or for the removal of constituents in air pollution control equipment. Tier I analysis is the estimation of predicted allowable feed rates and their comparison to the proposed pollutant feed rates. The predicted feed rates are converted to predicted emission rates in subsequent tables of Tab B. Tier II analysis is the comparison of the predicted emission rates with those proposed, with no credit for partitioning or APC removal. The Tier I/Tier II analysis performed for the deactivation furnace is presented in its entirety in **Appendix M.**

The impacts calculated with these simplified methods are inherently conservative. Consequently they limited allowable feed rates beyond what was acceptable to the Seneca Army Depot. Meteorologists in the office of the engineer spoke to NYSDEC Air personnel and agreement was reached on a more sophisticated method for estimating impacts which did not require the level of effort necessary to develop a full blown Industrial Source Complex (ISC) dispersion model. Under NYSDEC's guidance EPA's air model SCREEN was used to predict impacts for a 1 lb/hr pollutant source. USEPA SCREEN is described in EPA document 450/4-88-010. This analysis satisfies the definition of site specific model under both NYSDEC guidance and EPA Tier III, and became the basis upon which all pollutant and munition feed rates were set.

In addition to the parameters considered in AG-1's point source method, USEPA SCREEN examines a wide range of wind speed and stability classes. It uses standard methods to calculate plume rise from point sources as well as stack tip downwash, buoyancy induced dispersion and building wake and cavity effects. The model considers various terrains and estimates an impact at one or more receptors.

SCREEN was used to predict the maximum average hourly impact which would result from 1 lb/hr of pollutant being emitted from the deactivation furnace. SCREEN predicted the maximum impact would be 18.55 ug/m^3 and would occur at a distance of 3450 feet from the deactivation furnace. The impacts expected from actual pollutant emissions will be directly proportional to this impact, i.e., a pollutant emitted at the rate of 2 lb/hr will produce a maximum hourly impact of 37.1 ug/m^3 at 3450 feet, and a pollutant emitted at the rate of 0.5 lb/hr will produce a maximum hourly impact of 9.28 ug/m^3. Using this proportional comparison, impacts were estimated for all pollutants which are expected to be generated by the deactivation furnace. The SCREEN analysis and a brief descriptive report are located in **Appendix J**.

For cases where impacts required recalculation to another time averaged basis the conversion factors provided by NYSDEC and summarized in **Table 4-3** were used. The factors are conservative estimates for the effect of changing wind direction and dispersion effects which can be expected to occur over the specified duration.

Table 4-3

NYSDEC Impact Conversion Factors

To Convert From	To	Multiply By
1 hour impact	24 hour impact	0.4
1 hour impact	3 month impact	0.2
1 hour impact	1 year impact	0.1

4.4 CALCULATION OF ALLOWABLE EMISSION RATES BASED ON NYSDEC GUIDANCE

After an impact was predicted for a generic source it became possible to predict impacts for the actual source. This was done by taking the ambient air quality standards and guidance for each pollutant and setting them up in a proportion with the generic impact predicted in **Section 4.3**. Hence an emission rate for each pollutant was calculated. These emission rates represent the rates at which pollutants can be emitted to the air and not exceed allowable ambient air quality standards and guidance.

As described in Air Guide-1 and in Volume IV, the air quality standards and guidance were developed to protect human health and the environment. Hence the state and the EPA have relied on toxicological risk data (i.e., risk assessments) to develop these numbers. By starting with these risk based limits, Seneca Army Depot has affectively incorporated a risk assessment into the calculated pollutant emission rates. Where SGC and AGC values were available or derivable the following equations were used to back calculate acceptable emission rates.

EQ 4.4.1

Qs (lb/hr) = SGC (ug/m^3) x 1 (lb/hr) / 18.55 (ug/m^3)

In order to establish an allowable emission rate for each pollutant, a value which met the requirements of the SGC, the allowable short term impact averaged on an hourly basis, was first calculated using EQ 4.4.1. The equation which is a simple ratio generates the emission rate Qs. In order to determine whether Qs will meet the annual average ambient requirements the following methodology was used.

1. A conservative yearly impact was predicted for a source which emits a pollutant at a concentration equal to the SGC. NYSDEC recommends that to derive an annual impact from an hourly number multiply it by 0.10. However, as the furnace will be permitted to operate only 2080 hours (40 hours a week, 52 weeks per year) out of the 8760 hour year (24 hours a day, 365 days per year) the actual predicted impact will be less than that, in proportion to the number of hours of operation to the total number of hours in a year. Consequently:

   Predicted Annual Impact (PAI) = SGC x 0.10 x 2080/8760

2. The PAI is then compared to the AGC. If it is less than the AGC, then the emission rate Qs satisfies the hourly and annual guidance and can be used to back calculate a munition feed rate. If the PAI exceeds the AGC, then the emission rate Qs satisfies the hourly guidance but not the annual guidance; thus, the emission rate must be reduced.

3. If the emission rate has been shown to exceed the AGC in step 2, then the rate must be reduced by multiplying Qs by the ratio of the AGC to the PAI. The resulting emission rate, Qa, will satisfy the hourly and annual guidance and can be used to back calculate a munition feed rate. The equation for Qa is:

   Qa = Qs x AGC/PAI

Algebraically steps 1 through 3 reduce to EQ. 4.4.2. For the purpose of calculating acceptable emission rates under AG-1, the most restrictive value obtained from equations 4.4.1 and 4.4.2 were used.

EQ 4.4.2

Qa (lb/hr) = [Qs x AGC] / [(0.1 x SGC x 2080 (hrs)/8760 (hrs)]

These equations or derivations were used to generate emission rates in all cases. The actual calculations are included in Appendix D. The resulting allowable emission rates meet all Federal standards and State guidance for the emission of the toxic pollutants known to be emitted from the deactivation furnace.

4.5 CALCULATION OF ALLOWABLE EMISSION RATES BASED ON FEDERAL GUIDANCE

As described previously, Volume IV of the incinerator guidance series contains proposed allowable ambient air impacts which are more restrictive than current 40 CFR Part 264 Subpart O limits. The proposed guidance defines a risk based impact called a Reference Air Concentration (RAC). In order to show compliance with this guidance, which in most cases is also more restrictive than NYSDEC guidance, the following equation was used to back calculate allowable emission rates. The equation was derived from methodology similar to that used to derive emission rates from NYSDEC guidance.

The RAC is an acceptable lifetime impact, which SEAD has conservatively used as an annually averaged impact. As described in **Section 4.2** the impact of 1 lb/hr of pollutant from the deactivation furnace is predicted to be 18.55 ug/m^3 on an hourly average. For lack of Federal guidance the NYSDEC conversion factor for an hourly averaged impact to an annually averaged impact is used. The resulting predicted annually averaged impact is 1.855 ug/m^3. The RAC is simply multiplied by the ratio of 1 lb/hr emission to an impact of 1.855 ug/m^3 and by the ratio of the total number of hours in a year of operation to the total number of hours of operation, which were described previously. The resulting allowable emission rates meet the requirements of Federal guidance. The equation 4.5.1 follows:

EQ 4.5.1

Qa = [RAC (ug/m^3) x 1 (lb/hr)]/[(1.855 (ug/m^3) x 2080 (hrs)/8760 (hrs)]

4.6 BACK CALCULATION OF MUNITION FEED RATES

Two emission rates were derived for each pollutant; one from NYSDEC ambient air quality limits and the other from EPA limits. The lowest of the emission rates established for each pollutant was then selected as its maximum allowable emission rate. This information is summarized in **Table 4-4.** Feedrates were then calculated by dividing the maximum allowable emission rate for each pollutant, by the fraction expected to partition to the gas phase (the remainder going to kiln bottoms) and then by the fraction which is expected to pass through the baghouse (filter fabric). Volume IV of the incinerator guidance series describes a similar methodology for deriving feed rates in its Tab D, "To establish the interim feed rate limits, the permit writer should back-calculate from an acceptable emission limit using reasonable but conservative assumptions regarding: (1) the removal efficiency of the emission control device and (2) partitioning of metals to bottom ash".

It should be noted that the removal efficiencies are minimum values and actual partitioning and baghouse removal efficiencies are expected to be higher. The baghouse removal efficiencies, metals' partitioning data, and the resulting allowable feed rates are summarized in **Table 4-4** for each pollutant. It should also be noted that in the case of HCl emissions are limited to 4.0 lb/hr by 40 CFR 264.343.A.2.b. Seneca Army Depot has conservatively decided to limit chlorine emissions and feed rate in any form to 3.0 lb/hr. Similarly for the calculation of feed rate reductions, all particulate matter was assumed to exist as PM-10. This conservative assumption adds another margin of safety to the calculated allowable feed rates. It should also be noted that the deactivation furnace does not represent a "major stationary source" as it does not belong to the list of 28 source categories, and does not have the potential to emit greater than 250 tons per year of any pollutant subject to regulation under the Clean Air Act (i.e. SO_2, NO_2).

Munition feed rates established by U.S. Army experiments were then reduced where necessary to reflect the maximum allowable feed rates for each pollutant identified in **Table 4-4**. The munitions generating the highest allowable emissions of each pollutant were chosen as test parameters for the Trial Burns. No emission rate or feed rate for any pollutant will exceed the allowable rates established in the Trial Burns.

The resulting allowable feed rates for the 200 munitions that are proposed to be incinerated are listed in **Table 4-5** of this section and on the individual waste characterization sheets located in **Appendix C.** Kiln temperature and rotation rates for standard operation are recorded where available in **Appendix L.** In addition, **Table 4-5** lists the item feed rate, thermal input rate, ash yield rate, chlorine feed rate, the organic hazardous constituent feed rates, and hazardous metal constituent feed rates for each munition item. This data set provides the basis for selecting trial burn wastes, as described in **Section 5.**

Table 4-4
SUMMARY OF ALLOWABLE POLLUTANT EMISSION AND FEED RATES

Pollutant	Federal Standards & NYSDEC Guidance Emission Rate (lb/hr)	EPA Guidance Emission Rate (lb/hr)	Metal Partitioning Removal (%)	Baghouse Removal (%)	Federal Standards & NYSDEC Guidance Feed Rate (lb/hr)	EPA Guidance Feed Rate (lb/hr)	Max. Allowable Feed Rate (lb/hr)
Aluminum	10.81	NA	0 (3)	90 (3)	108	NA	108
Antimony	2.72	0.68	0	95	54	13.6	13.6
Barium	1.14	114	50	95	45	4560	45
Chrome VI	4.5×10^{-5}	1.9×10^{-3}	95	99 (3)	0.09	3.8	0.09
HCl	4.0	4.4	0	0	4.0 (4)	4.4	3.0 (5)
Lead	1.7	0.2	0	99 (1)	170	20.4	20.4
Nickel	0.081	NA	0	90 (3)	0.81	NA	0.81
NO_2	227	NA	NA	NA	4540	NA	4540
Particulate (PM-10)	10.1	NA	0	90 (3)	101	NA	101
SO_2	49.2	NA	NA	NA	49.2	NA	49.2
Strontium	0.54	NA	89 (2)	95 (3)	98	NA	98
Tin	10.81	NA	0 (3)	90 (3)	108	NA	108
Zinc	8.09	NA	0 (3)	90 (3)	80	NA	80

Trial Burn Report - Lake City Army Ammunition Plant - USAEHA
EPA/600/9-89/072
Conservative Estimate
40 CFR 264.343 A.2.b
Self Imposed restriction

ote: Except as specified baghouse removal efficiency and partitioning data from EPA, Volume IV of the Incineration Guidance Series.
All metal emission limits are associated with the elemental metal although actual metal emissions will be as oxides which are less toxic.
All chrome was assumed to exist as Chrome VI.

The heating value, ash content, chlorine content and organic hazardous constituent data in the tables are derived from the detailed waste characterization data in **Appendix C**. **Table C-1** presents ash yield, chlorine content, and higher heating value data for each chemical compound used in the munition formulations. The ash yields and heating values are based on thermodynamic reaction pathways for the munitions in the incinerator environment. **Table C-2** provides chemical compositions for the munition items. These data are based on military specifications for manufacture of the munitions and are thus thought to be quite accurate.

TABLE 4–5
SUMMARY OF MUNITION FEED RATES

COMPONENT	ITEM RATE items/hr	PEP QUANT (gr/item)	PEP RATE (lb/hr)	CL CONT (lb/lb)	ASH CONT (lb/lb)	HEAT VALUE (BTU/lb)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBP RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)
HEI – M56A3 (w/double base propellant)	900	769.38	98.92	0.0000	0.1413	5625	0.0049	13.9741	556474	6.81	0.01	0.09	0.00	0.18	0.00	0.00	0.00	4.24	0.24	0.70
HEI – M96	900	638.59	82.10	0.0347	0.2781	4745	2.8454	22.8352	389576	3.61	0.02	0.00	0.00	0.05	0.00	0.36	0.00	0.00	0.00	0.48
HEI – M97A2 (w/Single base propellant)	900	676.51	86.98	0.0000	0.1343	5295	0.0000	11.6842	460546	5.40	0.01	0.09	0.00	0.19	0.00	0.51	0.00	0.01	6.20	0.85
HEI – M97A2 (w/Double base propellant)	900	710.45	91.34	0.0000	0.1389	5732	0.0000	12.6840	523610	5.40	0.01	0.09	0.00	0.19	0.00	0.77	0.00	6.20	0.65	0.98
HEI – M210 (w/double base propellant)	900	702.89	90.37	0.0061	0.1624	5773	0.5545	14.6802	521698	5.23	0.04	0.04	0.00	0.16	0.00	0.77	0.00	6.17	0.65	0.97
Ball,Long Rifle–M24\Tracer,Long Rifle	22500	3.03	9.73	0.0000	0.0903	4870	0.0000	0.8790	47380	0.00	0.07	0.27	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00
1\Short,Blank Commercial\Ball,Long Rifle Ball,Hornet–M65	22500	13.71	44.08	0.0000	0.0293	5259	0.0000	1.2929	231843	0.00	0.07	0.27	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00
– M1,Tracer w/I276	16000	70.07	160.17	0.0000	0.2219	4531	0.0000	35.5337	725735	0.92	0.15	4.91	0.00	0.22	10.09	0.00	0.01	0.00	10.29	1.60
– M1,Tracer w/I280	20000	66.25	189.29	0.0000	0.1746	4772	0.0000	33.0559	903238	0.11	0.19	0.29	0.00	0.28	10.18	0.00	0.00	0.00	12.86	2.01
– M1,HPT	22500	55.80	179.34	0.0000	0.0124	4762	0.0000	2.2234	854075	0.13	0.21	0.32	0.00	0.31	0.00	0.00	0.00	0.00	13.50	2.26
– M1,Ball Carbine	22500	14.90	47.89	0.0000	0.0323	5024	0.0000	1.5477	240589	0.13	0.21	0.32	0.00	0.31	0.00	0.00	0.00	1.93	0.32	0.64
– M2,AP (w/4895)	22500	59.00	189.63	0.0000	0.0128	4786	0.0000	2.4304	907592	0.13	0.21	0.32	0.00	0.31	0.00	0.00	0.00	0.00	16.08	2.26
– M2,AP (w/WC852)	22500	62.30	200.25	0.0000	0.0212	5236	0.0000	4.2424	1048465	0.13	0.21	0.32	0.00	0.31	0.00	0.00	0.00	13.18	1.93	2.58
– M2,Ball (w/IMR 4895)	22500	53.69	172.58	0.0000	0.0129	4801	0.0000	2.2214	828575	0.13	0.21	0.32	0.00	0.31	0.00	0.00	0.00	0.00	14.46	2.25
–M2,Ball (w/WC 852)	22500	56.49	181.58	0.0000	0.0184	5292	0.0000	3.3366	960926	0.13	0.21	0.32	0.00	0.31	0.00	0.00	0.00	12.21	1.61	2.57
– M6,Grenade (carbine)	22500	24.39	78.40	0.0000	0.0402	4850	0.0000	3.1547	380261	0.13	0.21	0.32	0.00	0.31	0.00	0.00	0.00	2.89	0.64	0.96
– M3,Grenade	22500	48.49	155.86	0.0000	0.0143	4792	0.0000	2.2214	746945	0.13	0.21	0.32	0.00	0.31	0.00	0.00	0.00	0.00	13.18	1.93
– M2,Ball OHF	22500	61.09	196.36	0.0000	0.0207	5247	0.0000	4.0570	1030226	0.13	0.21	0.32	0.00	0.31	0.00	0.00	0.00	13.18	1.61	2.57
– M14,API (w/WC 852)	22500	58.89	189.29	0.0000	0.0610	5256	0.0000	11.5385	994906	1.29	0.21	2.03	0.00	0.31	0.00	0.00	0.00	12.21	1.61	2.57
– M14,API (w/IMR 4895)	22500	55.69	179.00	0.0000	0.0542	4824	0.0000	9.7029	863567	1.29	0.21	2.03	0.00	0.31	0.00	0.00	0.00	0.00	14.46	2.25
– M18,HPT (w/WC820,Carbine)	22500	15.67	50.37	0.0000	0.0226	5019	0.0000	1.1367	252782	0.00	0.07	0.27	0.00	0.20	0.00	0.00	0.00	1.93	0.32	0.64
– M22.Frangible	22500	12.08	38.83	0.0000	0.0495	4239	0.0000	1.9207	164583	0.13	0.21	0.32	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.45
– M25,Tracer (w/WC852)	22500	63.49	204.08	0.0123	0.0934	5112	2.5027	19.0626	1043281	0.13	0.21	0.32	0.00	0.31	5.19	0.00	0.00	12.21	1.61	2.57
– M25,Tracer (w/IMR4895)	22500	57.62	185.21	0.0135	0.0713	4947	2.5027	13.2035	916172	0.13	0.21	0.32	0.00	0.31	1.08	0.00	0.00	0.00	14.46	2.25
– M27,Tracer (w/I–276)	22500	21.40	68.79	0.0000	0.2899	4560	0.0000	19.9439	313660	0.13	0.21	2.51	0.00	0.31	6.01	0.00	0.00	1.93	0.32	0.64
– M27,Tracer (w/I–280)	22500	21.41	68.82	0.0000	0.2857	4613	0.0000	19.6613	317431	0.13	0.21	0.32	0.00	0.31	7.81	0.00	0.00	1.93	0.32	0.64

TABLE 4–5
SUMMARY OF MUNITION FEED RATES

COMPONENT	ITEM RATE items/hr	PEP QUANT (gr/item)	PEP RATE (lb/hr)	CL CONT (lb/lb)	ASH CONT (lb/lb)	HEAT VALUE (BTU/lb)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBP RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	R (
– M72,Ball–Match	22500	53.69	172.58	0.00	0.01	4801	0.00	2.22	828575	0.13	0.21	0.32	0.00	0.31	0.00	0.00	0.00	0.00	14.46	2.25	
– M190, Blank (w/WC Blank)	22500	16.03	51.53	0.00	0.15	4226	0.00	7.63	217763	0.13	0.21	0.32	0.00	0.31	5.26	0.00	0.00	1.29	0.32	0.64	
– M1909,Blank (w/SR 4990)	22500	17.99	57.83	0.00	0.17	3970	0.00	9.81	229572	0.13	0.21	1.59	0.00	0.31	5.26	0.00	0.00	1.29	0.32	0.64	
Ball,Special–PGU–12/B	22500	6.31	20.28	0.00	0.04	5310	0.00	0.74	107707	0.00	0.07	0.26	0.00	0.18	0.00	0.00	0.00	0.00	0.00	0.00	
Ball,Special–M41 (w/SR 7325)	22500	5.40	17.36	0.00	0.04	4450	0.00	0.74	77247	0.00	0.07	0.26	0.00	0.18	0.00	0.00	0.00	0.00	0.61	0.19	
Ball,Special–M41 (w/HPC1)	22500	4.84	15.56	0.00	0.06	5335	0.00	0.91	82994	0.00	0.07	0.26	0.00	0.18	0.00	0.00	0.00	0.00	0.61	0.19	
ı Projectile,AP–T–M81	1300	150.17	27.89	0.10	0.23	6710	2.91	6.39	187133	0.00	0.00	0.00	0.00	0.00	5.35	0.00	0.00	0.00	0.00	0.00	
ı Practice Ctg. – M385	660	69.62	6.56	0.00	0.03	4838	0.00	0.19	31757	0.04	0.00	0.06	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	
ı Practice Ctg. – M407	660	84.48	7.97	0.06	0.61	875	0.48	4.85	6968	0.04	0.00	0.01	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	
liber Ball,HPT–M1(w/HPC18)	22500	8.06	25.91	0.00	0.06	4714	0.00	1.48	122123	0.00	0.09	0.37	0.00	0.27	0.00	0.00	0.00	0.00	0.00	0.00	
liber Ball,HPT–M1(w/SR7970)	22500	7.94	25.52	0.00	0.04	4493	0.00	1.05	114672	0.00	0.09	0.37	0.00	0.27	0.00	0.00	0.00	0.00	1.13	0.29	
liber Blank – M9	22500	11.47	36.87	0.00	0.08	3952	0.00	3.03	145695	0.00	0.09	1.45	0.00	0.27	0.00	0.00	0.00	0.00	0.00	0.42	
liber Tracer – M26 (w/SR 7970)	22500	12.38	39.79	0.00	0.44	3761	0.00	17.47	149665	0.00	0.09	5.84	0.00	0.27	3.27	0.00	0.01	0.00	0.96	0.26	
liber Tracer – M26 (w/HPC 18)	22500	12.58	40.44	0.00	0.44	3930	0.00	17.90	158896	0.00	0.09	5.84	0.00	0.27	3.27	0.00	0.01	0.00	0.00	0.00	
liber Ball – M1911 (w/SR 7970) 5 caliber Match–M1911(w/SR7970)	22500	5.82	18.71	0.00	0.06	4421	0.00	1.05	82711	0.00	0.09	0.37	0.00	0.27	0.00	0.00	0.00	0.00	0.80	0.23	
liber Ball – M1911 (w/HPC 18) 5 caliber Line Throwing–M32(w/HPC18)	22500	6.00	19.29	0.00	0.07	4685	0.00	1.43	90348	0.00	0.09	0.37	0.00	0.27	0.00	0.00	0.00	0.00	0.00	0.00	
liber Tracer – M1	3500	127.80	63.90	0.00	0.52	4849	0.00	33.18	309857	0.00	0.07	4.00	0.00	0.19	10.35	0.00	0.01	0.00	12.00	1.55	
liber Ball,HPT–M1	8000	69.00	78.86	0.00	0.06	8835	0.00	4.76	696713	0.00	0.16	0.60	0.00	0.44	0.00	0.00	0.00	27.43	2.74	4.11	
liber Incendiary – M1	7600	103.00	111.83	0.00	0.42	7715	0.00	47.48	862802	6.64	0.16	10.35	0.00	0.42	0.00	0.00	0.00	26.06	2.61	3.91	
liber Blank – M1	8000	52.40	59.89	0.00	0.04	4764	0.00	2.14	285268	0.00	0.16	0.60	0.00	0.44	0.00	0.00	0.00	1.03	0.57	0.80	
liber Blank – M1A1	8000	52.70	60.23	0.00	0.03	4932	0.00	1.69	297039	0.00	0.16	0.60	0.00	0.44	0.00	0.00	0.00	0.00	0.00	0.00	
liber Ball,AP–M2(w/WC860)&.50caliber ball–M2	8000	63.50	72.57	0.00	0.07	9101	0.00	4.76	660465	0.00	0.16	0.60	0.00	0.44	0.00	0.00	0.00	26.86	2.74	4.00	
liber Ball,AP–M2(w/IMR5010)	8000	80.50	92.00	0.00	0.04	5864	0.00	3.46	539470	0.00	0.16	0.60	0.00	0.44	0.00	0.00	0.00	0.00	26.86	3.54	
liber API – M8 (w/WC 860)	8000	78.50	89.71	0.00	0.27	8519	0.31	24.19	764319	3.09	0.16	4.23	0.00	0.44	0.00	0.00	0.00	26.86	2.74	4.00	
liber API – M8 (w/IMR 5010)	8000	64.45	73.66	0.00	0.30	6710	0.00	22.40	494275	3.09	0.16	4.23	0.00	0.44	0.00	0.00	0.00	0.00	26.86	3.54	
liber Tracer – M10	3700	106.75	56.43	0.00	0.53	6130	0.00	29.80	345875	0.00	0.08	0.28	0.00	0.20	10.28	0.00	0.00	0.00	12.69	1.64	

TABLE 4–5
SUMMARY OF MUNITION FEED RATES

COMPONENT	ITEM RATE items/hr	PEP QUANT (gr/item)	PEP RATE (lb/hr)	CL CONT (lb/lb)	ASH CONT (lb/lb)	HEAT VALUE (BTU/lb)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT RATE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBP RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)
liber Tracer – M17 (w/I–508)	2700	138.95	53.60	0.04	0.50	3628	2.16	26.99	194431	0.00	0.06	2.92	0.00	0.15	10.47	0.00	0.00	0.00	8.68	1.12
liber Tracer – M17 (w/I–176)	3800	105.92	57.50	0.05	0.51	4986	2.82	29.53	286683	0.00	0.08	4.35	0.00	0.21	7.40	0.00	0.01	0.00	12.21	1.57
liber API–T – M20	6600	73.20	69.02	0.00	0.43	6153	0.25	29.75	424674	2.55	0.14	5.42	0.00	0.36	3.20	0.00	0.00	0.00	21.69	2.83
liber Incendiary – M23(w/IM–28)	6377	143.70	130.91	0.02	0.74	5914	1.97	96.78	774189	14.76	0.13	18.14	0.00	0.35	0.00	0.00	0.00	0.00	20.50	2.82
liber Incendiary – M23(w/IM–11)	6377	143.70	130.91	0.00	0.75	5856	0.00	98.17	766663	14.76	0.13	22.21	0.00	0.35	0.00	0.00	0.00	0.00	20.50	2.82
liber Ball – M33 (w/WC 860)	8000	63.50	72.57	0.00	0.07	9101	0.00	4.76	660465	0.00	0.16	0.60	0.00	0.44	0.00	0.00	0.00	26.86	2.74	4.00
liber Ball – M33 (w/IMR 5010)	8000	50.50	57.71	0.00	0.06	6770	0.00	3.46	390738	0.00	0.16	0.60	0.00	0.44	0.00	0.00	0.00	0.00	26.86	3.54
liber Ball,Spotter–Tracer–M48A1	6600	165.72	156.25	0.00	0.35	4959	0.75	54.36	774864	0.00	0.35	10.40	0.00	0.72	2.08	0.00	0.02	4.15	14.05	1.04
liber Ball,Spotter–Tracer–M48A2	6600	165.86	156.38	0.00	0.35	5002	0.68	54.51	782275	0.21	0.35	9.90	0.00	0.72	2.13	0.00	0.01	4.15	14.05	1.04
liber API – T49	7439	82.30	87.46	0.00	0.05	8293	0.00	4.60	725336	0.00	0.15	0.56	0.00	0.41	0.00	0.00	0.00	26.78	2.66	4.04
liber Ball,Practice–T249–E2	8000	120.90	138.17	0.00	0.02	5201	0.00	2.50	718608	0.00	0.16	0.60	0.00	0.44	0.00	0.00	0.00	5.03	17.03	1.26
liber Ball,HPT–T251	8000	52.90	60.46	0.00	0.04	5632	0.00	2.72	340465	0.00	0.16	0.60	0.00	0.44	0.00	0.00	0.00	0.00	15.43	2.06
m – M193 (w/WC 844,double base propellant)	22500	27.44	88.20	0.00	0.01	5041	0.00	0.93	444665	0.10	0.14	0.22	0.00	0.21	0.00	0.00	0.00	3.38	0.61	0.96
m – M193 (w/IMR 8208,single base propellant)	22500	27.44	88.20	0.00	0.02	4447	0.00	1.38	392261	0.10	0.14	0.22	0.00	0.21	0.00	0.00	0.00	0.00	0.00	1.13
m grenade – M195 (IMR–4475,single base propellant)	22500	29.06	93.41	0.00	0.01	4821	0.00	1.38	450313	0.10	0.14	0.22	0.00	0.21	0.00	0.00	0.00	0.00	8.68	1.13
m HPT – M197 (IMR–4475,single base propellant)	22500	18.47	59.37	0.00	0.02	4662	0.00	1.13	276771	0.10	0.14	0.22	0.00	0.21	0.00	0.00	0.00	0.00	3.28	0.71
m Tracer – M196 (IMR–8208,single base propellant)	22500	30.43	97.81	0.01	0.12	4352	0.78	12.04	425665	0.10	0.14	0.35	0.00	0.35	4.12	0.00	0.00	0.00	0.00	1.09
m Tracer – M196 (WC–844,double base propellant)	22500	30.44	97.85	0.01	0.12	4868	0.78	11.61	476290	0.10	0.14	0.35	0.00	0.35	4.12	0.00	0.00	3.25	0.58	0.93
nm AP – M61 (w/double base propellant)	22500	44.51	143.06	0.00	0.01	5290	0.00	1.55	756788	0.01	0.20	0.32	0.00	0.32	0.00	0.00	0.00	9.22	1.32	1.98
nm Tracer – M62 (w/double base propellant)	22500	48.36	155.46	0.01	0.12	5113	1.84	18.25	794919	2.05	0.18	0.27	0.00	0.27	6.12	0.00	0.00	8.62	1.23	1.85
nm Grenade – M64 (w/single base propellant)	22500	40.51	130.22	0.00	0.03	4609	0.00	3.59	600208	0.12	0.17	0.27	0.00	0.26	0.00	2.04	0.00	0.00	8.75	0.77
nm Blank – M82 (w/single base propellant)	22500	17.63	56.67	0.00	0.03	4943	0.00	1.92	280096	0.14	0.22	0.41	0.00	0.33	0.00	0.00	0.00	0.00	2.42	0.60
nm Blank – M82 (w/double base propellant)	22500	18.84	60.57	0.00	0.04	5244	0.00	2.27	317623	0.14	0.22	0.41	0.00	0.33	0.00	0.40	0.00	0.72	0.48	0.72
n Projectile,HVTP–T–M315A1	660	0.02	0.00	0.00	0.48	2254	0.00	0.00	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
n Projectile,AP–T–M339	330	0.02	0.00	0.00	0.48	2254	0.00	0.00	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ropellant	NA	NA	199.51	0.00	0.00	5312	0.00	0.00	1059830	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.40	22.81	0.00

TABLE 4–5
SUMMARY OF MUNITION FEED RATES

COMPONENT	ITEM RATE item/hr	PEP QUANT (gr/item)	PEP RATE (lb/hr)	CL CONT (lb/lb)	ASH CONT (lb/lb)	HEAT VALUE (BTU/lb	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT RATE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBP RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)
ropellant	NA	NA	125.03	0.0200	0.0316	5116	2.4979	3.9533	639587	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Plunger – M1	3126	2.3500	1.0494	0.0000	0.8677	1685	0.0000	0.9106	1768	0.00	0.02	0.12	0.04	0.53	0.00	0.00	0.00	0.00	0.00	0.00
Delay – M9	63338	1.3301	12.0350	0.0000	0.7392	1571	0.0000	8.8963	18901	0.36	0.26	0.38	0.00	6.92	0.00	0.00	0.00	0.00	0.00	0.00
– M2	3978	2.2400	1.2730	0.0000	0.8414	1563	0.0000	1.0711	1990	0.00	0.02	0.12	0.04	0.68	0.00	0.00	0.00	0.00	0.00	0.00
nator – M16A1	958	8.8400	1.2098	0.0142	0.7108	1557	0.0171	0.8600	1883	0.00	0.00	0.10	0.04	0.49	0.00	0.00	0.00	0.00	0.00	0.00
nator – M17	19302	4.7701	13.1533	0.0000	0.5688	2199	0.0000	7.4812	28923	0.00	0.00	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00
nator – M18	21286	5.1801	15.7521	0.0184	0.5684	2126	0.2903	8.9538	33496	0.00	0.72	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00
nator – M23	25882	4.2101	15.5666	0.0179	0.5737	2100	0.2781	8.9312	32696	0.00	0.69	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00
nator – M22	27007	4.1802	16.1276	0.0180	0.5577	2186	0.2902	8.9942	35260	0.00	0.72	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00
nator – M24	21692	3.9001	12.0859	0.0260	0.7499	1119	0.3138	9.0637	13521	0.00	0.78	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00
nator – M35	17386	7.0102	17.4112	0.0000	0.4297	2948	0.0000	7.4810	51326	0.00	0.00	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00
nator – M30A1	37960	2.8001	15.1848	0.0000	0.4927	2203	0.0000	7.4813	33455	0.00	0.00	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00
nator – M36A1	26072	5.4602	20.3369	0.0000	0.3680	2419	0.0000	7.4844	49204	0.00	0.00	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00
nator – M37	18124	6.8301	17.6842	0.0148	0.4978	2521	0.2622	8.8031	44585	0.00	0.65	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00
nator – M41	15894	7.1701	16.2803	0.0347	0.5480	2106	0.5649	8.9212	34291	0.00	0.46	0.00	0.00	7.00	0.00	0.00	0.00	0.00	0.00	0.00
nator – M42	15586	8.7002	19.3715	0.0000	0.4611	2975	0.0000	8.9317	57630	0.36	0.26	0.42	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00
nator – M44	21971	5.3802	16.8868	0.0172	0.5274	2348	0.2906	8.9062	39649	0.00	0.68	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00
nator – M45	14403	8.0301	16.5226	0.0353	0.5418	1858	0.5834	8.9521	30707	0.00	0.46	0.00	0.00	7.00	0.00	0.00	0.00	0.00	0.00	0.00
nator – M47	39394	2.4301	13.6760	0.0000	0.5792	1799	0.0000	7.9216	24599	0.00	0.20	0.18	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00
nator – M48	38387	4.2401	23.2521	0.0000	0.3218	2525	0.0000	7.4814	58714	0.00	0.00	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00
nator – M53	628	3.6100	0.3239	0.0347	0.9192	–252	0.0112	0.2977	–82	0.00	0.00	0.10	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00
nator – M55	76271	1.3101	14.2749	0.0000	0.5662	1819	0.0000	8.0828	25966	0.00	0.24	0.29	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00
nator – M57A1/A2	46340	2.2001	14.5649	0.0000	0.5839	1930	0.0000	8.5048	28116	0.00	0.86	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00
nator – M58	85663	2.7102	33.1662	0.0538	0.4347	2158	1.7852	14.4161	71573	0.00	5.02	0.00	0.00	4.17	0.00	0.00	0.00	0.00	0.00	0.00
nator – M59	38048	2.4401	13.2630	0.0000	0.5867	1784	0.0000	7.7813	23663	0.00	0.12	0.14	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00
nator – M61	217732	0.7102	22.0905	0.0000	0.5877	1317	0.0000	12.9831	29102	0.00	2.46	2.31	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00

TABLE 4-5
SUMMARY OF MUNITION FEED RATES

COMPONENT	ITEM RATE items/hr	PEP QUANT (gr/item)	PEP RATE (lb/hr)	CL CONT (lb/lb)	ASH CONT (lb/lb)	HEAT VALUE (BTU/lb)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)
nator – M63	32012	3.3101	15.1377	0.0000	0.5179	2056	0.0000	7.8391	31123	0.00	0.16	0.15	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00
nator – M80	20097	5.2001	14.9296	0.0000	0.5011	2170	0.0000	7.4813	32402	0.00	0.00	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00
nator – M84	70466	1.9202	19.3296	0.0000	0.3871	2330	0.0000	7.4823	45032	0.00	0.00	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00
nator – MK18 Mod 0	38172	2.1101	11.5066	0.0206	0.7532	1123	0.2366	8.6668	12921	0.00	0.59	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00
nator – MK 19 Mod 0	65701	1.7101	16.0510	0.0288	0.6145	1837	0.4616	9.8632	29487	0.00	1.15	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00
nator – MK 25 Mod 0	20216	4.0901	11.8122	0.0233	0.7518	1120	0.2757	8.8800	13225	0.00	0.69	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00
nator – MK 28 Mod 0	9651	7.5401	10.3956	0.0000	0.7196	1387	0.0000	7.4812	14416	0.00	0.00	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00
nator – MK 29 Mod 0	27776	2.4601	9.7616	0.0000	0.7664	1135	0.0000	7.4813	11079	0.00	0.00	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00
nator – MK33 Mod 0	18467	3.7001	9.7614	0.0000	0.7664	1135	0.0000	7.4811	11079	0.00	0.00	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00
nator – MK 37 Mod 0	42705	2.0601	12.5681	0.0000	0.5953	2056	0.0000	7.4814	25844	0.00	0.00	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00
nator – MK 43 Mod 0	35588	3.9302	19.9810	0.0199	0.4750	2623	0.3971	9.4913	52420	0.00	0.99	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00
nator – MK 44 Mod 0	36153	2.8401	14.6685	0.0234	0.6272	1790	0.3437	9.1997	26253	0.00	0.86	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00
nator – MK 44 Mod 1	35568	2.8801	14.6343	0.0000	0.5847	1891	0.0000	8.5564	27668	0.00	0.48	0.46	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00
nator – MK 54 Mod 0	14538	4.7001	9.7614	0.0000	0.7664	1135	0.0000	7.4811	11079	0.00	0.00	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00
nator – MK 55 Mod 0	26080	4.2402	15.7976	0.0000	0.4736	2711	0.0000	7.4814	42834	0.00	0.00	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00
nator – MK 56 Mod 0	375601	0.3902	20.9360	0.0964	0.7061	1070	2.0189	14.7832	22411	0.00	5.02	0.00	0.00	4.19	0.00	0.00	0.00	0.00	0.00	0.00
nator – MK 59 Mod 0	38172	2.7101	14.7788	0.0000	0.5062	2536	0.0000	7.4813	37475	0.00	0.00	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00
nator – MK 96 Mod 0	38604	2.7701	15.2769	0.0000	0.4897	2000	0.0000	7.4814	30554	0.00	0.00	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00
nator – T 83E1	232020	1.6302	54.0328	0.0000	0.1865	3299	0.0000	10.0761	178240	0.00	1.19	1.05	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00
nator – T 84E1	41359	2.1601	12.7629	0.0000	0.6157	1669	0.0000	7.8580	21300	0.00	0.17	0.16	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00
Point Detonating –MK27(w/booster)	660	351.1232	33.1059	0.0001	0.0106	5203	0.0038	0.3525	172246	0.00	0.00	0.00	0.00	0.32	0.00	0.00	0.00	0.00	0.00	0.00
Auxiliary Detonating –MK31 Mod2(w/booster)	16030	5.0290	11.5164	0.0000	0.7144	1190	0.0000	8.2271	13707	0.00	0.30	0.34	0.00	6.94	0.00	0.00	0.00	0.00	0.00	0.00
Point Detonating – M48	3163	6.1720	2.7889	0.0159	0.7941	1331	0.0444	2.2145	3711	0.00	0.13	0.12	0.04	1.52	0.00	0.00	0.00	0.00	0.00	0.00
Base Detonating – M66A1/A2	660	107.3870	10.1251	0.0314	0.2662	4721	0.3183	2.6948	47801	0.00	0.00	0.00	0.00	0.23	0.74	0.00	0.00	0.00	0.00	0.00
Point Detonating –M78A1(w/booster)	3954	9.7080	5.4836	0.0110	0.7765	1225	0.0605	4.2579	6717	0.00	0.17	0.12	0.04	3.35	0.00	0.00	0.00	0.00	0.00	0.00
Grenade – M204A2, M206, M213, M214	579305	0.3845	31.8204	0.0000	0.6759	2717	0.0000	21.5068	86468	3.56	2.56	3.77	0.00	6.97	0.00	0.00	0.00	0.00	0.00	0.00

TABLE 4-5
SUMMARY OF MUNITION FEED RATES

COMPONENT	ITEM RATE items/hr	PEP QUANT (gr/item)	PEP RATE (lb/hr)	CL CONT (lb/lb)	ASH CONT (lb/lb)	HEAT VALUE (BTU/lb)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBP RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)
MTSQ-M502	440	331.9320	20.8643	0.0002	0.0162	5171	0.0049	0.3370	107898	0.00	0.01	0.00	0.00	0.28	0.00	0.00	0.00	0.00	0.00	0.00
Point Detonating-Base Detonating-M509A1	11000	125.3929	197.05	0.0000	0.0118	5158	0.0000	2.3292	1016355	0.00	0.00	0.00	0.00	2.16	0.00	0.00	0.00	0.00	0.00	0.00
Proximity-M513A1(w/booster)	3600	388.3040	199.70	0.0000	0.0043	5235	0.0000	0.8675	1045413	0.00	0.00	0.00	0.00	0.80	0.00	0.00	0.00	0.00	0.00	0.00
Point Detonating-M521	13859	7.7620	15.37	0.0175	0.6011	1894	0.2692	9.2372	29101	0.00	0.56	0.00	0.00	6.96	0.00	0.00	0.00	0.00	0.00	0.00
Point Detonating-M525(w/booster)	5000	270.0119	192.87	0.0003	0.0106	4108	0.0620	2.0438	792382	0.00	0.15	0.00	0.00	1.60	0.00	0.00	0.00	0.00	0.00	0.00
Point Detonating-M557,M572(w/booster)	440	28.5650	1.80	0.0034	0.2523	11778	0.0062	0.4530	21147	0.00	0.02	0.07	0.01	0.21	0.00	0.00	0.00	0.00	0.00	0.00
Point Detonating-M564(w/booster)	3800	361.7247	196.36	0.0034	0.0277	4085	0.6664	5.4462	802196	0.00	0.51	0.02	0.00	3.56	0.00	0.00	0.00	0.00	0.00	0.00
Activator,Anti-tank-M1	13850	47.1999	93.39	0.0082	0.0932	4844	0.7682	8.7058	452371	0.00	0.00	0.00	0.00	7.09	0.00	0.00	0.00	0.00	0.00	0.00
on Ctg., Bomb-CCU-1/B	6600	8.5560	8.07	0.0000	0.2019	5188	0.0000	1.6291	41854	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
er - M21A4	440	321.3019	20.20	0.0000	0.0084	5216	0.0000	0.1701	105336	0.00	0.00	0.00	0.00	0.16	0.00	0.00	0.00	0.00	0.00	0.00
er, Fuze--M125A1	3600	379.4549	195.15	0.0000	0.0043	5602	0.0000	0.8337	1093317	0.00	0.00	0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
er - MK39 Mod 0	3400	415.8030	201.96	0.0000	0.0000	5261	0.0000	0.0000	1062519	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
on Ctg. - M5A2	19416	40.0118	110.98	0.0000	0.0083	5343	0.0000	0.9250	592947	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
on Element, Electric-M91(1377-00-007-4880)	660	13.9700	1.32	0.1141	0.4009	3429	0.1503	0.5281	4517	0.00	0.00	0.00	0.00	0.30	0.00	0.00	0.00	0.00	0.00	0.00
Plunger, 0.5sec-M1	40099	2.2100	12.66	0.0157	0.6941	1344	0.1989	8.7873	17017	0.00	0.16	0.00	0.00	6.99	0.00	0.00	0.00	0.00	0.00	0.00
t	22500	10.0032	32.15	0.0000	0.0000	5261	0.0000	0.0000	169158	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
lse Ctg. - MK15 Mod 0	45000	0.2700	1.74	0.0000	0.4379	2224	0.0000	0.7601	3861	0.00	0.00	0.00	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00
r Ctg. - M21,M22	2460	2.2320	0.78	0.0000	0.1950	3819	0.0000	0.1530	2996	0.02	0.03	0.04	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00
ssembly w/primer for an 81mm Mortar	2460	100.2336	35.22	0.0005	0.0106	5340	0.0173	0.3738	188092	0.00	0.01	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.26
er - A216 (Primer Mix 5061)	126515	2.3001	41.57	0.0000	0.6428	1205	0.0000	26.7218	50104	0.00	2.60	9.48	0.00	6.92	0.00	0.00	0.00	0.00	0.00	0.00
er - A216 (Primer Mix #5074)	6016	2.2800	1.96	0.0000	0.5628	882	0.0000	1.1028	1729	0.00	0.17	0.40	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00
er - M1BA2	20000	21.8001	62.29	0.0070	0.0257	9653	0.4381	1.6032	601255	0.00	0.35	0.00	0.00	0.51	0.00	0.00	0.00	0.00	0.00	0.00
er - M22A3	21000	66.0001	198.00	0.0023	0.4129	2386	0.4600	81.7555	472461	0.00	0.37	0.00	0.00	0.53	0.00	0.00	0.00	0.00	0.00	0.00
er - M23A1/A2	66000	21.0002	198.00	0.0073	0.4178	2353	1.4459	82.7235	465993	0.00	1.15	0.00	0.00	1.67	0.00	0.00	0.00	0.00	0.00	0.00
r Stab - M26	75000	1.8002	19.2875	0.1527	0.6003	1128	2.9447	11.5788	21764	0.00	2.39	0.00	0.00	4.11	0.00	0.00	0.00	0.00	0.00	0.00
er - M31	10000	51.0001	72.8573	0.0030	0.1307	7651	0.2190	9.5215	557439	0.00	0.17	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00

TABLE 4-5
SUMMARY OF MUNITION FEED RATES

COMPONENT	ITEM RATE items/hr	PEP QUANT (gr/item)	PEP RATE (lb/hr)	CL CONT (lb/lb)	ASH CONT (lb/lb)	HEAT VALUE (BTU/lb)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT RATE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBP RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)
er – M31A2/B2	10000	51.0001	72.86	0.0030	0.1307	7651	0.2190	9.5215	557439	0.0000	0.1749	0.0000	0.0000	0.2536	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
er – M32	330000	2.0902	98.54	0.0291	0.4423	2222	2.8643	43.5857	218923	0.0000	2.3780	0.0000	0.0000	3.3502	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
er – No.34	500309	0.5901	42.18	0.0000	0.6257	2007	0.0000	26.3911	84666	2.8603	4.6345	7.1978	0.0000	6.9190	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
er – FA34	500309	0.5901	42.18	0.0000	0.6257	2007	0.0000	26.3911	84666	2.8603	4.6345	7.1978	0.0000	6.9190	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
er – M28B2	2640	300.9811	113.51	0.0005	0.4112	2398	0.0578	46.6728	272165	0.0000	0.0462	0.0000	0.0000	0.0669	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
er – M34	22500	0.5900	1.90	0.0000	0.6257	2007	0.0000	1.1865	3806	0.1286	0.2083	0.3237	0.0000	0.3111	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
er – M40A2	1320	271.0157	51.11	0.0006	0.4112	2398	0.0289	21.0129	122551	0.0000	0.0231	0.0000	0.0000	0.0335	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
er – M57	660	56.8740	5.36	0.0027	0.4792	506	0.0145	2.5697	2715	0.0000	0.0115	0.0000	0.0000	0.0167	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
er – M71	22500	3.5290	11.34	0.0172	0.4282	2294	0.1953	4.8566	26026	0.0000	0.1620	0.0000	0.0000	0.2282	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
er – M82	22500	0.6314	2.03	0.0043	0.4135	2380	0.0086	0.8392	4831	0.0000	0.0072	0.0000	0.0000	0.0071	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
er, Percussion–M26	75000	1.8168	19.47	0.1516	0.6015	1134	2.9502	11.7088	22077	0.0000	2.4377	0.0000	0.0000	4.1763	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
er, Percussion–M47 & M68	4500	301.0099	193.51	0.0005	0.4111	2398	0.0986	79.5537	464075	0.0000	0.0787	0.0000	0.0000	0.1141	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
er, Percussion–M79	3700	381.0099	201.39	0.0004	0.4110	2399	0.0810	82.7744	483118	0.0000	0.0647	0.0000	0.0000	0.0938	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
er, Electric–M80A1	1600	872.9780	199.54	0.0004	0.2458	3220	0.0754	49.0375	642534	0.0000	0.0000	0.0000	0.0000	0.1493	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
er – M35	355000	0.3702	18.77	0.1563	0.5546	1398	2.9346	10.4117	26240	0.0000	2.1930	0.0000	0.0000	3.2439	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
er – M28/M28A2/M28B1/M28	2460	101.0001	35.49	0.0015	0.1264	7713	0.0539	4.4874	273769	0.0000	0.0430	0.0000	0.0000	0.0624	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
er – M29A1 (NOL 60)	366893	0.5101	26.74	0.0000	0.5141	1389	0.0000	13.7438	37149	0.0000	1.8876	3.6129	0.0000	6.9189	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
er – M29A1 (#5061)	579305	0.5001	41.39	0.0000	0.6545	1190	0.0000	27.0865	49234	0.0000	2.3852	9.6504	0.0000	6.9191	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
– M5	49157	1.3901	9.76	0.0000	0.7664	1135	0.0000	7.4814	11080	0.0000	0.0000	0.0000	0.0000	6.9309	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
– M7	44369	1.5401	9.76	0.0000	0.7664	1135	0.0000	7.4814	11080	0.0000	0.0000	0.0000	0.0000	6.9308	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
– XM9	30641	2.2301	9.76	0.0000	0.7664	1135	0.0000	7.4814	11080	0.0000	0.0000	0.0000	0.0000	6.9308	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
er, Rocket Motor–M20A1	24000	58.1659	199.43	0.0021	0.4106	2419	0.4186	81.8769	482355	0.0000	0.0000	0.0000	0.0000	0.8301	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
er, Rocket Motor–MK117,MK118	2280	30.0090	9.77	0.0000	0.4107	2401	0.0000	4.0143	23468	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
er, Rocket Motor–MK125–5	6600	10.0090	9.44	0.0000	0.4107	2401	0.0000	3.8758	22658	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
et, 3.5 inch–M29A2	347	2578.18	127.80	0.0196	0.0401	5055	2.4996	5.1301	646060	0.0000	0.0000	0.0000	0.0000	0.0120	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
et Motor, 3.5 inch	240	2520.01	86.40	0.0200	0.0316	5116	1.7246	2.7295	442018	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

TABLE 4-5
SUMMARY OF MUNITION FEED RATES

COMPONENT	ITEM RATE items/hr	PEP QUANT (gr/item)	PEP RATE (lb/hr)	CL CONT (lb/lb)	ASH CONT (lb/lb)	HEAT VALUE (BTU/lb)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBP RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)
, Ground Illuminating(Red)-M158	1600	538.51	123.09	0.0006	0.5877	2828	0.08	72.33	348122	0.00	0.03	0.00	0.00	0.04	9.84	0.00	0.00	0.00	0.00	0.00
- XC9/MK 1 Mod 0	950000	1.47	199.51	0.0039	0.3946	2276	0.79	78.72	454162	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
r - M5A2B1/B2	8000	35.00	40.00	0.0405	0.8893	4169	1.62	35.57	166754	0.69	0.00	0.00	0.00	0.00	9.18	0.00	0.00	0.00	0.00	0.00
r - M10/XM10	7500	63.00	67.50	0.0000	0.8773	3959	0.00	59.22	267243	0.00	0.00	0.00	0.00	0.00	9.67	0.00	0.00	0.00	0.00	0.00
r - M12	1800	62.90	16.17	0.1700	0.0831	1897	2.75	1.34	30678	0.00	0.00	5.21	0.00	0.00	0.22	0.00	0.00	0.00	0.00	0.00
r - M13	4500	110.90	71.29	0.0351	0.7617	3940	2.50	54.30	280902	0.00	0.00	10.99	0.00	0.00	9.83	0.00	0.00	0.00	0.00	0.00
r - No. 1/No. 2 (75-14-333)	6000	48.90	41.91	0.0394	0.8924	4172	1.65	37.40	174855	0.77	0.00	0.00	0.00	0.00	9.63	0.00	0.00	0.00	0.00	0.00
1 HE-T(MK4) (w/single base propellant)	900	722.52	92.90	0.0000	0.0039	4551	0.00	0.36	422780	0.00	0.00	0.00	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.80
ide Fuze (M215)	1175	0.37	0.06	0.0000	0.6686	2701	0.00	0.04	168	0.01	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Time M65A1	7300	51.99	54.22	0.0000	0.0481	281	0.00	2.61	15249	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Base Detonating(M91A1 w/booster)	1900	353.40	95.92	0.0162	0.3369	5137	1.55	32.32	492720	0.85	0.00	0.00	0.00	0.34	8.04	0.00	0.00	0.00	0.00	0.00
Point Detonating(M564 w/booster)	1900	361.71	98.18	0.0034	0.0277	4085	0.33	2.72	401089	0.00	0.26	0.01	0.00	1.78	0.00	0.00	0.00	0.00	0.00	0.00
ator Projectile M74	500	557.84	39.85	0.0000	0.5557	3471	0.00	22.14	138293	3.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
m Blank Cartridge (M200)	22500	7.97	25.61	0.0002	0.0431	4845	0.01	1.11	124081	0.09	0.14	0.39	0.00	0.21	0.00	0.00	0.00	0.23	0.23	0.34
Cartridge HEI-Single base	900	991.48	127.48	0.0052	0.1585	5278	0.66	20.20	672759	7.62	0.05	0.99	0.00	0.09	0.00	0.27	0.00	0.00	7.94	1.09
Cart API M53	1200	748.75	128.36	0.0056	0.0996	5356	0.72	12.78	687415	1.71	0.00	1.23	0.00	0.09	0.00	0.00	0.00	9.87	1.05	1.56
Cart INC M96	900	635.47	81.70	0.0349	0.2742	4770	2.85	22.40	389730	3.62	0.02	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.48
M501	220	1060.00	33.31	0.0125	0.6026	1881	0.42	20.08	62664	0.00	1.22	0.36	0.00	16.07	0.00	0.00	0.00	0.00	0.00	0.00
, Illuminating-AN-M37A2	25971	80.70	299.42	0.0033	0.4206	2424	0.98	125.94	725899	0.00	0.00	0.08	0.00	0.40	2.26	0.00	0.00	0.00	0.00	0.00
, Illuminating-AN-M43A2	32941	63.77	300.08	0.0036	0.4169	2416	1.08	125.12	724957	0.00	0.00	0.10	0.00	0.50	1.43	0.00	0.00	0.00	0.00	0.00

SECTION 5

TRIAL BURN WASTE SELECTION

5.1 Permitting Criteria

Due to the large number of waste munitions listed in Section 4, SEAD submits that it is impractical to perform a Trial Burn for each. For this reason, it is recommended that incinerator feed rate limitations defined in SEAD's permit be established for a set of worst case munitions. Once the worst case munitions are designated, Trial Burns will be conducted for each at the feed rate designated in **Section 4.0**. Data from these Trial Burns will then be used to demonstrate the incineration system's ability to safely and efficiently destroy waste munitions while complying with established discharge limitations. Munitions with compositions that are easier to destroy than the worst case set could then be allowed to be incinerated at rates up to those identified in **Table 4.5**.

SEAD recommends that the set of worst case munitions reviewed during Trial Burns include munitions that represent the greatest potential source of POHC, particulate, HCl and metals emissions. Additionally, SEAD recommends that munitions with a high level of Dioxin and Furan precursor compounds also be incinerated during a Trial Burn to produce data pertinent to the level of these types of emissions.

SEAD recommends that the following set of criteria be used to identify and select the set of worst case munition feed streams.

1. <u>POHC Emissions and Destruction and Removal Efficiency (DRE)</u>. The munitions selected to demonstrate the incinerator's DRE should contain the most difficult to incinerate POHCs. Additionally, these munitions should be fed to the incinerator at rates which produce the highest concentrations of the POHC achievable. It is also considered important that the POHC selected not be a product of incomplete combustion from other compounds contained in the munition, nor should it be a known "problem POHC". (Note: Several "problem POHCs" are identified in "Developing a Trial Burn Plan, Seminars for Hazardous Waste Incinerator Permit Writers, Inspectors and Operators," EPA/625/4-87/017).

   Two methods have been established to measure a materials incinerability. One method uses a compound's heat of combustion to rank the incinerability of the POHC. Under this method, a compound with a lower heat of combustion is predicted to be more difficult to incinerate than one with a higher value for its heat of combustion.

The second, and perhaps, more reliable ranking method is based on the compound's Thermal Stability at low Oxygen Index ($TSLoO_2$). This methodology is defined in Appendix D, Volume II of the hazardous waste guidance series (i.e., "Guidance on Setting Permit Conditions and Reporting Trial Burn Results," EPA/625/6-89/019, January 1989). Under this methodology, a compound with a lower $TSLoO_2$ is predicted to be more difficult to incinerate.

In order to be conservative, SEAD proposes to select worst case POHCs using both methods. Once SEAD demonstrates that the incinerator system is capable of meeting DRE requirements for both worst case waste munitions, one may assume that any POHC with a higher heat of combustion or a higher $TSLoO_2$ that is fed at a lower feed rate would also meet the DRE requirements.

2. Particulate Emissions. The feed item selected for determining compliance with particulate emissions limitations should have the greatest potential to generate particulate matter (i.e., the highest ash yield rate). The demonstration of compliance with having met the particulate emission limits with the waste stream most likely to generate the highest emissions, it should indicate that feeding wastes with a lower ash yield rate will not result in emissions exceeding the applicable limits.

3. HCl Emissions. The feed item selected for the demonstration that HCl emissions will not exceed allowable levels should have a chlorine feed rate which would produce the maximum HCl emissions. If the HCl emissions limit of 4 pounds per hour is not exceeded for the waste item having the highest chlorine feed rate (and thus, the highest potential HCl emissions), one may assume that feeding waste with a lower chlorine feed rate would not result in HCl emissions greater than 4 pounds per hour.

4. Metal Emissions. The feed items selected for determining metal emissions should have a metal content which would result in the maximum potential metal emissions. Different metals have different partition coefficients and should be tested separately. The presence of chlorides can affect metal emission as some metal chlorides are more volatile than their oxide counterparts. If the metal chloride has a higher volatility than its oxide

counterpart, the waste feed should also have a stoichiometrically significant amount of chlorides present. If metal emissions limits are met with the highest metal feed rates and in the presence of chlorides (if applicable), it may be assumed that feeding waste with lower metal feed rates and lower chloride concentrations (if applicable) would not result in emissions exceeding the application limits.

5. Dioxins and Furans Emissions. The feed item selected for determining Dioxin and Furan emissions should have the maximum precursor to Dioxin and Furans feed rate and a stoichiometrically significant amount of chlorides presents. Having met Dioxin and Furan emission rate limits with the item with the highest precursor feed rate, it can be assumed that items with a lower precursor feed rate would also meet emission rate limits.

Another criteria which will be used as a basis for the selection of trial burn waste feed item is the following:

6. Waste (PEP) Mass Feed Rate. The item with the maximum waste Propellant/ Explosive/Pyrotechnic (PEP) mass feed rate will be selected as a waste feed item.

The following emissions are of regulatory concern during the Trial Burn. These species will be assessed during the Trial Burn, but these species will not be used as a basis for waste munition selection:

7. Product of Incomplete Combustion (PIC) Emissions. PIC emissions will be characterized as part of the analytical process performed on samples collected during the Trial Burn. PICs will be reported in the final report.

8. Oxides of Nitrogen (NO_x) Emissions. NO_x emissions will be monitored during the Trial Burn. Data developed will be reviewed and reported as part of the Trial Burn Report.

9. Oxides of Sulfur (SO_x) Emissions. SO_x emissions will be controlled by limiting, on an annual basis, the total mass of sulfur containing compounds which are fed to the deactivation furnace, pursuant to all applicable state and federal regulators.

5.2 POHC Waste Feed Item Selection

Table 5-1 lists compounds that are identified as constituents of the munitions waste feed stream and are also identified as Hazardous Constituents in Title 40 Code of Federal Regulations (CFR) Appendix VIII. As is seen, four organic compounds dibutylphthalate, dinitrotoluene, diphenylamine and nitroglycerine and should be considered as potential POHCs for the Trial Burn series.

Table 5-2 presents heat of combustion and thermal stability index data for each of these candidate POHCs. (Hexachlorobenzene (HCB) and Trichloroethylene (TCE) are also included in this table although neither is a component of waste which will be fed to the deactivation furnace). Ranking these compounds, included in the waste, from lowest to highest (i.e., from hardest to easiest to incinerate) on the heat of combustion scale results in an order of compounds of Nitroglycerin, Dinitrotoluene, Dibutylphthalate and Diphenylamine.

A similar rank ordering based on Thermal Stability Index, again ordered from most difficult to easiest to incinerate, yields a listing of Diphenylamine, Dinitrotoluene, Dibutyl phthalate and Nitroglycerin.

TABLE 5-1

APPENDIX VIII CHEMICAL CONSTITUENTS PRESENT IN THE WASTE FEED

Inorganic Compounds	Organic Compounds	Organo-Metallic Compounds
aluminum dichromate	dibutylphthalate (DBP)	barium stearate
antimony trisulfide	dinitrotoluene (DNT)*	lead styphanate
barium carbonate	diphenylamine (DPA)	
barium chromate	nitroglycerine (NG)	
barium nitrate		
barium peroxide		
lead azide		
lead dioxide		
lead thiocyanate		

* 2,4 and 2,6 dinitrotoluene. The only other dinitrotoluene isomer discussed in this document is 3,4 dinitrotoluene (3,4-DNT) which is used as a spike. When this isomer is being discussed it will be referred to as 3,4-DNT. All other references to DNT within this document refer to the isomers 2,4-DNT and 2,6 DNT.

TABLE 5-2

PRINCIPLE ORGANIC HAZARDOUS CONSTITUENT (POHC) RANKING

POHC Compound	Heat of Combustion KCal/Gram	Thermal Stability Index Rank
DBP	7.34	261-265
DNT	4.68	168-173
DPA	9.09	42-44
NG	3.79	281
HCB	1.74	31-33
TCE	1.79	41

The items that were selected as POHCs from amongst the waste feed constituents were NG and DNT. DBP was not chosen as a POHC because of its relatively high heat of combustion and high TSI ranking. DPA would have been chosen because it is present in a large number of munitions in relatively high concentration, and according to its TSI ranking it is the most difficult compound to incinerate (of compounds present in munitions). However, there are problems associated with the recovery of DPA in the presence of NO_x. These problems are well documented in papers by the AEHA. DPA is also identified as a problem POHC in Volume III of the incineration guidance series. This creates certain problems for the trial burn, since DPA is present in a large number of munitions and cannot practically be removed from the list of munitions to be burned in the furnace. All other components of munitions are Class 4 compounds or lower and therefore are move easily destroyed. For this reason HCB (Class 1) and TCE (Class 2) have been identified as surrogate POHCs for DPA. In order to be conservative DNT was added to the list to insure that even with its expected greater mass flow (see Table 4-5) it would be successfully destroyed. NG was chosen as a POHC based solely upon its low heat of combustion after HCB and TCE (as shown in Table 5-2).

SEAD believes that this combination of POHCs suitably challenges the incinerator on both incinerability scales. These POHCs represent the major portion of the waste feed organic constituents other than materials that are present as PEP components. Nitroglycerin, and Dinitrotoluene and Hexachlorobenzene have also been designated as POHCs at other deactivation furnaces, thus this combination will provide a basis for assessing the capabilities of the SEAD facility relative to others. Finally, these three materials are not known to be PICs of other compounds.

For NG, the preferred item for testing is items 143 (see **Table 4-5**), which yields 44.4 lb/hr of NG. For DNT the item selected is item 49 with a feed rate of 26.9 lb/hr (see Table 4-5). HCB and TCE will be spiked into item 182 (rocket motors) and fed at a rate of 4.11 lb/hr. The spiking procedure to be used is described in its entirety in **Appendix P**.

Once the POHCs were selected, it was necessary to verify that the allowable feed rate calculated in **Section 4**. Since the Trial Burn must demonstrate a Destruction and Removal Efficiency (DRE) of 99.99%, it is necessary to show that the stack gas will contain a measurable amount of POHC. These calculations are based on:

1. POHC Feed rate,
2. Stack gas flowrate,
3. Stack gas sampling method,
4. Stack gas moisture content,
5. Stack gas sample rate,
6. The instrument detection limit for the POHC, and
7. The desired sample volume

The result of the calculation is the minimum sampling time required to collect an easily measurable amount of POHC from the exiting stack gas. The calculations are located in **Appendix D** and summarized in **Section 7**, the sampling and analysis plan. All POHC feed rates were shown to yield a measurable quantity of material in the exiting stack gas after 99.99% DRE. Item and test feed rates are summarized in **Table 5-4**, which is located after **Section 5-7**.

5.3 PARTICULATE WASTE FEED ITEM SELECTION

The particulate emissions for the Ammunition Peculiar Equipment (APE) incinerators are proportional to the ash feed rate. To select a waste stream that would be representative of worst case particulate emissions, it is necessary to consider the ash yield data presented in **Section 4**. Based on these data, the logical choice for this requirement, is Item 57, with a total ash feed rate of 98.2 lb/hr (**see Table 4-5**). Item and test feed rates are summarized in **Table 5-4**. In order to demonstrate that the normal in line baghouse cleaning cycle does not result in a particulate emission excursion, the trial burn will be conducted so that a timed baghouse cleaning occurs during this test.

5.4 HCl TESTING CONSIDERATIONS

A determination of the HCl emission level is required by 40 CFR 270.62 (b)(6)(ii). However, from the data presented in the **Table 4-5**, none of the munition items have the potential to exceed the 4 lb/hr HCl emission rate based on stoichiometric chlorine content (Seneca has decided to limit feed rates of chlorine to the incinerator to less than 3 lb/hr). For this reason, HCl testing is not necessary and is excluded from the trial burn plan.

5.5 METAL WASTE FEED ITEMS SELECTION

Eleven metal hazardous waste constituents, have been identified in the 200 waste feed items and are listed in **Table 5-1.** Waste feed items were selected based on the maximum feed rate of each hazardous metal compound. In addition, chlorides should be present in the waste stream for those metals which exhibit increased volatility in the presence of chlorides. **Table 5-3** shows the relative volatility of the four metals of concern (antimony, barium, chromium, and lead). For these metals, only lead exhibits an increase in volatilizing due to the presence of chlorides. Volatilizing temperature in this table is defined as the temperature at which the effective vapor pressure is 10^{-6} atm. Although lead volatility is greatly effected by the presence of chlorides, this still represents a small vapor pressure.

TABLE 5-3

RELATIVE VOLATILITY OF HAZARDOUS METALS[1]

	Volatility Temp °F [2]	
Metal	Chlorine = 0%	Chlorine = 0.5%
antimony	1220	1220
barium	1560	1680
chromium	2600	2600
lead	1160	5

(1) Adapted from Table 3-1, "Analysis of Metals in Trial Burn Tests - Case Study 1: Amoco Whiting Fluidized Bed Incinerator" by Energy and Environmental Research Corporation, January 5, 1989.

(2) Temperature at which the effective vapor pressure is 10^{-6} atm

Based upon the information presented in **Section 4, Table 4-5** the following munitions have been selected for the trial burn. For antimony, the preferred waste feed item for testing is Item 120, with a total antimony feed rate of 5.0 lb/hr.

For barium, item 57 was selected representing a total barium feed rate of 22.2 lb/hr.

For chromium, the preferred waste feed item is Item 127 with a total chromium feed rate of 0.04 lb/hr.

For lead, item 200 was selected representing a total lead feed rate of 16.1 lb/hr. The chlorine feed rate for item 200 is 0.42 lb/hr (1.25% of the total feed on a mass basis). Item and test feed rates are summarized in **Table 5-4**.

It should be noted that a trial burn will be performed for each metal designated as a hazardous constituent in Appendix VIII of 40 CFR 261, which is proposed to be fed to the deactivation furnace. As described earlier in this section trial burns will be performed for : antimony, barium, chromium, and the lead. These trial burns will verify that the emissions associated with the metal feed rates calculated in **Section 4** comply with all applicable standards and guidance. When the test data has adequately demonstrated compliance, it will become the basis for a permit to operate the deactivation furnace.

Trial burns are not necessary and will not be conducted for metals not included in Appendix VIII of 40 CFR 261. These metals are significantly less toxic than those included in Appendix VIII. Feed rate for these metals were reduced as described in **Section 4** to comply with all applicable emission standards and guidance.

Metals which are proposed to be fed to the deactivation furnace but are not identified as beings Hazardous in Appendix VIII of 40 CFR 261 are: aluminum, nickel, strontium, tin, and zinc. Of these five metals only nickel and zinc have specific ambient or impact guidance. For these two metals proposed feed rates are less than allowable calculated emission rates.

For alumnimum, strontium, and tin there are no specific Federal or State ambient air quality or impact standards or guidance. Generally if no guidance for a chemical exists, it is because the chemical is regarded as benign, not often encountered in toxic quantity, or both. As described previously NYSDEC provides methodology for developing conservative allowable "interim" or "deminimis" impacts, which have built in to them a large safety margin. Consequently, the emission limits developed for these three metals of low toxicity are inherently lower than they would be for metals of similar toxicity, for which the state has developed guidance. In any event the maximum proposed feed rate for tin was less than the allowable emission rate calculated from its "interim" value. Feed rate for aluminum and strontium were reduced as described in Section 4 to comply with their respective "interim" and "deminimis" impacts.

In general the five metals discussed here are of low toxicity and do not require the same level of control as those identified in Appendix VIII of 40 CFR 261. SEAD is seeking to operate the deactivation furnace in a way which is protective of human health and the environment; and although no trial burn will be devoted to testing for these metals, SEAD has limited munition feed to meet all applicable guidance.

5.6 DIOXIN AND FURAN WASTE FEED ITEM SELECTION

Polyvinylchloride (PVC) is a documented dioxin and furan precursor. The item which represents the greatest PVC feed rate is item 23 at 3.09 lb/hr (**see Appendix C**). Item and test feed rates are summarized in **Table 5-4**.

5.7 WASTE (PEP) FEED ITEM SELECTION

The feed item with the highest PEP mass feed rate is Item 23 with a total PEP feed rate of 204 lb/hr (**see Table 4-5**). This item was also selected for the dioxin/furan precursor trial burn. Item and test feed rates are summarized in **Table 5-4**.

TABLE 5-4
TRIAL BURN FEED RATE SUMMARY

TEST	ITEM	ITEM FEED RATE (ITEM/HR)	PARAMETER	PARAMETER FEED RATE (LB/HR)
1.	Spiked 182	NA	HCB	4.11
2.	Spiked 182	NA	TCE	4.11
3.	143	19,416	NG	44.39

TEST	ITEM	ITEM FEED RATE (ITEM/HR)	PARAMETER	PARAMETER FEED RATE (LB/HR)
4.	49	8,000	DNT	26.86
5.	57	6,377	PARTICULATE BARIUM	98.17 22.21
6.	120	375,601	ANTIMONY	5.02
7.	127	3,163	CHROMIUM	0.04
8.	200	220	LEAD	16.07
9.	23	22,500	DIOXIN/FURAN PRECURSOR MAX WASTE (PEP)	 3.09 204

SECTION 6

TRIAL BURN PROTOCOL

6.1 Trial Burn Test Series

The trial burn will consist of a series of nine tests. The objectives of these tests are to set feed rates and operational conditions for the deactivation furnace. **Table 6-1** summarizes the nine tests that are proposed for performance and identifies the waste feed parameter to be tested. Operating conditions to be used during the test series are summarized in **Table 6-2**.

The kiln and afterburner temperatures proposed for use during all the tests are practical minimums for incinerator operation. The 1200°F afterburner setpoint specification is the lowest temperature that would be used during normal operations. To achieve these minimum temperatures while maintaining the highest possible combustion gas flowrate, both the afterburner and kiln burners will be operated at extremely lean air-to-fuel ratios. Air flows to both burners will be maximized with fuel feedrates adjusted by the kiln and afterburner temperature controllers. Thus, these tests will be conducted under the practical worst-case conditions.

For tests 1 and 2, which measure DRE's for Class 1 and 2 compounds respectively, experience has shown that a higher after burner temperature is required (1600°F). Actual trial burns have also shown the requirement for a 1450°F afterburner temperature for munitions which contain NG. Finally all tests with munitions which contain DPA will be conducted at 1600°F.

Finally, it should be realized that the upgraded APE incinerators are virtually new systems with respect to process operation and control. The addition of the afterburner significantly changes the operation of the downstream equipment. Thus, the proposed operating conditions may require some modification following pre-trial burn testing of the system. Thus, the operating conditions identified for use during the nine test series may require some modification. The proposed operating conditions will be evaluated during a limited pre-trial test (mini burn) and necessary modifications will be identified to the EPA and NYSDEC prior to the start of the Trail Burn series.

TABLE 6-1

TRIAL BURN PROTOCOL

Test Series	Feed Item	Objective
1.	Item 182 - 3.5" Rocket Motor Spiked w/HCB	Maximum feed rate of HCB, the most difficult POHC to destroy based on TSI ranking
2.	Item 182 - 3.5" Rocket Motor Spike w/TCE	Maximum feedrate of TCE the second most difficult POHC to destroy based on TSI ranking
3.	Item 143 - Ignit. CTG M5A2	Maximum feed rate of NG, the most difficult POHC to destroy based on heats of combustion ranking (after HCB and TCE)
4.	Item 49 - .50 Caliber Ball, AP-M2 (w/IMR5010)	Maximum feed rate of DNT for confirmational testing
5.	Item 57 - .50 Caliber Incendiary - M23 (w/1M-11)	Maximum ash feed rate for particulate (PM-10) testing Maximum feed rate of Inorganic Barium
6.	Item 120 - Detonator -MK56 Mod 0	Maximum feed rate of Antimony
7.	Item 127 - Fuze Point Detonating - M48	Maximum feed rate of Chromium
8.	Item 200 - Fuze M501	Maximum feed rate of Lead with high chlorine
9.	Item 23 - 30 cal-M25 Tracer (w/WC852)	Maximum feed rates of Dioxin and Furan Precusor Maximum Waste (PEP) Feed Rate

TABLE 6-2

TRIAL BURN OPERATIONS SUMMARY

Parameter	Test Series 1 Item 182-3.5" Rocket Motor Spiked w/HCB	Test Series 2 Item 182 3.5" Rocket Motor Spiked w/TCE	Test Series 3 Item 143 Ignition Ctg. -M5A2	Test Series 4 Item 49 .50 Caliber Ball AP-M2 (w/IMR5010)
Number of Runs	3	3	3	3
Kiln Outlet Temperature (°F) Range Expected Setpoint	250-800 450	250-800 450	250-800 400	250-800 450
Afterburner Outlet Temp. (°F) Range Expected Setpoint	1200-1800 1600	1200-1800 1600	1200-1800 1450	1200-1800 1600
Stack Gas Velocity (fps) Range	40-50	40-50	40-50	40-50
Kiln Pressure (in H_2O)	-.15 to -.25	-.15 to -.25	-.15 to -.25	-.15 to -.25
Kiln Rotation (rpm)	1.0	1.0	1.5	1.8
PEP Waste Feedrate (lb/hr)	NA	NA	110.98	92.00
Waste Feedrate (items/hr)	NA	NA	19,146	8000
Baghouse Pressure Drop (in H_2O)	2.5 to 4.5	2.5 to 4.5	2.5 to 4.5	2.5 to 4.5
Cyclone Pressure Drop (in H_2O)	2 to 4	2 to 4	2 to 4	2 to 4
Baghouse Outlet Temp. (°F)	150-250	150-250	150-250	150 to 250
CO Level (ppm)	<100	<100	<100	<100
Fuel Usage (gph) Expected Range	30-50	30-50	30-50	30-50
HTHE Exit Temp. (°F)	<1000°	<1000°	<1000°	<1000°
LTHE Exit Temp. (°F)	<250°	<250°	<250°	<250°

TABLE 6-2

TRIAL BURN OPERATIONS SUMMARY

Parameter		Test Series 5 Item 57 .50 Caliber Incendiary -M23 (w/1M-11)	Test Series 6 Item 120 Detonator -MK56 MOD0	Test Series 7 Item 127 Fuze Point Detonating-M48
Number of Runs		3	3	3
Kiln Outlet Temperature (°F)	Range	250-800	250-800	250-800
	Expected Setpoint	450	400	400
Afterburner Outlet Temp. (°F)	Range	1200-1800	1200-1800	1200-1800
	Expected Setpoint	1600	1200	1200
Stack Gas Velocity (fps)	Range	40-50	40-50	40-50
Kiln Pressure (in H_2O)		-.15 to -.25	-.15 to -.25	-.15 to -.25
Kiln Rotation (rpm)		1.5	1.2	1.2
PEP Waste Feedrate ((lb/hr)		130.91	20.94	2.79
Waste Feedrate (items/hr)		6377	375,601	3,163
Baghouse Pressure Drop (in H_2O)		2.5 to 4.5	2.5 to 4.5	2.5 to 4.5
Cyclone Pressure Drop (in H_2O)		2 to 4	2 to 4	2 to 4
Baghouse Outlet Temp. (°F)		150-250	150-250	150-250
CO Level (ppm)		<100	<100	<100
Fuel Usage (gph)	Expected Range	30-50	30-50	30-50
HTHE Exit Temp. (°F)		<1000°	<1000°	<1000°
LTHE Exit Temp. (°F)		<250°	<250°	<250°

TABLE 6-2

TRIAL BURN OPERATIONS SUMMARY

Parameter		Test Series 8 Item 200 Fuze M501	Test Series 9 Item 23 30 Cal-M25 Tracer (w/WC852)
Number of Runs		3	3
Kiln Outlet Temperature (°F)	Range	250-800	250-800
Expected Setpoint		400	350
Afterburner Outlet Temp. (°F)	Range	1200-1800	1200-1600
Expected Setpoint		1200	1600
Stack Gas Velocity (fps)	Range	40-50	40-50
Kiln Pressure (in H_2O)		-.15 to -.25	-.15 to -.25
Kiln Rotation (rpm)		1.7	1.5
PEP Waste Feedrate ((lb/hr)		33.31	204.08
Waste Feedrate (items/hr)		220	22,500
Baghouse Pressure Drop (in H_2O)		2.5 to 4.5	2.5 to 4.5
Cyclone Pressure Drop (in H_2O)		2 to 4	2 to 4
Baghouse Outlet Temp. (°F)		150-250	150-250
CO Level (ppm)		<100	<100
Fuel Usage (gph) Expected Range		30-50	30-50
HTHE Exit Temp. (°F)		<1000°	<1000°
LTHE Exit Temp. (°F)		<250°	<250°

6.2 Mass and Energy Balances

Mass and energy balance calculations were performed on each of the nine trial burn test series. The mass and energy balance calculations were performed to model and predict the performance of the APE 1236 incinerator system at the operating conditions stated in this Trial Burn Plan. The mass and energy balance calculations about the incinerator system were based upon the following assumptions:

- No. 2 fuel oil would be used as auxiliary fuel in both the rotary kiln and afterburner.

- Primary and secondary combustion air and cooling air for the gas coolers enter at the annual average ambient temperature and relative humidity of 50°F and 70%, respectively.

For each test series, auxiliary fuel was used to obtain the required heat release rates in the rotary kiln and afterburner. The quantity of excess air was determined based on maintaining the desired operating temperatures required to obtain the destruction and removal efficiencies for each test series.

The waste feed items presented in **Section 5.7** were compiled based on their ultimate or elemental analyses (i.e., mass percentages of C, H, O, N, S, Cl, etc.) in order to facilitate input to the mass and energy balance calculations. The ultimate analyses for the waste feed streams associated with the nine test series are presented in **Table 6-3**.

The results of the mass and energy balance calculations for each test series is summarized on process flow diagrams in **Figures 6-1** through **6-9**. The actual computer printouts containing the data for the nine test series are presented in **Appendix D-4**.

TABLE 6–3
SENECA ARMY DEPOT
TRIAL BURN PLAN
INCINERATOR WASTE FEED STREAM ULTIMATE ANALYSIS DATA

WASTE FEED ITEM DESCRIPTION	ITEM FEEDRATE (Items/hr)	PEP FEEDRATE (lbs/hr)	HEATING VALUE HHV (Btu/lb)	HEATING VALUE LHV (Btu/lb)	% Comb.	% Water	% Inerts	% C	% H	% O	% N	% S	% Cl	% F
piked Item 182														
Carbon Black	20	0.086	14,095		100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
Ethyl Centralite	20	0.065	15,093		100.00	0.00	0.00	76.12	7.46	5.97	10.45	0.00	0.00	0.00
Nitrocellulose	20	3.931	4,338		100.00	0.00	0.00	24.24	2.36	59.26	14.14	0.00	0.00	0.00
Nitroglycerin	20	2.556	6,822		100.00	0.00	0.00	15.87	2.22	63.41	18.50	0.00	0.00	0.00
Potassium Perchlorate	20	0.562	264		100.00	0.00	0.00	0.00	0.00	46.19	0.00	0.00	25.59	0.00
Hexachlorobenzene	N.A	4.110	3,566		100.00	0.00	0.00	25.30	0.00	0.00	0.00	0.00	74.70	0.00
Total/Average =	20	11.310	4,553		100.00	0.00	0.00	22.41	1.36	37.26	9.16	0.00	28.42	0.00
piked Item 182														
Carbon Black	20	0.086	14,095		100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
Ethyl Centralite	20	0.065	15,093		100.00	0.00	0.00	76.12	7.46	5.97	10.45	0.00	0.00	0.00
Nitrocellulose	20	3.931	4,338		100.00	0.00	0.00	24.24	2.36	59.26	14.14	0.00	0.00	0.00
Nitroglycerin	20	2.556	6,822		100.00	0.00	0.00	15.87	2.22	63.41	18.50	0.00	0.00	0.00
Potassium Perchlorate	20	0.562	264		100.00	0.00	0.00	0.00	0.00	46.19	0.00	0.00	25.59	0.00
Trichloroethylene	N.A	4.110	3,047		100.00	0.00	0.00	18.28	0.77	0.00	0.00	0.00	80.95	0.00
Total/Average =	20	11.310	4,364		100.00	0.00	0.00	19.85	1.64	37.26	9.16	0.00	30.69	0.00
tem 143														
Ethyl Centralite	19,416	0.832	15,093		100.00	0.00	0.00	76.12	7.46	5.97	10.45	0.00	0.00	0.00
Nitrocellulose	19,416	64.091	4,338		100.00	0.00	0.00	24.24	2.36	59.26	14.14	0.00	0.00	0.00
Nitroglycerin	19,416	44.392	6,822		100.00	0.00	0.00	15.87	2.22	63.41	18.50	0.00	0.00	0.00
Potassium Nitrate	19,416	1.667	(286)		100.00	0.00	0.00	0.00	0.00	47.47	13.86	0.00	0.00	0.00
Total/Average =	19,416	110.981	5,343		100.00	0.00	0.00	20.92	2.31	60.34	15.85	0.00	0.00	0.00

TABLE 6–3
SENECA ARMY DEPOT
TRIAL BURN PLAN
INCINERATOR WASTE FEED STREAM ULTIMATE ANALYSIS DATA

WASTE FEED ITEM DESCRIPTION	ppm Si	ppm Na, K, B, Ca, Mg	Heavy Metals ppm Al	ppm Ba	ppm Cr	ppm Pb	ppm Sb	ppm Sn	ppm Sr	ppm Zn	ppm Total Heavy Metals	Total Ash Formed (lbs/hr)
piked Item 182												
Carbon Black	0	0	0	0	0	0	0	0	0	0	0	0.000
Ethyl Centralite	0	0	0	0	0	0	0	0	0	0	0	0.000
Nitrocellulose	0	0	0	0	0	0	0	0	0	0	0	0.000
Nitroglycerin	0	0	0	0	0	0	0	0	0	0	0	0.000
Potassium Perchlorate	0	282,200	0	0	0	0	0	0	0	0	0	0.227
Hexachlorobenzene	0	0	0	0	0	0	0	0	0	0	0	0.000
Total/Average =	0	14,013	0	0	0	0	0	0	0	0	0	0.227
piked Item 182												
Carbon Black	0	0	0	0	0	0	0	0	0	0	0	0.000
Ethyl Centralite	0	0	0	0	0	0	0	0	0	0	0	0.000
Nitrocellulose	0	0	0	0	0	0	0	0	0	0	0	0.000
Nitroglycerin	0	0	0	0	0	0	0	0	0	0	0	0.000
Potassium Perchlorate	0	282,200	0	0	0	0	0	0	0	0	0	0.227
Trichloroethylene	0	0	0	0	0	0	0	0	0	0	0	0.000
Total/Average =	0	14,013	0	0	0	0	0	0	0	0	0	0.227
em 143												
Ethyl Centralite	0	0	0	0	0	0	0	0	0	0	0	0.000
Nitrocellulose	0	0	0	0	0	0	0	0	0	0	0	0.000
Nitroglycerin	0	0	0	0	0	0	0	0	0	0	0	0.000
Potassium Nitrate	0	386,700	0	0	0	0	0	0	0	0	0	0.925
Total/Average =	0	5,808	0	0	0	0	0	0	0	0	0	0.925

TABLE 6–3
SENECA ARMY DEPOT
TRIAL BURN PLAN
INCINERATOR WASTE FEED STREAM ULTIMATE ANALYSIS DATA

WASTE FEED ITEM DESCRIPTION	ITEM FEEDRATE (Items/hr)	PEP FEEDRATE (lbs/hr)	HEATING VALUE HHV (Btu/lb)	HEATING VALUE LHV (Btu/lb)	% Comb.	% Water	% Inerts	% C	% H	% O	% N	% S	% Cl	% F
tem 49														
Antimony Trisulfide	8,000	0.229	1,802		100.00	0.00	0.00	0.00	0.00	0.00	0.00	28.32	0.00	0.00
Barium Nitrate	8,000	1.131	(716)		100.00	0.00	0.00	0.00	0.00	36.73	10.72	0.00	0.00	0.00
Calcium Silicide	8,000	0.194	6,001		100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dinitrotoluene	8,000	26.857	8,424		100.00	0.00	0.00	46.15	3.31	35.16	15.38	0.00	0.00	0.00
Diphenylamine	8,000	3.543	16,376		100.00	0.00	0.00	85.17	6.55	0.00	8.28	0.00	0.00	0.00
Graphite	8,000	1.029	14,095		100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
Gum Arabic	8,000	0.011	6,842		100.00	0.00	0.00	52.00	3.00	30.00	15.00	0.00	0.00	0.00
Lead Styphnate	8,000	0.994	2,254		100.00	0.00	0.00	15.99	0.23	28.43	9.33	0.00	0.00	0.00
Nitrocellulose	8,000	55.200	4,338		100.00	0.00	0.00	24.24	2.36	59.26	14.14	0.00	0.00	0.00
Potassium Sulfate	8,000	2.743	(699)		100.00	0.00	0.00	0.00	0.00	36.73	0.00	18.40	0.00	0.00
Tetracene	8,000	0.069	1,181		100.00	0.00	0.00	94.70	5.30	0.00	0.00	0.00	0.00	0.00
Total/Average =	8,000	92.000	5,864		100.00	0.00	0.00	32.66	2.64	47.68	13.53	0.62	0.00	0.00
tem 57														
Antimony Trisulfide	6,377	0.182	1,802		100.00	0.00	0.00	0.00	0.00	0.00	0.00	28.32	0.00	0.00
Barium Nitrate	6,377	41.897	(716)		100.00	0.00	0.00	0.00	0.00	36.73	10.72	0.00	0.00	0.00
Calcium Silicide	6,377	0.155	6,001		100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dinitrotoluene	6,377	20.498	8,424		100.00	0.00	0.00	46.15	3.31	35.16	15.38	0.00	0.00	0.00
Diphenylamine	6,377	2.824	16,376		100.00	0.00	0.00	85.17	6.55	0.00	8.28	0.00	0.00	0.00
Graphite	6,377	0.820	14,095		100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
Gum Arabic	6,377	0.009	6,842		100.00	0.00	0.00	52.00	3.00	30.00	15.00	0.00	0.00	0.00
Lead Styphnate	6,377	0.793	2,254		100.00	0.00	0.00	15.99	0.23	28.43	9.33	0.00	0.00	0.00
Magnesium/Aluminum Alloy	6,377	40.995	11,602		100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nitrocellulose	6,377	20.498	4,338		100.00	0.00	0.00	24.24	2.36	59.26	14.14	0.00	0.00	0.00
Potassium Sulfate	6,377	2.186	(699)		100.00	0.00	0.00	0.00	0.00	36.73	0.00	18.40	0.00	0.00
Tetracene	6,377	0.055	1,181		100.00	0.00	0.00	94.70	5.30	0.00	0.00	0.00	0.00	0.00
Total/Average =	6,377	130.911	5,856		100.00	0.00	0.00	13.63	1.03	27.33	8.29	0.35	0.00	0.00
tem 120														
Antimony Trisulfide	375,601	6.979	1,802		100.00	0.00	0.00	0.00	0.00	0.00	0.00	28.32	0.00	0.00
Carborundum	375,601	1.074	0		100.00	0.00	0.00	29.97	0.00	0.00	0.00	0.00	0.00	0.00
Lead Azide	375,601	5.905	1,135		100.00	0.00	0.00	0.00	0.00	0.00	28.86	0.00	0.00	0.00
Potassium Chlorate	375,601	6.979	449		100.00	0.00	0.00	0.00	0.00	39.16	0.00	0.00	28.93	0.00
Total/Average =	375,601	20.936	1,070		100.00	0.00	0.00	1.54	0.00	13.05	8.14	9.44	9.64	0.00

VK1

TABLE 6-3
SENECA ARMY DEPOT
TRIAL BURN PLAN
INCINERATOR WASTE FEED STREAM ULTIMATE ANALYSIS DATA

WASTE FEED ITEM DESCRIPTION	ppm Si	ppm Na, K, B, Ca, Mg	Heavy Metals ppm Al	ppm Ba	ppm Cr	ppm Pb	ppm Sb	ppm Sn	ppm Sr	ppm Zn	ppm Total Heavy Metals	Total Ash Formed (lbs/hr)
tem 49												
Antimony Trisulfide	0	0	0	0	0	0	716,800	0	0	0	716,800	0.196
Barium Nitrate	0	0	0	525,500	0	0	0	0	0	0	525,500	0.664
Calcium Silicide	583,600	416,400	0	0	0	0	0	0	0	0	0	0.356
Dinitrotoluene	0	0	0	0	0	0	0	0	0	0	0	0.000
Diphenylamine	0	0	0	0	0	0	0	0	0	0	0	0.000
Graphite	0	0	0	0	0	0	0	0	0	0	0	0.000
Gum Arabic	0	0	0	0	0	0	0	0	0	0	0	0.000
Lead Styphnate	0	0	0	0	0	460,200	0	0	0	0	460,200	0.474
Nitrocellulose	0	0	0	0	0	0	0	0	0	0	0	0.000
Potassium Sulfate	0	448,700	0	0	0	0	0	0	0	0	0	1.766
Tetracene	0	0	0	0	0	0	0	0	0	0	0	0.000
Total/Average =	1,232	14,257	0	6,463	0	4,974	1,781	0	0	0	13,217	3.456
tem 57												
Antimony Trisulfide	0	0	0	0	0	0	716,800	0	0	0	716,800	0.156
Barium Nitrate	0	0	0	525,500	0	0	0	0	0	0	525,500	24.581
Calcium Silicide	583,600	416,400	0	0	0	0	0	0	0	0	0	0.284
Dinitrotoluene	0	0	0	0	0	0	0	0	0	0	0	0.000
Diphenylamine	0	0	0	0	0	0	0	0	0	0	0	0.000
Graphite	0	0	0	0	0	0	0	0	0	0	0	0.000
Gum Arabic	0	0	0	0	0	0	0	0	0	0	0	0.000
Lead Styphnate	0	0	0	0	0	460,200	0	0	0	0	460,200	0.378
Magnesium/Aluminum Alloy	0	640,000	360,000	0	0	0	0	0	0	0	360,000	71.364
Nitrocellulose	0	0	0	0	0	0	0	0	0	0	0	0.000
Potassium Sulfate	0	448,700	0	0	0	0	0	0	0	0	0	1.408
Tetracene	0	0	0	0	0	0	0	0	0	0	0	0.000
Total/Average =	690	208,404	112,735	168,182	0	2,786	998	0	0	0	284,701	98.171
tem 120												
Antimony Trisulfide	0	0	0	0	0	0	716,800	0	0	0	716,800	5.989
Carborundum	700,300	0	0	0	0	0	0	0	0	0	0	1.074
Lead Azide	0	0	0	0	0	711,400	0	0	0	0	711,400	4.526
Potassium Chlorate	0	319,100	0	0	0	0	0	0	0	0	0	3.195
Total/Average =	35,914	106,367	0	0	0	200,650	238,933	0	0	0	439,583	14.783

TABLE 6–3
SENECA ARMY DEPOT
TRIAL BURN PLAN
INCINERATOR WASTE FEED STREAM ULTIMATE ANALYSIS DATA

WASTE FEED ITEM DESCRIPTION	ITEM FEEDRATE (Items/hr)	PEP FEEDRATE (lbs/hr)	HEATING VALUE HHV (Btu/lb)	HEATING VALUE LHV (Btu/lb)	% Comb.	% Water	% Inerts	% C	% H	% O	% N	% S	% Cl	% F
tem 127														
Antimony Trisulfide	3,163	0.176	1,802		100.00	0.00	0.00	0.00	0.00	0.00	0.00	28.32	0.00	0.00
Barium Chromate	3,163	0.190	(495)		100.00	0.00	0.00	0.00	0.00	25.26	0.00	0.00	0.00	0.00
Barium Nitrate	3,163	0.027	(716)		100.00	0.00	0.00	0.00	0.00	36.73	10.72	0.00	0.00	0.00
Boron	3,163	0.036	0		100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lead Azide	3,163	2.111	1,135		100.00	0.00	0.00	0.00	0.00	0.00	28.86	0.00	0.00	0.00
Lead Styphnate	3,163	0.054	2,254		100.00	0.00	0.00	15.99	0.23	28.43	9.33	0.00	0.00	0.00
Potassium Chlorate	3,163	0.154	449		100.00	0.00	0.00	0.00	0.00	39.16	0.00	0.00	28.93	0.00
Silicon Carbide	3,163	0.027	0		100.00	0.00	0.00	29.97	0.00	0.00	0.00	0.00	0.00	0.00
Tetracene	3,163	0.009	1,181		100.00	0.00	0.00	94.70	5.30	0.00	0.00	0.00	0.00	0.00
Vinyl Alcohol Acetate Resin	3,163	0.005	0		100.00	0.00	0.00	55.80	7.03	37.17	0.00	0.00	0.00	0.00
Total/Average =	3,163	2.789	1,005		100.00	0.00	0.00	1.00	0.03	4.85	22.13	1.79	1.59	0.00
tem 200														
Antimony Trisulfide	220	1.699	1,802		100.00	0.00	0.00	0.00	0.00	0.00	0.00	28.32	0.00	0.00
Barium Nitrate	220	0.673	(716)		100.00	0.00	0.00	0.00	0.00	36.73	10.72	0.00	0.00	0.00
Tetracene	220	0.133	1,181		100.00	0.00	0.00	94.70	5.30	0.00	0.00	0.00	0.00	0.00
Tetryl	220	5.910	5,261		100.00	0.00	0.00	29.28	1.76	44.57	24.39	0.00	0.00	0.00
Potassium Chlorate	220	1.436	449		100.00	0.00	0.00	0.00	0.00	39.16	0.00	0.00	28.93	0.00
Carborundum	220	0.217	0		100.00	0.00	0.00	29.97	0.00	0.00	0.00	0.00	0.00	0.00
Lead Azide	220	21.634	1,135		100.00	0.00	0.00	0.00	0.00	0.00	28.86	0.00	0.00	0.00
Lead Styphnate	220	1.612	2,254		100.00	0.00	0.00	15.99	0.23	28.43	9.33	0.00	0.00	0.00
Total/Average =	220	33.314	1,881		100.00	0.00	0.00	6.54	0.34	11.71	23.74	1.44	1.25	0.00

TABLE 6–3
SENECA ARMY DEPOT
TRIAL BURN PLAN
INCINERATOR WASTE FEED STREAM ULTIMATE ANALYSIS DATA

WASTE FEED ITEM DESCRIPTION	ppm Si	ppm Na, K, B, Ca, Mg	Heavy Metals ppm Al	ppm Ba	ppm Cr	ppm Pb	ppm Sb	ppm Sn	ppm Sr	ppm Zn	ppm Total Heavy Metals	Total Ash Formed (lbs/hr)
tem 127												
Antimony Trisulfide	0	0	0	0	0	0	716,800	0	0	0	716,800	0.151
Barium Chromate	0	0	0	542,100	205,300	0	0	0	0	0	747,400	0.190
Barium Nitrate	0	0	0	525,500	0	0	0	0	0	0	525,500	0.016
Boron	0	1,000,000	0	0	0	0	0	0	0	0	0	0.117
Lead Azide	0	0	0	0	0	711,400	0	0	0	0	711,400	1.618
Lead Styphnate	0	0	0	0	0	460,200	0	0	0	0	460,200	0.026
Potassium Chlorate	0	319,100	0	0	0	0	0	0	0	0	0	0.070
Silicon Carbide	700,300	0	0	0	0	0	0	0	0	0	0	0.027
Tetracene	0	0	0	0	0	0	0	0	0	0	0	0.000
Vinyl Alcohol Acetate Resin	0	0	0	0	0	0	0	0	0	0	0	0.000
Total/Average =	6,808	30,540	0	41,998	13,971	547,454	45,294	0	0	0	648,716	2.215
tem 200												
Antimony Trisulfide	0	0	0	0	0	0	716,800	0	0	0	716,800	1.458
Barium Nitrate	0	0	0	525,500	0	0	0	0	0	0	525,500	0.395
Tetracene	0	0	0	0	0	0	0	0	0	0	0	0.000
Tetryl	0	0	0	0	0	0	0	0	0	0	0	0.000
Potassium Chlorate	0	319,100	0	0	0	0	0	0	0	0	0	0.657
Carborundum	700,300	0	0	0	0	0	0	0	0	0	0	0.217
Lead Azide	0	0	0	0	0	711,400	0	0	0	0	711,400	16.580
Lead Styphnate	0	0	0	0	0	460,200	0	0	0	0	460,200	0.769
Total/Average =	4,552	13,753	0	10,615	0	484,257	36,557	0	0	0	531,429	20.076

TABLE 6–3
SENECA ARMY DEPOT
TRIAL BURN PLAN
INCINERATOR WASTE FEED STREAM ULTIMATE ANALYSIS DATA

WASTE FEED ITEM DESCRIPTION	ITEM FEEDRATE (Items/hr)	PEP FEEDRATE (lbs/hr)	HEATING VALUE HHV (Btu/lb)	HEATING VALUE LHV (Btu/lb)	% Comb.	% Water	% Inerts	% C	% H	% O	% N	% S	% Cl	% F
tem 23														
Aluminum Powder	22,500	0.129	13,313		100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Antimony Trisulfide	22,500	0.289	1,802		100.00	0.00	0.00	0.00	0.00	0.00	0.00	28.32	0.00	0.00
Barium Nitrate	22,500	0.611	(716)		100.00	0.00	0.00	0.00	0.00	36.73	10.72	0.00	0.00	0.00
Calcium Carbonate	22,500	1.607	(787)		100.00	0.00	0.00	12.00	0.00	47.96	0.00	0.00	0.00	0.00
Calcium Resinate	22,500	0.161	14,854		100.00	0.00	0.00	78.33	9.20	9.50	0.00	0.00	0.00	0.00
Dibutylphthalate	22,500	12.214	13,210		100.00	0.00	0.00	69.04	7.97	22.99	0.00	0.00	0.00	0.00
Dinitrotoluene	22,500	1.607	8,424		100.00	0.00	0.00	46.15	3.31	35.16	15.38	0.00	0.00	0.00
Diphenylamine	22,500	2.571	16,376		100.00	0.00	0.00	85.17	6.55	0.00	8.28	0.00	0.00	0.00
Graphite	22,500	0.643	14,095		100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
Lead Styphnate	22,500	0.707	2,254		100.00	0.00	0.00	15.99	0.23	28.43	9.33	0.00	0.00	0.00
Magnesium	22,500	5.304	10,653		100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nitrocellulose	22,500	141.107	4,338		100.00	0.00	0.00	24.24	2.36	59.26	14.14	0.00	0.00	0.00
Nitroglycerin	22,500	17.679	6,822		100.00	0.00	0.00	15.87	2.22	63.41	18.50	0.00	0.00	0.00
Parlon Chlorinated Rubber	22,500	1.157	4,200		100.00	0.00	0.00	30.88	4.12	0.00	0.00	0.00	65.00	0.00
PETN	22,500	0.096	3,527		100.00	0.00	0.00	18.99	2.53	60.76	17.72	0.00	0.00	0.00
Polyvinyl Chloride	22,500	3.086	8,918		100.00	0.00	0.00	38.43	4.84	0.00	0.00	0.00	56.73	0.00
Potassium Nitrate	22,500	2.571	(286)		100.00	0.00	0.00	0.00	0.00	47.47	13.86	0.00	0.00	0.00
Sodium Sulfate	22,500	0.964	(705)		100.00	0.00	0.00	0.00	0.00	45.05	0.00	22.57	0.00	0.00
Strontium Nitrate	22,500	10.029	(786)		100.00	0.00	0.00	0.00	0.00	45.36	13.24	0.00	0.00	0.00
Strontium Peroxide	22,500	1.479	(12)		100.00	0.00	0.00	0.00	0.00	26.75	0.00	0.00	0.00	0.00
Tetracene	22,500	0.064	1,181		100.00	0.00	0.00	94.70	5.30	0.00	0.00	0.00	0.00	0.00
Total/Average =	22,500	204.076	5,112		100.00	0.00	0.00	25.03	2.52	51.98	12.50	0.15	1.23	0.00

Notes:

1. Hourly rate is based on operation of the incinerator at 100% heat load.
2. Heavy metals include: Al, Ba, Cr, Pb, Sb, Sn, Sr, Zn.
3. All percentages are based on weight.
4. All averages are weighted averages based on material feedrate.

TABLE 6–3
SENECA ARMY DEPOT
TRIAL BURN PLAN
INCINERATOR WASTE FEED STREAM ULTIMATE ANALYSIS DATA

WASTE FEED ITEM DESCRIPTION	ppm Si	ppm Na, K, B, Ca, Mg	Heavy Metals ppm Al	ppm Ba	ppm Cr	ppm Pb	ppm Sb	ppm Sn	ppm Sr	ppm Zn	ppm Total Heavy Metals	Total Ash Formed (lbs/hr)
tem 23												
Aluminum Powder	0	0	1,000,000	0	0	0	0	0	0	0	1,000,000	0.243
Antimony Trisulfide	0	0	0	0	0	0	716,800	0	0	0	716,800	0.248
Barium Nitrate	0	0	0	525,500	0	0	0	0	0	0	525,500	0.358
Calcium Carbonate	0	400,400	0	0	0	0	0	0	0	0	0	0.900
Calcium Resinate	0	29,700	0	0	0	0	0	0	0	0	0	0.014
Dibutylphthalate	0	0	0	0	0	0	0	0	0	0	0	0.000
Dinitrotoluene	0	0	0	0	0	0	0	0	0	0	0	0.000
Diphenylamine	0	0	0	0	0	0	0	0	0	0	0	0.000
Graphite	0	0	0	0	0	0	0	0	0	0	0	0.000
Lead Styphnate	0	0	0	0	0	460,200	0	0	0	0	460,200	0.337
Magnesium	0	1,000,000	0	0	0	0	0	0	0	0	0	8.795
Nitrocellulose	0	0	0	0	0	0	0	0	0	0	0	0.000
Nitroglycerin	0	0	0	0	0	0	0	0	0	0	0	0.000
Parlon Chlorinated Rubber	0	0	0	0	0	0	0	0	0	0	0	0.000
PETN	0	0	0	0	0	0	0	0	0	0	0	0.000
Polyvinyl Chloride	0	0	0	0	0	0	0	0	0	0	0	0.000
Potassium Nitrate	0	386,700	0	0	0	0	0	0	0	0	0	1.427
Sodium Sulfate	0	323,800	0	0	0	0	0	0	0	0	0	0.543
Strontium Nitrate	0	0	0	0	0	0	0	0	414,000	0	414,000	4.910
Strontium Peroxide	0	0	0	0	0	0	0	0	732,500	0	732,500	1.286
Tetracene	0	0	0	0	0	0	0	0	0	0	0	0.000
Total/Average =	0	35,568	630	1,573	0	1,595	1,016	0	25,652	0	30,465	19.063

FIGURE 6-1
SENECA ARMY DEPOT
TRIAL BURN PLAN - TEST NO. 1
MASS AND ENERGY BALANCES

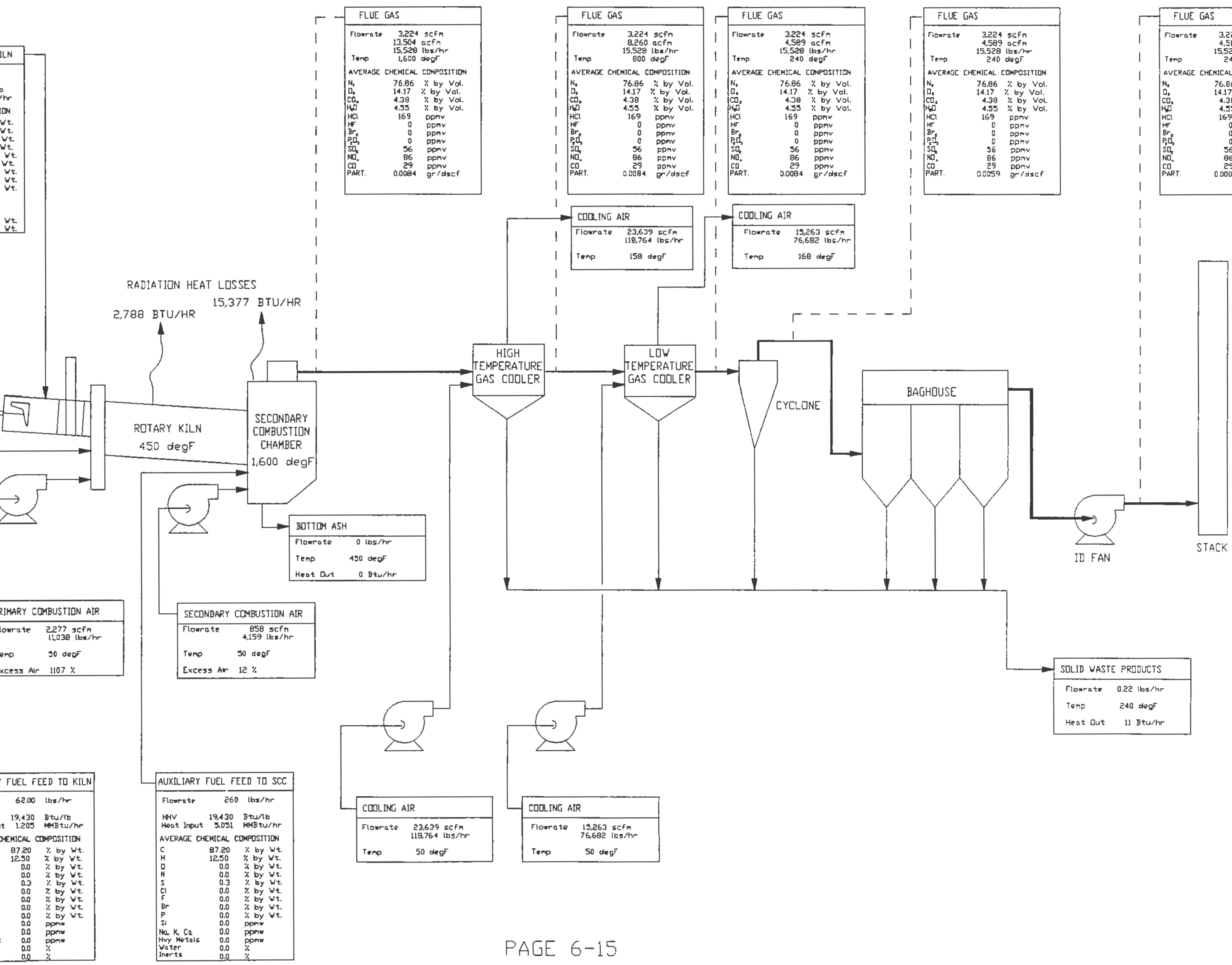


FIGURE 6 L
SENECA ARMY DEPOT
TRIAL BURN PLAN - TEST NO. 2
MASS AND ENERGY BALANCES

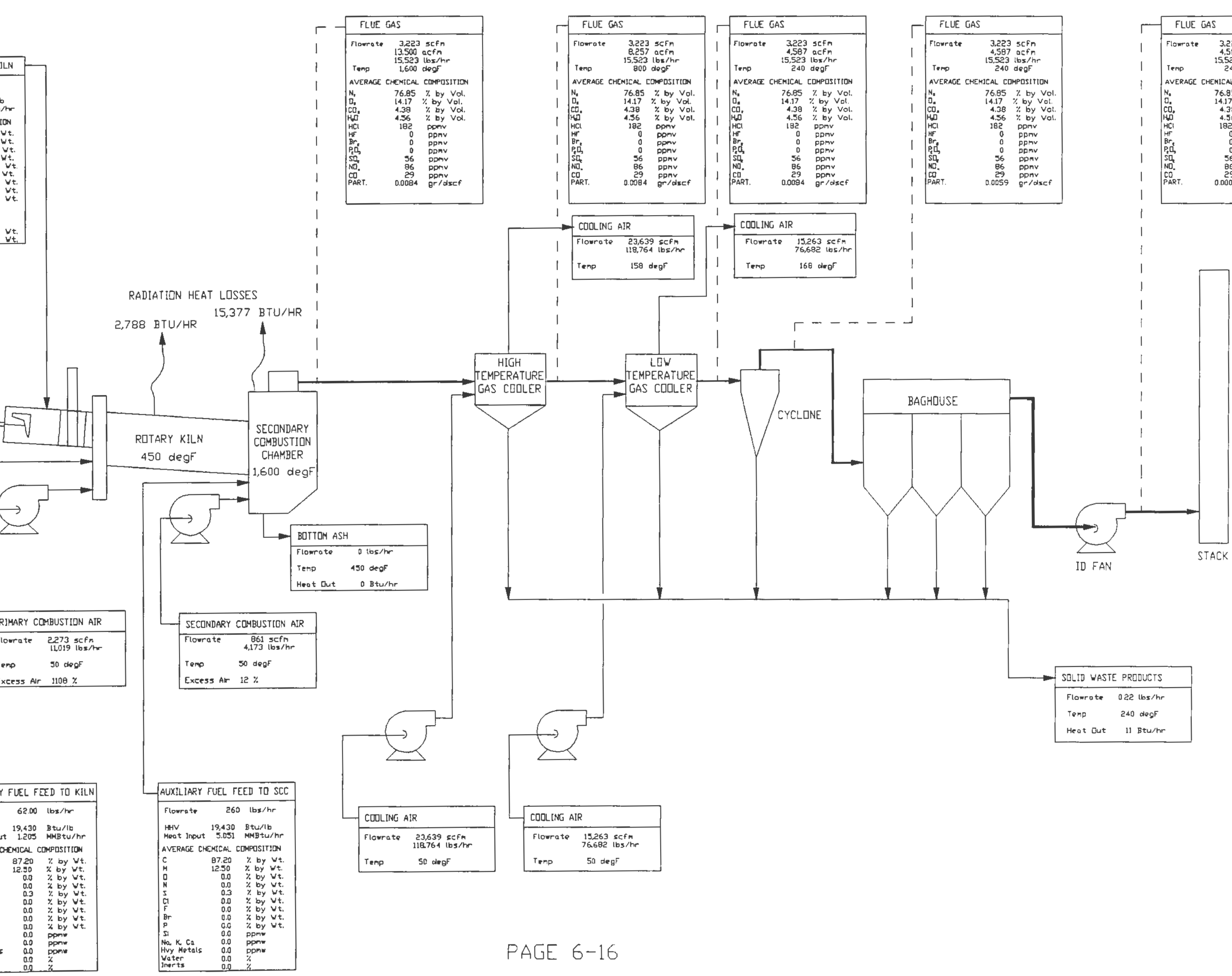


FIGURE 6-3
SENECA ARMY DEPOT
TRIAL BURN PLAN - TEST NO. 3
MASS AND ENERGY BALANCES

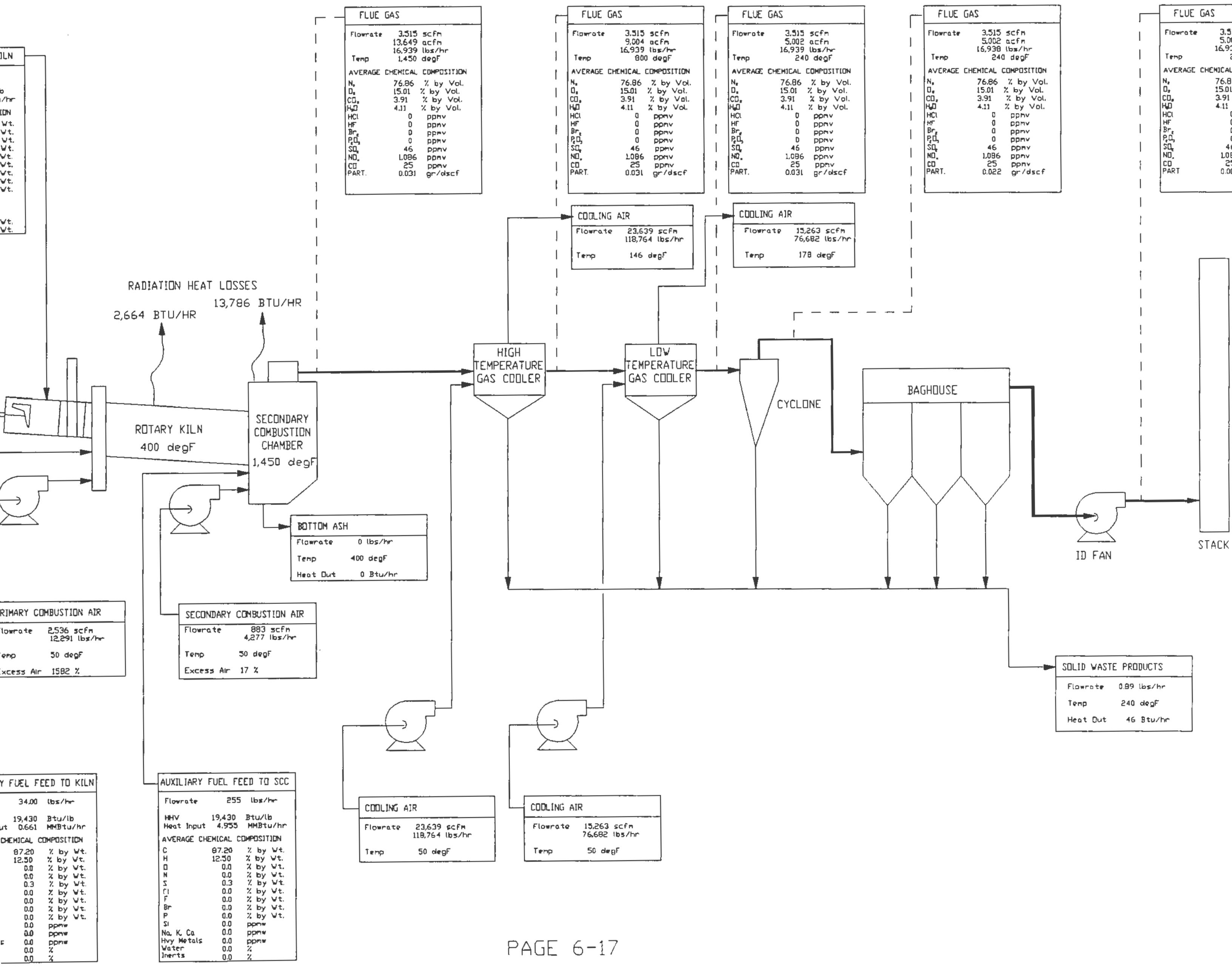


FIGURE 6-4
SENECA ARMY DEPOT
TRIAL BURN PLAN - TEST NO. 4
MASS AND ENERGY BALANCES

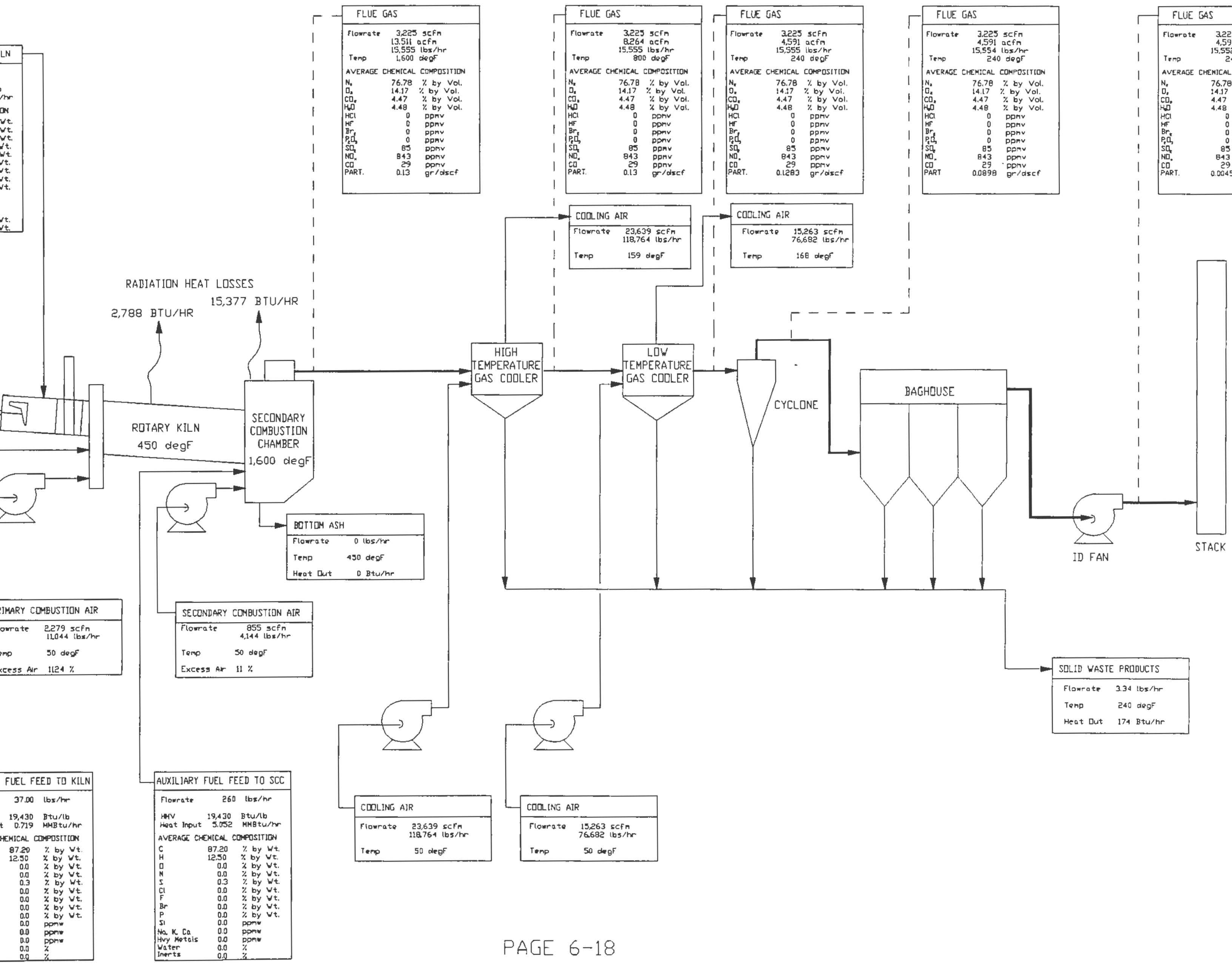


FIGURE 6-5
SENECA ARMY DEPOT
TRIAL BURN PLAN - TEST NO. 5
MASS AND ENERGY BALANCES

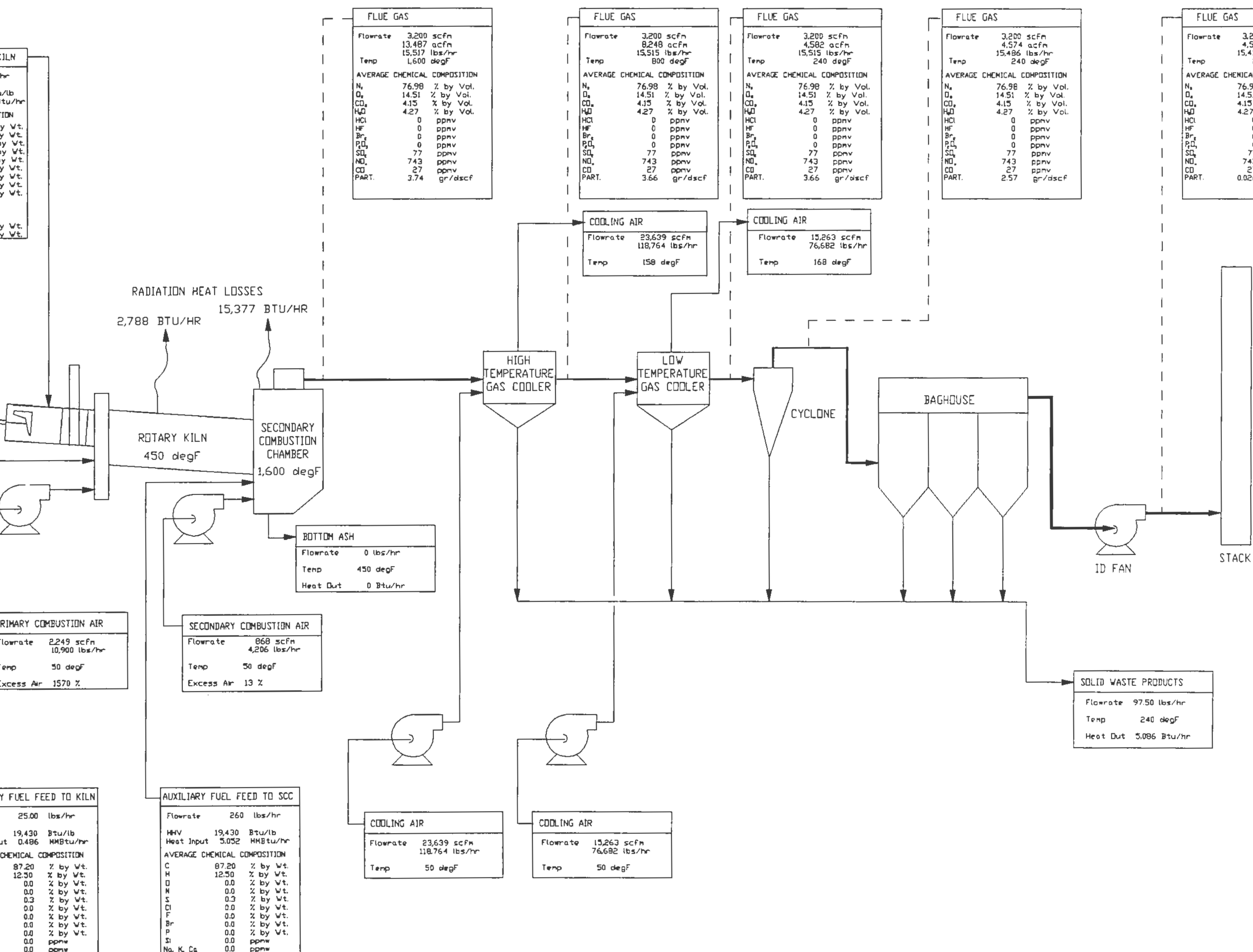


FIGURE 6-6
SENECA ARMY DEPOT
TRIAL BURN PLAN - TEST NO. 6
MASS AND ENERGY BALANCES

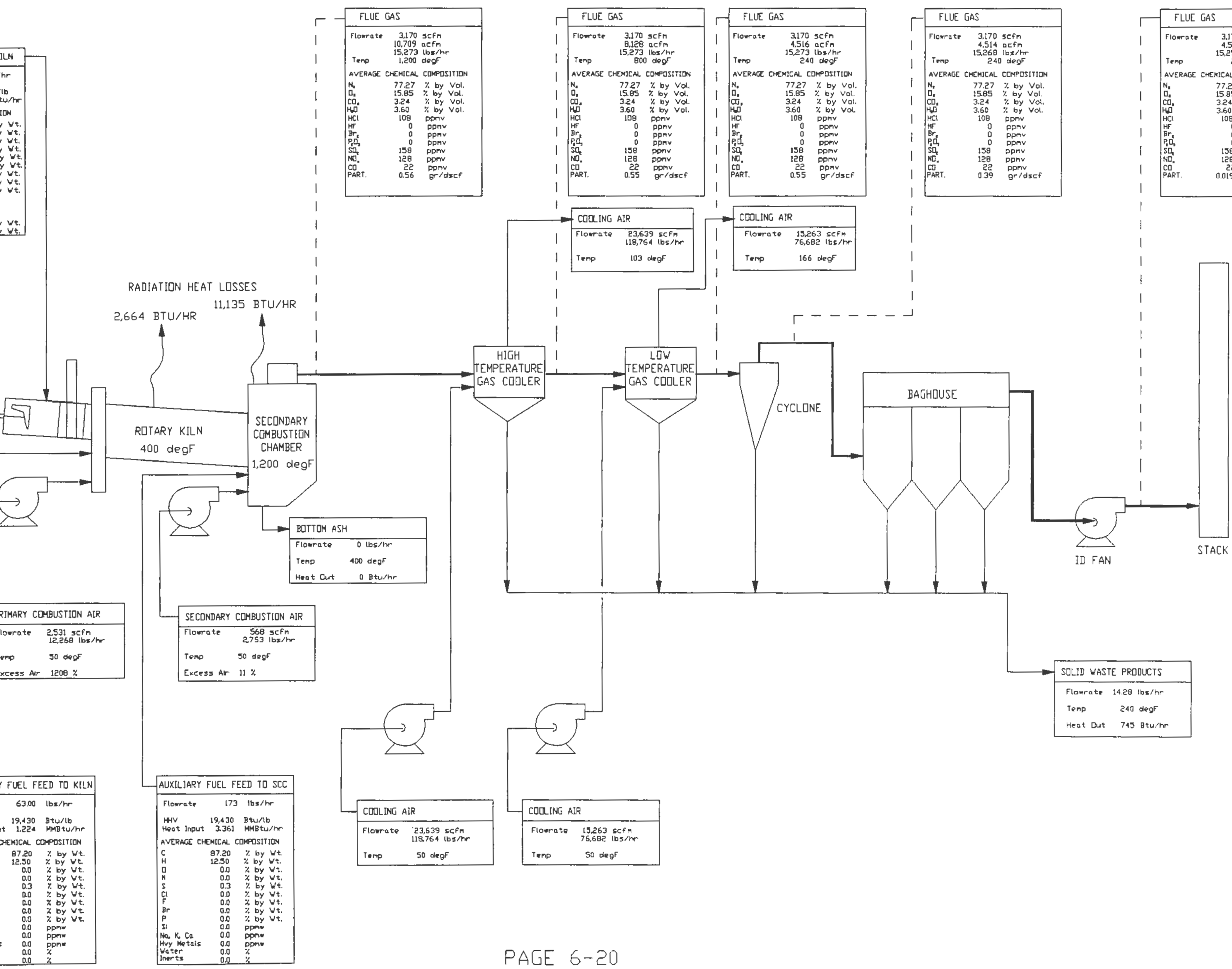


FIGURE 6-/
SENECA ARMY DEPOT
TRIAL BURN PLAN - TEST NO. 7
MASS AND ENERGY BALANCES

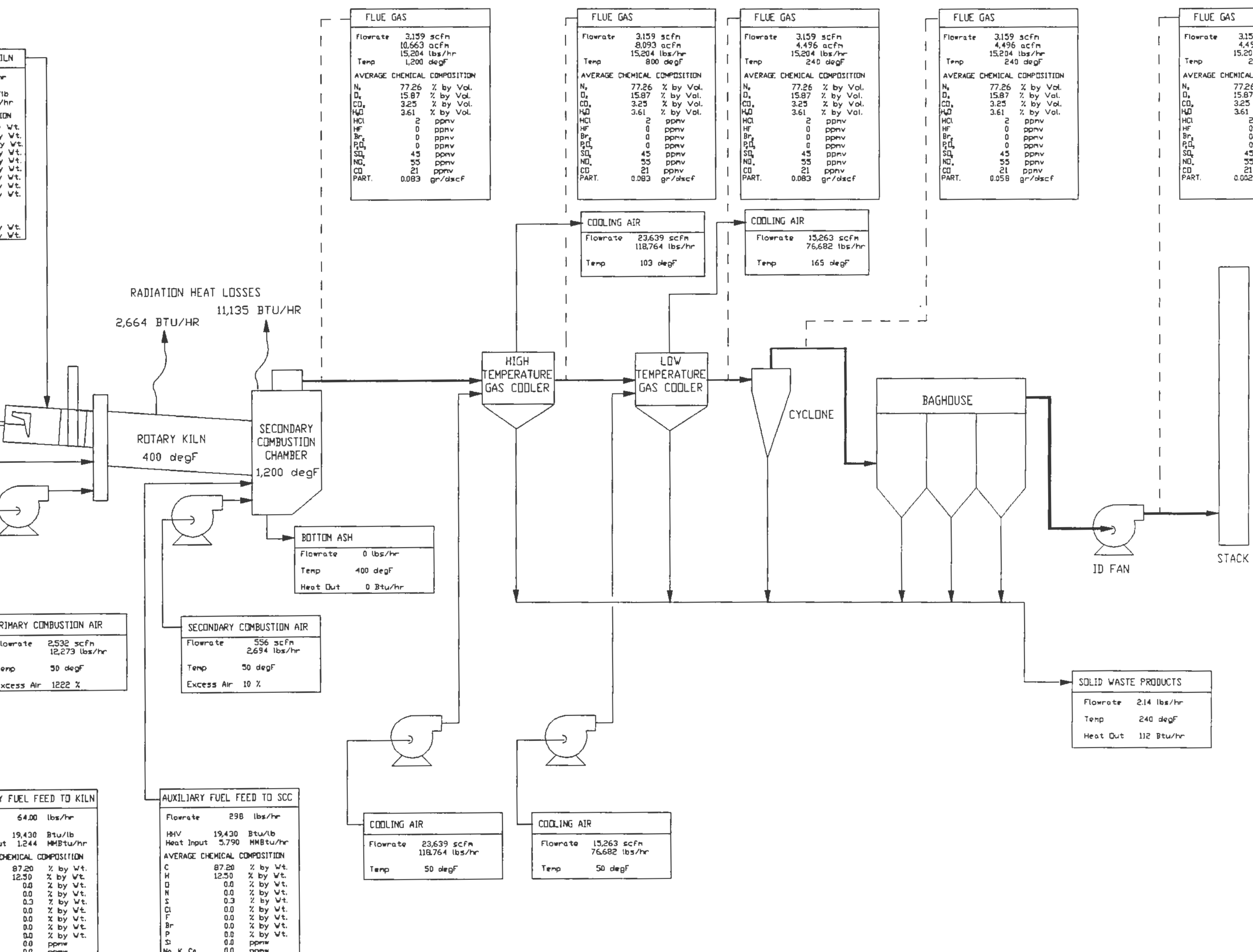


FIGURE 6-8
SENECA ARMY DEPOT
TRIAL BURN PLAN - TEST NO. 8
MASS AND ENERGY BALANCES

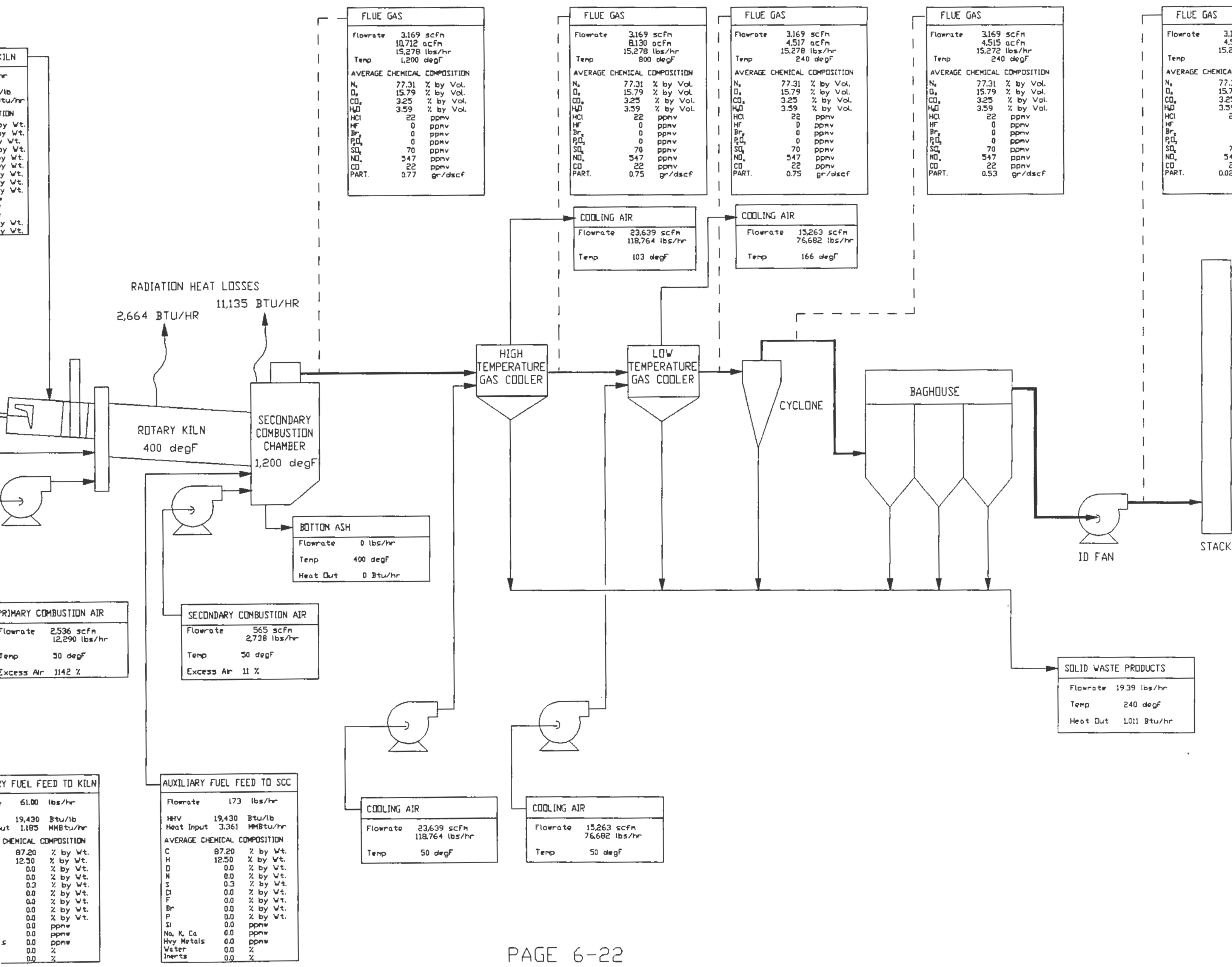
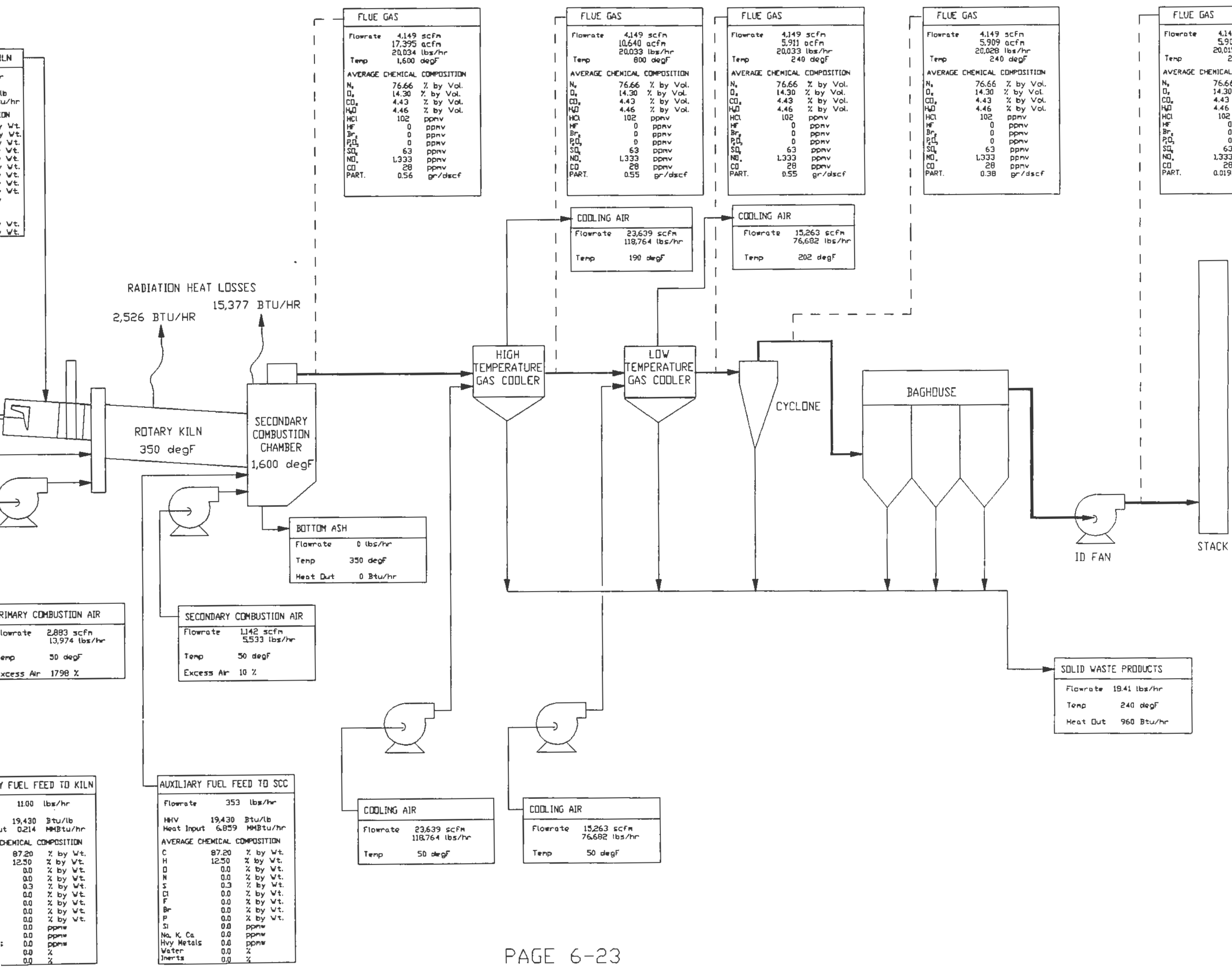


FIGURE 6 ,
SENECA ARMY DEPOT
TRIAL BURN PLAN - TEST NO. 9
MASS AND ENERGY BALANCES



SECTION 7

SAMPLING AND ANALYSIS PLAN

The goal of the Sampling and Analysis Plan presented for the APE 1236 deactivation furnace at the Seneca Army Depot is to ensure collection of valid data which will show compliance with all applicable regulations and standards regarding the operation of an industrial furnace. Federal permit standards for burners are described in 40 CFR Part 266, Subpart H (12). This federal code recognizes the overlap with the overall facility's Part B permit, nonetheless, it is specific in identifying wastes and waste streams that must be sampled and analyzed for a permit to be issued. EPA-approved sampling and analytical methods are also described in these regulations which detail procedures that must be followed for the collection of valid data. Accordingly, the methods specified in this plan will be those described in 40 CFR Part 60 Appendix A; SW-846, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, 3rd Edition;, and the EPA Methods Manual for Compliance with the BIF Regulations. The exception to this will be the sampling and analytical methods used to sample energetic compounds in stack gas and fly ash. These methods have been established by the United States Army Environmental Hygiene Agency (AEHA) and are presented in **Attachment B** of the Quality Assurance/Quality Control (QA/QC) Plan **(Appendix G)**. It is believed that the USCOE and AEHA are the best sources for sampling and analytical methods of Propellants, Explosives and Pyrotechnics (PEP).

The sampling and analytical program presented here will involve sampling of the following items:

- Residue (fly ash), collected from the ash chute of the two (2) gas coolers, the cyclone and the baghouse,
- Stack gas, leaving downstream of all the Air Pollution Control Devices (APCD), and

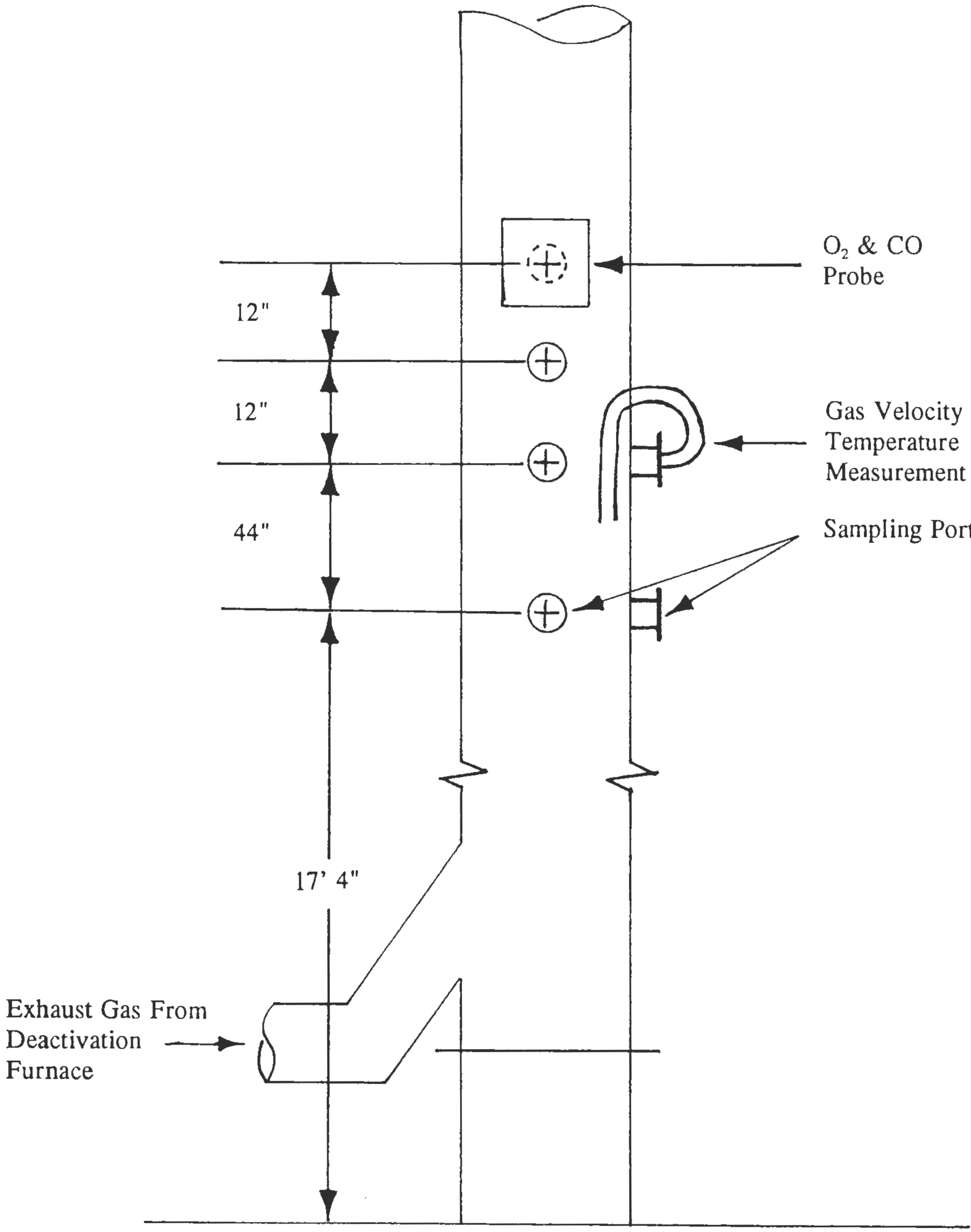
Fly ash analytes, including POHCs, the thirteen (13) RCRA metals and Dioxin and Furans, will be sampled from the two gas coolers, the cyclone, and the baghouse. The location of fly ash sampling points are shown in drawing No. SK87-12, which is located in **Map Pocket 5 of Appendix P**. Samples of the munition waste feed will not be collected due to the hazardous nature of sampling, shipping and analyzing energetic compounds. Instead of actual chemical analysis of the various munitions that will be burned, the military chemical specifications for these wastes will be used as the basis for determining the waste feed characterization. Stack gas will be evaluated continuously with continuous emission monitors (CEM) while grab samples are collected with sampling trains.

Carbon monoxide (CO), oxygen (O_2), total hydrocarbons (THC), and nitrogen oxides (NO_x) will be measured continuously. Continuous measurements of CO and O_2 will be performed by monitors that are a part of the APE 1236 instrumentation. Carbon dioxide (CO_2), O_2, chlorinated dioxins and furans, antimony (Sb), barium (Ba), chromium (Cr), lead (Pb), particulate matter, hexachlorobenzene (HCB), trichloroethene (TCE), nitroglycerine (NG), and dinitrotoluene (DNT) will be sampled with manual sampling trains.

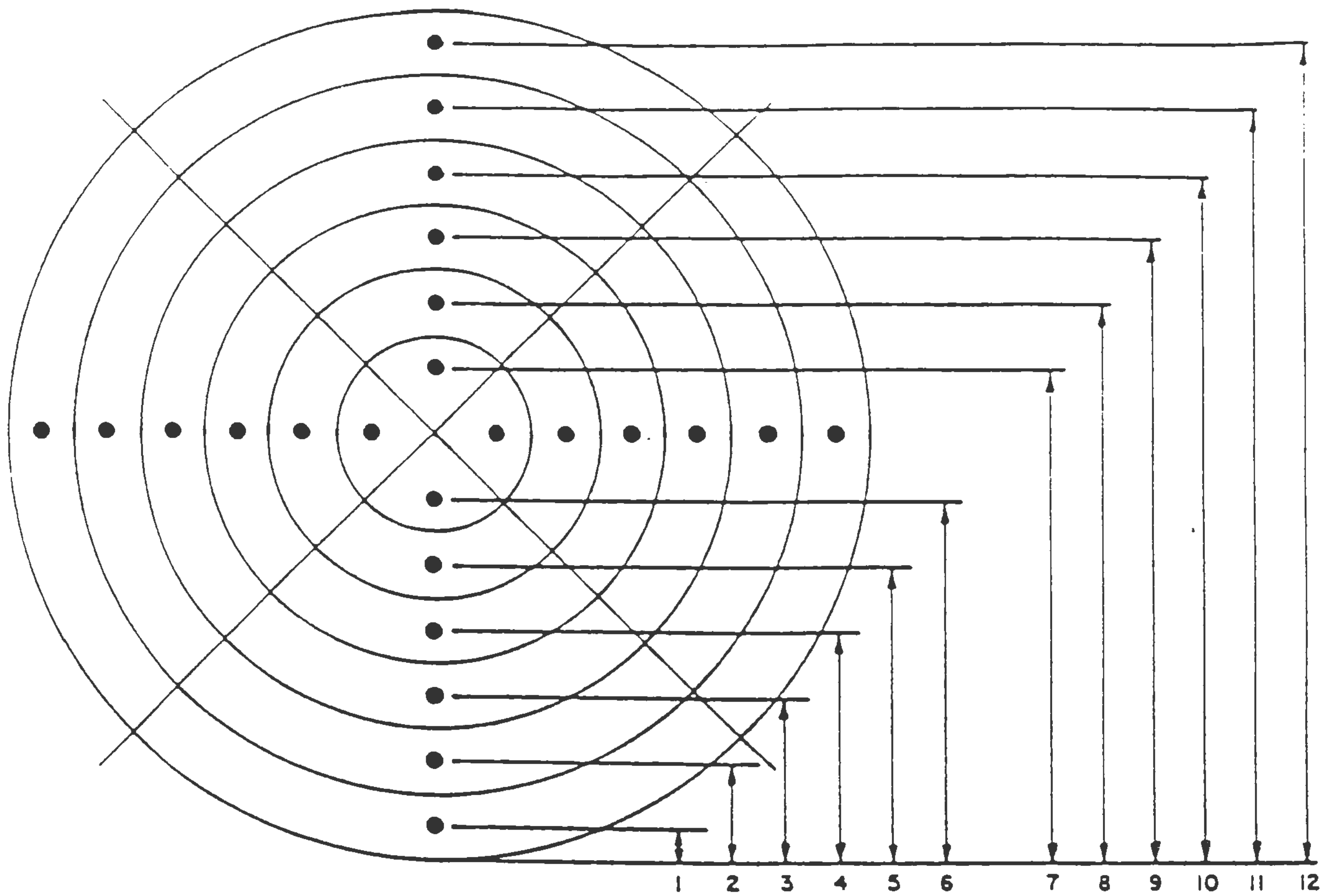
Each test burn will consist of three valid sampling runs. The duration of each run will vary depending on the required sampling procedure and method detection limit. Runs will be considered invalid and will be repeated if samples are out of control for isokinetic sampling or do not pass post-test leak checks. Operational problems occurring during testing may also cause a run to be rejected. Such rejections will be considered on a case-by-case basis, with concurrence of regulatory observers.

The sampling locations for stack testing are shown in **Figure 7-1**. The APE 1236 has a 30 foot stack that is 20 inches in diameter (O.D.). Sampling ports for continuous emissions monitoring instruments and for sample trains are located at approximately 20 feet above grade. There are two ports arranged so that perpendicular sampling traverses can be accommodated. **Figure 7-2** shows the sampling locations for each traverse. A sampling platform provides safe and easy access to the sample ports. Drawing No. SK87-12 in **Map Pocket 5 of Appendix P** also illustrates where the fly ash samples will be collected during the trial burn.

Table 7-1 shows that nine test conditions have been identified for the trial burn. A summary of sampling and analytical procedures, monitoring procedures, the test schedule and the final report outline are presented in the following subsections.



Stack Sample Port Locations
Figure 7-1



Point No.	Percentage of Stack Diameter	Distance From Stack Wall
1	2.1	1/2"
2	6.7	1 1/4"
3	11.8	2 1/4"
4	17.7	3 3/8"
5	25.0	4 7/8"
6	35.6	6 7/8"
7	64.4	12 1/2"
8	75.0	14 1/2"
9	82.3	16"
10	88.2	17 1/8"
11	93.3	18 1/8"
12	97.9	18 7/8"

EXHAUST STACK TRAVERSE

Figure 7-2

TABLE 7-1
TRIAL BURN TESTING SUMMARY

Analysis Parameters	Sampling Method	Collection Frequency	Test Series Number	Sample Preparation	Analytical Method
		STACK GAS			
Particulate Matter	Reference Method 5	3 runs/test series	4	NA(1)	Reference Method 5
Stack Gas Volumetric Flowrate	Reference Method 2	3 runs/test series	all	NA	NA
Temperature	Reference Method 2	3 runs/test series	all	NA	NA
Moisture	Reference Method 4	3 runs/test series	all	NA	NA
CO_2, O_2	Reference Method 3 and CEMs	3 runs/test series and Continuous	all	NA	Reference Method 3 and CEMs
NO_x	Reference Method 7E	Continuous	all	NA	Reference Methods 7E
CO	CEM	Continuous	all	NA	NDIR
THC	Reference Method 25A	Continuous	all	NA	Reference Method 25A
POHCs (HCB) (TCE) (NG) (DNT)	 SW-846 Method 0010 SW-846 Method 0030 AEHA STEM Method (2) AEHA STEM Method	 3 runs/test series 3 runs/test series 3 runs/test series 3 runs/test series	 1 2 3 4	 SW-846 Method 0010 SW-846 Method 5040 AEHA STEM Method AEHA STEM Method	 SW-846 Method 8120A SW-846 Method 5040(8240) AEHA STEM Method AEHA STEM Method
Barium	BIF Metals Method(3)	3 runs/test series	5	BIF Metals Method	SW-846 Method 6010A
Antimony	BIF Metals Method	3 runs/test series	6	BIF Metals Method	SW-846 Method 6010A
Chromium	BIF Metals Method	3 runs/test series	7	BIF Metals Method	SW-846 Method 6010A
Lead	BIF Metals Method	3 runs/test series	8	BIF Metals Method	SW-846 Method 6010A
Dioxins/Furans	Reference Method 23	3 runs/test series	9	Reference Method 23	Reference Method 23
		FLY ASH			
HCB	Trowel Method (S007)	3 samples/series	1	SW-846 Method 3540	SW-846 Method 8120A
TCE	Trowel Method (S007)	3 samples/series	2	SW-846 Method 5030	SW-846 Method 8010
NG	Trowel Method (S007)	3 samples/series	3	SW-846 Method 3540	AEHA STEM Method
DNT	Trowel Method (S007)	3 samples/series	4	SW-846 Method 3540	AEHA STEM
13 RCRA Metals	Trowel Method (S007)	3 samples/series	All	SW-846 Method 1311 SW-846 Method 3050	SW-846 Method 6010A SW-84 Method 7471
Dioxins/Furans	Trowel Method (S007)	3 samples/series	9	SW-846 Method 8280	SW-846 Method 8280

(1) Not Applicable
(2) Army Environmental Hygiene Agency Sampling Train for Energetic Materials
(3) Boiler and Industrial Furnace Metals Method
(4) Arthur D. Little, "Sampling and Analysis Methods for Hazardous Waste Combustion" EPA-600/8-84-002, PB84-155845, February 1984

7.2 SAMPLING, ANALYSIS AND MONITORING PROCEDURES

7.2.1 Furnace Temperature

The furnace temperature will be measured by type K thermocouples as described in **Section 2**. Thermocouple locations on the kiln are shown in **Figure 2-4**. Measurements are recorded on magnetic media at the control panel. Spot measurements will be taken as is necessary.

7.2.2 Stack Gas CO_2 and O_2 Content

The CO_2 and O_2 content of the exhaust gas from the APE 1236 will be measured by the field sampling team using USEPA Reference Method 3 (40 CFR Part 60 Appendix A). Method 3 utilizes an Orsat analyzer to measure the concentration of oxygen and carbon dioxide in a sample of dry stack gas. It is assumed that the balance of the dry stack gas is nitrogen and then the stack gas molecular weight is calculated. The result is accurate if no other compounds (other than carbon monoxide) are present at significant concentration. The presence of carbon monoxide does not introduce errors since its molecular weight is the same as that of molecular nitrogen.

A Method 3 train will be operated simultaneously with each USEPA Reference Method 5 (RM5), RM23, BIF Metals Method, SW-846 Method 0010, SW-846 Method 0030 or AEHA STEM sampling run. An integrated sample will be collected over the same time period that the other train is operating. Stack gas will be collected at about 0.5 liter/minute. The Method 3 train will collect stack gas from the same sampling points in the stack that the other train will be sampling. This will be accomplished by attaching the Method 3 probe to the other train's probe and traversing the same sampling points.

At the conclusion of the sampling period, the collected sample will be analyzed for carbon dioxide and oxygen. A sample of gas is caused to displace 100 cc of slightly acidic water in a burette. This gas is then flushed back and forth through a gas washing bottle that contains a strong caustic solution that absorbs carbon dioxide. The volume of gas remaining is then measured in the burette. The gas is then flushed through a second gas washing bottle that contains alkaline paragallol, an oxygen absorbing solution.

After each absorbing step, the volume of gas remaining is measured and recorded. The gas remaining is assigned a molecular weight of 28 atomic mass units (the molecular weight of both CO and N_2).

The presence of other gases at typically encountered concentrations (i.e., SO_2, NO_x, argon) does not affect the accuracy of the method significantly.

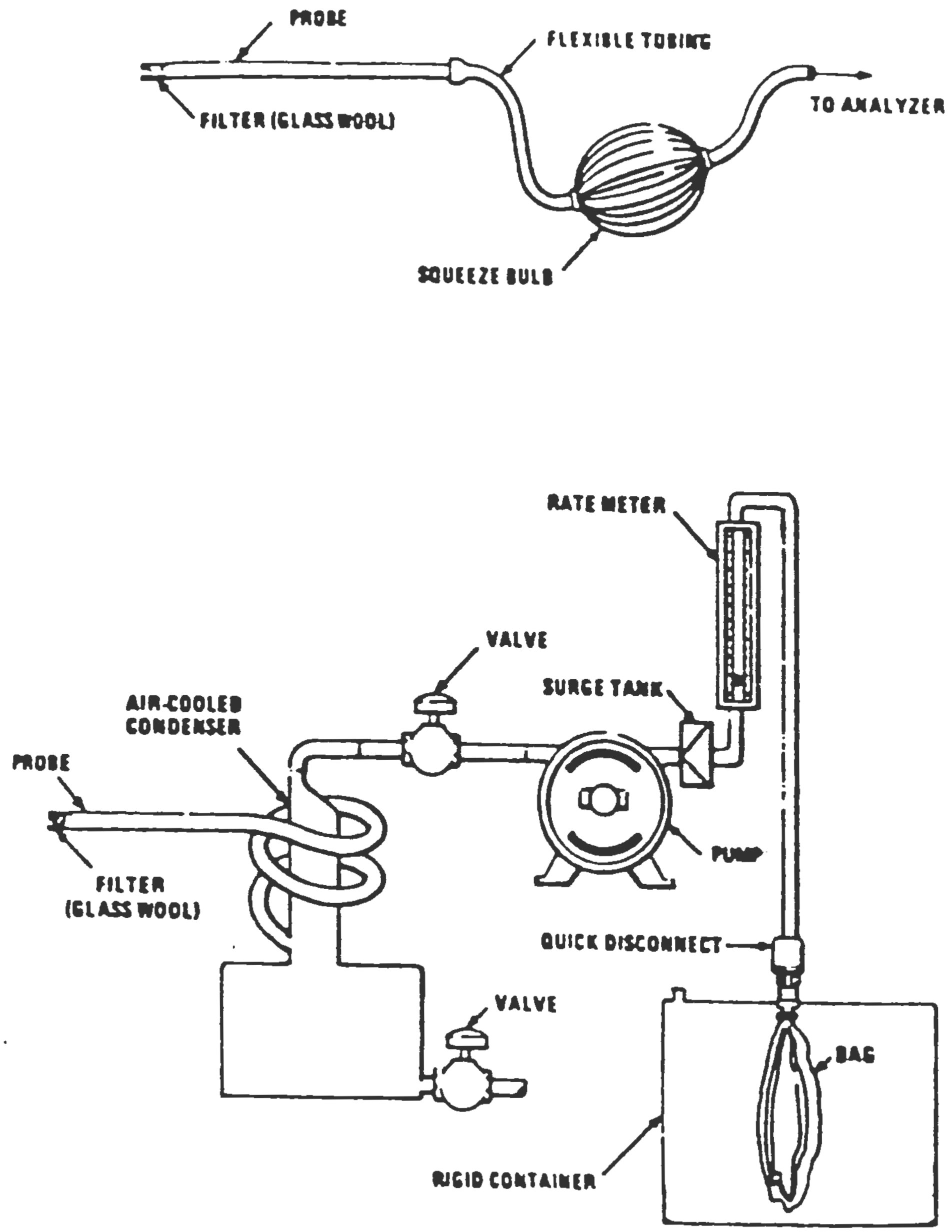
Stack gas sampling with Method 3 will be performed with the sampling train depicted in **Figure 7-3**. The sampling train consists of a sampling probe, a gas drying system, a pump, a rate meter and an inert-plastic bag. Several options exist for configuration of the sampling train. A condenser is depicted in Figure 7-3, but often chilled impingers are used for moisture removal. Also, a peristaltic pump can replace the pump and rate meter and the rigid container is often omitted.

Quality assurance and quality control procedures for this method will be applied as described in Method 3 and in the SEAD Trial Burn Quality Assurance and Quality Control Plan **(Appendix G)**.

7.2.3 Carbon Monoxide Monitor

The concentration of carbon monoxide will be measured by a CO analyzer permanently installed in the control room. The analyzer uses non-dispersive infrared (NDIR) technology to continuously measure the amount of CO present in the gas stream. Analysis of CO is based upon the absorption of infrared radiation by the CO molecule. The intensity of the absorption depends on the concentration of CO present. Two infrared light beams are generated, with one part passing through the sample cell, and the other part passing through a reference cell. Inside the reference cell is a non-absorbing gas such as nitrogen. The light that is passed through the cells is then detected by a detector based on the Luft principle. The detector converts the difference in energy between sample and reference cells to a change in capacitance. The capacitance change is equivalent to the amount of CO present. The output signal from the analyzer is sent to a data acquisition system (DAS) that converts the signal to ppm of CO and makes a correction to 7% O_2. This corrected value is recorded.

When the APE 1236 deactivation furnace is operating, stack gas is drawn continuously from a port in the stack at approximately 20 feet above grade and delivered to the analyzer in the control room. The gas is pulled through a heated line (constructed of material that is non-reactive to the gas) at a rate specific to the analyzer. The sample is conditioned prior to analysis since the NDIR analyzer requires a cool and dry sample. Sample gas conditioning involves the removal of particles and moisture from the sample prior to introduction to the analyzer. The sample conditioning system consists of a dual-channel refrigerated condenser and a multiple-stage filtration unit.



METHOD 3 SAMPLING TRAIN

Figure 7-3

The analyzer operating range corresponds to specifications in the BIF regulations. The CO analyzer is a Rosemount/Beckman 880 NDIR; a dual-range model that has a 0-200 ppm range and a 0-3000 ppm range. After the sampling system is ready for use, calibration gases are directly introduced into the instrument for an analyzer calibration error check. When this has been completed, calibration gas is introduced into the sampling system at the probe to provide a sampling system bias check. An automatic calibration is performed daily when the furnace is operating. These procedures are used to validate the analyzers responses during the monitoring period. Further details regarding calibration gases, operating procedures, QA/QC procedures and corrective actions are provided in the SEAD Trial Burn Quality Assurance and Quality Control Plan **(Appendix G)**. Manufacturer's information for the CO analyzer is included in **Appendix B**.

7.2.4 Oxygen Monitor

Oxygen concentration in the stack gas will be measured by an O_2 monitor permanently installed in the control room. Oxygen is detected by using Faraday's principle that comparatively measures the magnetic susceptibility of a gas volume by the force acting upon a non-magnetic test body suspended in a disproportionate magnetic field. The test body is mounted on a platinum suspension in a strong, relatively disproportionate magnetic field. Because oxygen is more paramagnetic than the test body, the magnetic force acts to reject the test body from the magnetic field. As oxygen is introduced to the analyzer, a force manifests itself upon the test body and rotates it out of the magnetic field. When this occurs, a diamond-shaped mirror mounted on the platinum suspension also is rotated. This rotation causes the mirror to reflect a pre-focused light source unequally across two photocells. (When the mirror is in a neutral position, the photocells are illuminated equally.) Through an operational amplifier, the photocells apply a feedback current to the test body. The electromagnetic force that is created by the feedback current is opposite and almost equal to the magnetic force applied to the test body. The feedback current is a linear function of the oxygen concentration and an output signal is generated that can be converted and recorded as oxygen concentration in stack gas.

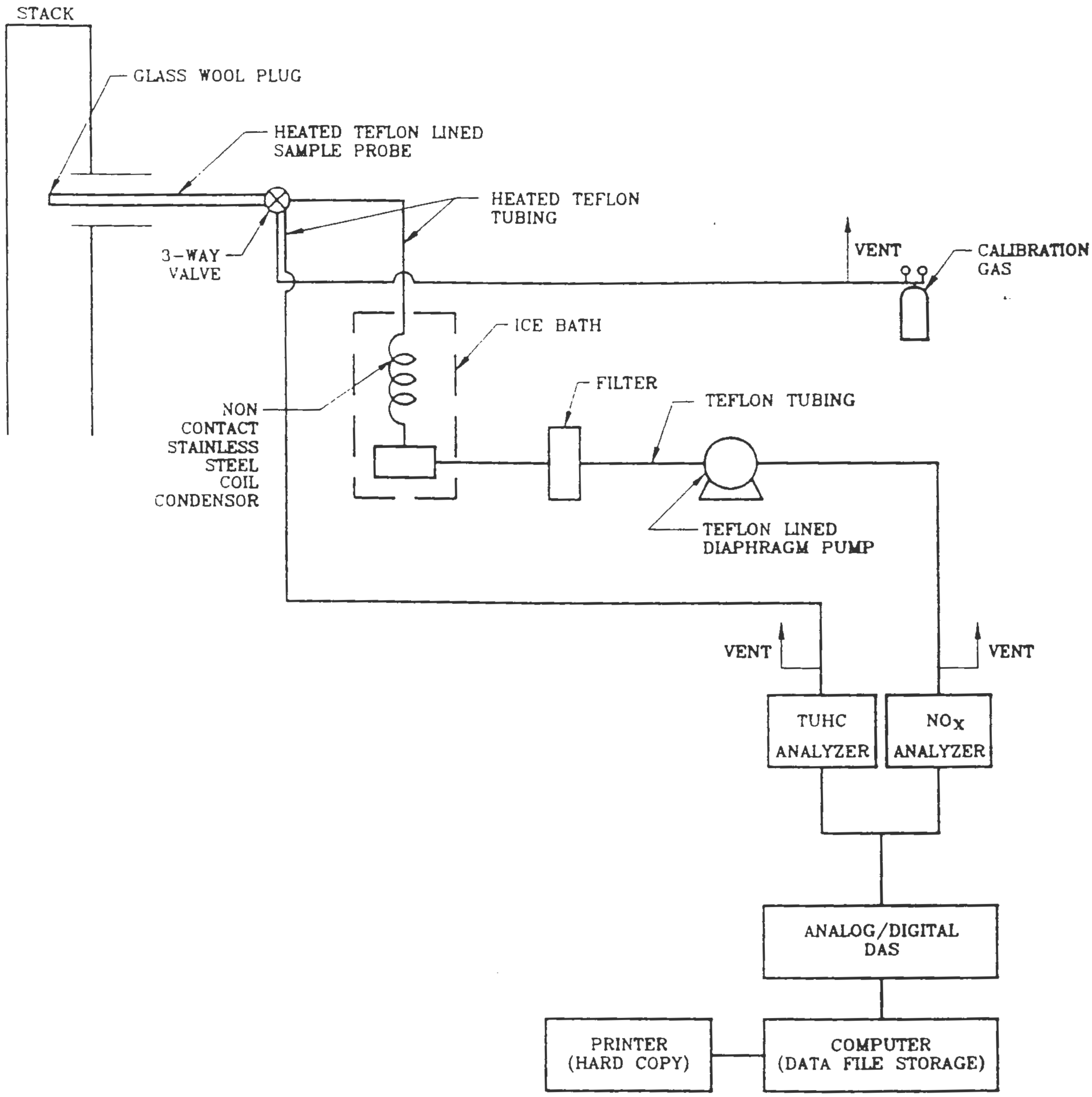
When the APE 1236 deactivation furnace is operating, stack gas is drawn continuously from a port in the stack at approximately 20 feet above grade and delivered to the analyzer in the control room. The gas is pulled through a heated line (constructed of material that is non-reactive to the gas) at a rate specific to the analyzer. The sample is conditioned prior to analysis since the paramagnetic oxygen analyzer requires a cool and dry sample. Sample gas conditioning involves removal of particles and moisture from the sample prior to introduction to the analyzer. The sample conditioning system consists of a dual channel refrigerated condenser and a multiple-stage filtration unit.

The analyzer operating range is chosen based on the BIF regulations. The O_2 analyzer is a Rosemount Analytical 755R Paramagnetic Oxygen Analyzer. The standard full-scale operating ranges for this instrument are 0-5%, 0-10%, 0-25%, 0-50%, and 0-100%. During the trial burn the system will be operating in the 0-25% range. After the sampling system is ready for use, calibration gases are directly introduced into the instrument for an analyzer calibration error check. When this has been completed, calibration gas is introduced into the sampling system at the probe to provide a sampling system bias check. A calibration error check and a sampling system bias check are performed daily. These procedures are used to validate the analyzers responses during the monitoring period. Further details regarding calibration gases, operating procedures, QA/QC procedures and corrective actions are provided in the SEAD Trial Burn Quality Assurance and Quality Control Plan **(Appendix G)**. Manufacturer's information for the Oxygen analyzer is included in **Appendix B**.

7.2.5 Nitrogen Oxides Emissions Measurements

Nitrogen oxides will be determined using the sampling procedures outlined in EPA Reference Method 7E. Method 7E is based upon the chemiluminescent reaction between nitric oxide (NO) and ozone (O_3). When these two compounds react, a characteristic wavelength of light is emitted. The light is passed through a photomultiplier tube that amplifies the light beam. The intensity of the amplified light beam is measured by a detector that converts the light energy into an electronic signal. The magnitude of the signal is proportional to the amount of NO present in the gas sample. The instrument contains an internal source of ozone and a catalytic reduction chamber where NO_2 in the sample is reduced to NO prior to its introduction into the reaction chamber. The reduction catalyst may be bypassed, allowing for sequential analysis of total NO_x and then NO. The concentration of NO_2 may then be determined by difference.

During each trial burn run, stack gas will be drawn from the stack at a sampling port that is approximately 20 feet above grade. A heated sampling probe will be placed into the sampling port and gas will be drawn down a heated line and delivered to the nitrogen oxide analyzer located in a mobile continuous emission monitoring unit located less than 100 feet away from the stack. Sample gas is conditioned before being introduced to the analyzer. The gas conditioning system consists of a non-contact ice-bath condenser, and a particle filter (**Figure 7-4**). When stack gas sample is being



**METHOD 7E AND METHOD 25A
CONTINUOUS EMISSIONS MONITORING SYSTEM**

Figure 7-4

analyzed, the instrument output is monitored by a PC-driven data acquisition system. The system records instrument responses at thirty second intervals, calculates the concentrations of target analytes, and prints a record of the results and logs the data to a disk. The disk files are later processed with another suitable software package for data reduction.

The analyzer operating range is selected such that the pollutant gas concentration equivalent to the emission standard is not less than thirty percent of the span. The NO_x analyzer is a Thermo Environmental Model 10-AR with multiple ranges as follows: 0-2.5 ppm, 0-10 ppm, 0-25 ppm, 0-100 ppm, 0-250 ppm, 0-1000 ppm, 0-2500 ppm, and 0-10000 ppm. After the sampling system is ready for use, calibration gases are directly introduced into the instrument for an analyzer calibration error check. When this has been completed, calibration gas is introduced into the sampling system at the probe to provide a sampling system bias check. A sampling system bias check is performed prior to every run. At the completion of each run, a sampling system bias is again performed. These procedures are used to validate the analyzers responses during the sampling period, for observed calibration errors and drift. Further details regarding calibration gases, operating procedures, QA/QC procedures and corrective actions are provided in the SEAD Trial Burn Quality Assurance and Quality Control Plan (**Appendix G**).

7.2.6 Total Hydrocarbon Emissions Measurement

Total Hydrocarbons (THC) will be measured by using EPA Reference Method 25A. This method analyzes a gas sample for the concentration of total gaseous organic vapors. A flame ionization analyzer is used to perform the analysis. Specifically, a flame ionization detector will be used to continuously monitor the stack gas for total hydrocarbon concentration. The principle of operation is that the combustion of hydrocarbon in a flame releases a large number of ions that create a current between two electrodes. The strength of the current is measured by an electrometer amplifier and is directly proportional to the hydrocarbon concentration in the flame.

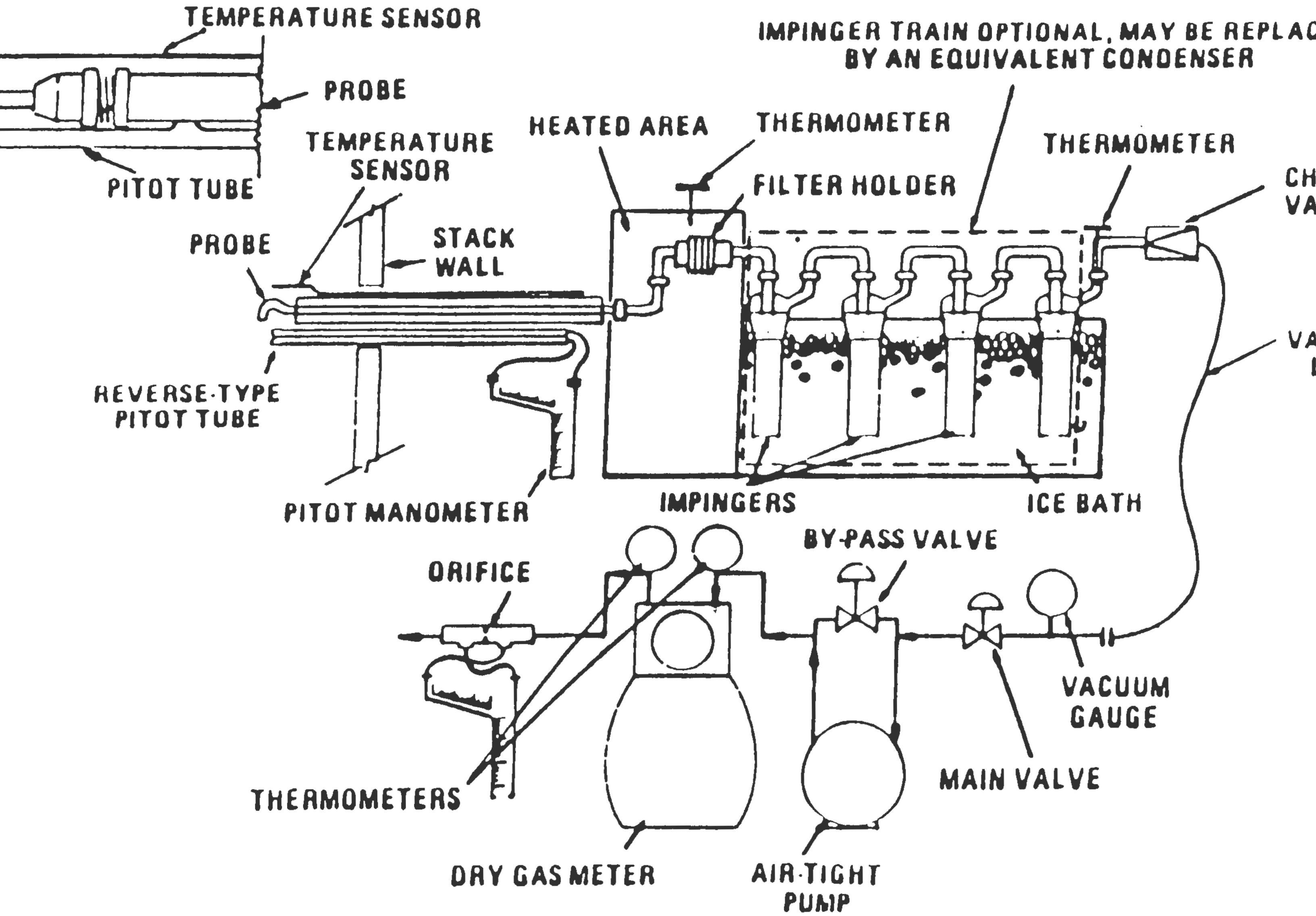
During each trial burn run, stack gas will be drawn from the stack at a sampling port that is approximately 20 feet above grade. A heated sampling probe will be placed into the sampling port and gas will be drawn down a heated line and delivered to the THC analyzer located in a mobile continuous emission monitoring unit located less than 100 feet away from the stack. Sample gas is not conditioned before being introduced to the analyzer; instead it is analyzed hot and wet (**Figure 7-4**). When stack gas sample is being analyzed, the instrument output is monitored by a PC-driven data acquisition system. The system records instrument responses at thirty second intervals, calculates the concentrations of target analytes, and records the results in a written report, as well as on a hard disk drive. The responses are then imported into Lotus 1-2-3 or another suitable software package for data reduction.

The analyzer operating range is selected to be between 1.5 and 2.5 times the applicable emission limit. The THC analyzer is a J.U.M. Engineering Model VE-7 with multiple ranges as follows: 0-10 ppm, 0-100 ppm, 0-1000 ppm, 0-10000 ppm, 0-100000 ppm. After the sampling system is ready for use, calibration gas is introduced into the sampling system at the probe to provide a sampling system calibration error check. A calibration error check is performed within two hours of the start of every run. At the completion of each run, a calibration drift check and a sampling system bias are also performed. These procedures are used to validate the analyzers responses during the sampling period, and to calculate the measurement system error and drift. Further details regarding calibration gases, operating procedures, QA/QC procedures and corrective actions are provided in the SEAD Trial Burn Quality Assurance and Quality Control Plan (**Appendix G**).

7.2.7 Particulate Matter Emission Rate

Particulate matter is withdrawn isokinetically from the source and collected on a glass fiber filter maintained at a temperature in the range of 120 ± 14° C (248 ± 25° F). The particle mass, which includes any material that condenses at or above the filtration temperatures, is determined gravimetrically after removal of uncombined water.

EPA Reference Method 5 will be used to measure the particulate matter emission rate. Three Method 5 sampling runs will be conducted for each trial burn condition where particulate matter is the parameter of concern. The sampling train to be used is shown in **Figure 7-5**. The sampling train consists of a stainless steel nozzle; a glass probe liner with a heating system capable of maintaining the sample gas temperature at 248 ± 25° F; a type-S Pitot tube to determine velocity head in order to calculate stack gas velocity and volumetric flow; a dual inclined manometer for measuring the velocity pressure and orifice differential pressure; a glass filter holder with a glass filter frit support to support the particle filter; a filter heating system capable of maintaining the sample gas temperature at 248 ± 25° F; and a temperature gauge capable of measuring the temperature to within 3° F. Also included in the sampling train is a moisture condenser that is necessary to determine the stack gas moisture content. Four impingers are connected in series with leak-free ground glass fittings. The first impinger is a modified Greenburg-Smith impinger that is charged with



METHOD 5 SAMPLING TRAIN

Figure 7-5

100 ml of water, and the second impinger is a standard Greenburg-Smith that is also charged with 100 ml of water. The third and fourth impingers are modified Greenburg-Smith impingers. The third impinger is empty, and the fourth contains a known mass of silica gel used as a final water trap and to protect the sample pump. The metering system consists of a vacuum gauge, leak free pump, thermometers capable of measuring temperatures to within 5.4° F , and a dry gas meter capable of measuring volume to within 2 percent.

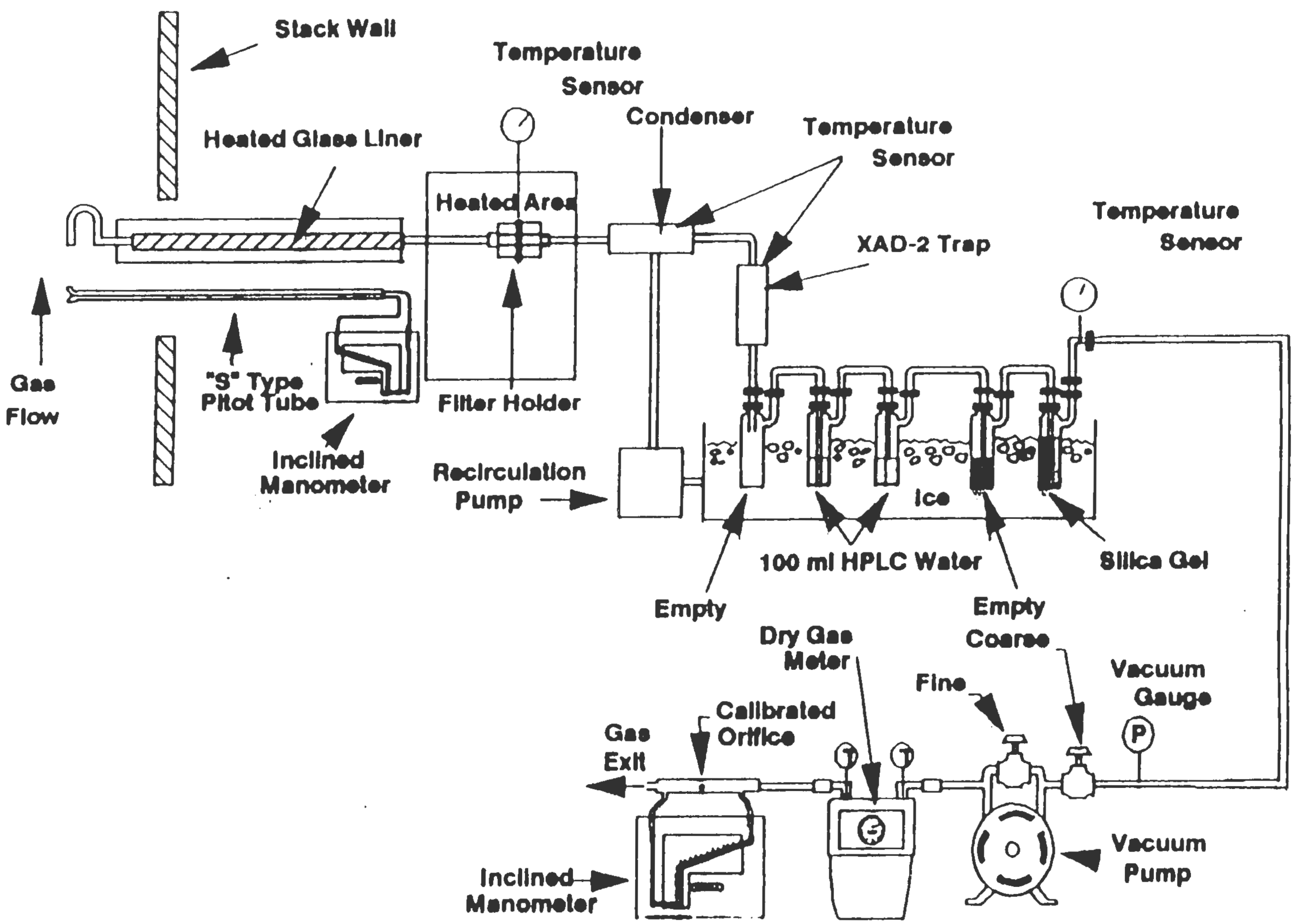
After the sampling location and minimum number of sampling points have been determined (RM 1), the stack pressure and temperature and the range of velocity heads are measured (RM 2), and the moisture content (RM 4) and dry gas molecular weight (RM 3) are determined. A nozzle size is then selected based on the range of velocity heads such that it is not necessary to change nozzles to maintain isokinetic sampling rates, and the differential pressure gauge is checked to ensure that it is capable of measuring the range of velocity heads.

The total sampling time is selected such that the sampling time per point is not less than two minutes, and that the sample volume taken meets or exceeds the minimum required volume. When the sample run is completed, the probe, filter assembly and impingers are removed to the cleanup area for sample recovery. More detailed descriptions of EPA Method 5 sampling and analysis procedures and quality assurance actions are provided in the SEAD Trial Burn Quality Assurance and Quality Control Plan (**Appendix G**).

7.2.8 Dioxin and Furan Emission Rates

Dioxin and furan sampling and analysis will be accomplished by using EPA Reference Method 23. Stack gas will be drawn isokinetically through a sampling train that incorporates a sorbent trap that can effectively collect dioxins and furans. The adsorbent trap, a glass fiber filter, and appropriate impinger solutions and train rinses will be collected and then extracted for analysis. Dioxins and furans are separated from the sample extract by high resolution gas chromatography and then measured by high resolution mass spectrometry.

Three Method 23 sampling runs will be conducted for each trial burn condition where there is a concern of dioxin and furan emissions. The sampling train to be used is shown in **Figure 7-6**. The sampling train consists of a glass nozzle; a glass probe liner with a heating system capable of maintaining the sample gas temperature at 248 $\pm$ 25° F; a type-S Pitot tube to determine velocity head in order to calculate stack gas velocity and volumetric flow; a dual inclined manometer for



METHOD 23 AND SW-846 METHOD 0010 SAMPLING TRAIN

Figure 7-6

measuring the velocity pressure and orifice differential pressure; a glass filter holder with a glass filter frit support to support the particle filter; a filter heating system capable of maintaining the sample gas temperature at 248 ± 25° F; and a temperature gauge capable of measuring the temperature to within 3° F. After the filter section there is a sorbent module assembly. This assembly consists of a coil condenser and a XAD-2® sorbent module. Following the sorbent module is the impinger train. Five impingers are connected in series with leak-free ground glass fittings. The first impinger is an empty, short-stemmed modified Greenburg-Smith impinger. The second impinger is a modified Greenburg-Smith with 100 ml of water. The third impinger is a standard Greenburg-Smith type charged with 100 ml of water. The fourth and fifth impingers are modified Greenburg-Smith impingers. The fourth impinger is empty, and the fifth contains a known mass of silica gel used as a final water trap and to protect the sample pump. The metering system consists of a vacuum gauge, leak free pump, thermometers capable of measuring temperatures to within 5.4° F, and a dry gas meter capable of measuring volume to within 2 percent.

After the sampling location and minimum number of sampling points have been determined, the stack pressure and temperature and the range of velocity heads are measured, and the moisture content and dry gas molecular weight are determined. A nozzle size is then selected based on the range of velocity heads such that it is not necessary to change nozzles to maintain isokinetic sampling rates, and the differential pressure gauge is checked to ensure that it is capable of measuring the range of velocity heads.

The total sampling time is selected such that the sampling time per point is not less than two minutes, and that the sample volume taken meets or exceeds the minimum required volume. The probe, filter assembly, sorbent module, and impingers are removed to the cleanup area for sample recovery. More detailed descriptions of EPA Method 23 sampling and analysis procedures and quality assurance actions are provided in the SEAD Trial Burn Quality Assurance and Quality Control Plan (**Appendix G**).

7.2.9 <u>Metals Emission Rate</u>

Stack gas is withdrawn isokinetically and particulate and gaseous metals are collected with a Method 5 style sampling train. A heated filter is used to collect particle associated metals and chilled impingers filled with absorbing solution are used to collect vapor-phase metals. Sampling train components are broken into "front-half" and "back-half" fractions and returned to the laboratory for analysis. Each half is digested with acid solutions to dissolve organics and remove organics that might create analytical interferences. Digested samples will be analyzed for antimony, barium, chromium, and lead. Atomic absorption spectroscopy (AAS) will be used to perform this analysis.

The Boiler and Industrial Furnace (BIF) Methodology for the Determination of Metals Emissions in Exhaust Gases from Hazardous Waste Incineration and Similar Combustion Processes will be used to measure the metals emission rate. Three BIF Metal Method sampling runs will be conducted for each trial burn condition where metal emission rates must be monitored. The sampling train to be used is shown in **Figure 7-5** (same as a Method 5 train). The sampling train consists of a glass nozzle; a glass probe liner with a heating system capable of maintaining the sample gas temperature at 248 ± 25° F; a type-S Pitot tube to determine velocity head in order to calculate stack gas velocity and volumetric flow; a dual inclined manometer for measuring the velocity pressure and orifice differential pressure; a glass filter holder with a glass filter frit support to support the particle filter; a filter heating system capable of maintaining the sample gas temperature at 248 ± 25° F; and a temperature gauge capable of measuring the temperature to within 3° F. The back-half of the sampling train consists of four impingers connected in series with leak-free ground glass fittings. The first impinger is an empty modified Greenburg-Smith impinger. The second impinger is a modified Greenburg-Smith that is charged with 100 ml of HNO_3/H_2O_2. The third impinger is a Greenburg-Smith impinger also charged with 100 ml of HNO_3/H_2O_2. The fourth impinger contains a known mass of silica gel used as a final water trap and to protect the sample pump. The metering system consists of a vacuum gauge, leak free pump, thermometers capable of measuring temperatures to within 5.4° F, and a dry gas meter capable of measuring volume to within 2 percent.

After the sampling location and minimum number of sampling points have been determined, the stack pressure and temperature and the range of velocity heads are measured, and the moisture content and dry gas molecular weight are determined. A nozzle size is then selected based on the range of velocity heads such that it is not necessary to change nozzles to maintain isokinetic sampling rates, and the differential pressure gauge is checked to ensure that it is capable of measuring the range of velocity heads.

The total sampling time is selected such that the sampling time per point is not less than two minutes, and that the sample volume taken meets or exceeds the minimum required volume. The probe, filter assembly and impingers are removed to the cleanup area for sample recovery. More detailed descriptions of BIF Metal Method sampling and analysis procedures and quality assurance actions are provided in both **Appendix E** and the SEAD Trial Burn Quality Assurance and Quality Plan (**Appendix G**).

7.2.10 Exhaust Gas Flowrate

A Type-S Pitot tube and a Type-K thermocouple have been inserted into the stack at about twenty feet above grade. These instruments are connected to transmitters that send signals to a signal conditioning device. This device then processes the signal and performs calculations to convert the measured velocity heads and temperatures to stack gas velocities. Further detail regarding the continuous gas flow monitoring system and its operation is presented in **Appendix B** and in the SEAD Trial Burn Quality Assurance/Quality Control Plan (**Appendix G**).

Exhaust Gas Flow Rate will also be monitored using EPA Reference Method 2 concurrently with EPA RM 5, EPA RM 23, BIF Metals Method, SW-846 0010 and the AEHA Sampling Train for Energetic Materials (STEM) method. Three velocity traverses using EPA RM 2 will also be conducted for each test condition prior to the start of source testing. More detailed descriptions of EPA RM 2 sampling and analysis procedures and quality assurance actions are provided in the SEAD Trial Burn Quality Assurance and Quality Control Plan (**Appendix G**).

7.1.11 Principle Organic Hazardous Component (POHC) Emission Rate

Three source testing methods will be used to determine the POHC emission rates. EPA's SW-846 Method 0010 Semi-volatile organic sampling train, SW-846 Method 0030 volatile Organic Sampling Train (VOST), and the AEHA's STEM train are the methods that have been selected to monitor POHC emission rates. The three methods are generally based upon the same sample collection principles. Stack gas will be drawn isokinetically (except for VOST) through a sampling train that incorporates a sorbent module that can effectively collect the organic compounds of concern, POHCs. The sorbent module (containing XAD-2® Resin), a glass fiber filter, and appropriate impinger solutions and train rinses will be collected and then extracted for analysis. Specific POHCs are separated from the sample extract by high resolution gas chromatography and then measured by the appropriate analytical technique (i.e., mass spectrometry, electron capture detection, etc.).

HCB sampling and analysis will be accomplished by using the SW-846 Method 0010 sampling method. Three Method 0010 sampling runs will be conducted for the trial burn condition where HCB is the POHC of concern. Test runs for HCB will be 1 hour in duration. These determinations were based on the need to establish a 99.99 percent DRE for HCB. Calculations that demonstrate that the sampling duration allotted is adequate are presented in **Appendix D-3**.

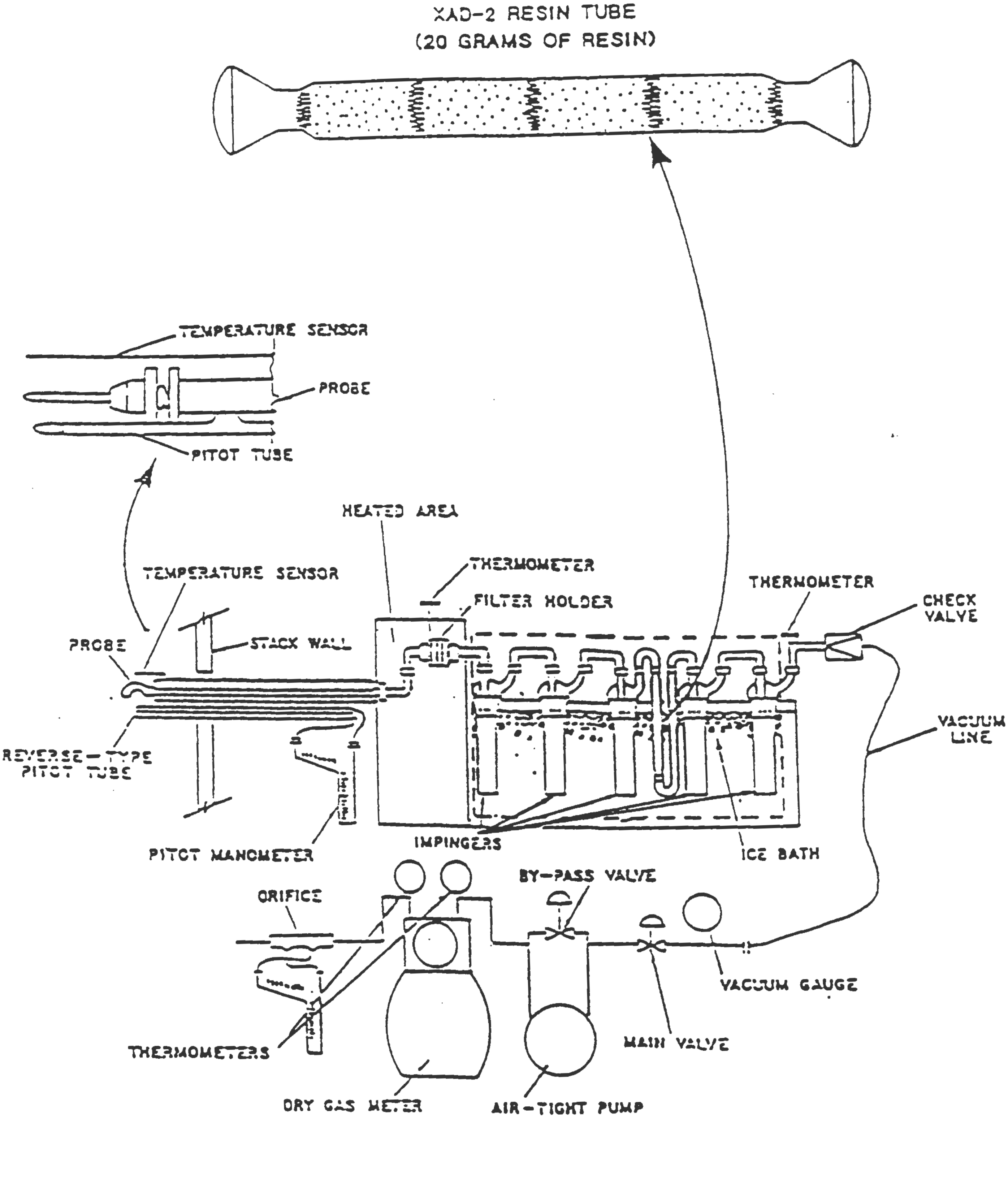
The sampling train to be used for HCB sampling is shown in **Figure 7-6**. Method 0010 sampling collection procedures are similar to those described for Method 23 in **Section 7.2.8**. More detailed descriptions of Method 0010 sampling and analysis procedures and quality assurance actions are provided in both **Appendix E** and the SEAD Trial Burn Quality Assurance and Quality Control Plan (**Appendix G**). Sample gas will be collected at a rate of 30 dry standard cubic feet per hour (dscf/h).

POHC sampling and analysis for energetic compounds will be accomplished by using the AEHA STEM sampling method. Three STEM sampling runs will be conducted for each trial burn condition where nitroglycerine (NG) or Dinitrotoulene (DNT) is the POHC of concern. A sample period of 1 hour at a rate of 30 dscf/h will generate sufficient POHC to establish a 99.99 percent DRE for NG and DNT. Calculations are presented in **Appendix D-3**.

The sampling train to be used to sample NG and DNT is shown in **Figure 7-7**. The sampling train consists of a stainless steel nozzle; a glass probe liner with a heating system capable of maintaining the sample gas temperature at 248 ± 25° F; a type-S Pitot tube to determine velocity head in order to calculate stack gas velocity and volumetric flow; a dual inclined manometer for measuring the velocity pressure and orifice differential pressure; a glass filter holder with a glass filter frit support to support the particle filter; a filter heating system capable of maintaining the sample gas temperature at 248 ± 25° F; and a temperature gauge capable of measuring the temperature to within 3° F.

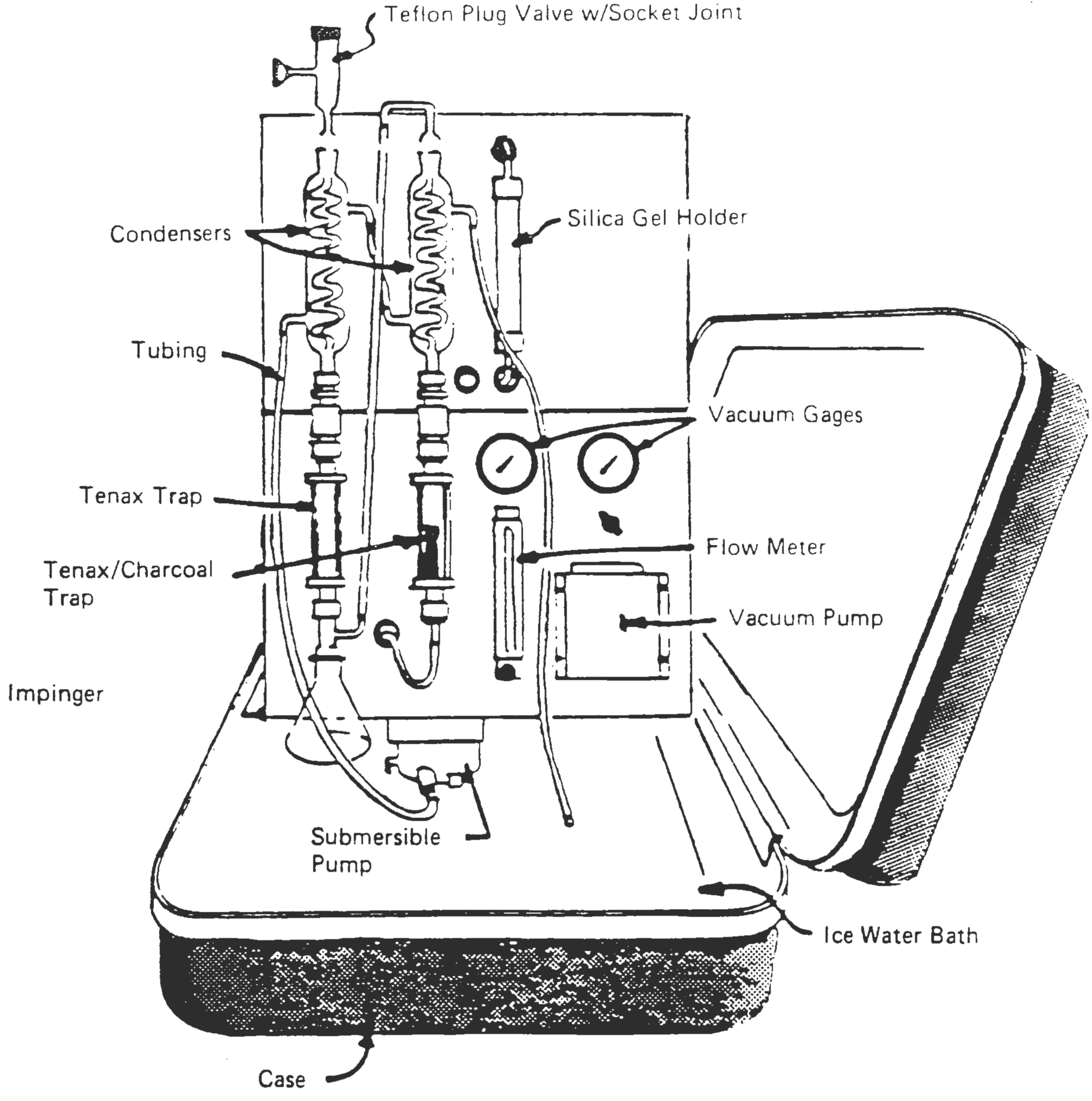
STEM sampling procedures are similar to those described for Method 23 in **Section 7.2.8**. The probe, filter assembly, XAD-sorbent module, and impingers are removed to the cleanup area for sample recovery as per the AEHA STEM method. More detailed descriptions of the STEM sampling and analysis procedures and quality assurance actions are provided in both **Appendix E** and the SEAD Trial Burn Quality Assurance and Quality Control Plan (**Appendix G**).

TCE sampling and sample preparation for analysis will be accomplished by using SW-846 Method 0030 (VOST). Sample analysis will be accomplished by using analytical method 5040. The Method 0030 sampling runs will be conducted for each trial burn condition where TCE is the POHC of concern. Each sampling run will be of 20 minutes duration. Calculations that demonstrate that the sampling duration allotted is adequate are presented in Appendix D-3. Sample gas will be collected at a rate of 1 liter/minute. Total sample volume will be 20 liters. A VOST sampling train is shown in **Figure 7-8**. More detailed descriptions of Method 0030 sampling and analysis procedures and quality assurance actions are provided in the SEAD Trial Burn Quality Assurance and Quality Control Plan (**Appendix G**).



AEHA SAMPLING TRAIN FOR ENERGETIC MATERIALS

Figure 7-7



Volatile Organic Sampling Train (VOST).

Figure 7-8

7.2.12 Waste Feed Sampling

Due to the explosive danger involved, waste feed sampling and analysis will not be performed during this trial burn.

7.2.13 Waste Feed Rates

Waste feed rates will be automatically monitored by the automatic waste feed system. The system will be calibrated prior to the trial burn. A full description has been provided in **Section 2** and in the SEAD Trial Burn Quality Assurance and Quality Control Plan.

7.2.14 Waste Composition

Visual inspection will identify what ordnance are put into the Automatic Waste Feed System. As described in **Section 2**, the chemical composition of these ordnances will be based on the military specifications.

7.2.15 Auxiliary Fuel Rate

Auxiliary fuel rate will be monitored continuously by a flowmeter located in the fuel oil piping. The flowmeter transmits an electronic signal to the main control panel for recording.

7.2.16 Key Process Data

The key process data described in **Section 6** will be recorded continuously at the main control panel, as described in **Section 2.2.1**.

7.2.17 Ash Sampling and Analysis

Ash samples will be collected from all locations in the system where ash accumulates and is discharged. Ash samples will be collected from the heat exchangers, cyclone, and baghouse. Samples will be collected with a trowel. SW-846 8120A will be used for HCB analysis of the ash. TCE will be analyzed using SW-846 8010. SW-846 methods will be used for metals analysis of the ash and the AEHA STEM method will be used to analyze the ash for energetic compounds. Ash samples will be collected at the end of each run if enough ash is present. If not, samples will be collected at the end of a test series.

7.2.18 Particulate Fugitive Emission Monitoring

During the trial burn ambient particulate concentrations will be measured. The goal of this work will be to demonstrate that no uncontrolled particulate emissions are generated. Sampling stations will be set up at the point where fugitive particulate emissions are most likely to occur, and at an upwind location representative of background. The resulting data will be included in the Trial Burn report. The Particulate Fugitive Emission Monitoring Plan is presented in its entirety in **Appendix N**.

7.3 TEST SCHEDULE

Table 7-2 presents the detailed source testing schedule for the trial burn. Sampling of fly ash from the incineration process will occur at the conclusion of each sample run, if enough material is available. Process monitoring data will be recorded continuously during the trial burn. Waste feed rate will be set prior to each run of a test condition and then monitored during the run.

The source test schedule has been planned using one hour sampling times for the BIF Metals Method, RM 5, and the AEHA STEM. SW-846 Method 0010 and RM 23 have 3 and 7.5-hour sample periods, respectively. The schedule is designed to simultaneously test for the feed parameter of concern and other parameters such as NO_x, CO, CO_2, O_2, and THC.

7.4 TRIAL BURN REPORT OUTLINE

The following is the proposed outline for the trial burn report:

- Preliminary
- Preface
- Table of Contents/Tables and Figures
- 1.0 Summary of Results
- 2.0 Introduction
- 3.0 Performance Results
- 4.0 Process Operating Conditions
- 5.0 Sampling and Analysis Results

- Appendix A Detailed Sampling and Analysis Results
- Appendix B Raw Data Logs
- Appendix C Sample Traceability Records
- Appendix D QA Results
- Appendix E Sampling and Analysis Methods
- Appendix F Chromatograms

TABLE 7-2
SEAD Trial Burn Daily Sampling Schedule

	Test Condition 1 (HCB)		Test Condition 2 (TCE)	Test Condition 3 (NG)	Test Condition 4 (DNT)		Test Condition 5 (TSP, Ba)		Test Condition 6 (Sb)	Test Condition 7 (Cr)	Test Condition 8 (Pb)	Test Conditi (Dioxin/Fur (Max PE	
ne	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10	Day 11	Day 12	Day 13
7:00	RM 2,3,4	RM 2,3,4	RM 2,3,4	RM 2,3,4	RM 2,3,4	RM 2,3,4	RM 2,3,4	RM 2,3,4	RM 2,3,4	RM 2,3,4	RM 2,3,4	RM 2,3,4	RM 2,3,4
7:30													
8:00													
8:30	RM 7E, 10,25A	RM 7E,10,25A	RM 7E, 10, 25A	RM 7E, 10,25A	RM 7E, 10,25A	RM 7E, 10,25A	RM 7E, 10,25A	RM 7E, 10,25A	RM 7E,10,25A	RM 7E,10,25A	RM 7E,10,25A	RM 7E, 10,25A	RM 7E, 10,25A
9:00	SW846-0010/ RM3 (Run 1)	SW846-0010/ RM3 (Run 3)	SW-846-0030/ RM3 (Run 1)	AEHA STEM/ RM3 (Run 1)	SW846-STEM/RM3 (Run 3)	SW846-STEM/ RM3 (Run 1)	RM 3,5 (Run 1)	RM 3, BIF Metals (Run 1)	RM 3, BIF Metals (Run 1)	RM 3, BIF Metals (Run 1)	RM 3, BIF Metals (Run 1)	RM 23/RM 3 (Run 1)	RM 23/RM (Run 2)
9:30													
0:00							End Run 1	End Run 1	End Run 1	End Run 1	End Run 1		
0:30			End Run 1	End Run 1			CEM drift/bias check	CEM drift/bias check	CEM drift/bias check	CEM drift/bias check	CEM drift/bias check		
1:00			CEM drift bias	CEM drift/bias check/S007			RM 3,5 (Run 2)	RM 3, BIF Metals (Run 2)	RM 3, BIF Metals (Run 2)	RM 3, BIF Metals (Run 2)	RM 3, BIF Metals (Run 2)		
1:30													
2:00			SW-846-0030/ RM3 (RUN2)	AEHA STEM/ RM3 (Run 2)			End Run 2	End Run 2	End Run 2	End Run 2	End Run 2		
2:30	End Run 1	End Run 3			End Run 1	End Run 3	CEM drift/bias check	CEM drift/bias check	CEM drift/bias check	CEM drift/bias check	CEM drift/bias check		

TABLE 7-2
SEAD Trial Burn Daily Sampling Schedule

	Test Condition 1 (HCB)		Test Condition 2 (TCE)	Test Condition 3 (NG)	Test Condition 4 (DNT)		Test Condition 5 (TSP, Ba)		Test Condition 6 (Sb)	Test Condition 7 (Cr)	Test Condition 8 (Pb)	Test Condit (Dioxin/Fu (Max PE	
ne	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10	Day 11	Day 12	Day 1
:00	CEM drift/ bias check/ S007	CEM drift/ bias check/ S007			CEM drift/bias check/S007	CEM drift/bias check/S007							
:30	SW846-0010/RM3 (Run 2)		End Run 2	End Run 2	SW846-STEM/ RM3 (Run 2)		RM 3,5 (Run 3)	RM 3, BIF Metals (Run 3)	RM 3, BIF Metals (Run 3)	RM 3, BIF Metals (Run 3)	RM 3, BIF Metals (Run 3)		
:00			CEM drift/ bias check/ S007	CEM drift/bias check/S007									
:30							End Run 3	End Run 3	End Run 3	End Run 3	End Run 3		
:00			SW846-0030/ RM3 (RUN3)	AEHA STEM/ RM3 (Run 3)			CEM drift/bias check	CEM drift/bias check	CEM drift/bias check	CEM drift/bias check	CEM drift/bias check		
:30													
:00													
:30	End Run 2		End Run 3	End Run 3	End Run 2							End Run 1	End Run
:00	CEM drift/ bias check/ S007		CEM drift/ bias check/ S007	CEM drift bias check/ S007	CEM drift/ bias check/ S007							CEM drift/ bias check	CEM drift/bias check

SECTION 8

AUTOMATIC WASTE FEED SHUT OFF TEST PROCEDURES

Process conditions which indicate how well the incinerator is destroying waste are continuously measured and recorded. These process conditions are also continuously input to the automatic waste feed shut off system (AWFSO). When any of these conditions deviate from acceptable limits which are established during the trial burn, the AWFSO system stops waste feed to the incinerator. The AWFSO conditions and proposed limits are listed in **Section 2.3.3** of this document.

The AWFSO system is tested weekly and tested prior to the trial burn tests to ensure proper operation. The test procedures are given in **Table 8-1** on the following pages.

These same procedures will be used to test the AWFSO system prior to the trial burn.

TABLE 8-1

AUTOMATIC WASTE FEED SHUT-OFF TEST PROCEDURES

Prior to starting these procedures:

1. The incinerator is to be operating at full thermal conditions.
2. All AWFSO interlocks are to be cleared.
3. The waste loading conveyor is to be started but no munitions fed.

Stack gas carbon monoxide (CO):

1. Change the 1 hour averaging shutdown parameter in computer system to zero.
2. Introduce calibration gas of > 100 PPM into the analyzer sampling system (see Beckman Operation and Maintenance Manual for procedure). When the rolling average of the CO corrected for O_2 on a dry basis is above 100 ppm:
   a. An alarm will be indicated.
   b. The waste loading conveyor will stop.
3. Purge the sampling system with nitrogen. When the rolling average of the CO corrected for O_2 on a dry basis drops below 100 ppm:
   a. The alarm will clear.
   b. The waste loading conveyor can be restarted.
4. Reset the 1 hour averaging shutdown parameter in the computer system to 1 hour.

Carbon monoxide analyzer failure:

1. Turn off power switch on CO analyzer:
   a. An alarm will be indicated.
   b. The waste loading conveyor will stop.

2. Turn on CO analyzer power switch:

    a. The alarm will clear.
    b. The waste loading conveyor can be restarted.

Oxygen analyzer failure:

1. Turn off power switch on oxygen analyzer:

    a. An alarm will be indicated.
    b. The waste loading conveyor will stop.

2. Turn on oxygen analyzer power switch:

    a. The alarm will clear.
    b. The waste loading conveyor can be restarted.

Baghouse bypass:

1. Actuate baghouse bypass:

    a. An alarm will be indicated.
    b. The waste loading conveyor will stop.

2. Return baghouse bypass to normal:

    a. The alarm will clear.
    b. The waste loading conveyor can be restarted.

Afterburner temperature:

1. Lower the set point on afterburner temperature controller to 1150 °F. When the afterburner temperature drops below 1200 °F:

    a. An alarm will be indicated.
    b. The waste loading conveyor will stop.

2. Raise the set point on the afterburner temperature controller to the normal value (> 1200 °F). When the temperature reaches 1200 °F:

    a. The alarm will clear.
    b. The waste loading conveyor can be restarted.

3. Place afterburner temperature controller in manual. Disconnect the afterburner thermocouple. Connect a millivolt source to afterburner temperature transmitter (TT-701). Increase millivolt signal to the control instruments. When the simulated temperature reaches 1800 °F:

   a. An alarm will be indicated.
   b. The waste loading conveyor will stop.

4. Disconnect millivolt source and reconnect thermocouple. When temperature drops below 1800 °F:

   a. The Alarm will clear.
   b. The waste loading conveyor can be restarted.

Kiln temperature:

1. Lower the set point on kiln temperature controller to below the AWFSO interlock value. When the kiln temperature drops below the AWFSO interlock value:

   a. An alarm will be indicated.

   b. The waste loading conveyor will stop.

2. Raise the set point on the kiln temperature controller to the normal value. When the temperature reaches the AWFSO interlock value:

   a. The alarm will clear.
   b. The waste loading conveyor can be restarted.

3. Place kiln temperature controller in manual. Disconnect the kiln thermocouple. Connect a millivolt source to the kiln temperature transmitter (TT-601). Increase millivolt signal to the control instruments. When the simulated temperature reaches 1100 °F:

   a. An alarm will be indicated.
   b. The waste loading conveyor will stop.

4. Disconnect millivolt source and reconnect thermocouple. When temperature drops below 1100 °F:

   a. The Alarm will clear.
   b. The waste loading conveyor can be restarted.

Kiln pressure:

1. With an inclined manometer increase pressure on high pressure side of differential pressure transmitter. When the kiln pressure goes positive:

   a. An alarm will be indicated
   b. The waste loading conveyor will stop.

2. Disconnect manometer. If the kiln pressure returns to vacuum:

   a. The Alarm will clear
   b. The waste loading conveyor can be restarted.

Waste feed rate:

Place a weight in the waste feed monitoring system. Weight must be heavier than allowable munitions weight programmed into computer system. Attempt to start waste feed monitoring system. Computer system will not allow the weight to be fed to the conveyor.

Stack gas velocity:

1. With an inclined manometer increase pressure on high pressure side of differential pressure transmitter. Stack gas velocity signal will increase. When the simulated velocity reaches 50 feet/second:

   a. An alarm will be indicated.
   b. The waste loading conveyor will stop.

2. Disconnect manometer. When velocity drops below 50 fps:

   a. The Alarm will clear.
   b. The waste loading conveyor can be restarted.

High temperature gas cooler exit temperature:

1. Disconnect the gas cooler exit thermocouple. Connect a millivolt source to the gas cooler exit temperature transmitter (TT-801). Increase millivolt signal to the control instruments. When the simulated temperature reaches 850 °F:

   a. An alarm will be indicated.
   b. The waste loading conveyor will stop.

2. Disconnect millivolt source and reconnect thermocouple. When temperature drops below 850 °F:

   a. The Alarm will clear.
   b. The waste loading conveyor can be restarted.

Low temperature gas cooler exit temperature:

1. Place low temperature gas cooler temperature controller in manual. Disconnect the gas cooler exit thermocouple. Connect a millivolt source to the gas cooler exit temperature transmitter (TT-901). Increase millivolt signal to the control instruments. When the simulated temperature reaches 350 °F:

   a. An alarm will be indicated.
   b. The waste loading conveyor will stop.

2. Disconnect millivolt source and reconnect thermocouple. When temperature drops below 350 °F:

   a. The Alarm will clear.
   b. The waste loading conveyor can be restarted.

Kiln burner flameout:

1. Close the block valve upstream of the safety shut-off valve on the oil line to the kiln burner. When the flame goes out:

   a. The safety shut-off valves will close.
   b. The flame supervisor will start post-purge.
   c. An alarm will be indicated.
   d. The waste loading conveyor will stop.

2. Re-ignite the burner.

   a. The alarm will clear.

b. The waste loading conveyor can be restarted.

Afterburner burner flameout:

1. Close the block valve upstream of the safety shut-off valve on the oil line to the afterburner burner. When the flame goes out:

    a. The safety shut-off valves will close.
    b. The flame supervisor will start post-purge.
    c. An alarm will be indicated.
    d. The waste loading conveyor will stop.

2. Re-ignite the burner.

    a. The alarm will clear.
    b. The waste loading conveyor can be restarted.

Kiln rotation drive:

1. Turn off motor drive which rotates kiln. When kiln stops rotation:

    a. An alarm will be indicated.
    b. The waste loading conveyor will stop.

2. Restart the motor drive. When the kiln starts rotating:

    a. The alarm will clear.
    b. The waste loading conveyor can be restarted.

Kiln residue conveyor:

1. Turn off the kiln residue conveyor motor.

    a. An alarm will be indicated.
    b. The waste loading conveyor will stop.

2. Restart the kiln residue conveyor motor.

    a. The alarm will clear.
    b. The waste loading conveyor can be restarted.

ID Fan:

1. Turn off the ID fan motor.

   a. An alarm will be indicated.
   b. The waste loading conveyor will stop.

2. Restart the ID fan motor.

   a. The alarm will clear.
   b. The waste loading conveyor can be restarted.

Baghouse pressure drop:

1. Disconnect differential pressure transmitter wiring in main control panel and connect 4-20 milliamp calibrator. Vary milliamp signal until 2 inches WC is indicated on panel instruments:

   a. An alarm will be indicated.
   b. The waste loading conveyor will stop.

2. Vary milliamp signal until greater than 2 inches WC is located on panel instruments:

   a. The alarm will clear.
   b. The waste loading conveyor can be restarted.

3. Restart waste loading conveyor.

4. Increase milliamp signal until 6 inches WC is indicated on panel instruments:

   a. An alarm will be indicated.
   b. The waste loading conveyor will stop.

5. Disconnect calibrator and reconnect transmitter wiring. If differential pressure is between 2 and 6 inches of WC:

   a. The alarm will clear.
   b. The waste loading conveyor can be restarted.

Device failure:

1. Terminate electrical power to each of the following devices to be tested:

   a. An alarm will be indicated.
   b. The waste loading conveyor will stop.

2. Restore power to each of the devices:

   a. The alarm will clear.
   b. The waste loading conveyor can be restarted.

Devices to be tested:

- Multi-input recorder
- Honeywell process controllers
- Waste weighing system

Signal failure:

1. Disconnect signal return wire for the instrument signals to be tested:

   a. An alarm will be indicated.
   b. The waste loading conveyor will stop.

2. Reconnect signal return wire for the instrument signals to be tested:

   a. The alarm will clear.

   b. The waste loading conveyor can be restarted.

Instrument signals to be tested:

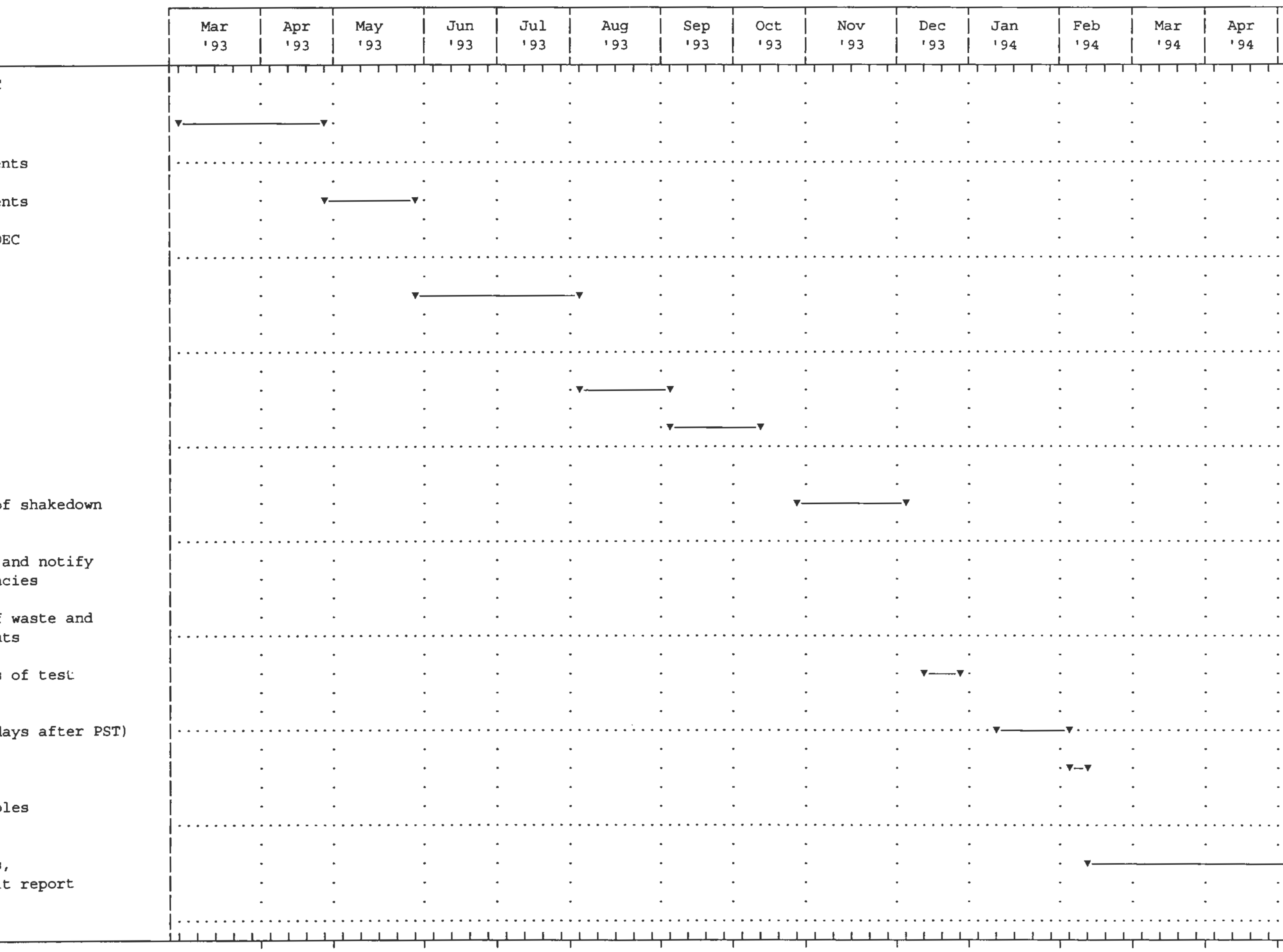
- Temperature inputs.
- Baghouse differential pressure transmitter.

SECTION 9

TRIAL BURN TEST SCHEDULE

A specific date and schedule for the trial burn test cannot be established until the permit is issued. A proposed event schedule for the trial burn is shown on **Table 9-1**. This schedule assumes that the Trial Burn Plan is approved as described in this document.

Plan Overview Schedule



APPENDIX A

LIST OF DRAWINGS

APPENDIX A

DRAWINGS

The following is a list of full size drawings which are located in map pockets in Appendix 14 of the RCRA Part B Permit Application.

Pocket	Drawing No. (If Applicable)	Description
01	AC-SK-87-12	Furnace Site (Proposed)
02	AC-SK-88-55-01	Seneca Army Depot Layout
03	AC-SK-88-55-02	SEAD - Furnace Site Layout, Sheet 1 SEAD - Furnace Site Elevation, Sheet 2 SEAD - Furnace Site Elevation, Sheet 3
04	SK-88-55-05	APE 1236 Upgrade - Site Enclosure Layout
05	SK-88-07	Functional Process Control Diagram
06	ACT-377-200-12	Burner and Blower Assembly
07	11268-10-1	Afterburner (Southern Technologies) (3 Sheets)
08		High Temperature Gas Cooler Low Temperature Gas Cooler
09	BC86-510-1	Cyclone*
10	N741382	Baghouse*
11	SK-89-09-00	Data List
12	SK-89-09-01	Waste Feed Rate Monitoring System, General Assembly
13	SK-89-09-02	Outer Frame Assembly, Sheet 1 Outer Frame Details, Sheet 2 Outer Frame Details, Sheet 3 Outer Frame Details, Sheet 4
14	SK-89-09-03	Inner Frame Assembly

14	SK-89-09-04	Inner Frame Details
15	SK-89-09-05	Transfer Assembly
16	SK-89-09-06	Push Off Box Details
17	SK-89-09-07	TT-B Weight Scale Frame Details
18	SK-89-09-08	Series 1000 Weigh Scale Frame Details
19	SK-89-09-09	Scale Top Assembly
20	SK-89-09-10	Chute Assembly Details, Sheets 1 and 2
21	SK-89-09-11	Swing Door Assembly and Details
22	SK-89-09-12	Sliding Door Assembly
23	SK-89-09-13	Door Lock Assembly
24	SK-89-09-14	Window Details
25	SK-89-09-15	Cover Plate Details
26	SK-89-09-16	Pneumatic Component Layout
27	SK-89-09-17	Pneumatic Schematic
28	SK-89-09-18	Vacant (Elect. Component Layout)
29	SK-89-09-19	Pneumatic Valve Box
30	SK-89-09-20	Control Box
31	11268-10, Rev. 4	Catwalk and Afterburner Elevations
32		High Temperature Gas Cooler Elevation
33		Low Temperature Gas Cooler Elevation

* Denotes drawings which have not been previously submitted and which are located in the Map Pockets of this Trail Burn Plan.

APPENDIX B

EQUIPMENT AND INSTRUMENTATION INFORMATION

APPENDIX B

EQUIPMENT AND INSTRUMENTATION INFORMATION

TABLE OF CONTENTS

NOTE: This information is included in the 6NYCRR Part 373 Permit Application.

APPENDIX C

WASTE CHARACTERIZATION TABLES

APPENDIX C

WASTE CHARACTERIZATION TABLES

TABLE OF CONTENTS

C-1

HEATING VALUE, ASH, AND CHLORINE CONTENT FOR MUNITION COMPONENTS

APPENDIX C-1

Heating Value, Ash, Metal, and Chlorine Content Data for Munition Components

	CHLORINE CONTENT (lb/lb)	ASH CONTENT (lb/lb)	HEATING VALUE (BTU/lb)	ALUMINUM CONTENT (lb/lb)	ANTIMONY CONTENT (lb/lb)	BARIUM CONTENT (lb/lb)	CHROMIUM CONTENT (lb/lb)	LEAD CONTENT (lb/lb)	STRONTIUM CONTENT (lb/lb)	TIN CONTENT (lb/lb)	ZINC CONTENT (lb/lb)	DBP CONTENT (lb/lb)	DNT CONTENT (lb/lb)	DPA CONTENT (lb/lb)	HCB CONTENT (lb/lb)	NG CONTENT (lb/lb)
	0.0000	0.0000	14,095	0	0	0	0	0	0	0	0	0	0	0	0	0
	0.0000	1.8895	13,312	1	0	0	0	0	0	0	0	0	0	0	0	0
	0.0000	0.6791	5,878	0.36	0	0	0	0	0	0	0	0	0	0	0	0
	0.0000	0.8582	1,802	0	0.72	0	0	0	0	0	0	0	0	0	0	0
	0	0	17500	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	1	−497	0	0	0.54	0.22	0	0	0	0	0	0	0	0	0
	0.0000	0.5867	(716)	0	0	0.53	0	0	0	0	0	0	0	0	0	0
	0	0.2177	13830	0	0	0.11	0	0	0	0	0	0	0	0	0	0
	0	0.4107	2401	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	3.2201	25143	0	0	0	0	0	0	0	0	0	0	0	0	0
	0.0000	0.5603	(787)	0	0	0	0	0	0	0	0	0	0	0	0	0
	0.0000	1.8311	6,000	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0.0924	16040	0	0	0	0	0	0	0	0	0	0	0	0	0
	0.0000	0.0872	14,855	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	14095	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0.0000	0.0000	13,210	0	0	0	0	0	0	0	0	1	0	0	0	0
	0.0000	0.0000	8,424	0	0	0	0	0	0	0	0	0	1	0	0	0
	0.0000	0.0000	16,376	0	0	0	0	0	0	0	0	0	0	1	0	0
	0	0	15093	0	0	0	0	0	0	0	0	0	0	0	0	0
	0.0000	0.0000	14,095	0	0	0	0	0	0	0	0	0	0	0	0	0
	0.0000	0.0000	6,840	0	0	0	0	0	0	0	0	0	0	0	0	0
	0.7469	0	3222	0	0	0	0	0	0	0	0	0	0	0	1	0
	0.0000	0.0000	4,252	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0.0000	0.7664	1,135	0	0	0	0	0.71	0	0	0	0	0	0	0	0
	0	0.6903	2097	0	0	0	0	0.71	0	0	0	0	0	0	0	0
	0.0000	0.4766	2,254	0	0	0	0	0.44	0	0	0	0	0	0	0	0
	0	0.6903	2097	0	0	0	0	0.71	0	0	0	0	0	0	0	0
	0	0	15292	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	1.6583	10653	0	0	0	0	0	0	0	0	0	0	0	0	0
m Alloy	0.0000	1.7408	11,602	0.36	0	0	0	0	0	0	0	0	0	0	0	0
	0.0000	0.0000	4,338	0	0	0	0	0	0	0	0	0	0	0	0	0
	0.0000	0.0000	6,822	0	0	0	0	0	0	0	0	0	0	0	0	1
	0	0	4153	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	3531	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	2.2914	10215	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	20000	0	0	0	0	0	0	0	0	0	0	0	0	0
	0.5673	0	8918	0	0	0	0	0	0	0	0	0	0	0	0	0
	0.2893	0.4578	449	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0.5549	−286	0	0	0	0	0	0	0	0	0	0	0	0	0
te	0.2559	0.4050	264	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0.6439	−699	0	0	0	0	0	0	0	0	0	0	0	0	0
	0.0000	0.0000	4,126	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0.4761	89	0	0	0	0	0	0	0	0	0	0	0	0	0
	0.0000	0.5632	(705)	0	0	0	0	0	0	0	0	0	0	0	0	0

APPENDIX C–1

Heating Value, Ash, Metal, and Chlorine Content Data for Munition Components

	CHLORINE CONTENT (lb/lb)	ASH CONTENT (lb/lb)	HEATING VALUE (BTU/lb)	ALUMINUM CONTENT (lb/lb)	ANTIMONY CONTENT (lb/lb)	BARIUM CONTENT (lb/lb)	CHROMIUM CONTENT (lb/lb)	LEAD CONTENT (lb/lb)	STRONTIUM CONTENT (lb/lb)	TIN CONTENT (lb/lb)	ZINC CONTENT (lb/lb)	DBP CONTENT (lb/lb)	DNT CONTENT (lb/lb)	DPA CONTENT (lb/lb)	HCB CONTENT (lb/lb)	NG CONTENT (lb/lb)
	0	0.4896	−786	0	0	0	0	0	0.41	0	0	0	0	0	0	0
	0	0	3983	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	1184	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	5261	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	1	0	0	0	0	0	0	0	0.79	0	0	0	0	0	0
	0.0000	0.0000	3,294	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	6516	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	10245	0	0	0	0	0	0	0	0	0	0	0	0	0
	0.0000	0.0000	20,000	0	0	0	0	0	0	0	0	0	0	0	0	0
	0.0000	0.1287	15,400	0	0	0	0	0	0	0	0.1	0	0	0	0	0
	0.0000	0.9100	0	0	0	0.81	0	0	0	0	0	0	0	0	0	0
	0.0000	0.2000	0	0	0	0	0	0	0.16	0	0	0	0	0	0	0
	0.0000	0.8700	(13)	0	0	0	0	0	0.73	0	0	0	0	0	0	0
Rubber	0.6500	0.0000	4,200	0	0	0	0	0	0	0	0	0	0	0	0	0
	0.0000	1.3500	5,160	0	0	0	0	0	0	0	0	0	0	0	0	0
	0.0000	1.0000	0	0	0	0	0	0.87	0	0	0	0	0	0	0	0
	0.0000	1.0000	0	0	0	0.7	0	0	0	0	0	0	0	0	0	0
	0.0000	1.0000	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0.0000	1.0000	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0.0000	1.2700	1,412	0	0	0	0	0	0	0	0	0	0	0	0	0
loy	0.0000	1.0000	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0.0000	1.0000	0	0	0	0	0	0	0	0	0	0	0	0	0	0
te Resin	0.0000	0.0000	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0.0000	0.0000	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0.0000	0.0000	14,095	0	0	0	0	0	0	0	0	0	0	0	0	0
um Powder	0.0000	0.7900	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0.0000	0.0000	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0.0000	1.0000	0	0	0	0	0	0	0	0	0	0	0	0	0	0
decane	0.6600	0.0000	5,011	0	0	0	0	0	0	0	0	0	0	0	0	0
	0.0000	0.0000	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0.0000	0.0000	12,955	0	0	0	0	0	0	0	0	0	0	0	0	0
	0.0000	0.0000	(46)	0	0	0	0	0	0	0	0	0	0	0	0	0

C-2

CHEMICAL COMPOSITIONS OF MUNITIONS

TABLE C-2

NOTES: Some munitions have acceptable ranges for some PEP components. The values corresponding to the higher limit have been used for each munition characterization. Therefore, the sum of components may exceed 100%.

BTU, CHLORINE, AND ASH FEED RATES

I : 1
20mm HEI – M56A3 (w/double base propellant)
TE: 900 items/hr
: 789.38 grains/item

METALS FEED RATES POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	CCMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALU (BTU/hr)	ALUM RATE (lb/hr)	ANT RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBP RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
ck	0.08	0.0103	0.0000	0.0000	145	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
vder	52.496	6.7495	0.0000	12.7532	69,849	6.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ulfide	0.15	0.0193	0.0000	0.0166	35	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.3	0.1671	0.0000	0.0981	(120)	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
onate	6.04	0.7766	0.0000	0.4351	(611)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
le	0.46	0.0591	0.0000	0.1083	355	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ate	0.08	0.0103	0.0000	0.0009	153	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	33.004	4.2434	0.0000	0.0000	56,055	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.24	0.00	0.00	0.00	0.00	0.00
	1.83	0.2353	0.0000	0.0000	1,982	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24	0.00	0.00	0.00	0.00
e	5.42	0.6969	0.0000	0.0000	11,412	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.70	0.00	0.00	0.00
	2.06	0.2649	0.0000	0.0000	3,733	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.08	0.0103	0.0000	0.0000	70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5.88	0.7560	0.0000	0.0000	3,215	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.22	0.1569	0.0000	0.1202	178	0.00	0.00	0.00	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	1.3	0.1671	0.0000	0.0797	377	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
luminum Alloy	1.38	0.1774	0.0000	0.3089	2,059	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	495.616	63.7221	0.0000	0.0000	276,426	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	57.767	7.4272	0.0000	0.0000	50,668	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.43	0.00
rchlorate	0.15	0.0193	0.0049	0.0078	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	99.3212	12.7699	0.0000	0.0000	52,688	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.61	0.0784	0.0000	0.0442	(55)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
nol	0.08	0.0103	0.0000	0.0000	34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2.98	0.3831	0.0000	0.0000	7,663	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.08	0.0103	0.0000	0.0013	158	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	769.385	98.9209	0.0049	13.9741	556,474	6.81	0.01	0.09	0.00	0.18	0.00	0.00	0.00	4.24	0.24	0.70	0.00	7.43	0.02

BTU, CHLORINE, AND ASH FEED RATES

: 2
20mm HEI – M96
TE: 900 items/hr
: 638.59 grains/item

						METALS FEED RATES								POTENTIAL POHC FEED RATES					
	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALU (BTU/hr)	ALUM RATE (lb/hr)	ANT RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBP RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
lfide	0.26	0.0334	0.0000	0.0287	60	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
ate	3.19	0.4101	0.0000	0.0358	6,093	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3.77	0.4847	0.0000	0.0000	7,938	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.48	0.00	0.00	0.00
ate	0.51	0.0656	0.0000	0.0453	138	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
uminum Alloy	78.101	10.0418	0.0000	17.4803	116,502	3.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	459.206	59.0408	0.0000	0.0000	256,119	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.19	0.0244	0.0000	0.0000	86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
orate	1.09	0.1401	0.0405	0.0642	63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
chlorate	85.251	10.9608	2.8049	4.4391	2,894	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
fate	3.51	0.4513	0.0000	0.2906	(315)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09
	3.51	0.4513	0.0000	0.4513	0	0.00	0.00	0.00	0.00	0.00	0.00	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	638.588	82.1042	2.8454	22.8352	389,576	3.61	0.02	0.00	0.00	0.05	0.00	0.36	0.00	0.00	0.00	0.48	0.00	0.00	0.11

BTU, CHLORINE, AND ASH FEED RATES

: 3

20mm HEI – M97A2 (w/Single base propellant)

TE: 900 items/hr

: 676.51 grains/item

METALS FEED RATES

POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALU (BTU/hr)	ALUM RATE (lb/hr)	ANT RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBP RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
ck	0.06	0.0077	0.0000	0.0000	109	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
wder	41.965	5.3955	0.0000	16.1948	71,825	5.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ulfide	0.13	0.0167	0.0000	0.0143	30	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.28	0.1646	0.0000	0.0966	(118)	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
de	0.45	0.0579	0.0000	0.1059	347	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ate	0.06	0.0077	0.0000	0.0007	115	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	0.06	0.0077	0.0000	0.0000	102	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
	48.216	6.1992	0.0000	0.0000	52,222	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.20	0.00	0.00	0.00	0.00
e	6.58	0.8460	0.0000	0.0000	13,854	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.85	0.00	0.00	0.00
	3.32	0.4269	0.0000	0.0000	6,017	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.06	0.0077	0.0000	0.0000	53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5.88	0.7560	0.0000	0.0000	3,215	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.28	0.1646	0.0000	0.1261	187	0.00	0.00	0.00	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	1.28	0.1646	0.0000	0.0784	371	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	472.636	60.7675	0.0000	0.0000	263,609	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
lfate	5.05	0.6493	0.0000	0.4181	(454)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13
	80.661	10.3707	0.0000	0.0000	42,790	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5.05	0.6493	0.0000	0.6493	0	0.00	0.00	0.00	0.00	0.00	0.00	0.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00
nol	0.06	0.0077	0.0000	0.0000	25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2.43	0.3124	0.0000	0.0000	6,249	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	676.508	86.9796	0.0000	11.6842	460,546	5.40	0.01	0.09	0.00	0.19	0.00	0.51	0.00	0.01	6.20	0.85	0.00	0.00	0.13

BTU, CHLORINE, AND ASH FEED RATES

: 4
20mm HEI – M97A2 (w/Double base propellant)
TE: 900 items/hr
: 710.45 grains/item

						METALS FEED RATES								POTENTIAL POHC FEED RATES					
	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALU (BTU/hr)	ALUM RATE (lb/hr)	ANT RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBP RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
k	0.06	0.0077	0.0000	0.0000	109	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
vder	41.965	5.3955	0.0000	10.1948	71,825	5.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ulfide	0.13	0.0167	0.0000	0.0143	30	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.28	0.1646	0.0000	0.0966	(118)	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
onate	5.04	0.6480	0.0000	0.3631	(510)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.45	0.0579	0.0000	0.1059	347	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ate	0.06	0.0077	0.0000	0.0007	115	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	48.216	6.1992	0.0000	0.0000	81,891	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.20	0.00	0.00	0.00	0.00	0.00
	5.04	0.6480	0.0000	0.0000	5,459	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.65	0.00	0.00	0.00	0.00
e	7.6	0.9771	0.0000	0.0000	16,002	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.98	0.00	0.00	0.00
	3.32	0.4269	0.0000	0.0000	8,017	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.06	0.0077	0.0000	0.0000	53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5.88	0.7560	0.0000	0.0000	3,215	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.26	0.1646	0.0000	0.1261	187	0.00	0.00	0.00	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	1.26	0.1646	0.0000	0.0784	371	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	432.016	55.5449	0.0000	0.0000	240,954	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	55.817	7.1765	0.0000	0.0000	48,958	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.18	0.00
ate	7.6	0.9771	0.0000	0.5422	(279)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	80.661	10.3707	0.0000	0.0000	42,790	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	2.55	0.3279	0.0000	0.1846	(231)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08
	7.6	0.9771	0.0000	0.9771	0	0.00	0.00	0.00	0.00	0.00	0.00	0.77	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ol	0.06	0.0077	0.0000	0.0000	25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2.49	0.3201	0.0000	0.0000	6,403	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	710.454	91.3442	0.0000	12.6840	523,810	5.40	0.01	0.09	0.00	0.19	0.00	0.77	0.00	6.20	0.65	0.98	0.00	7.18	0.08

BTU, CHLORINE, AND ASH FEED RATES

R : 5
20mm HEI – M210 (w/double base propellant)
ATE: 900 items/hr
: 702.89 grains/item

METALS FEED RATES | POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALU (BTU/hr)	ALUM RATE (lb/hr)	ANT RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBP RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
wder	35.124	4.5159	0.0000	8.5329	60,116	4.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ulfide	0.45	0.0579	0.0000	0.0497	104	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
e	0.65	0.0836	0.0000	0.0490	(60)	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
onate	5.05	0.6493	0.0000	0.3638	(511)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
nate	0.78	0.1003	0.0000	0.0087	1,490	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ate	47.956	6.1658	0.0000	0.0000	81,450	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.17	0.00	0.00	0.00	0.00	0.00
	5.05	0.6493	0.0000	0.0000	5,470	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.65	0.00	0.00	0.00	0.00
e	7.58	0.9746	0.0000	0.0000	15,960	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.97	0.00	0.00	0.00
	3.11	0.3999	0.0000	0.0000	5,636	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.06	0.0077	0.0000	0.0000	53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5.9	0.7586	0.0000	0.0000	3,225	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.23	0.1581	0.0000	0.1212	179	0.00	0.00	0.00	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	0.84	0.1080	0.0000	0.0515	243	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
luminum Alloy	15.491	1.9917	0.0000	3.4672	23,108	0.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	420.685	54.0881	0.0000	0.0000	234,634	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	55.537	7.1405	0.0000	0.0000	48,712	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.14	0.00
	0.13	0.0167	0.0000	0.0000	59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
rchlorate	16.852	2.1667	0.5545	0.8775	572	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	68.238	8.7735	0.0000	0.0000	36,199	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	2.53	0.3253	0.0000	0.1832	(229)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08
	7.58	0.9746	0.0000	0.9746	0	0.00	0.00	0.00	0.00	0.00	0.00	0.77	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2.01	0.2584	0.0000	0.0000	5,169	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.06	0.0077	0.0000	0.0010	119	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	702.893	90.3720	0.5545	14.6802	521,698	5.23	0.04	0.04	0.00	0.16	0.00	0.77	0.00	6.17	0.65	0.97	0.00	7.14	0.09

BTU, CHLORINE, AND ASH FEED RATES

: 6
22cal Ball,Long Rifle—M24\Tracer,Long Rifle—M861\Short,Blank Commercial \Ball,Long Rifle
TE: 22,500 items/hr
: 3.03 grains/item

						METALS FEED RATES								POTENTIAL POHC FEED RATES					
	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALU (BTU/hr)	ALUM RATE (lb/hr)	ANT RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBP RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
lfide	0.03	0.0964	0.0000	0.0828	174	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
	0.16	0.5143	0.0000	0.3017	(368)	0.00	0.00	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
le	0.03	0.0964	0.0000	0.1766	579	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.04	0.1286	0.0000	0.0000	1,941	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.01	0.0321	0.0000	0.0000	453	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.14	0.4500	0.0000	0.2145	1,014	0.00	0.00	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.554	4.9950	0.0000	0.0000	21,668	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.003	3.2239	0.0000	0.0000	21,994	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.22	0.00
fate	0.05	0.1607	0.0000	0.1035	(112)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
	0.01	0.0321	0.0000	0.0000	38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3.027	9.7296	0.0000	0.8790	47,380	0.00	0.07	0.27	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.22	0.05

BTU, CHLORINE, AND ASH FEED RATES

: 7
22cal Ball,Hornet−M65
TE: 22,500 items/hr
: 13.71 grains/item

METALS FEED RATES — POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALU (BTU/hr)	ALUM RATE (lb/hr)	ANT RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBP RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
lfide	0.03	0.0964	0.0000	0.0828	174	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
	0.16	0.5143	0.0000	0.3017	(368)	0.00	0.00	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.03	0.0964	0.0000	0.1766	579	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.19	0.6107	0.0000	0.0000	9,218	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.05	0.1607	0.0000	0.0000	2,265	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.14	0.4500	0.0000	0.2145	1,014	0.00	0.00	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	7.8125	25.1116	0.0000	0.0000	108,934	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5.0416	16.2051	0.0000	0.0000	110,551	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.21	0.00
ate	0.25	0.8036	0.0000	0.5174	(562)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16
	0.01	0.0321	0.0000	0.0000	38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	13.7141	44.0810	0.0000	1.2929	231,843	0.00	0.07	0.27	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.21	0.18

BTU, CHLORINE, AND ASH FEED RATES

: 6
30 cal – M1,Tracer w/I276
TE: 16,000 items/hr
: 70.07 grains/item

						METALS FEED RATES								POTENTIAL POHC FEED RATES					
	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALU (BTU/hr)	ALUM RATE (lb/hr)	ANT RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBP RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
wder	0.401	0.9166	0.0000	1.7319	12,201	0.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ulfide	0.09	0.2057	0.0000	0.1765	371	0.00	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
	0.19	0.4343	0.0000	0.2546	(311)	0.00	0.00	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
de	2.526	5.7783	0.0000	5.2582	0	0.00	0.00	4.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ate	1.083	2.4754	0.0000	0.2159	36,772	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4.5014	10.2889	0.0000	0.0000	86,674	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.29	0.00	0.00	0.00	0.00
e	0.702	1.6046	0.0000	0.0000	26,276	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.60	0.00	0.00	0.00
	0.2	0.4571	0.0000	0.0000	6,443	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.22	0.5029	0.0000	0.2397	1,133	0.00	0.00	0.00	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3.9212	8.9627	0.0000	14.8629	95,480	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	47.2015	107.8892	0.0000	0.0000	468,023	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.03	0.0686	0.0000	0.0000	242	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
fate	0.501	1.1451	0.0000	0.7374	(800)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23
ate	4.3313	9.9001	0.0000	4.8471	(7,781)	0.00	0.00	0.00	0.00	0.00	4.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
late	0.652	1.4903	0.0000	0.2981	0	0.00	0.00	0.00	0.00	0.00	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
oxide	3.4711	7.9339	0.0000	6.9025	(99)	0.00	0.00	0.00	0.00	0.00	5.79	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.02	0.0457	0.0000	0.0000	54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.03	0.0686	0.0000	0.0088	1,056	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
	70.0735	160.1680	0.0000	35.5337	725,735	0.92	0.15	4.91	0.00	0.22	10.09	0.00	0.01	0.00	10.29	1.60	0.00	0.00	0.26

BTU, CHLORINE, AND ASH FEED RATES

: 9
30 cal -- M1,Tracer w/l280
TE: 20,000 items/hr
: 86.25 grains/item

METALS FEED RATES

POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALU (BTU/hr)	ALUM RATE (lb/hr)	ANT RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBP RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
vder	0.04	0.1143	0.0000	0.2159	1,521	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ulfide	0.09	0.2571	0.0000	0.2207	463	0.00	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
	0.19	0.5429	0.0000	0.3185	(389)	0.00	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ate	1.344	3.8400	0.0000	0.3348	57,043	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4.5014	12.8611	0.0000	0.0000	108,342	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.86	0.00	0.00	0.00	0.00
e	0.702	2.0057	0.0000	0.0000	32,846	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.01	0.00	0.00	0.00
	0.2	0.5714	0.0000	0.0000	8,054	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.22	0.6286	0.0000	0.2996	1,417	0.00	0.00	0.00	0.00	0.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3.9212	11.2034	0.0000	16.5786	119,350	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	47.2015	134.8615	0.0000	0.0000	585,029	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.03	0.0857	0.0000	0.0000	303	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
fate	0.501	1.4314	0.0000	0.9217	(1,001)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.29
ate	4.3313	12.3751	0.0000	6.0589	(9,727)	0.00	0.00	0.00	0.00	0.00	5.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
late	0.652	1.8629	0.0000	0.3726	0	0.00	0.00	0.00	0.00	0.00	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
oxide	2.307	6.5914	0.0000	5.7345	(82)	0.00	0.00	0.00	0.00	0.00	4.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.02	0.0571	0.0000	0.0000	68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	86.2514	189.2897	0.0000	33.0559	903,238	0.11	0.19	0.29	0.00	0.28	10.18	0.00	0.00	0.00	12.86	2.01	0.00	0.00	0.32

BTU, CHLORINE, AND ASH FEED RATES

: 10
30 cal – M1,HPT
TE: 22,500 items/hr
: 55.80 grains/item

						METALS FEED RATES								POTENTIAL POHC FEED RATES					
	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALU (BTU/hr)	ALUM RATE (lb/hr)	ANT RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBP RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
vder	0.04	0.1286	0.0000	0.2429	1,712	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ulfide	0.09	0.2893	0.0000	0.2483	521	0.00	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
	0.19	0.6107	0.0000	0.3583	(437)	0.00	0.00	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4.2013	13.5042	0.0000	0.0000	113,759	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.50	0.00	0.00	0.00	0.00
e	0.702	2.2564	0.0000	0.0000	36,951	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.26	0.00	0.00	0.00
	0.2	0.6429	0.0000	0.0000	9,061	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.22	0.7071	0.0000	0.3370	1,594	0.00	0.00	0.00	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	49.6016	159.4337	0.0000	0.0000	691,623	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.03	0.0964	0.0000	0.0000	340	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
fate	0.501	1.6104	0.0000	1.0369	(1,126)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.32
	0.02	0.0643	0.0000	0.0000	76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	55.7959	179.3439	0.0000	2.2234	854,075	0.13	0.21	0.32	0.00	0.31	0.00	0.00	0.00	0.00	13.50	2.26	0.00	0.00	0.37

BTU, CHLORINE, AND ASH FEED RATES

: 11
30 cal – M1, Ball Carbine
TE: 22,500 items/hr
: 14.90 grains/item

						METALS FEED RATES								POTENTIAL POHC FEED RATES					
	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALU (BTU/hr)	ALUM RATE (lb/hr)	ANT RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBP RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
vder	0.04	0.1286	0.0000	0.2429	1,712	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ulfide	0.09	0.2893	0.0000	0.2483	521	0.00	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
	0.19	0.6107	0.0000	0.3583	(437)	0.00	0.00	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
onate	0.1	0.3214	0.0000	0.1801	(253)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	0.601	1.9318	0.0000	0.0000	25,519	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.93	0.00	0.00	0.00	0.00	0.00
	0.1	0.3214	0.0000	0.0000	2,708	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.32	0.00	0.00	0.00	0.00
	0.2	0.6429	0.0000	0.0000	10,527	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.64	0.00	0.00	0.00
	0.1	0.3214	0.0000	0.0000	4,531	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.22	0.7071	0.0000	0.3370	1,594	0.00	0.00	0.00	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	11.7037	37.6190	0.0000	0.0000	163,191	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.404	4.5129	0.0000	0.0000	30,787	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.51	0.00
	0.03	0.0964	0.0000	0.0000	340	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.1	0.3214	0.0000	0.1810	(227)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08
	0.02	0.0643	0.0000	0.0000	76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	14.8987	47.8887	0.0000	1.5477	240,589	0.13	0.21	0.32	0.00	0.31	0.00	0.00	0.00	1.93	0.32	0.64	0.00	4.51	0.12

BTU, CHLORINE, AND ASH FEED RATES

: 12
30 cal – M2,AP (w/4895)
TE: 22,500 items/hr
: 59.00 grains/item

METALS FEED RATES — POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALU (BTU/hr)	ALUM RATE (lb/hr)	ANT RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBP RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	RATE (lb/hr)
vder	0.04	0.1286	0.0000	0.2429	1,712	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
lfide	0.09	0.2893	0.0000	0.2483	521	0.00	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
	0.19	0.6107	0.0000	0.3583	(437)	0.00	0.00	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5.0016	16.0766	0.0000	0.0000	135,429	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.08	0.00	0.00	0.00	0.00
	0.702	2.2564	0.0000	0.0000	36,951	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.26	0.00	0.00	0.00
	0.2	0.6429	0.0000	0.0000	9,061	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.22	0.7071	0.0000	0.3370	1,594	0.00	0.00	0.00	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	51.9017	166.8268	0.0000	0.0000	723,695	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.03	0.0964	0.0000	0.0000	340	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ate	0.601	1.9318	0.0000	1.2439	(1,350)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.39
	0.02	0.0643	0.0000	0.0000	76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	58.9963	189.6308	0.0000	2.4304	907,592	0.13	0.21	0.32	0.00	0.31	0.00	0.00	0.00	0.00	16.08	2.26	0.00	0.00	0.43

BTU, CHLORINE, AND ASH FEED RATES

: 13

30 cal – M2,AP (w/WC852)

TE: 22,500 items/hr

: 62.30 grains/item

						METALS FEED RATES								POTENTIAL POHC FEED RATES					
	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALU (BTU/hr)	ALUM RATE (lb/hr)	ANT RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBP. RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
vder	0.04	0.1286	0.0000	0.2429	1,712	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ulfide	0.09	0.2893	0.0000	0.2483	521	0.00	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
	0.19	0.6107	0.0000	0.3583	(437)	0.00	0.00	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
onate	0.601	1.9318	0.0000	1.0824	(1,520)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	4.1013	13.1828	0.0000	0.0000	174,144	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.18	0.00	0.00	0.00	0.00	0.00
	0.601	1.9318	0.0000	0.0000	16,273	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.93	0.00	0.00	0.00	0.00
e	0.802	2.5779	0.0000	0.0000	42,215	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.58	0.00	0.00	0.00
	0.2	0.6429	0.0000	0.0000	9,061	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.22	0.7071	0.0000	0.3370	1,594	0.00	0.00	0.00	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	48.2015	154.9335	0.0000	0.0000	672,102	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	6.1019	19.6133	0.0000	0.0000	133,802	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	19.61	0.00
	0.03	0.0964	0.0000	0.0000	340	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
rate	0.802	2.5779	0.0000	1.4305	(737)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.3	0.9643	0.0000	0.5431	(680)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24
	0.02	0.0643	0.0000	0.0000	76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	62.3007	200.2524	0.0000	4.2424	1,048,465	0.13	0.21	0.32	0.00	0.31	0.00	0.00	0.00	13.18	1.93	2.58	0.00	19.61	0.28

BTU, CHLORINE, AND ASH FEED RATES

: 14
30 cal – M2,Ball (w/IMR 4895)
TE: 22,500 items/hr
: 53.69 grains/item

METALS FEED RATES — POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALU (BTU/hr)	ALUM RATE (lb/hr)	ANT RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBP RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
vder	0.04	0.1286	0.0000	0.2429	1,712	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ulfide	0.09	0.2893	0.0000	0.2483	521	0.00	0.21	0.00	0.00	0.00	0:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
	0.19	0.6107	0.0000	0.3583	(437)	0.00	0.00	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4.50001	14.4643	0.0000	0.0000	121,848	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14.46	0.00	0.00	0.00	0.00
	0.70002	2.2501	0.0000	0.0000	36,847	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.25	0.00	0.00	0.00
	0.2	0.6429	0.0000	0.0000	9,061	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.22	0.7071	0.0000	0.3370	1,594	0.00	0.00	0.00	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	47.2	151.7144	0.0000	0.0000	658,137	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.03	0.0964	0.0000	0.0000	340	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
fate	0.50001	1.6072	0.0000	1.0349	(1,123)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.32
	0.02	0.0643	0.0000	0.0000	76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	53.6901	172.5752	0.0000	2.2214	828,575	0.13	0.21	0.32	0.00	0.31	0.00	0.00	0.00	0.00	14.46	2.25	0.00	0.00	0.36

BTU, CHLORINE, AND ASH FEED RATES

l : 15
30 cal – M2, Ball (w/WC 852)
TE: 22,500 items/hr
: 56.49 grains/item

METALS FEED RATES POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALU (BTU/hr)	ALUM RATE (lb/hr)	ANT RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBP RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
wder	0.04	0.1286	0.0000	0.2429	1,712	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ulfide	0.09	0.2893	0.0000	0.2483	521	0.00	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
	0.19	0.6107	0.0000	0.3583	(437)	0.00	0.00	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
onate	0.1	0.3214	0.0000	0.1801	(253)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	3.80001	12.2143	0.0000	0.0000	161,351	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.21	0.00	0.00	0.00	0.00	0.00
	0.50001	1.6072	0.0000	0.0000	13,539	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.61	0.00	0.00	0.00	0.00
s	0.80002	2.5715	0.0000	0.0000	42,111	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.57	0.00	0.00	0.00
	0.2	0.6429	0.0000	0.0000	9,061	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	0.22	0.7071	0.0000	0.3370	1,594	0.00	0.00	0.00	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	43.9	141.1072	0.0000	0.0000	612,123	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5.50002	17.6786	0.0000	0.0000	120,604	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17.68	0.00
	0.03	0.0964	0.0000	0.0000	340	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
rate	0.80002	2.5715	0.0000	1.4269	(735)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.3	0.9643	0.0000	0.5431	(680)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24
	0.02	0.0643	0.0000	0.0000	76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	56.4901	181.5753	0.0000	3.3366	960,926	0.13	0.21	0.32	0.00	0.31	0.00	0.00	0.00	12.21	1.61	2.57	0.00	17.68	0.28

BTU, CHLORINE, AND ASH FEED RATES

: 16
30 cal – M6, Grenade (carbine)
TE: 22,500 items/hr
: 24.39 grains/item

METALS FEED RATES — POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALU (BTU/hr)	ALUM RATE (lb/hr)	ANT RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBP RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
vder	0.04	0.1286	0.0000	0.2429	1,712	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ulfide	0.09	0.2893	0.0000	0.2483	521	0.00	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
	0.19	0.6107	0.0000	0.3583	(437)	0.00	0.00	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
onate	0.2	0.6429	0.0000	0.3602	(506)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	0.90002	2.8929	0.0000	0.0000	38,215	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.89	0.00	0.00	0.00	0.00	0.00
	0.2	0.6429	0.0000	0.0000	5,415	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.64	0.00	0.00	0.00	0.00
	0.3	0.9643	0.0000	0.0000	15,791	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.96	0.00	0.00	0.00
	0.1	0.3214	0.0000	0.0000	4,531	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.22	0.7071	0.0000	0.3370	1,594	0.00	0.00	0.00	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	18.9001	60.7502	0.0000	0.0000	263,534	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2.30007	7.3931	0.0000	0.0000	50,436	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.39	0.00
	0.03	0.0964	0.0000	0.0000	340	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
rate	0.80002	2.5715	0.0000	1.4269	(735)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.1	0.3214	0.0000	0.1810	(227)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08
	0.02	0.0643	0.0000	0.0000	76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	24.3902	78.3970	0.0000	3.1547	380,261	0.13	0.21	0.32	0.00	0.31	0.00	0.00	0.00	2.89	0.64	0.96	0.00	7.39	0.12

BTU, CHLORINE, AND ASH FEED RATES

:	17
	30 cal – M3,Grenade
TE:	22,500 items/hr
:	48.49 grains/item

METALS FEED RATES — POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALU (BTU/hr)	ALUM RATE (lb/hr)	ANT RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBP RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
wder	0.04	0.1286	0.0000	0.2429	1,712	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ulfide	0.09	0.2893	0.0000	0.2483	521	0.00	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
	0.19	0.6107	0.0000	0.3583	(437)	0.00	0.00	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4.10001	13.1786	0.0000	0.0000	111,017	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.18	0.00	0.00	0.00	0.00
e	0.60001	1.9286	0.0000	0.0000	31,583	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.93	0.00	0.00	0.00
	0.2	0.6429	0.0000	0.0000	9,061	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	0.22	0.7071	0.0000	0.3370	1,594	0.00	0.00	0.00	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	42.5	136.6072	0.0000	0.0000	592,602	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.03	0.0964	0.0000	0.0000	340	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
fate	0.50001	1.6072	0.0000	1.0349	(1,123)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.32
	0.02	0.0643	0.0000	0.0000	76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	48.4901	155.8609	0.0000	2.2214	746,945	0.13	0.21	0.32	0.00	0.31	0.00	0.00	0.00	0.00	13.18	1.93	0.00	0.00	0.36

BTU, CHLORINE, AND ASH FEED RATES

: 18
30 cal – M2,Ball OHF
TE: 22,500 items/hr
: 81.09 grains/item

METALS FEED RATES — POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALU (BTU/hr)	ALUM RATE (lb/hr)	ANT RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBP RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
vder	0.04	0.1286	0.0000	0.2429	1,712	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
lfide	0.09	0.2893	0.0000	0.2483	521	0.00	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
	0.19	0.6107	0.0000	0.3583	(437)	0.00	0.00	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
onate	0.50001	1.6072	0.0000	0.9005	(1,265)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	4.10001	13.1786	0.0000	0.0000	174,089	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.18	0.00	0.00	0.00	0.00	0.00
	0.50001	1.6072	0.0000	0.0000	13,539	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.61	0.00	0.00	0.00	0.00
	0.80002	2.5715	0.0000	0.0000	42,111	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.57	0.00	0.00	0.00
	0.2	0.6429	0.0000	0.0000	9,061	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.22	0.7071	0.0000	0.3370	1,594	0.00	0.00	0.00	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	47.4	152.3572	0.0000	0.0000	660,926	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5.90002	18.9643	0.0000	0.0000	129,375	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	18.96	0.00
	0.03	0.0964	0.0000	0.0000	340	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
rate	0.80002	2.5715	0.0000	1.4269	(735)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.3	0.9643	0.0000	0.5431	(680)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24
	0.02	0.0643	0.0000	0.0000	78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	81.0901	196.3611	0.0000	4.0570	1,030,226	0.13	0.21	0.32	0.00	0.31	0.00	0.00	0.00	13.18	1.61	2.57	0.00	18.96	0.28

BTU, CHLORINE, AND ASH FEED RATES

: 19
30 cal – M14,API (w/WC 852)
TE: 22,500 items/hr
: 58.89 grains/item

METALS FEED RATES — POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALU (BTU/hr)	ALUM RATE (lb/hr)	ANT RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBP RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
vder	0.04	0.1286	0.0000	0.2429	1,712	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ulfide	0.09	0.2893	0.0000	0.2483	521	0.00	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
	1.19003	3.8251	0.0000	2.2442	(2,739)	0.00	0.00	2.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
onate	0.50001	1.6072	0.0000	0.9005	(1,265)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	3.80001	12.2143	0.0000	0.0000	161,351	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.21	0.00	0.00	0.00	0.00	0.00
	0.50001	1.6072	0.0000	0.0000	13,539	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.61	0.00	0.00	0.00	0.00
	0.80002	2.5715	0.0000	0.0000	42,111	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.57	0.00	0.00	0.00
	0.2	0.6429	0.0000	0.0000	9,061	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.22	0.7071	0.0000	0.3370	1,594	0.00	0.00	0.00	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
uminum Alloy	1.00003	3.2144	0.0000	5.5956	37,293	1.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	43.9	141.1072	0.0000	0.0000	612,123	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5.50002	17.6786	0.0000	0.0000	120,604	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17.68	0.00
	0.03	0.0964	0.0000	0.0000	340	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ate	0.80002	2.5715	0.0000	1.4269	(735)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.3	0.9643	0.0000	0.5431	(680)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24
	0.02	0.0643	0.0000	0.0000	76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	58.8902	169.2898	0.0000	11.5385	994,906	1.29	0.21	2.03	0.00	0.31	0.00	0.00	0.00	12.21	1.61	2.57	0.00	17.68	0.28

BTU, CHLORINE, AND ASH FEED RATES

: 20
30 cal – M14,API (w/IMR 4895)
TE: 22,500 items/hr
: 55.69 grains/item

						METALS FEED RATES								POTENTIAL POHC FEED RATES					
	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALU (BTU/hr)	ALUM RATE (lb/hr)	ANT RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBP RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
vder	0.04	0.1286	0.0000	0.2429	1,712	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ulfide	0.09	0.2893	0.0000	0.2483	521	0.00	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
	1.19003	3.8251	0.0000	2.2442	(2,739)	0.00	0.00	2.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4.50001	14.4643	0.0000	0.0000	121,848	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14.46	0.00	0.00	0.00	0.00
	0.70002	2.2501	0.0000	0.0000	36,847	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.25	0.00	0.00	0.00
	0.2	0.6429	0.0000	0.0000	9,061	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	0.22	0.7071	0.0000	0.3370	1,594	0.00	0.00	0.00	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
luminum Alloy	1.00003	3.2144	0.0000	5.5956	37,293	1.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	47.2	151.7144	0.0000	0.0000	658,137	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.03	0.0964	0.0000	0.0000	340	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
lfate	0.50001	1.6072	0.0000	1.0349	(1,123)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.32
	0.02	0.0643	0.0000	0.0000	76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	55.6901	179.0040	0.0000	9.7029	863,567	1.29	0.21	2.03	0.00	0.31	0.00	0.00	0.00	0.00	14.46	2.25	0.00	0.00	0.36

BTU, CHLORINE, AND ASH FEED RATES

: 21
30 cal – M18,HPT (w/WC820,Carbine)
TE: 22,500 items/hr
: 15.67 grains/item

METALS FEED RATES — POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALU (BTU/hr)	ALUM RATE (lb/hr)	ANT RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBP RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
ulfide	0.03	0.0964	0.0000	0.0828	174	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
	0.16	0.5143	0.0000	0.3017	(368)	0.00	0.00	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
onate	0.1	0.3214	0.0000	0.1801	(253)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
de	0.03	0.0964	0.0000	0.1766	579	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	0.60001	1.9286	0.0000	0.0000	25,477	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.93	0.00	0.00	0.00	0.00	0.00
	0.1	0.3214	0.0000	0.0000	2,708	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.32	0.00	0.00	0.00	0.00
e	0.2	0.6429	0.0000	0.0000	10,527	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.64	0.00	0.00	0.00
	0.1	0.3214	0.0000	0.0000	4,531	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	0.14	0.4500	0.0000	0.2145	1,014	0.00	0.00	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	12.6	40.5001	0.0000	0.0000	175,690	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.50004	4.8216	0.0000	0.0000	32,893	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.82	0.00
e	0.1	0.3214	0.0000	0.1810	(227)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08
	0.01	0.0321	0.0000	0.0000	38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	15.6701	50.3681	0.0000	1.1367	252,782	0.00	0.07	0.27	0.00	0.20	0.00	0.00	0.00	1.93	0.32	0.64	0.00	4.82	0.09

BTU, CHLORINE, AND ASH FEED RATES

: 22
30 cal – M22.Frangible
TE: 22,500 items/hr
: 12.08 grains/item

METALS FEED RATES POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALU (BTU/hr)	ALUM RATE (lb/hr)	ANT RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBP RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
wder	0.04	0.1286	0.0000	0.2429	1,712	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ulfide	0.09	0.2893	0.0000	0.2483	521	0.00	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
	0.19	0.6107	0.0000	0.3583	(437)	0.00	0.00	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.14	0.4500	0.0000	0.0000	7,369	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.45	0.00	0.00	0.00
	0.04	0.1286	0.0000	0.0000	1,812	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	0.22	0.7071	0.0000	0.3370	1,594	0.00	0.00	0.00	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	10.9	35.0358	0.0000	0.0000	151,985	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.03	0.0964	0.0000	0.0000	340	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
rate	0.40001	1.2857	0.0000	0.7135	(368)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
lfate	0.01	0.0321	0.0000	0.0207	(22)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
	0.02	0.0643	0.0000	0.0000	76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	12.08	38.8287	0.0000	1.9207	164,583	0.13	0.21	0.32	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.45	0.00	0.00	0.05

BTU, CHLORINE, AND ASH FEED RATES

R : 23
30 cal – M25,Tracer (w/WC852)
TE: 22,500 items/hr
: 63.49 grains/item

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALU (BTU/hr)	ALUM RATE (lb/hr)	ANT RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBP RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
						METALS FEED RATES								POTENTIAL POHC FEED RATES					
wder	0.04	0.1286	0.0000	0.2429	1,712	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ulfide	0.09	0.2893	0.0000	0.2483	521	0.00	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
e	0.19	0.6107	0.0000	0.3583	(437)	0.00	0.00	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
onate	0.50001	1.6072	0.0000	0.9005	(1,265)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
nate	0.05	0.1607	0.0000	0.0140	2,387	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ate	3.80001	12.2143	0.0000	0.0000	161,351	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.21	0.00	0.00	0.00	0.00	0.00
	0.50001	1.6072	0.0000	0.0000	13,539	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.61	0.00	0.00	0.00	0.00
e	0.80002	2.5715	0.0000	0.0000	42,111	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.57	0.00	0.00	0.00
	0.2	0.6429	0.0000	0.0000	9,061	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	0.22	0.7071	0.0000	0.3370	1,594	0.00	0.00	0.00	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.65005	5.3037	0.0000	8.7952	56,501	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	43.9	141.1072	0.0000	0.0000	612,123	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5.50002	17.6786	0.0000	0.0000	120,604	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17.68	0.00
nated Rubber	0.36001	1.1572	0.7522	0.0000	4,860	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.03	0.0964	0.0000	0.0000	340	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ride	0.96003	3.0858	1.7506	0.0000	27,519	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
rate	0.80002	2.5715	0.0000	1.4269	(735)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	0.3	0.9643	0.0000	0.5431	(680)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24
ate	3.12001	10.0286	0.0000	4.9100	(7,882)	0.00	0.00	0.00	0.00	0.00	4.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
oxide	0.46001	1.4786	0.0000	1.2864	(18)	0.00	0.00	0.00	0.00	0.00	1.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.02	0.0643	0.0000	0.0000	76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	63.4902	204.0757	2.5027	19.0626	1,043,281	0.13	0.21	0.32	0.00	0.31	5.19	0.00	0.00	12.21	1.61	2.57	0.00	17.68	0.28

BTU, CHLORINE, AND ASH FEED RATES

:   24
             30 cal – M25,Tracer (w/IMR4895)
TE: 22,500 items/hr
:   57.62 grains/item

METALS FEED RATES   POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALU (BTU/hr)	ALUM RATE (lb/hr)	ANT RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBP RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
vder	0.04	0.1286	0.0000	0.2429	1,712	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ulfide	0.09	0.2893	0.0000	0.2483	521	0.00	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
	0.19	0.6107	0.0000	0.3583	(437)	0.00	0.00	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
onate	0.50001	1.6072	0.0000	0.9005	(1,265)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4.50001	14.4643	0.0000	0.0000	121,848	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14.46	0.00	0.00	0.00	0.00
	0.70002	2.2501	0.0000	0.0000	36,847	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.25	0.00	0.00	0.00
	0.2	0.6429	0.0000	0.0000	9,061	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.22	0.7071	0.0000	0.3370	1,594	0.00	0.00	0.00	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.65005	5.3037	0.0000	8.7952	56,501	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	47.2	151.7144	0.0000	0.0000	658,137	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ated Rubber	0.36001	1.1572	0.7522	0.0000	4,860	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.03	0.0964	0.0000	0.0000	340	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ride	0.96003	3.0858	1.7506	0.0000	27,519	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
fate	0.50001	1.6072	0.0000	1.0349	(1,123)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.32
oxide	0.46001	1.4786	0.0000	1.2864	(18)	0.00	0.00	0.00	0.00	0.00	1.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.02	0.0643	0.0000	0.0000	76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	57.6202	185.2077	2.5027	13.2035	916,172	0.13	0.21	0.32	0.00	0.31	1.08	0.00	0.00	0.00	14.46	2.25	0.00	0.00	0.36

BTU, CHLORINE, AND ASH FEED RATES

R : 25
30 cal – M27,Tracer (w/l–276)
TE: 22,500 items/hr
: 21.40 grains/item

METALS FEED RATES · POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALU (BTU/hr)	ALUM RATE (lb/hr)	ANT RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBP RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
wder	0.04	0.1286	0.0000	0.2429	1,712	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ulfide	0.09	0.2893	0.0000	0.2483	521	0.00	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
e	0.19	0.6107	0.0000	0.3583	(437)	0.00	0.00	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ide	0.84002	2.7001	0.0000	2.4571	0	0.00	0.00	2.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
onate	0.1	0.3214	0.0000	0.1801	(253)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
nate	0.46001	1.4786	0.0000	0.1289	21,965	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ate	0.60001	1.9286	0.0000	0.0000	25,477	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.93	0.00	0.00	0.00	0.00	0.00
	0.1	0.3214	0.0000	0.0000	2,708	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.32	0.00	0.00	0.00	0.00
s	0.2	0.6429	0.0000	0.0000	10,527	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.64	0.00	0.00	0.00
	0.1	0.3214	0.0000	0.0000	4,531	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	0.22	0.7071	0.0000	0.3370	1,594	0.00	0.00	0.00	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.62005	5.2073	0.0000	8.6353	55,473	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	11.7	37.6073	0.0000	0.0000	163,140	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.40004	4.5001	0.0000	0.0000	30,700	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.50	0.00
	0.03	0.0964	0.0000	0.0000	340	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.1	0.3214	0.0000	0.1810	(227)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08
ate	1.83005	5.8823	0.0000	2.8800	(4,623)	0.00	0.00	0.00	0.00	0.00	2.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
alate	0.26	0.9000	0.0000	0.1800	0	0.00	0.00	0.00	0.00	0.00	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
oxide	1.47004	4.7251	0.0000	4.1109	(59)	0.00	0.00	0.00	0.00	0.00	3.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.02	0.0643	0.0000	0.0000	76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.01	0.0321	0.0000	0.0041	495	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	21.4003	88.7866	0.0000	19.9439	313,660	0.13	0.21	2.51	0.00	0.31	6.01	0.00	0.00	1.93	0.32	0.64	0.00	4.50	0.12

BTU, CHLORINE, AND ASH FEED RATES

: 26
30 cal – M27,Tracer (w/l–280)
TE: 22,500 items/hr
: 21.41 grains/item

						METALS FEED RATES									POTENTIAL POHC FEED RATES					
	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALU (BTU/hr)	ALUM RATE (lb/hr)	ANT RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBP RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
wder	0.04	0.1286	0.0000	0.2429	1,712	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ulfide	0.09	0.2893	0.0000	0.2463	521	0.00	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
	0.19	0.6107	0.0000	0.3583	(437)	0.00	0.00	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
onate	0.1	0.3214	0.0000	0.1801	(253)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ate	0.55001	1.7679	0.0000	0.1542	26,262	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	0.60001	1.9286	0.0000	0.0000	25,477	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.93	0.00	0.00	0.00	0.00	0.00
	0.1	0.3214	0.0000	0.0000	2,708	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.32	0.00	0.00	0.00	0.00
e	0.2	0.6429	0.0000	0.0000	10,527	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.64	0.00	0.00	0.00
	0.1	0.3214	0.0000	0.0000	4,531	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.22	0.7071	0.0000	0.3370	1,594	0.00	0.00	0.00	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.62005	5.2073	0.0000	8.6353	55,473	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	11.7	37.6073	0.0000	0.0000	163,140	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.40004	4.5001	0.0000	0.0000	30,700	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.50	0.00
	0.03	0.0964	0.0000	0.0000	340	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.1	0.3214	0.0000	0.1810	(227)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08
ate	1.83005	5.8823	0.0000	2.8800	(4,623)	0.00	0.00	0.00	0.00	0.00	2.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
late	0.28	0.9000	0.0000	0.1800	0	0.00	0.00	0.00	0.00	0.00	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
oxide	2.24007	7.2002	0.0000	6.2642	(90)	0.00	0.00	0.00	0.00	0.00	5.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.02	0.0643	0.0000	0.0000	76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	21.4103	68.8187	0.0000	19.8613	317,431	0.13	0.21	0.32	0.00	0.31	7.81	0.00	0.00	1.93	0.32	0.64	0.00	4.50	0.12

BTU, CHLORINE, AND ASH FEED RATES

R : 27
30 cal – M72,Ball–Match
ATE: 22,500 items/hr
G : 53.89 grain/item

						METALS FEED RATES								POTENTIAL POHC FEED RATES					
T	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBP RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
owder	0.04	0.1286	0.0000	0.2429	1,712	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
sulfide	0.09	0.2893	0.0000	0.2483	521	0.00	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
e	0.19	0.6107	0.0000	0.3583	(437)	0.00	0.00	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
e	4.50001	14.4843	0.0000	0.0000	121,848	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14.48	0.00	0.00	0.00	0.0
ne	0.70002	2.2501	0.0000	0.0000	36,847	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.25	0.00	0.00	0.0
	0.2	0.6429	0.0000	0.0000	9,061	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
ate	0.22	0.7071	0.0000	0.3370	1,594	0.00	0.00	0.00	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
e	47.2	151.7144	0.0000	0.0000	658,137	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	0.03	0.0964	0.0000	0.0000	340	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
ulfate	0.50001	1.6072	0.0000	1.0349	(1,123)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.3
	0.02	0.0643	0.0000	0.0000	76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	53.6901	172.5752	0.0000	2.2214	828,575	0.13	0.21	0.32	0.00	0.31	0.00	0.00	0.00	0.00	14.46	2.25	0.00	0.00	0.3

BTU, CHLORINE, AND ASH FEED RATES

R : 28
30 cal – M190, Blank (w/WC Blank)
ATE: 22,500 items/hr
: 18.03 grain/item

						METALS FEED RATES								POTENTIAL POHC FEED RATES						
	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBP RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
wder	0.04	0.1286	0.0000	0.2429	1,712	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
ulfide	0.09	0.2893	0.0000	0.2483	521	0.00	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
e	0.19	0.8107	0.0000	0.3583	(437)	0.00	0.00	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
onate	0.1	0.3214	0.0000	0.1801	(253)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
ate	0.40001	1.2857	0.0000	0.0000	16,985	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.29	0.00	0.00	0.00	0.00	0.0
	0.1	0.3214	0.0000	0.0000	2,708	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.32	0.00	0.00	0.00	0.0
e	0.2	0.6429	0.0000	0.0000	10,527	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.64	0.00	0.00	0.0
te	0.22	0.7071	0.0000	0.3370	1,594	0.00	0.00	0.00	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	11	35.3573	0.0000	0.0000	153,380	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	1.40004	4.5001	0.0000	0.0000	30,700	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.50	0.0
	0.03	0.0964	0.0000	0.0000	340	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
oxide	2.24007	7.2002	0.0000	6.2642	(90)	0.00	0.00	0.00	0.00	0.00	5.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	0.02	0.0643	0.0000	0.0000	76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	16.0302	51.5255	0.0000	7.6308	217,763	0.13	0.21	0.32	0.00	0.31	5.26	0.00	0.00	1.29	0.32	0.64	0.00	4.50	0.0

BTU, CHLORINE, AND ASH FEED RATES

R : 29
30 cal – M1909,Blank (w/SR 4990)
ATE: 22,500 items/hr
: 17.99 grain/item

METALS FEED RATES

POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBP RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
wder	0.04	0.1286	0.0000	0.2429	1,712	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ulfide	0.09	0.2893	0.0000	0.2483	521	0.00	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
nate	0.1	0.3214	0.0000	0.3214	0	0.00	0.00	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.80002	2.5715	0.0000	1.5087	(1,841)	0.00	0.00	1.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ate	0.40001	1.2857	0.0000	0.0000	16,985	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.29	0.00	0.00	0.00	0.00	0.00
	0.1	0.3214	0.0000	0.0000	2,708	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.32	0.00	0.00	0.00	0.00
e	0.2	0.6429	0.0000	0.0000	10,527	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.64	0.00	0.00	0.00
	0.05	0.1607	0.0000	0.0000	2,265	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	0.22	0.7071	0.0000	0.3370	1,594	0.00	0.00	0.00	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	11.8	37.9287	0.0000	0.0000	164,535	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.40004	4.5001	0.0000	0.0000	30,700	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.50	0.00
	0.03	0.0964	0.0000	0.0000	340	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
rate	0.50001	1.6072	0.0000	0.8918	(460)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
oxide	2.24007	7.2002	0.0000	6.2642	(90)	0.00	0.00	0.00	0.00	0.00	5.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.02	0.0643	0.0000	0.0000	76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	17.9902	57.8256	0.0000	9.8144	229,572	0.13	0.21	1.59	0.00	0.31	5.26	0.00	0.00	1.29	0.32	0.64	0.00	4.50	0.04

BTU, CHLORINE, AND ASH FEED RATES

: 30

38cal Ball,Special-PGU-12/B

TE: 22,500 items/hr

: 6.31 grain/item

METALS FEED RATES

POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBP RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
ulfide	0.03	0.0964	0.0000	0.0828	174	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
	0.15	0.4821	0.0000	0.2829	(345)	0.00	0.00	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
le	0.03	0.0964	0.0000	0.1766	579	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.09	0.2893	0.0000	0.0000	4,366	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.03	0.0964	0.0000	0.0000	1,359	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	0.13	0.4179	0.0000	0.1992	942	0.00	0.00	0.00	0.00	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3.44001	11.0572	0.0000	0.0000	47,966	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2.40007	7.7145	0.0000	0.0000	52,628	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.71	0.00
	0.01	0.0321	0.0000	0.0000	38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	6.31008	20.2824	0.0000	0.7413	107,707	0.00	0.07	0.26	0.00	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.71	0.01

BTU, CHLORINE, AND ASH FEED RATES

R : 31
38cal Ball,Special–M41 (w/SR 7325)
ATE: 22,500 items/hr
: 5.40 grain/item

METALS FEED RATES

POTENTIAL POHC FEED RATES

T	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBP RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
ulfide	0.03	0.0964	0.0000	0.0828	174	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
e	0.15	0.4821	0.0000	0.2829	(345)	0.00	0.00	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
de	0.03	0.0964	0.0000	0.1766	579	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	0.19	0.6107	0.0000	0.0000	5,145	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.61	0.00	0.00	0.00	0.0
e	0.06	0.1929	0.0000	0.0000	3,158	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.00	0.00	0.0
	0.02	0.0643	0.0000	0.0000	906	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
te	0.13	0.4179	0.0000	0.1992	942	0.00	0.00	0.00	0.00	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	4.78002	15.3643	0.0000	0.0000	66,850	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	0.01	0.0321	0.0000	0.0000	38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	5.40002	17.3572	0.0000	0.7413	77,247	0.00	0.07	0.28	0.00	0.18	0.00	0.00	0.00	0.00	0.61	0.19	0.00	0.00	0.0

BTU, CHLORINE, AND ASH FEED RATES

:	32
	38cal Ball,Special–M41 (w/HPC1)
TE:	22,500 items/hr
:	4.84 grain/item

METALS FEED RATES — POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBP RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
ulfide	0.03	0.0964	0.0000	0.0828	174	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
	0.15	0.4821	0.0000	0.2829	(345)	0.00	0.00	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
le	0.03	0.0964	0.0000	0.1766	579	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.19	0.6107	0.0000	0.0000	5,145	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.61	0.00	0.00	0.00	0.00
e	0.06	0.1929	0.0000	0.0000	3,158	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.00	0.00	0.00
e	0.06	0.1929	0.0000	0.0000	2,911	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.02	0.0643	0.0000	0.0000	906	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	0.13	0.4179	0.0000	0.1992	942	0.00	0.00	0.00	0.00	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2.48007	7.9717	0.0000	0.0000	34,581	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.60005	5.1430	0.0000	0.0000	35,086	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.14	0.00
fate	0.08	0.2571	0.0000	0.1656	(180)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05
	0.01	0.0321	0.0000	0.0000	38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4.84012	15.5575	0.0000	0.9069	82,994	0.00	0.07	0.26	0.00	0.18	0.00	0.00	0.00	0.00	0.61	0.19	0.00	5.14	0.07

BTU, CHLORINE, AND ASH FEED RATES

R : 33
40mm Projectile,AP-T-M81
ATE: 1,300 items/hr
: 150.17 grain/item

METALS FEED RATES

POTENTIAL POHC FEED RATES

T	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBP RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
	14.515	2.6956	0.0000	0.0000	11,195	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	37.8114	7.0221	0.0000	0.0000	140,442	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
oride	27.621	5.1296	2.9100	0.0000	45,746	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
rate	70.2226	13.0413	0.0000	6.3850	(10,250)	0.00	0.00	0.00	0.00	0.00	5.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	150.17	27.8867	2.9100	6.3850	187,133	0.00	0.00	0.00	0.00	0.00	5.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0

BTU, CHLORINE, AND ASH FEED RATES

l:	34
	40mm Practice Ctg. – M385
TE:	660 items/hr
:	69.62 grain/item

METALS FEED RATES

POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBP RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
wder	0.39	0.0368	0.0000	0.0695	490	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ulfide	0.04	0.0038	0.0000	0.0032	7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
)	1.16	0.1094	0.0000	0.0642	(78)	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.05	0.0047	0.0000	0.0000	71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.39	0.1311	0.0000	0.0000	1,847	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	0.2	0.0189	0.0000	0.0090	43	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	54.635	5.1513	0.0000	0.0000	22,346	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	10.961	1.0335	0.0000	0.0000	7,050	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.03	0.00
rate	0.77	0.0726	0.0000	0.0403	(21)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.02	0.0019	0.0000	0.0000	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	69.616	6.5638	0.0000	0.1862	31,757	0.04	0.00	0.06	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.03	0.0

BTU, CHLORINE, AND ASH FEED RATES

R : 35
40mm Practice Ctg. – M407
TE: 660 items/hr
: 84.48 grain/item

METALS FEED RATES

POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBP RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
wder	0.39	0.0368	0.0000	0.0695	490	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ulfide	0.07	0.0066	0.0000	0.0057	12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.13	0.0123	0.0000	0.0072	(9)	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.05	0.0047	0.0000	0.0000	71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.02	0.0019	0.0000	0.0000	27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.83	0.0783	0.0000	0.0600	89	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	0.29	0.0273	0.0000	0.0130	62	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3.01	0.2838	0.0000	0.0000	1,231	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2.1	0.1980	0.0000	0.0000	1,351	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.00
lorate	17.751	1.6737	0.4842	0.7662	751	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
rate	0.11	0.0104	0.0000	0.0058	(3)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.29	0.0273	0.0000	0.0000	113	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
bonate	20.833	1.9643	0.0000	0.9352	175	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	6.94	0.6543	0.0000	0.0000	2,606	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.65
	0.03	0.0028	0.0000	0.0000	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	31.635	2.9827	0.0000	2.9827	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	84.479	7.9652	0.4842	4.8452	6,968	0.04	0.00	0.01	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.66

BTU, CHLORINE, AND ASH FEED RATES

: 36
.45 caliber Ball,HPT–M1(w/HPC18)
TE: 22,500 items/hr
: 8.06 grain/item

METALS FEED RATES — POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBP RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
ulfide	0.04	0.1286	0.0000	0.1103	232	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
	0.22	0.7071	0.0000	0.4149	(506)	0.00	0.00	0.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
le	0.04	0.1286	0.0000	0.2354	771	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.05	0.1607	0.0000	0.0000	2,265	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
s	0.07	0.2250	0.0000	0.0000	3,396	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.07	0.2250	0.0000	0.0000	3,171	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	0.19	0.6107	0.0000	0.2911	1,377	0.00	0.00	0.00	0.00	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5.64002	18.1286	0.0000	0.0000	78,642	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.51004	4.8537	0.0000	0.0000	33,112	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.85	0.00
rate	0.09	0.2893	0.0000	0.1605	(83)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
fate	0.13	0.4179	0.0000	0.2691	(292)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08
	0.01	0.0321	0.0000	0.0000	38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	8.06006	25.9073	0.0000	1.4813	122,123	0.00	0.09	0.37	0.00	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.85	0.1

BTU, CHLORINE, AND ASH FEED RATES

:   37
.45 caliber Ball,HPT–M1(w/SR7970)
TE: 22,500 items/hr
:   7.94 grain/item

						METALS FEED RATES								POTENTIAL POHC FEED RATES					
	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBP RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
ulfide	0.04	0.1286	0.0000	0.1103	232	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
	0.22	0.7071	0.0000	0.4149	(506)	0.00	0.00	0.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
le	0.04	0.1286	0.0000	0.2354	771	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.35001	1.1250	0.0000	0.0000	9,477	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.13	0.00	0.00	0.00	0.00
s	0.09	0.2893	0.0000	0.0000	4,737	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.29	0.00	0.00	0.00
	0.03	0.0964	0.0000	0.0000	1,359	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	0.19	0.6107	0.0000	0.2911	1,377	0.00	0.00	0.00	0.00	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	6.97002	22.4036	0.0000	0.0000	97,187	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.01	0.0321	0.0000	0.0000	38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	7.94003	25.5215	0.0000	1.0517	114,672	0.00	0.09	0.37	0.00	0.27	0.00	0.00	0.00	0.00	1.13	0.29	0.00	0.00	0.02

BTU, CHLORINE, AND ASH FEED RATES

: 38
.45 caliber Blank – M9
TE: 22,500 items/hr
: 11.47 grain/item

						METALS FEED RATES								POTENTIAL POHC FEED RATES					
	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBP RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
ulfide	0.04	0.1286	0.0000	0.1103	232	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
nate	0.1	0.3214	0.0000	0.3214	0	0.00	0.00	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.72002	2.3144	0.0000	1.3578	(1,657)	0.00	0.00	1.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
le	0.04	0.1286	0.0000	0.2354	771	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.13	0.4179	0.0000	0.0000	6,843	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.42	0.00	0.00	0.00
	0.04	0.1286	0.0000	0.0000	1,812	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	0.19	0.6107	0.0000	0.2911	1,377	0.00	0.00	0.00	0.00	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	9.80003	31.5001	0.0000	0.0000	136,647	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
rate	0.40001	1.2857	0.0000	0.7135	(368)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.01	0.0321	0.0000	0.0000	38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	11.4701	36.8681	0.0000	3.0296	145,695	0.00	0.09	1.45	0.00	0.27	0.00	0.00	0.00	0.00	0.00	0.42	0.00	0.00	0.02

BTU, CHLORINE, AND ASH FEED RATES

R : 39

.45 caliber Tracer – M26 (w/SR 7970)

ATE: 22,500 items/hr

: 12.38 grain/item

METALS FEED RATES

POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBP RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
ulfide	0.04	0.1286	0.0000	0.1103	232	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
	0.22	0.7071	0.0000	0.4149	(506)	0.00	0.00	0.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
ide	2.10006	6.7502	0.0000	6.1427	0	0.00	0.00	5.47	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
de	0.04	0.1286	0.0000	0.2354	771	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
nate	0.25	0.8036	0.0000	0.0701	11,937	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	0.3	0.9643	0.0000	0.0000	8,123	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.96	0.00	0.00	0.00	0.0
e	0.08	0.2571	0.0000	0.0000	4,211	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.00	0.00	0.0
	0.02	0.0643	0.0000	0.0000	906	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
te	0.19	0.6107	0.0000	0.2911	1,377	0.00	0.00	0.00	0.00	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
owder	1.18003	3.7930	0.0000	6.2899	40,406	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	5.97002	19.1393	0.0000	0.0000	83,243	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
ate	1.00003	3.2144	0.0000	1.5738	(2,527)	0.00	0.00	0.00	0.00	0.00	1.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
alate	0.15	0.4821	0.0000	0.0964	0	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
oxide	0.80002	2.5715	0.0000	2.2372	(32)	0.00	0.00	0.00	0.00	0.00	1.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	0.01	0.0321	0.0000	0.0000	38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	0.03	0.0964	0.0000	0.0124	1,485	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.0
	12.3802	39.7934	0.0000	17.4741	149,665	0.00	0.09	5.84	0.00	0.27	3.27	0.00	0.01	0.00	0.96	0.26	0.00	0.00	0.02

BTU, CHLORINE, AND ASH FEED RATES

:   40
.45 caliber Tracer – M26 (w/HPC 18)
ATE: 22,500 items/hr
:   12.58 grain/item

						METALS FEED RATES								POTENTIAL POHC FEED RATES					
	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBP RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
ulfide	0.04	0.1286	0.0000	0.1103	232	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
	0.22	0.7071	0.0000	0.4149	(506)	0.00	0.00	0.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
de	2.10006	6.7502	0.0000	6.1427	0	0.00	0.00	5.47	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
de	0.04	0.1286	0.0000	0.2354	771	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
nate	0.25	0.8036	0.0000	0.0701	11,937	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.06	0.1929	0.0000	0.0000	2,718	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.1	0.3214	0.0000	0.0000	4,851	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.06	0.1929	0.0000	0.0000	2,718	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	0.19	0.6107	0.0000	0.2911	1,377	0.00	0.00	0.00	0.00	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
owder	1.18003	3.7930	0.0000	6.2899	40,406	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4.84002	15.5572	0.0000	0.0000	67,487	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.29004	4.1466	0.0000	0.0000	28,288	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.15	0.00
rate	0.11	0.3536	0.0000	0.1962	(101)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
lfate	0.11	0.3536	0.0000	0.2277	(247)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07
ate	1.00003	3.2144	0.0000	1.5738	(2,527)	0.00	0.00	0.00	0.00	0.00	1.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
alate	0.15	0.4821	0.0000	0.0964	0	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
oxide	0.80002	2.5715	0.0000	2.2372	(32)	0.00	0.00	0.00	0.00	0.00	1.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.01	0.0321	0.0000	0.0000	38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.03	0.0964	0.0000	0.0124	1,485	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
	12.5802	40.4363	0.0000	17.8980	158,896	0.00	0.09	5.84	0.00	0.27	3.27	0.00	0.01	0.00	0.00	0.00	0.00	4.15	0.0

BTU, CHLORINE, AND ASH FEED RATES

R : 41
.45 caliber Ball – M1911 (w/SR 7970) & .45 caliber Match–M1911(w/SR7970)
TE: 22,500 items/hr
: 5.82 grain/item

METALS FEED RATES — POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBP RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
ulfide	0.04	0.1286	0.0000	0.1103	232	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
)	0.22	0.7071	0.0000	0.4149	(506)	0.00	0.00	0.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
de	0.04	0.1286	0.0000	0.2354	771	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.25	0.8036	0.0000	0.0000	6,769	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.80	0.00	0.00	0.00	0.00
s	0.07	0.2250	0.0000	0.0000	3,685	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.00	0.00	0.00
	0.02	0.0643	0.0000	0.0000	906	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	0.19	0.6107	0.0000	0.2911	1,377	0.00	0.00	0.00	0.00	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4.98002	16.0072	0.0000	0.0000	69,439	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.01	0.0321	0.0000	0.0000	38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5.82002	18.7072	0.0000	1.0517	82,711	0.00	0.09	0.37	0.00	0.27	0.00	0.00	0.00	0.00	0.80	0.23	0.00	0.00	0.02

BTU, CHLORINE, AND ASH FEED RATES

: 42
.45 caliber Ball – M1911 (w/HPC 18) & .45 caliber Line Throwing – M32(w/HPC18)
TE: 22,500 items/hr
: 8.00 grain/item

METALS FEED RATES | POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBP RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
ulfide	0.04	0.1286	0.0000	0.1103	232	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
	0.22	0.7071	0.0000	0.4149	(506)	0.00	0.00	0.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
le	0.04	0.1286	0.0000	0.2354	771	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.06	0.1929	0.0000	0.0000	2,718	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
s	0.08	0.2571	0.0000	0.0000	3,881	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.05	0.1607	0.0000	0.0000	2,265	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	0.19	0.6107	0.0000	0.2911	1,377	0.00	0.00	0.00	0.00	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4.03001	12.9536	0.0000	0.0000	56,193	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.08003	3.4715	0.0000	0.0000	23,683	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.47	0.00
rate	0.11	0.3536	0.0000	0.1962	(101)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
fate	0.09	0.2893	0.0000	0.1863	(202)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06
	0.01	0.0321	0.0000	0.0000	38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	8.00004	19.2858	0.0000	1.4342	90,348	0.00	0.09	0.37	0.00	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.47	0.08

BTU, CHLORINE, AND ASH FEED RATES

R : 43
.50 caliber Tracer – M1
ATE: 3,500 items/hr
: 127.80 grain/item

						METALS FEED RATES								POTENTIAL POHC FEED RATES					
	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBP RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
ulfide	0.2	0.1000	0.0000	0.0858	180	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
	0.99	0.4950	0.0000	0.2904	(354)	0.00	0.00	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
de	9.24008	4.6200	0.0000	4.2042	0	0.00	0.00	3.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
de	0.17	0.0850	0.0000	0.1556	510	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
nate	5.06004	2.5300	0.0000	0.2206	37,583	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	24	12.0000	0.0000	0.0000	101,088	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.00	0.00	0.00	0.00	0.00
e	3.10002	1.5500	0.0000	0.0000	25,383	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.55	0.00	0.00	0.00
	1	0.5000	0.0000	0.0000	7,048	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.01	0.0050	0.0000	0.0000	34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	0.87	0.4350	0.0000	0.2073	980	0.00	0.00	0.00	0.00	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
owder	17.94	8.9700	0.0000	14.8750	95,558	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	23	11.5000	0.0000	0.0000	49,887	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
lfate	2.40002	1.2000	0.0000	0.7727	(839)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24
ate	20.31	10.1550	0.0000	4.9719	(7,982)	0.00	0.00	0.00	0.00	0.00	4.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
late	3.05002	1.5250	0.0000	0.3050	0	0.00	0.00	0.00	0.00	0.00	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
oxide	16.29	8.1450	0.0000	7.0862	(102)	0.00	0.00	0.00	0.00	0.00	5.95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.06	0.0300	0.0000	0.0000	36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.11	0.0550	0.0000	0.0071	847	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
	127.8	63.9001	0.0000	33.1818	309,857	0.00	0.07	4.00	0.00	0.19	10.35	0.00	0.01	0.00	12.00	1.55	0.00	0.00	0.26

BTU, CHLORINE, AND ASH FEED RATES

:	44
	.50 caliber Ball,HPT–M1
TE:	8,000 items/hr
:	69.00 grain/item

METALS FEED RATES

POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBP RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
ulfide	0.2	0.2286	0.0000	0.1962	412	0.00	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
	0.99001	1.1314	0.0000	0.6638	(810)	0.00	0.00	0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
onate	2.40002	2.7429	0.0000	1.5368	(2,159)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
le	0.17	0.1943	0.0000	0.3558	1,166	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	24	27.4286	0.0000	0.0000	362,332	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	27.43	0.00	0.00	0.00	0.00	0.00
	2.40002	2.7429	0.0000	0.0000	23,106	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.74	0.00	0.00	0.00	0.00
e	3.60004	4.1143	0.0000	0.0000	67,376	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.11	0.00	0.00	0.00
	1.00001	1.1429	0.0000	0.0000	16,109	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.01	0.0114	0.0000	0.0000	78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.87	0.9943	0.0000	0.4739	2,241	0.00	0.00	0.00	0.00	0.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4.50002	5.1429	0.0000	0.0000	22,310	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	26.4	30.1715	0.0000	0.0000	205,830	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	30.17	0.00
rate	1.20001	1.3714	0.0000	0.7610	(392)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	1.20001	1.3714	0.0000	0.7724	(967)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.34
	0.06	0.0686	0.0000	0.0000	81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	69.0002	78.8574	0.0000	4.7599	696,713	0.00	0.16	0.60	0.00	0.44	0.00	0.00	0.00	27.43	2.74	4.11	0.00	30.17	0.38

BTU, CHLORINE, AND ASH FEED RATES

l : 45
.50 caliber Incendiary -- M1
TE: 7,600 items/hr
: 103.00 grain/item

						METALS FEED RATES								POTENTIAL POHC FEED RATES					
	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBP RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
ulfide	0.2	0.2171	0.0000	0.1864	391	0.00	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
	17.99	19.5320	0.0000	11.4594	(13,985)	0.00	0.00	10.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
onate	2.40002	2.6057	0.0000	1.4600	(2,051)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
le	0.17	0.1846	0.0000	0.3380	1,107	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	24	26.0572	0.0000	0.0000	344,215	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	26.06	0.00	0.00	0.00	0.00	0.00
	2.40002	2.6057	0.0000	0.0000	21,951	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.61	0.00	0.00	0.00	0.00
s	3.60003	3.9086	0.0000	0.0000	64,007	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.91	0.00	0.00	0.00
	1.00001	1.0857	0.0000	0.0000	15,303	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.01	0.0109	0.0000	0.0000	74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	0.87	0.9446	0.0000	0.4502	2,129	0.00	0.00	0.00	0.00	0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
uminum Alloy	17	18.4572	0.0000	32.1302	214,140	6.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4.50002	4.8857	0.0000	0.0000	21,194	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	26.4	28.6629	0.0000	0.0000	195,538	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	28.66	0.00
rate	1.20001	1.3029	0.0000	0.7230	(373)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	1.20001	1.3029	0.0000	0.7338	(919)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33
	0.06	0.0651	0.0000	0.0000	77	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	103	111.8288	0.0000	47.4809	862,802	6.64	0.16	10.35	0.00	0.42	0.00	0.00	0.00	26.06	2.61	3.91	0.00	28.66	0.36

BTU, CHLORINE, AND ASH FEED RATES

: 46
.50 caliber Blank – M1
TE: 8,000 items/hr
: 52.40 grain/item

						METALS FEED RATES								POTENTIAL POHC FEED RATES					
	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBP RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
ulfide	0.2	0.2286	0.0000	0.1962	412	0.00	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
	0.99001	1.1314	0.0000	0.6638	(810)	0.00	0.00	0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
onate	0.5	0.5714	0.0000	0.3202	(450)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
le	0.17	0.1943	0.0000	0.3558	1,166	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	0.90001	1.0286	0.0000	0.0000	13,588	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.03	0.00	0.00	0.00	0.00	0.00
	0.5	0.5714	0.0000	0.0000	4,814	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.57	0.00	0.00	0.00	0.00
e	0.7	0.8000	0.0000	0.0000	13,101	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.80	0.00	0.00	0.00
	0.2	0.2286	0.0000	0.0000	3,222	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.01	0.0114	0.0000	0.0000	78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	0.87	0.9943	0.0000	0.4739	2,241	0.00	0.00	0.00	0.00	0.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	42.0001	48.0001	0.0000	0.0000	208,224	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5.10005	5.8286	0.0000	0.0000	39,763	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.83	0.00
e	0.2	0.2286	0.0000	0.1287	(161)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06
	0.06	0.0686	0.0000	0.0000	81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	52.4001	59.8859	0.0000	2.1385	285,268	0.00	0.16	0.60	0.00	0.44	0.00	0.00	0.00	1.03	0.57	0.80	0.00	5.83	0.0

BTU, CHLORINE, AND ASH FEED RATES

R : 47
.50 caliber Blank – M1A1
ATE: 8,000 items/hr
: 52.70 grain/item

						METALS FEED RATES								POTENTIAL POHC FEED RATES					
	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBP RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
ulfide	0.2	0.2286	0.0000	0.1962	412	0.00	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
)	0.99001	1.1314	0.0000	0.6638	(810)	0.00	0.00	0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
de	0.17	0.1943	0.0000	0.3558	1,166	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.01	0.0114	0.0000	0.0000	78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	0.87	0.9943	0.0000	0.4739	2,241	0.00	0.00	0.00	0.00	0.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	34.9	39.8858	0.0000	0.0000	173,024	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	15.5	17.7143	0.0000	0.0000	120,847	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17.71	0.00
	0.06	0.0686	0.0000	0.0000	81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	52.7001	60.2287	0.0000	1.6896	297,039	0.00	0.16	0.60	0.00	0.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17.71	0.03

BTU, CHLORINE, AND ASH FEED RATES

: 48
.50 caliber Ball,AP-M2(w/WC860)&.50caliber ball-M2
TE: 8,000 items/hr
: 63.50 grain/item

						METALS FEED RATES								POTENTIAL POHC FEED RATES					
	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBP RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
lfide	0.2	0.2286	0.0000	0.1962	412	0.00	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
	0.99001	1.1314	0.0000	0.6638	(810)	0.00	0.00	0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
nate	2.40002	2.7429	0.0000	1.5368	(2,159)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.17	0.1943	0.0000	0.3558	1,166	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	23.5	26.8572	0.0000	0.0000	354,783	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	26.86	0.00	0.00	0.00	0.00	0.00
	2.40002	2.7429	0.0000	0.0000	23,106	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.74	0.00	0.00	0.00	0.00
	3.50004	4.0000	0.0000	0.0000	65,505	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.00	0.00	0.00	0.00
	0.90001	1.0286	0.0000	0.0000	14,498	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.01	0.0114	0.0000	0.0000	78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.87	0.9943	0.0000	0.4739	2,241	0.00	0.00	0.00	0.00	0.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.20002	0.2286	0.0000	0.0000	992	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	25.9	29.6000	0.0000	0.0000	201,931	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	29.60	0.00
ate	1.20001	1.3714	0.0000	0.7610	(392)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	1.20001	1.3714	0.0000	0.7724	(967)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.34
	0.06	0.0686	0.0000	0.0000	81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	63.5002	72.5717	0.0000	4.7599	660,465	0.00	0.16	0.60	0.00	0.44	0.00	0.00	0.00	26.86	2.74	4.00	0.00	29.60	0.38

BTU, CHLORINE, AND ASH FEED RATES

R : 49
.50 caliber Ball,AP-M2(w/IMR5010)
ATE: 8,000 items/hr
: 60.50 grain/item

						METALS FEED RATES								POTENTIAL POHC FEED RATES					
	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBP RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
ulfide	0.2	0.2286	0.0000	0.1962	412	0.00	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
	0.99001	1.1314	0.0000	0.6638	(810)	0.00	0.00	0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
de	0.17	0.1943	0.0000	0.3558	1,186	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	23.5	26.8572	0.0000	0.0000	226,245	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	26.86	0.00	0.00	0.00	0.00
e	3.10003	3.5429	0.0000	0.0000	58,018	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.54	0.00	0.00	0.00
	0.90001	1.0286	0.0000	0.0000	14,498	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.01	0.0114	0.0000	0.0000	78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	0.87	0.9943	0.0000	0.4739	2,241	0.00	0.00	0.00	0.00	0.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	48.3	55.2000	0.0000	0.0000	239,458	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
lfate	2.40002	2.7429	0.0000	1.7661	(1,917)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.55
	0.06	0.0686	0.0000	0.0000	81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	80.5001	92.0001	0.0000	3.4557	539,470	0.00	0.16	0.60	0.00	0.44	0.00	0.00	0.00	0.00	26.86	3.54	0.00	0.00	0.58

BTU, CHLORINE, AND ASH FEED RATES

: 50
.50 caliber API – M8 (w/WC 860)
TE: 8,000 items/hr
: 78.50 grain/item

						METALS FEED RATES								POTENTIAL POHC FEED RATES					
	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBP RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
ulfide	0.2	0.2286	0.0000	0.1962	412	0.00	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
	0.45	0.5143	0.0000	0.0000	9,000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	6.99007	7.9887	0.0000	4.6869	(5,720)	0.00	0.00	4.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
onate	2.40002	2.7429	0.0000	1.5368	(2,159)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
le	0.17	0.1943	0.0000	0.3558	1,166	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	23.5	26.8572	0.0000	0.0000	354,783	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	26.86	0.00	0.00	0.00	0.00	0.00
	2.40002	2.7429	0.0000	0.0000	23,106	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.74	0.00	0.00	0.00	0.00
e	3.50004	4.0000	0.0000	0.0000	65,505	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.00	0.00	0.00	0.00
	0.90001	1.0286	0.0000	0.0000	14,498	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.01	0.0114	0.0000	0.0000	78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	0.87	0.9943	0.0000	0.4739	2,241	0.00	0.00	0.00	0.00	0.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
uminum Alloy	7.50008	8.5715	0.0000	14.9213	99,447	3.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.20002	0.2286	0.0000	0.0000	992	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	25.9	29.6000	0.0000	0.0000	201,931	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	29.60	0.00
rate	1.20001	1.3714	0.0000	0.7610	(392)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
rchlorate	1.05001	1.2000	0.3071	0.4860	317	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	1.20001	1.3714	0.0000	0.7724	(967)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.34
	0.06	0.0686	0.0000	0.0000	81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	78.5004	89.7147	0.3071	24.1903	764,319	3.09	0.16	4.23	0.00	0.44	0.00	0.00	0.00	26.86	2.74	4.00	0.00	29.60	0.38

BTU, CHLORINE, AND ASH FEED RATES

: 51
.50 caliber API – M8 (w/IMR 5010)
TE: 8,000 items/hr
: 64.45 grain/item

									METALS FEED RATES						POTENTIAL POHC FEED RATES				
	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBP RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
lfide	0.2	0.2286	0.0000	0.1962	412	0.00	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
	0.45	0.5143	0.0000	0.0000	9,000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	6.99007	7.9887	0.0000	4.6869	(5,720)	0.00	0.00	4.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.17	0.1943	0.0000	0.3558	1,166	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	23.5	26.8572	0.0000	0.0000	226,245	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	26.86	0.00	0.00	0.00	0.00
	3.10003	3.5429	0.0000	0.0000	58,018	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.54	0.00	0.00	0.00
	0.90001	1.0286	0.0000	0.0000	14,498	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.01	0.0114	0.0000	0.0000	78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.87	0.9943	0.0000	0.4739	2,241	0.00	0.00	0.00	0.00	0.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
uminum Alloy	7.50008	8.5715	0.0000	14.9213	99,447	3.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	18.3	20.9143	0.0000	0.0000	90,726	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
fate	2.40002	2.7429	0.0000	1.7661	(1,917)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.55
	0.06	0.0686	0.0000	0.0000	81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	64.4503	73.6574	0.0000	22.4002	494,275	3.09	0.16	4.23	0.00	0.44	0.00	0.00	0.00	0.00	26.86	3.54	0.00	0.00	0.58

BTU, CHLORINE, AND ASH FEED RATES

: 52
.50 caliber Tracer – M10
TE: 3,700 items/hr
: 106.75 grain/item

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	METALS FEED RATES AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	POTENTIAL POHC FEED RATES DBP RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
lfide	0.2	0.1057	0.0000	0.0907	190	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
	0.99	0.5233	0.0000	0.3070	(375)	0.00	0.00	0.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ate	6.43006	3.3987	0.0000	0.2964	50,488	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	24	12.6857	0.0000	0.0000	106,865	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.69	0.00	0.00	0.00	0.00
	3.10002	1.6386	0.0000	0.0000	26,833	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.64	0.00	0.00	0.00
	1	0.5286	0.0000	0.0000	7,450	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.01	0.0053	0.0000	0.0000	36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.87	0.4599	0.0000	0.2192	1,037	0.00	0.00	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
owder	18.05	9.5407	0.0000	15.8214	101,637	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	23	12.1572	0.0000	0.0000	52,738	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
fate	2.40002	1.2686	0.0000	0.8168	(887)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25
oxide	26.64	14.0812	0.0000	12.2506	(176)	0.00	0.00	0.00	0.00	0.00	10.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.06	0.0317	0.0000	0.0000	38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	106.75	56.4251	0.0000	29.8021	345,875	0.00	0.08	0.28	0.00	0.20	10.28	0.00	0.00	0.00	12.69	1.64	0.00	0.00	0.27

BTU, CHLORINE, AND ASH FEED RATES

: 53
.50 caliber Tracer – M17 (w/I–508)
TE: 2,700 items/hr
: 138.95 grains/item

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
						METALS FEED RATES								POTENTIAL POHC FEED RATES					
ulfide	0	0.0771	0.0000	0.0662	139	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
	1	0.3819	0.0000	0.2240	(273)	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
de	9	3.3596	0.0000	3.0572	0	0.00	0.00	2.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
le	0	0.0656	0.0000	0.1201	393	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ate	1	0.4821	0.0000	0.0420	7,162	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	23	8.6786	0.0000	0.0000	73,108	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.68	0.00	0.00	0.00	0.00
e	3	1.1186	0.0000	0.0000	18,318	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.12	0.00	0.00	0.00
	1	0.3471	0.0000	0.0000	4,893	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0	0.0039	0.0000	0.0000	26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	1	0.3356	0.0000	0.1599	756	0.00	0.00	0.00	0.00	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
owder	16	6.1753	0.0000	10.2405	85,785	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	9	3.4714	0.0000	0.0000	15,059	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ated Rubber	3	1.1649	0.7572	0.0000	4,892	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ride	6	2.4686	1.4004	0.0000	22,015	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
fate	2	0.8872	0.0000	0.5712	(620)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.18
ate	59	22.6800	0.0000	11.1041	(17,826)	0.00	0.00	0.00	0.00	0.00	9.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
late	1	0.2893	0.0000	0.0579	0	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
oxide	4	1.5467	0.0000	1.3457	(19)	0.00	0.00	0.00	0.00	0.00	1.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0	0.0231	0.0000	0.0000	27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0	0.0386	0.0000	0.0050	594	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	139	53.5951	2.1576	26.9939	194,431	0.00	0.06	2.92	0.00	0.15	10.47	0.00	0.00	0.00	8.68	1.12	0.00	0.00	0.19

BTU, CHLORINE, AND ASH FEED RATES

: 54
.50 caliber Tracer – M17 (w/l–176)
TE: 3,800 items/hr
: 105.92 grains/item

METALS FEED RATES | POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
lfide	0.2	0.1086	0.0000	0.0932	196	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
	0.99	0.5374	0.0000	0.3153	(385)	0.00	0.00	0.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
le	9.24008	5.0160	0.0000	4.5646	0	0.00	0.00	4.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.17	0.0923	0.0000	0.1690	554	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ate	1.25001	0.6786	0.0000	0.0592	10,080	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	22.5	12.2143	0.0000	0.0000	102,893	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.21	0.00	0.00	0.00	0.00
	2.90002	1.5743	0.0000	0.0000	25,781	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.57	0.00	0.00	0.00
	0.9	0.4886	0.0000	0.0000	6,886	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.01	0.0054	0.0000	0.0000	37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.87	0.4723	0.0000	0.2251	1,065	0.00	0.00	0.00	0.00	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
wder	16.06	8.7183	0.0000	14.4575	92,876	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	9.00002	4.8857	0.0000	0.0000	21,194	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ated Rubber	2.40002	1.3029	0.8469	0.0000	5,472	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ide	6.40006	3.4743	1.9710	0.0000	30,984	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ate	2.30002	1.2486	0.0000	0.8040	(873)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25
te	25.8	14.0057	0.0000	6.8572	(11,008)	0.00	0.00	0.00	0.00	0.00	5.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ate	0.75	0.4071	0.0000	0.0814	0	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
xide	4.01003	2.1769	0.0000	1.8939	(27)	0.00	0.00	0.00	0.00	0.00	1.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.06	0.0326	0.0000	0.0000	39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.11	0.0597	0.0000	0.0077	920	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
	105.92	57.4996	2.8178	29.5280	286,683	0.00	0.08	4.35	0.00	0.21	7.40	0.00	0.01	0.00	12.21	1.57	0.00	0.00	0.27

BTU, CHLORINE, AND ASH FEED RATES

:	55
	.50 caliber API-T - M20
TE:	6,600 items/hr
:	73.20 grains/item

METALS FEED RATES — POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
ulfide	0.2	0.1886	0.0000	0.1618	340	0.00	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
	0.45	0.4243	0.0000	0.0000	7,425	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	6.99006	6.5906	0.0000	3.8667	(4,719)	0.00	0.00	3.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
de	2.52002	2.3760	0.0000	2.1622	0	0.00	0.00	1.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
le	0.17	0.1603	0.0000	0.2935	962	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ate	0.83	0.7826	0.0000	0.0682	11,625	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	23	21.6857	0.0000	0.0000	182,681	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	21.69	0.00	0.00	0.00	0.00
e	3.00002	2.8286	0.0000	0.0000	46,321	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.83	0.00	0.00	0.00
	0.9	0.8486	0.0000	0.0000	11,961	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.01	0.0094	0.0000	0.0000	64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	0.87	0.8203	0.0000	0.3909	1,849	0.00	0.00	0.00	0.00	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
uminum Alloy	7.50007	7.0715	0.0000	12.3101	82,043	2.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
owder	3.12002	2.9417	0.0000	4.8783	31,338	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	13.7	12.9172	0.0000	0.0000	56,035	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
rchlorate	1.05	0.9900	0.2533	0.4010	261	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
fate	2.30002	2.1686	0.0000	1.3964	(1,516)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.43
ate	3.33003	3.1397	0.0000	1.5372	(2,468)	0.00	0.00	0.00	0.00	0.00	1.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
late	0.5	0.4714	0.0000	0.0943	0	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
oxide	2.87002	2.5174	0.0000	2.1902	(31)	0.00	0.00	0.00	0.00	0.00	1.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.06	0.0566	0.0000	0.0000	67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.03	0.0283	0.0000	0.0036	436	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	73.2003	69.0174	0.2533	29.7544	424,674	2.55	0.14	5.42	0.00	0.36	3.20	0.00	0.00	0.00	21.69	2.83	0.00	0.00	0.46

BTU, CHLORINE, AND ASH FEED RATES

: 56
.50 caliber Incendiary – M23(w/M–28)
TE: 8,377 items/hr
: 143.70 grains/item

						METALS FEED RATES								POTENTIAL POHC FEED RATES					
	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
lfide	0.2	0.1822	0.0000	0.1564	328	0.00	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
	37.56	34.2172	0.0000	20.0752	(24,500)	0.00	0.00	18.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.17	0.1549	0.0000	0.2836	929	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	22.5	20.4975	0.0000	0.0000	172,671	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.50	0.00	0.00	0.00	0.00
	3.10002	2.8241	0.0000	0.0000	48,248	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.82	0.00	0.00	0.00
	0.9	0.8199	0.0000	0.0000	11,556	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.01	0.0091	0.0000	0.0000	62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.87	0.7926	0.0000	0.3777	1,786	0.00	0.00	0.00	0.00	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
uminum Alloy	45	40.9950	0.0000	71.3642	475,624	14.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	22.5	20.4975	0.0000	0.0000	88,918	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
chlorate	8.43007	7.6798	1.9653	3.1103	2,027	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ate	2.40002	2.1864	0.0000	1.4078	(1,528)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.44
	0.06	0.0547	0.0000	0.0000	65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	143.7	130.9109	1.9653	96.7752	774,189	14.76	0.13	18.14	0.00	0.35	0.00	0.00	0.00	0.00	20.50	2.82	0.00	0.00	0.46

BTU, CHLORINE, AND ASH FEED RATES

: 57
.50 caliber Incendiary – M23(w/IM–11)
TE: 6,377 items/hr
: 143.70 grains/item

						METALS FEED RATES							POTENTIAL POHC FEED RATES					
	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
ulfide	0.2	0.1822	0.0000	0.1564	328	0.00	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
	45.99	41.8969	0.0000	24.5809	(29,998)	0.00	0.00	22.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.17	0.1549	0.0000	0.2836	929	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	22.5	20.4975	0.0000	0.0000	172,671	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.50	0.00	0.00	0.00	0.00
	3.10002	2.8241	0.0000	0.0000	46,248	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.82	0.00	0.00	0.00
	0.9	0.8199	0.0000	0.0000	11,556	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.01	0.0091	0.0000	0.0000	62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.87	0.7926	0.0000	0.3777	1,786	0.00	0.00	0.00	0.00	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
uminum Alloy	45	40.9950	0.0000	71.3642	475,624	14.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	22.5	20.4975	0.0000	0.0000	88,918	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
fate	2.40002	2.1864	0.0000	1.4078	(1,528)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.44
	0.06	0.0547	0.0000	0.0000	65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	143.7	130.9108	0.0000	98.1706	766,863	14.76	0.13	22.21	0.00	0.35	0.00	0.00	0.00	0.00	20.50	2.82	0.00	0.00	0.46

BTU, CHLORINE, AND ASH FEED RATES

: 58
.50 caliber Ball – M33 (w/WC 860)
TE: 8,000 items/hr
: 63.50 grains/item

						METALS FEED RATES								POTENTIAL POHC FEED RATES					
	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
lfide	0.2	0.2286	0.0000	0.1962	412	0.00	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
	0.99001	1.1314	0.0000	0.6638	(810)	0.00	0.00	0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
nate	2.40002	2.7429	0.0000	1.5368	(2,159)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
s	0.17	0.1943	0.0000	0.3558	1,166	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	23.5	26.8572	0.0000	0.0000	354,783	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	26.86	0.00	0.00	0.00	0.00	0.00
	2.40002	2.7429	0.0000	0.0000	23,106	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.74	0.00	0.00	0.00	0.00
	3.50004	4.0000	0.0000	0.0000	65,505	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.00	0.00	0.00	0.00
	0.90001	1.0286	0.0000	0.0000	14,498	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.01	0.0114	0.0000	0.0000	78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.87	0.9943	0.0000	0.4739	2,241	0.00	0.00	0.00	0.00	0.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.20002	0.2286	0.0000	0.0000	992	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	25.9	29.6000	0.0000	0.0000	201,931	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	29.60	0.00
ate	1.20001	1.3714	0.0000	0.7610	(392)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
s	1.20001	1.3714	0.0000	0.7724	(967)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.34
	0.06	0.0686	0.0000	0.0000	81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	63.5002	72.5717	0.0000	4.7599	660,465	0.00	0.16	0.60	0.00	0.44	0.00	0.00	0.00	26.86	2.74	4.00	0.00	29.60	0.38

BTU, CHLORINE, AND ASH FEED RATES

:	59
	.50 caliber Ball – M33 (w/IMR 5010)
TE:	8,000 items/hr
:	50.50 grains/item

METALS FEED RATES — POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
lfide	0.2	0.2286	0.0000	0.1962	412	0.00	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
	0.99001	1.1314	0.0000	0.6638	(810)	0.00	0.00	0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.17	0.1943	0.0000	0.3558	1,186	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	23.5	26.8572	0.0000	0.0000	226,245	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	26.86	0.00	0.00	0.00	0.00
	3.10003	3.5429	0.0000	0.0000	58,018	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.54	0.00	0.00	0.00
	0.90001	1.0286	0.0000	0.0000	14,498	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.01	0.0114	0.0000	0.0000	78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.87	0.9943	0.0000	0.4739	2,241	0.00	0.00	0.00	0.00	0.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	18.3	20.9143	0.0000	0.0000	90,726	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ate	2.40002	2.7429	0.0000	1.7661	(1,917)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.55
	0.06	0.0686	0.0000	0.0000	81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	50.5001	57.7144	0.0000	3.4557	390,738	0.00	0.16	0.60	0.00	0.44	0.00	0.00	0.00	0.00	26.86	3.54	0.00	0.00	0.58

BTU, CHLORINE, AND ASH FEED RATES

: 60
.50 caliber Ball,Spotter–Tracer–M48A1
TE: 6,600 items/hr
: 165.72 grains/item

						METALS FEED RATES								POTENTIAL POHC FEED RATES					
	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
lfide	0.51	0.4809	0.0000	0.4127	867	0.00	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07
	16.96	15.9909	0.0000	9.3818	(11,449)	0.00	0.00	8.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
le	2.52002	2.3760	0.0000	2.1622	0	0.00	0.00	1.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.17	0.1603	0.0000	0.2935	962	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ate	0.33	0.3111	0.0000	0.0271	4,622	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	4.40004	4.1486	0.0000	0.0000	54,803	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.15	0.00	0.00	0.00	0.00	0.00
	14.9	14.0486	0.0000	0.0000	118,345	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14.05	0.00	0.00	0.00	0.00
	1.10001	1.0372	0.0000	0.0000	16,984	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.04	0.00	0.00	0.00
	0.7	0.6600	0.0000	0.0000	9,303	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.01	0.0094	0.0000	0.0000	64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.09	0.0849	0.0000	0.0650	96	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.87	0.8203	0.0000	0.3909	1,849	0.00	0.00	0.00	0.00	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ate	0.45	0.4243	0.0000	0.2929	890	0.00	0.00	0.00	0.00	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08
owder	2.56002	2.4137	0.0000	4.0027	25,713	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	96.7001	91.1744	0.0000	0.0000	395,514	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ated Rubber	0.24	0.2263	0.1471	0.0000	950	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ride	0.64	0.6034	0.3423	0.0000	5,381	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
orate	0.95	0.8957	0.2591	0.4101	402	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
fate	1.10001	1.0372	0.0000	0.6678	(725)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.21
us	15.62	14.7274	0.0000	33.7465	150,441	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	3.41003	3.2152	0.0000	1.5741	(2,527)	0.00	0.00	0.00	0.00	0.00	1.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
late	0.2	0.1886	0.0000	0.0377	0	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
oxide	1.07001	1.0089	0.0000	0.8777	(13)	0.00	0.00	0.00	0.00	0.00	0.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.06	0.0566	0.0000	0.0000	67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.16	0.1509	0.0000	0.0194	2,323	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00
	165.72	156.2505	0.7485	54.3622	774,864	0.00	0.35	10.40	0.00	0.72	2.08	0.00	0.02	4.15	14.05	1.04	0.00	0.00	0.36

BTU, CHLORINE, AND ASH FEED RATES

: 61
.50 caliber Ball,Spotter–Tracer–M48A2
TE: 8,600 items/hr
: 165.66 grains/item

METALS FEED RATES

POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
lfide	0.51	0.4809	0.0000	0.4127	867	0.00	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07
	15.96	15.0480	0.0000	8.8287	(10,774)	0.00	0.00	7.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
de	2.52002	2.3760	0.0000	2.1622	0	0.00	0.00	1.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.17	0.1603	0.0000	0.2935	962	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ate	0.57	0.5374	0.0000	0.0469	7,984	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	4.40004	4.1486	0.0000	0.0000	54,803	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.15	0.00	0.00	0.00	0.00	0.00
	14.9	14.0486	0.0000	0.0000	118,345	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14.05	0.00	0.00	0.00	0.00
	1.10001	1.0372	0.0000	0.0000	16,984	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.04	0.00	0.00	0.00
	0.6	0.5657	0.0000	0.0000	7,974	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.01	0.0094	0.0000	0.0000	64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.09	0.0849	0.0000	0.0650	96	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.87	0.8203	0.0000	0.3909	1,849	0.00	0.00	0.00	0.00	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ate	0.45	0.4243	0.0000	0.2929	890	0.00	0.00	0.00	0.00	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08
uminum Alloy	0.63	0.5940	0.0000	1.0340	6,892	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
owder	2.64002	2.4892	0.0000	4.1278	26,517	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	96.7001	91.1744	0.0000	0.0000	395,514	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ated Rubber	0.24	0.2263	0.1471	0.0000	950	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ride	0.68	0.6411	0.3637	0.0000	5,718	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
chlorate	0.72	0.6789	0.1737	0.2749	179	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
fate	1.10001	1.0372	0.0000	0.6678	(725)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.21
us	14.64	13.8034	0.0000	31.6292	141,002	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ate	3.53003	3.3283	0.0000	1.6295	(2,616)	0.00	0.00	0.00	0.00	0.00	1.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
late	0.2	0.1886	0.0000	0.0377	0	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
oxide	1.07001	1.0089	0.0000	0.8777	(13)	0.00	0.00	0.00	0.00	0.00	0.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.06	0.0566	0.0000	0.0000	67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.15	0.1414	0.0000	0.0182	2,178	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
vder	1.35001	1.2729	0.0000	1.7184	6,568	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	165.86	156.3825	0.6845	54.5081	782,275	0.21	0.35	9.90	0.00	0.72	2.13	0.00	0.01	4.15	14.05	1.04	0.00	0.00	0.36

BTU, CHLORINE, AND ASH FEED RATES

: 62
.50 caliber API – T49
TE: 7,439 items/hr
: 82.30 grains/item

						METALS FEED RATES								POTENTIAL POHC FEED RATES					
	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
lfide	0.2	0.2125	0.0000	0.1824	383	0.00	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
	0.99001	1.0521	0.0000	0.6173	(753)	0.00	0.00	0.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
nate	2.50002	2.6568	0.0000	1.4886	(2,091)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.17	0.1807	0.0000	0.3308	1,084	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	25.2	26.7804	0.0000	0.0000	353,770	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	26.78	0.00	0.00	0.00	0.00	0.00
	2.50002	2.6568	0.0000	0.0000	22,381	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.66	0.00	0.00	0.00	0.00
	3.80004	4.0384	0.0000	0.0000	66,132	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.04	0.00	0.00	0.00
	1.00001	1.0627	0.0000	0.0000	14,979	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.01	0.0106	0.0000	0.0000	73	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.87	0.9246	0.0000	0.4406	2,084	0.00	0.00	0.00	0.00	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	14.7	15.6219	0.0000	0.0000	67,768	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	27.7	29.4372	0.0000	0.0000	200,821	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	29.44	0.00
ate	1.30001	1.3815	0.0000	0.7666	(395)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.30001	1.3815	0.0000	0.7781	(974)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.35
	0.06	0.0638	0.0000	0.0000	75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	82.3002	67.4616	0.0000	4.6044	725,336	0.00	0.15	0.56	0.00	0.41	0.00	0.00	0.00	26.78	2.66	4.04	0.00	29.44	0.38

BTU, CHLORINE, AND ASH FEED RATES

: 63
.50 caliber Ball, Practice – T249 – E2
TE: 8,000 items/hr
: 120.90 grains/item

METALS FEED RATES

POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
lfide	0.2	0.2286	0.0000	0.1962	412	0.00	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
	0.99001	1.1314	0.0000	0.6638	(810)	0.00	0.00	0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.17	0.1943	0.0000	0.3558	1,166	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	4.40005	5.0286	0.0000	0.0000	66,428	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.03	0.00	0.00	0.00	0.00	0.00
	14.9	17.0286	0.0000	0.0000	143,449	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17.03	0.00	0.00	0.00	0.00
s	1.10001	1.2572	0.0000	0.0000	20,587	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.26	0.00	0.00	0.00
	0.4	0.4571	0.0000	0.0000	6,443	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.01	0.0114	0.0000	0.0000	78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.87	0.9943	0.0000	0.4739	2,241	0.00	0.00	0.00	0.00	0.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	96.7	110.5143	0.0000	0.0000	479,411	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
fate	1.10001	1.2572	0.0000	0.8095	(879)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25
	0.06	0.0686	0.0000	0.0000	81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	120.9	138.1716	0.0000	2.4991	718,608	0.00	0.16	0.60	0.00	0.44	0.00	0.00	0.00	5.03	17.03	1.26	0.00	0.00	0.29

BTU, CHLORINE, AND ASH FEED RATES

: 64
.50 caliber Ball,HPT–T251
TE: 8,000 items/hr
: 52.90 grains/item

METALS FEED RATES

POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
lfide	0.2	0.2286	0.0000	0.1962	412	0.00	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
	0.99001	1.1314	0.0000	0.6638	(810)	0.00	0.00	0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.17	0.1943	0.0000	0.3558	1,166	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	13.5	15.4286	0.0000	0.0000	129,970	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.43	0.00	0.00	0.00	0.00
	1.80002	2.0572	0.0000	0.0000	33,688	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.06	0.00	0.00	0.00
	0.6	0.6857	0.0000	0.0000	9,665	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.01	0.0114	0.0000	0.0000	78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.87	0.9943	0.0000	0.4739	2,241	0.00	0.00	0.00	0.00	0.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	33.3	38.0572	0.0000	0.0000	165,092	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
fate	1.40001	1.6000	0.0000	1.0302	(1,118)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.32
	0.06	0.0686	0.0000	0.0000	81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	52.9001	60.4572	0.0000	2.7199	340,465	0.00	0.16	0.60	0.00	0.44	0.00	0.00	0.00	0.00	15.43	2.06	0.00	0.00	0.35

BTU, CHLORINE, AND ASH FEED RATES

: 65
5.56mm – M193 (w/WC 844,double base propellant)
TE: 22,500 items/hr
: 27.44 grains/item

						METALS FEED RATES								POTENTIAL POHC FEED RATES					
	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
vder	0.03	0.0964	0.0000	0.1822	1,284	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
lfide	0.06	0.1929	0.0000	0.1655	348	0.00	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
	0.13	0.4179	0.0000	0.2452	(299)	0.00	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
onate	0.03	0.0964	0.0000	0.0540	(76)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	1.05003	3.3751	0.0000	0.0000	44,585	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.38	0.00	0.00	0.00	0.00	0.00
	0.19	0.6107	0.0000	0.0000	5,145	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.61	0.00	0.00	0.00	0.00
	0.3	0.9643	0.0000	0.0000	15,791	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.96	0.00	0.00	0.00
	0.001	0.0032	0.0000	0.0000	22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.15	0.4821	0.0000	0.2298	1,087	0.00	0.00	0.00	0.00	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	22.6801	72.9002	0.0000	0.0000	316,241	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2.75008	8.8395	0.0000	0.0000	60,303	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.84	0.00
	0.02	0.0643	0.0000	0.0000	227	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.03	0.0964	0.0000	0.0543	(68)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
	0.02	0.0643	0.0000	0.0000	76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	27.4412	88.2038	0.0000	0.9310	444,665	0.10	0.14	0.22	0.00	0.21	0.00	0.00	0.00	3.38	0.61	0.96	0.00	8.84	0.05

BTU, CHLORINE, AND ASH FEED RATES

: 86

5.56mm – M193 (w/IMR 8208,single base propellant)

TE: 22,500 items/hr

: 27.44 grains/item

						METALS FEED RATES								POTENTIAL POHC FEED RATES					
	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
vder	0.03	0.0964	0.0000	0.1822	1,284	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ulfide	0.06	0.1929	0.0000	0.1655	348	0.00	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
	0.13	0.4179	0.0000	0.2452	(299)	0.00	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.35001	1.1250	0.0000	0.0000	18,424	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.13	0.00	0.00	0.00
	0.11	0.3536	0.0000	0.0000	4,984	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.001	0.0032	0.0000	0.0000	22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	0.15	0.4821	0.0000	0.2298	1,087	0.00	0.00	0.00	0.00	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	26.3001	84.5360	0.0000	0.0000	366,717	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.02	0.0643	0.0000	0.0000	227	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
fate	0.27	0.8679	0.0000	0.5588	(607)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17
	0.02	0.0643	0.0000	0.0000	76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	27.4411	88.2035	0.0000	1.3815	392,261	0.10	0.14	0.22	0.00	0.21	0.00	0.00	0.00	0.00	0.00	1.13	0.00	0.00	0.2

BTU, CHLORINE, AND ASH FEED RATES

R : 67
5.56mm grenade – M195 (IMR–4475,single base propellant)
TE: 22,500 items/hr
: 29.06 grains/item

METALS FEED RATES / POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
wder	0.03	0.0964	0.0000	0.1822	1,284	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ulfide	0.06	0.1929	0.0000	0.1655	348	0.00	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
	0.13	0.4179	0.0000	0.2452	(299)	0.00	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2.70008	8.6788	0.0000	0.0000	73,110	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.68	0.00	0.00	0.00	0.00
e	0.35001	1.1250	0.0000	0.0000	18,424	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.13	0.00	0.00	0.00
	0.11	0.3536	0.0000	0.0000	4,984	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.001	0.0032	0.0000	0.0000	22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	0.15	0.4821	0.0000	0.2298	1,087	0.00	0.00	0.00	0.00	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	25.2201	81.0645	0.0000	0.0000	351,858	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.02	0.0643	0.0000	0.0000	227	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
fate	0.27	0.8679	0.0000	0.5588	(607)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17
	0.02	0.0643	0.0000	0.0000	76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	29.0612	93.4109	0.0000	1.3815	450,313	0.10	0.14	0.22	0.00	0.21	0.00	0.00	0.00	0.00	8.68	1.13	0.00	0.00	0.20

BTU, CHLORINE, AND ASH FEED RATES

l :	68
	5.56mm HPT – M197 (IMR–4475,single base propellant)
TE:	22,500 items/hr
:	18.47 grains/item

						METALS FEED RATES								POTENTIAL POHC FEED RATES					
	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
wder	0.03	0.0964	0.0000	0.1822	1,284	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ulfide	0.06	0.1929	0.0000	0.1655	348	0.00	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
	0.13	0.4179	0.0000	0.2452	(299)	0.00	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.02003	3.2767	0.0000	0.0000	27,619	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.28	0.00	0.00	0.00	0.00
e	0.22	0.7071	0.0000	0.0000	11,580	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.71	0.00	0.00	0.00
	0.09	0.2893	0.0000	0.0000	4,077	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.001	0.0032	0.0000	0.0000	22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	0.15	0.4821	0.0000	0.2298	1,087	0.00	0.00	0.00	0.00	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	16.5601	53.2267	0.0000	0.0000	230,906	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.02	0.0643	0.0000	0.0000	227	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
rate	0.17	0.5464	0.0000	0.3032	(156)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.02	0.0643	0.0000	0.0000	76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	18.4711	59.3713	0.0000	1.1259	276,771	0.10	0.14	0.22	0.00	0.21	0.00	0.00	0.00	0.00	3.28	0.71	0.00	0.00	0.03

BTU, CHLORINE, AND ASH FEED RATES

R : 69
5.56mm Tracer – M196 (IMR–8206,single base propellant)
ATE: 22,500 items/hr
I : 30.43 grains/item

METALS FEED RATES — POTENTIAL POHC FEED RATES

T	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
wder	0.03	0.0964	0.0000	0.1822	1,284	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
ulfide	0.06	0.1929	0.0000	0.1655	348	0.00	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
s	0.13	0.4179	0.0000	0.2452	(299)	0.00	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
ide	0.05	0.1607	0.0000	0.1463	0	0.00	0.00	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
nate	0.09	0.2893	0.0000	0.0252	4,297	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
e	0.34001	1.0929	0.0000	0.0000	17,897	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.09	0.00	0.00	0.0
	0.1	0.3214	0.0000	0.0000	4,531	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	0.001	0.0032	0.0000	0.0000	22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	0.05	0.1607	0.0000	0.1607	0	0.00	0.00	0.00	0.00	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
ate	0.15	0.4821	0.0000	0.2298	1,087	0.00	0.00	0.00	0.00	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
owder	1.02003	3.2787	0.0000	5.4370	34,928	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	25.3201	81.3860	0.0000	0.0000	353,052	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	0.02	0.0643	0.0000	0.0000	227	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
oride	0.43001	1.3822	0.7841	0.0000	12,326	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
lfate	0.26	0.8357	0.0000	0.5381	(584)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.1
rate	1.38004	4.4358	0.0000	2.1718	(3,487)	0.00	0.00	0.00	0.00	0.00	1.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
oxide	0.98003	3.1501	0.0000	2.7406	(39)	0.00	0.00	0.00	0.00	0.00	2.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	0.02	0.0643	0.0000	0.0000	76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	30.4312	97.8146	0.7841	12.0424	425,665	0.10	0.14	0.35	0.00	0.35	4.12	0.00	0.00	0.00	0.00	1.09	0.00	0.00	0.2

BTU, CHLORINE, AND ASH FEED RATES

l: 70
5.56mm Tracer – M196 (WC–844,double base propellant)
TE: 22,500 items/hr
: 30.44 grains/item

METALS FEED RATES | POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
vder	0.03	0.0964	0.0000	0.1822	1,284	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ulfide	0.06	0.1929	0.0000	0.1655	348	0.00	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
	0.13	0.4179	0.0000	0.2452	(299)	0.00	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
de	0.05	0.1607	0.0000	0.1463	0	0.00	0.00	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
onate	0.03	0.0964	0.0000	0.0540	(76)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ate	0.09	0.2893	0.0000	0.0252	4,297	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	1.01003	3.2465	0.0000	0.0000	42,887	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.25	0.00	0.00	0.00	0.00	0.00
	0.18	0.5786	0.0000	0.0000	4,874	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.58	0.00	0.00	0.00	0.00
e	0.29	0.9321	0.0000	0.0000	15,265	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.93	0.00	0.00	0.00
	0.001	0.0032	0.0000	0.0000	22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.05	0.1607	0.0000	0.1607	0	0.00	0.00	0.00	0.00	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	0.15	0.4821	0.0000	0.2298	1,087	0.00	0.00	0.00	0.00	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
owder	1.02003	3.2787	0.0000	5.4370	34,928	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	21.8401	70.2002	0.0000	0.0000	304,529	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2.65008	8.5181	0.0000	0.0000	58,111	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.52	0.00
	0.02	0.0643	0.0000	0.0000	227	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ride	0.43001	1.3822	0.7841	0.0000	12,326	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.03	0.0964	0.0000	0.0543	(68)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
ate	1.38004	4.4358	0.0000	2.1718	(3,487)	0.00	0.00	0.00	0.00	0.00	1.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
oxide	0.98003	3.1501	0.0000	2.7406	(39)	0.00	0.00	0.00	0.00	0.00	2.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.02	0.0643	0.0000	0.0000	76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	30.4413	97.8470	0.7841	11.6126	476,290	0.10	0.14	0.35	0.00	0.35	4.12	0.00	0.00	3.25	0.58	0.93	0.00	8.52	0.05

BTU, CHLORINE, AND ASH FEED RATES

: 71
7.62 mm AP – M61 (w/double base propellant)
TE: 22,500 items/hr
: 44.51 grains/item

METALS FEED RATES

POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
wder	0.0031	0.0100	0.0000	0.0188	133	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ulfide	0.0871	0.2800	0.0000	0.2403	504	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
	0.1867	0.6001	0.0000	0.3521	(430)	0.00	0.00	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
onate	0.1244	0.3999	0.0000	0.2240	(315)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	2.86849	9.2201	0.0000	0.0000	121,798	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.22	0.00	0.00	0.00	0.00	0.00
	0.41071	1.3201	0.0000	0.0000	11,121	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.32	0.00	0.00	0.00	0.00
e	0.61601	1.9800	0.0000	0.0000	32,425	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.98	0.00	0.00	0.00
	0.0031	0.0100	0.0000	0.0000	68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	0.224	0.7200	0.0000	0.3432	1,623	0.00	0.00	0.00	0.00	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	35.2178	113.2001	0.0000	0.0000	491,062	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4.50801	14.4900	0.0000	0.0000	98,851	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14.49	0.00
	0.028	0.0900	0.0000	0.0000	318	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.2053	0.6599	0.0000	0.3717	(465)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16
	0.0249	0.0800	0.0000	0.0000	95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	44.5076	143.0603	0.0000	1.5500	756,788	0.01	0.20	0.32	0.00	0.32	0.00	0.00	0.00	9.22	1.32	1.98	0.00	14.49	0.21

BTU, CHLORINE, AND ASH FEED RATES

: 72
7.62 mm Tracer – M62 (w/double base propellant)
TE: 22,500 items/hr
: 48.36 grains/item

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	METALS FEED RATES: AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	POTENTIAL POHC FEED RATES: DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
vder	0.0373	0.1199	0.0000	0.2265	1,596	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ulfide	0.0778	0.2501	0.0000	0.2146	451	0.00	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
	0.1587	0.5101	0.0000	0.2993	(365)	0.00	0.00	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
onate	0.1151	0.3700	0.0000	0.2073	(291)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ate	0.08	0.2571	0.0000	0.0224	3,820	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	2.68188	8.6203	0.0000	0.0000	113,875	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.62	0.00	0.00	0.00	0.00	0.00
	0.38271	1.2301	0.0000	0.0000	10,363	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.23	0.00	0.00	0.00	0.00
e	0.57561	1.8502	0.0000	0.0000	30,298	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.85	0.00	0.00	0.00
	0.0031	0.0100	0.0000	0.0000	68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.1929	0.6200	0.0000	0.2955	1,398	0.00	0.00	0.00	0.00	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
uminum Alloy	1.66765	5.3603	0.0000	9.3312	62,190	1.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	32.8876	105.7102	0.0000	0.0000	458,571	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4.21241	13.5399	0.0000	0.0000	92,369	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.54	0.00
	0.0218	0.0701	0.0000	0.0000	247	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ride	1.01113	3.2501	1.8438	0.0000	28,984	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.1929	0.6200	0.0000	0.3492	(437)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16
ate	3.27291	10.5201	0.0000	5.1506	(8,269)	0.00	0.00	0.00	0.00	0.00	4.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
oxide	0.77162	2.4802	0.0000	2.1578	(31)	0.00	0.00	0.00	0.00	0.00	1.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.0218	0.0701	0.0000	0.0000	83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	48.3649	155.4587	1.8438	18.2545	794,919	2.05	0.18	0.27	0.00	0.27	6.12	0.00	0.00	8.62	1.23	1.85	0.00	13.54	0.19

BTU, CHLORINE, AND ASH FEED RATES

R : 73
7.62 mm Grenade – M64 (w/single base propellant)
ATE: 22,500 items/hr
: 40.51 grains/item

						METALS FEED RATES								POTENTIAL POHC FEED RATES					
	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
wder	0.0373	0.1199	0.0000	0.2265	1,596	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ulfide	0.0716	0.2301	0.0000	0.1975	415	0.00	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
	0.1587	0.5101	0.0000	0.2993	(365)	0.00	0.00	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2.72228	8.7502	0.0000	0.0000	73,712	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.75	0.00	0.00	0.00	0.00
e	0.2396	0.7701	0.0000	0.0000	12,612	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.77	0.00	0.00	0.00
	0.1818	0.5201	0.0000	0.0000	7,330	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.0031	0.0100	0.0000	0.0000	68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	0.1867	0.6001	0.0000	0.2860	1,353	0.00	0.00	0.00	0.00	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	36.0827	115.9801	0.0000	0.0000	503,122	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.0249	0.0800	0.0000	0.0000	283	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.0218	0.0701	0.0000	0.0000	83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.80272	2.5802	0.0000	2.5802	0	0.00	0.00	0.00	0.00	0.00	0.00	2.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	40.5132	130.2210	0.0000	3.5895	600,208	0.12	0.17	0.27	0.00	0.26	0.00	2.04	0.00	0.00	8.75	0.77	0.00	0.00	0.03

BTU, CHLORINE, AND ASH FEED RATES

I:	74
	7.62 mm Blank – M82 (w/single base propellant)
TE:	22,500 items/hr
:	17.63 grains/item

METALS FEED RATES — POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
wder	0.0436	0.1401	0.0000	0.2648	1,866	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ulfide	0.0933	0.2999	0.0000	0.2574	540	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
	0.2427	0.7801	0.0000	0.4577	(559)	0.00	0.00	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
onate	0.1493	0.[illegible]799	0.0000	0.2689	(378)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.75292	2.4201	0.0000	0.0000	20,387	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.42	0.00	0.00	0.00	0.00
e	0.1867	0.6001	0.0000	0.0000	9,827	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.60	0.00	0.00	0.00
e	0.74982	2.4101	0.0000	0.0000	36,376	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.0467	0.1501	0.0000	0.0000	2,116	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	0.236[illegible]	[illegible].7599	0.0000	0.3621	1,713	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	14.9241	47.9702	0.0000	0.0000	208,095	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.0311	0.1000	0.0000	0.0000	353	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
fate	0.1493	0.4799	0.0000	0.3090	(335)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10
	0.0249	0.0800	0.0000	0.0000	95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	17.6308	56.6704	0.0000	1.9199	280,096	0.14	0.22	0.41	0.00	0.33	0.00	0.00	0.00	0.00	2.42	0.60	0.00	0.00	0.14

BTU, CHLORINE, AND ASH FEED RATES

R : 75
7.62 mm Blank – M82 (w/double base propellant)
ATE: 22,500 items/hr
: 18.84 grains/item

METALS FEED RATES — POTENTIAL POHC FEED RATES

T	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
wder	0.0436	0.1401	0.0000	0.2648	1,866	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
ulfide	0.0933	0.2999	0.0000	0.2574	540	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
e	0.2427	0.7801	0.0000	0.4577	(559)	0.00	0.00	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
onate	0.1493	0.4799	0.0000	0.2689	(378)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
ate	0.224	0.7200	0.0000	0.0000	9,511	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.72	0.00	0.00	0.00	0.00	0.0
e	0.1493	0.4799	0.0000	0.0000	4,043	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.48	0.00	0.00	0.00	0.0
e	0.224	0.7200	0.0000	0.0000	11,791	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.72	0.00	0.00	0.0
te	0.74982	2.4101	0.0000	0.0000	36,376	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	0.0591	0.1900	0.0000	0.0000	2,678	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
te	0.2364	0.7599	0.0000	0.3621	1,713	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	13.6764	43.9600	0.0000	0.0000	190,698	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	2.89428	8.6602	0.0000	0.0000	59,080	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.66	0.0
	0.0311	0.1000	0.0000	0.0000	353	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
rate	0.0156	0.0501	0.0000	0.0278	(14)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
te	0.0747	0.2401	0.0000	0.1352	(169)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	0.0249	0.0800	0.0000	0.0000	95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	0.1556	0.5001	0.0000	0.5001	0	0.00	0.00	0.00	0.00	0.00	0.00	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	18.8441	60.5705	0.0000	2.2741	317,623	0.14	0.22	0.41	0.00	0.33	0.00	0.40	0.00	0.72	0.48	0.72	0.00	8.66	0.1

BTU, CHLORINE, AND ASH FEED RATES

R : 76

76mm Projectile,HVTP-T-M315A1

TE: 660 items/hr

: 0.02 grains/item

						METALS FEED RATES								POTENTIAL POHC FEED RATES					
	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
te	0.02	0.0019	0.0000	0.0009	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	0.02	0.0019	0.0000	0.0009	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0

BTU, CHLORINE, AND ASH FEED RATES

R :	77
	76mm Projectile,AP-T-M339
TE:	330 items/hr
:	0.02 grains/item

					METALS FEED RATES								POTENTIAL POHC FEED RATES					
	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
te	0.02	0.0009	0.0000	0.0004	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.02	0.0009	0.0000	0.0004	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

: 78
M1 Propellant
TE: 190 lb/hr

METALS FEED RATES

POTENTIAL POHC FEED RATES

	COMP QUANT (%)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
te	6.0014	11.4027	0.0000	0.0000	150,629	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.40	0.00	0.00	0.00	0.00	0.00
	12.0028	22.8053	0.0000	0.0000	192,112	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	22.81	0.00	0.00	0.00	0.00
	87.0021	165.3040	0.0000	0.0000	717,089	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	105.006	199.5119	0.0000	0.0000	1,059,830	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.40	22.81	0.00	0.00	0.00	0.0

BTU, CHLORINE, AND ASH FEED RATES

R : 79
M7 Propellant
TE: 125 lb/hr

METALS FEED RATES

POTENTIAL POHC FEED RATES

T	COMP QUANT (%)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
:	1.20001	1.5000	0.0000	0.0000	21,143	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	0.901	1.1263	0.0000	0.0000	16,998	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
)	54.6068	68.2585	0.0000	0.0000	296,105	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	35.5044	44.3805	0.0000	0.0000	302,764	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	44.38
rchlorate	7.809	9.7613	2.4979	3.9533	2,577	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	100.021	125.0265	2.4979	3.9533	639,587	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	44.38

BTU, CHLORINE, AND ASH FEED RATES

R: 80
Delay Plunger – M1
ATE: 3,126 items/hr
l: 2.35 grains/item

METALS FEED RATES — POTENTIAL POHC FEED RATES

T	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
ulfide	0.05	0.0223	0.0000	0.0192	40	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
nate	0.42	0.1876	0.0000	0.1876	(93)	0.00	0.00	0.10	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.06	0.0268	0.0000	0.0157	(19)	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.08	0.0357	0.0000	0.1150	898	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.6	0.7145	0.0000	0.5476	811	0.00	0.00	0.00	0.00	0.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	0.12	0.0536	0.0000	0.0255	121	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.02	0.0089	0.0000	0.0000	11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2.35	1.0494	0.0000	0.9106	1,768	0	0.02	0.12	0.04	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R : 81
Non−Delay − M9
ATE: 63,338 items/hr
: 1.33 grains/item

METALS FEED RATES

POTENTIAL POHC FEED RATES

T	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
wder	0.04	0.3619	0.0000	0.6839	4,818	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ulfide	0.04	0.3619	0.0000	0.3106	652	0.00	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.08	0.7239	0.0000	0.4247	(518)	0.00	0.00	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.96008	8.6871	0.0000	6.6578	9,860	0.00	0.00	0.00	0.00	6.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	0.19001	1.7193	0.0000	0.8194	3,875	0.00	0.00	0.00	0.00	0.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.02	0.1810	0.0000	0.0000	214	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.33009	12.0350	0.0000	8.8963	18,901	0	0.26	0.38	0.00	6.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

l:	82
	Delay – M2
TE:	3,978 items/hr
:	2.24 grains/item

						METALS FEED RATES								POTENTIAL POHC FEED RATES				
	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
ulfide	0.05	0.0284	0.0000	0.0244	51	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
nate	0.33	0.1875	0.0000	0.1875	(93)	0.00	0.00	0.10	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
)	0.06	0.0341	0.0000	0.0200	(24)	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.06	0.0341	0.0000	0.1098	857	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.6	0.9093	0.0000	0.6969	1,032	0.00	0.00	0.00	0.00	0.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
le	0.12	0.0682	0.0000	0.0325	154	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.02	0.0114	0.0000	0.0000	13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2.24	1.2730	0.0000	1.0711	1,990	0	0.02	0.12	0.04	0.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R : 83
Detonator – M16A1
ATE: 958 items/hr
: 8.84 grains/item

METALS FEED RATES — POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
nate	1.37	0.1875	0.0000	0.1875	(93)	0.00	0.00	0.10	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
)	0.04	0.0055	0.0000	0.0032	(4)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.04	0.0055	0.0000	0.0055	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4.93	0.6747	0.0000	0.5171	766	0.00	0.00	0.00	0.00	0.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
nate	0.15	0.0205	0.0000	0.0142	43	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
r	0.33	0.0452	0.0000	0.0574	64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
lorate	0.15	0.0205	0.0059	0.0094	9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
rchlorate	0.32	0.0438	0.0112	0.0177	12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.23	0.1683	0.0000	0.0000	886	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
)	0.02	0.0027	0.0000	0.0000	18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
wder	0.26	0.0356	0.0000	0.0480	184	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	8.84	1.2098	0.0171	0.8600	1,883	0	0.00	0.10	0.04	0.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R: 84
Detonator – M17
ATE: 19,302 items/hr
: 4.77 grains/item

METALS FEED RATES — POTENTIAL POHC FEED RATES

COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
3.54009	9.7615	0.0000	7.4812	11,079	0.00	0.00	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.23003	3.3917	0.0000	0.0000	17,844	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.77012	13.1533	0.0000	7.4812	28,923	0	0.00	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R : 85

Detonator – M18

ATE: 21,286 items/hr

: 5.18 grains/item

METALS FEED RATES

POTENTIAL POHC FEED RATES

T	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
ulfide	0.33001	1.0035	0.0000	0.8612	1,808	0.00	0.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
n	0.05	0.1520	0.0000	0.1520	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3.21009	9.7614	0.0000	7.4812	11,079	0.00	0.00	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
lorate	0.33001	1.0035	0.2903	0.4594	451	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.26003	3.8316	0.0000	0.0000	20,158	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5.18014	15.7521	0.2903	8.9538	33,496	0	0.72	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R: 86
ATE: Detonator -- M23
25,882 items/hr
: 4.21 grains/item

METALS FEED RATES | POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
ulfide	0.26	0.9613	0.0000	0.8250	1,732	0.00	0.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.05	0.1849	0.0000	0.1849	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2.64009	9.7615	0.0000	7.4812	11,079	0.00	0.00	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
lorate	0.26	0.9613	0.2781	0.4401	432	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.00003	3.6975	0.0000	0.0000	19,453	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4.21012	15.5666	0.2781	8.9312	32,696	0	0.69	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R : 87
Detonator – M22
ATE: 27,007 items/hr
l : 4.18 grains/item

						METALS FEED RATES								POTENTIAL POHC FEED RATES				
T	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
sulfide	0.26001	1.0032	0.0000	0.8609	1,808	0.00	0.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
n	0.05	0.1929	0.0000	0.1929	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2.53009	9.7614	0.0000	7.4812	11,079	0.00	0.00	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
hlorate	0.26001	1.0032	0.2902	0.4592	450	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.08004	4.1669	0.0000	0.0000	21,922	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4.18015	16.1276	0.2902	8.9942	35,260	0	0.72	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R : 88

ATE: Detonator – M24

: 21,692 items/hr

3.90 grains/item

METALS FEED RATES

POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
ulfide	0.35001	1.0846	0.0000	0.9308	1,955	0.00	0.78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.05	0.1549	0.0000	0.1549	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3.15009	9.7617	0.0000	7.4814	11,080	0.00	0.00	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
lorate	0.35001	1.0846	0.3138	0.4965	487	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3.90011	12.0859	0.3138	9.0637	13,521	0	0.78	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R : 89
Detonator – M35
ATE: 17,386 items/hr
: 7.01 grains/item

METALS FEED RATES — POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
	3.93009	9.7612	0.0000	7.4810	11,079	0.00	0.00	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3.08007	7.6500	0.0000	0.0000	40,247	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	7.01016	17.4112	0.0000	7.4810	51,326	0	0.00	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

:	90
	Detonator – M30A1
TE:	37,960 items/hr
:	2.80 grains/item

METALS FEED RATES — POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
	1.80009	9.7616	0.0000	7.4813	11,079	0.00	0.00	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.00005	5.4231	0.0000	0.0000	22,376	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2.80014	15.1848	0.0000	7.4813	33,455	0	0.00	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R : 91
Detonator – M36A1
ATE: 26,072 items/hr
: 5.46 grains/item

METALS FEED RATES / POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
	2.00007	7.4494	0.0000	5.7092	8,455	0.00	0.00	0.00	0.00	5.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	1.00003	3.7247	0.0000	1.7752	8,395	0.00	0.00	0.00	0.00	1.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2.46009	9.1628	0.0000	0.0000	32,354	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5.46019	20.3369	0.0000	7.4844	49,204	0	0.00	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R : 92
ATE: Detonator – M37
: 18,124 items/hr
6.83 grains/item

METALS FEED RATES — POTENTIAL POHC FEED RATES

T	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
ulfide	0.35	0.9062	0.0000	0.7777	1,633	0.00	0.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
n	0.05	0.1295	0.0000	0.1295	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3.77009	9.7613	0.0000	7.4811	11,079	0.00	0.00	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
lorate	0.35	0.9062	0.2622	0.4149	407	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2.31005	5.9810	0.0000	0.0000	31,466	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	6.83014	17.6842	0.2622	8.8031	44,585	0	0.65	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R : 93
Detonator – M41
ATE: 15,894 items/hr
: 7.17 grains/item

METALS FEED RATES — POTENTIAL POHC FEED RATES

T	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
ulfide	0.28	0.6358	0.0000	0.5456	1,146	0.00	0.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3.93008	8.9235	0.0000	6.8390	10,128	0.00	0.00	0.00	0.00	6.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
nate	0.41	0.9309	0.0000	0.6426	1,952	0.00	0.00	0.00	0.00	0.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
lorate	0.86001	1.9527	0.5649	0.8940	877	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.69003	3.8373	0.0000	0.0000	20,188	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	7.17012	16.2803	0.5649	8.9212	34,291	0	0.46	0.00	0.00	7.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R: 94
Detonator – M42
ATE: 15,586 items/hr
: 8.70 grains/item

								METALS FEED RATES					POTENTIAL POHC FEED RATES					
	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
wder	0.16	0.3563	0.0000	0.6731	4,742	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ulfide	0.16	0.3563	0.0000	0.3057	642	0.00	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.36	0.8016	0.0000	0.4703	(574)	0.00	0.00	0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3.85008	8.5725	0.0000	6.5699	9,730	0.00	0.00	0.00	0.00	6.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	0.86001	1.9149	0.0000	0.9126	4,316	0.00	0.00	0.00	0.00	0.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3.31007	7.3701	0.0000	0.0000	38,774	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	8.70016	19.3715	0.0000	8.9317	57,630	0	0.26	0.42	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R : 95
Detonator – M44
ATE: 21,971 items/hr
: 5.38 grains/item

METALS FEED RATES — POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
ulfide	0.3	0.9416	0.0000	0.8081	1,697	0.00	0.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.05	0.1569	0.0000	0.1569	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3.11009	9.7617	0.0000	7.4814	11,080	0.00	0.00	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
lorate	0.32001	1.0044	0.2906	0.4598	451	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.60005	5.0221	0.0000	0.0000	26,421	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5.38015	16.8868	0.2906	8.9062	39,649	0	0.68	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

l:	96
	Detonator – M45
TE:	14,403 Items/hr
:	8.03 grains/Item

METALS FEED RATES

POTENTIAL POHC FEED RATES

	COMP QUANT (gr/Item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
ulfide	0.31	0.6378	0.0000	0.5474	1,149	0.00	0.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4.33008	8.9094	0.0000	6.8282	10,112	0.00	0.00	0.00	0.00	6.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
nate	0.46	0.9465	0.0000	0.6534	1,985	0.00	0.00	0.00	0.00	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
lorate	0.98002	2.0165	0.5834	0.9231	905	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.95004	4.0123	0.0000	0.0000	16,555	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	8.03014	16.5226	0.5834	8.9521	30,707	0	0.46	0.00	0.00	7.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R : 97
Detonator -- M47
ATE: 39,394 items/hr
: 2.43 grains/item

METALS FEED RATES — POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
ulfide	0.05	0.2814	0.0000	0.2415	507	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.06	0.3377	0.0000	0.1981	(242)	0.00	0.00	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.66009	9.3425	0.0000	7.1601	10,604	0.00	0.00	0.00	0.00	6.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	0.12	0.6753	0.0000	0.3219	1,522	0.00	0.00	0.00	0.00	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.52002	2.9265	0.0000	0.0000	12,075	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.02	0.1126	0.0000	0.0000	133	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2.43011	13.6760	0.0000	7.9216	24,599	0	0.20	0.18	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R: 98

Detonator – M48

TE: 38,387 items/hr

: 4.24 grains/item

METALS FEED RATES

POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
	1.76009	9.7618	0.0000	7.4814	11,080	0.00	0.00	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2.46001	13.4904	0.0000	0.0000	47,634	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4.2401	23.2521	0.0000	7.4814	58,714	0	0.00	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R : 99
Detonator – M53
ATE: 628 items/hr
: 3.61 grains/item

METALS FEED RATES | POTENTIAL POHC FEED RATES

T	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
nate	2.09	0.1875	0.0000	0.1875	(93)	0.00	0.00	0.10	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
rchlorate	0.49	0.0440	0.0112	0.0178	12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
kel Alloy	1.03	0.0924	0.0000	0.0924	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3.61	0.3239	0.0112	0.2977	(82)	0	0.00	0.10	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R: 100
Detonator – M55
ATE: 76,271 items/hr
: 1.31 grains/item

METALS FEED RATES | POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
ulfide	0.03	0.3269	0.0000	0.2805	589	0.00	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.05	0.5448	0.0000	0.3196	(390)	0.00	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.84009	9.1535	0.0000	7.0152	10,389	0.00	0.00	0.00	0.00	6.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	0.09	0.9806	0.0000	0.4674	2,210	0.00	0.00	0.00	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.29003	3.1601	0.0000	0.0000	13,039	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.01	0.1090	0.0000	0.0000	129	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.31012	14.2749	0.0000	8.0828	25,966	0	0.24	0.29	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R : 101
Detonator – M57A1/A2
TE: 46,340 items/hr
: 2.20 grains/item

METALS FEED RATES | POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
ulfide	0.18001	1.1917	0.0000	1.0227	2,147	0.00	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.40009	9.2686	0.0000	7.1035	10,520	0.00	0.00	0.00	0.00	6.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	0.12	0.7944	0.0000	0.3786	1,791	0.00	0.00	0.00	0.00	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.50003	3.3102	0.0000	0.0000	13,658	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2.20013	14.5649	0.0000	8.5048	28,116	0	0.86	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R:	102
	Detonator – M58
TE:	85,663 items/hr
:	2.71 grains/item

METALS FEED RATES — POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
ulfide	0.57006	6.9761	0.0000	5.9869	12,571	0.00	5.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.09001	1.1015	0.0000	1.1015	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.48005	5.8746	0.0000	4.5023	6,668	0.00	0.00	0.00	0.00	4.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
rchlorate	0.57006	6.9761	1.7852	2.8253	1,842	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.00001	12.2377	0.0000	0.0000	50,493	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2.71019	33.1662	1.7852	14.4161	71,573	0	5.02	0.00	0.00	4.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R : 103
Detonator – M59
ATE: 38,048 items/hr
: 2.44 grains/item

METALS FEED RATES   POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
ulfide	0.03	0.1631	0.0000	0.1399	294	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.05	0.2718	0.0000	0.1594	(195)	0.00	0.00	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.74009	9.4581	0.0000	7.2487	10,735	0.00	0.00	0.00	0.00	6.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	0.09	0.4892	0.0000	0.2331	1,103	0.00	0.00	0.00	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.52002	2.8265	0.0000	0.0000	11,662	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.01	0.0544	0.0000	0.0000	64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2.44011	13.2630	0.0000	7.7813	23,663	0	0.12	0.14	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R: 104

Detonator – M61

ATE: 217,732 items/hr

I: 0.71 grains/item

METALS FEED RATES

POTENTIAL POHC FEED RATES

T	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
ulfide	0.11003	3.4224	0.0000	2.9371	6,167	0.00	2.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.14004	4.3559	0.0000	2.5556	(3,119)	0.00	0.00	2.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.14004	4.3559	0.0000	3.3383	4,944	0.00	0.00	0.00	0.00	3.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	0.28008	8.7118	0.0000	4.1520	19,636	0.00	0.00	0.00	0.00	3.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.04001	1.2445	0.0000	0.0000	1,473	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.7102	22.0905	0.0000	12.9831	29,102	0	2.46	2.31	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R : 105
Detonator – M63
ATE: 32,012 items/hr
3 : 3.31 grains/item

METALS FEED RATES — POTENTIAL POHC FEED RATES

T	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
ulfide	0.05	0.2287	0.0000	0.1962	412	0.00	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.06	0.2744	0.0000	0.1610	(196)	0.00	0.00	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2.06009	9.4211	0.0000	7.2203	10,693	0.00	0.00	0.00	0.00	6.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ate	0.12	0.5488	0.0000	0.2615	1,237	0.00	0.00	0.00	0.00	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.00004	4.5733	0.0000	0.0000	18,870	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.02	0.0915	0.0000	0.0000	108	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3.31013	15.1377	0.0000	7.8391	31,123	0.00	0.16	0.15	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

):	106
	Detonator – M80
TE:	20,097 items/hr
:	5.20 grains/item

METALS FEED RATES — POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
	3.40009	9.7617	0.0000	7.4813	11,079	0.00	0.00	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.80005	5.1679	0.0000	0.0000	21,323	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5.20014	14.9296	0.0000	7.4813	32,402	0.00	0.00	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R: 107
Detonator – M84
ATE: 70,466 items/hr
: 1.92 grains/item

METALS FEED RATES — POTENTIAL POHC FEED RATES

T	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
	0.92009	9.2622	0.0000	7.0985	10,513	0.00	0.00	0.00	0.00	6.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ate	0.08	0.8053	0.0000	0.3838	1,815	0.00	0.00	0.00	0.00	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.92009	9.2622	0.0000	0.0000	32,705	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.92018	19.3296	0.0000	7.4823	45,032	0.00	0.00	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R: 106
Detonator -- MK18 Mod 0
TE: 38,172 items/hr
: 2.11 grains/item

METALS FEED RATES — POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
ulfide	0.15	0.8180	0.0000	0.7020	1,474	0.00	0.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.02	0.1091	0.0000	0.1091	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.79009	9.7616	0.0000	7.4813	11,079	0.00	0.00	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
lorate	0.15	0.8180	0.2366	0.3745	367	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2.11009	11.5066	0.2366	8.6668	12,921	0.00	0.59	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

ER : 109
Detonator – MK 19 Mod 0
ATE: 65,701 items/hr
G : 1.71 grains/item

METALS FEED RATES — POTENTIAL POHC FEED RATES

T	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
sulfide	0.17001	1.5957	0.0000	1.3694	2,875	0.00	1.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
n	0.03	0.2816	0.0000	0.2816	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.04009	9.7621	0.0000	7.4817	11,080	0.00	0.00	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
hlorate	0.17001	1.5957	0.4616	0.7305	716	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.30002	2.8159	0.0000	0.0000	14,815	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.71013	16.0510	0.4616	9.8632	29,487	0.00	1.15	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R: 110
Detonator – MK 25 Mod 0
ATE: 20,216 items/hr
: 4.09 grains/item

METALS FEED RATES — POTENTIAL POHC FEED RATES

T	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
ulfide	0.33	0.9530	0.0000	0.8179	1,717	0.00	0.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
n	0.05	0.1444	0.0000	0.1444	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3.38009	9.7617	0.0000	7.4814	11,080	0.00	0.00	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
lorate	0.33	0.9530	0.2757	0.4363	428	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4.09009	11.8122	0.2757	8.8800	13,225	0.00	0.69	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R: 111
Detonator – MK 28 Mod 0
ATE: 9,651 items/hr
3: 7.54 grains/item

METALS FEED RATES — POTENTIAL POHC FEED RATES

T	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
	7.08009	9.7614	0.0000	7.4812	11,079	0.00	0.00	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.46	0.6342	0.0000	0.0000	3,337	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	7.54009	10.3956	0.0000	7.4812	14,416	0.00	0.00	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R: 112
ATE: Detonator – MK 29 Mod 0
27,776 items/hr
: 2.46 grains/item

METALS FEED RATES — POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
	2.46009	9.7616	0.0000	7.4813	11,079	0.00	0.00	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2.46009	9.7616	0.0000	7.4813	11,079	0.00	0.00	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R : 113
Detonator – MK33 Mod 0
ATE: 18,467 items/hr
3 : 3.70 grains/item

						METALS FEED RATES								POTENTIAL POHC FEED RATES				
T	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
	3.70009	9.7614	0.0000	7.4811	11,079	0.00	0.00	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3.70009	9.7614	0.0000	7.4811	11,079	0.00	0.00	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R: 114
Detonator – MK 37 Mod 0
TE: 42,705 items/hr
: 2.06 grains/item

						METALS FEED RATES								POTENTIAL POHC FEED RATES				
	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
	1.60009	9.7617	0.0000	7.4814	11,080	0.00	0.00	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.46002	2.8065	0.0000	0.0000	14,765	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2.06011	12.5681	0.0000	7.4814	25,844	0.00	0.00	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R: 115
Detonator – MK 43 Mod 0
ATE: 35,588 Items/hr
3: 3.93 grains/Item

						METALS FEED RATES								POTENTIAL POHC FEED RATES					
T	COMP. QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
ulfide	0.27001	1.3727	0.0000	1.1781	2,474	0.00	0.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
n	0.04	0.2034	0.0000	0.2034	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.92009	9.7617	0.0000	7.4814	11,080	0.00	0.00	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
hlorate	0.27001	1.3727	0.3971	0.6284	616	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.43007	7.2705	0.0000	0.0000	38,250	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3.93018	19.9810	0.3971	9.4913	52,420	0.00	0.99	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R: 116
Detonator – MK 44 Mod 0
ATE: 36,153 items/hr
: 2.84 grains/item

METALS FEED RATES | POTENTIAL POHC FEED RATES

T	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
ulfide	0.23001	1.1879	0.0000	1.0195	2,141	0.00	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.03	0.1549	0.0000	0.1549	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.89009	9.7618	0.0000	7.4814	11,080	0.00	0.00	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
lorate	0.23001	1.1879	0.3437	0.5438	533	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.46002	2.3759	0.0000	0.0000	12,499	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2.84013	14.6685	0.3437	9.1997	26,253	0.00	0.86	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R : 117
Detonator – MK 44 Mod 1
ATE: 35,568 items/hr
3 : 2.88 grains/item

METALS FEED RATES — POTENTIAL POHC FEED RATES

T	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
ulfide	0.13	0.6605	0.0000	0.5669	1,190	0.00	0.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.17	0.8638	0.0000	0.5068	(618)	0.00	0.00	0.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.71008	8.6892	0.0000	6.6594	9,862	0.00	0.00	0.00	0.00	6.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ate	0.34001	1.7276	0.0000	0.8234	3,894	0.00	0.00	0.00	0.00	0.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.04	0.2032	0.0000	0.0000	241	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.49002	2.4899	0.0000	0.0000	13,099	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2.88011	14.6343	0.0000	8.5564	27,668	0.00	0.48	0.46	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R: 118

ATE: Detonator -- MK 54 Mod 0

: 14,538 items/hr

4.70 grains/item

METALS FEED RATES | POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
	4.70009	9.7614	0.0000	7.4811	11,079	0.00	0.00	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4.70009	9.7614	0.0000	7.4811	11,079	0.00	0.00	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R: 119

Detonator – MK 55 Mod 0

ATE: 26,080 items/hr

3: 4.24 grains/item

METALS FEED RATES

POTENTIAL POHC FEED RATES

T	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
	2.62009	9.7617	0.0000	7.4814	11,080	0.00	0.00	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.62006	6.0359	0.0000	0.0000	31,755	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4.24015	15.7976	0.0000	7.4814	42,834	0.00	0.00	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R: 120
Detonator – MK 56 Mod 0
TE: 375,601 items/hr
: 0.39 grains/item

METALS FEED RATES — POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
ulfide	0.13006	6.9787	0.0000	5.9891	12,576	0.00	5.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.02001	1.0737	0.0000	1.0737	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.11005	5.9050	0.0000	4.5256	6,702	0.00	0.00	0.00	0.00	4.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
lorate	0.13006	6.9787	2.0189	3.1948	3,133	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.39018	20.9360	2.0189	14.7832	22,411	0.00	5.02	0.00	0.00	4.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R : 121
Detonator – MK 59 Mod 0
ATE: 38,172 items/hr
3 : 2.71 grains/item

METALS FEED RATES

POTENTIAL POHC FEED RATES

T	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
	1.79009	9.7616	0.0000	7.4813	11,079	0.00	0.00	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.92005	5.0172	0.0000	0.0000	26,395	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2.71014	14.7788	0.0000	7.4813	37,475	0.00	0.00	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R: 122
Detonator – MK 96 Mod 0
TE: 38,604 items/hr
: 2.77 grains/item

METALS FEED RATES — POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
	1.77009	9.7618	0.0000	7.4814	11,080	0.00	0.00	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.00005	5.5151	0.0000	0.0000	19,474	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2.77014	15.2769	0.0000	7.4814	30,554	0.00	0.00	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R : 123
Detonator -- T 83E1
ATE: 232,020 items/hr
3 : 1.63 grains/item

METALS FEED RATES — POTENTIAL POHC FEED RATES

T	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
ulfide	0.05001	1.6576	0.0000	1.4226	2,987	0.00	1.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.06001	1.9891	0.0000	1.1670	(1,424)	0.00	0.00	1.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.22007	7.2944	0.0000	5.5904	8,279	0.00	0.00	0.00	0.00	5.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	0.12003	3.9785	0.0000	1.8961	8,967	0.00	0.00	0.00	0.00	1.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.16004	38.4503	0.0000	0.0000	158,646	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.02	0.6629	0.0000	0.0000	785	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.63016	54.0328	0.0000	10.0761	178,240	0.00	1.19	1.05	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R : 124
Detonator – T 84E1
TE: 41,359 items/hr
: 2.16 grains/item

METALS FEED RATES

POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
ulfide	0.04	0.2363	0.0000	0.2028	426	0.00	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.05	0.2954	0.0000	0.1733	(212)	0.00	0.00	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.59009	9.3949	0.0000	7.2003	10,663	0.00	0.00	0.00	0.00	6.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	0.1	0.5908	0.0000	0.2816	1,332	0.00	0.00	0.00	0.00	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.37002	2.1862	0.0000	0.0000	9,020	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.01	0.0591	0.0000	0.0000	70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2.16011	12.7629	0.0000	7.8580	21,300	0.00	0.17	0.16	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R : 125

Fuze,Point Detonating–MK27(w/booster)

ATE: 660 items/hr

: 351.12 grains/item

METALS FEED RATES

POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
ulfide	0.04	0.0038	0.0000	0.0032	7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4.75	0.4479	0.0000	0.3432	508	0.00	0.00	0.00	0.00	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
lorate	0.14	0.0132	0.0038	0.0060	6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	346.193	32.6411	0.0000	0.0000	171,725	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	351.123	33.1059	0.0038	0.3525	172,246	0.00	0.00	0.00	0.00	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

: 126
Fuze,Auxiliary Detonating—MK31 Mod2(w/booster)
TE: 16,030 items/hr
: 5.03 grains/item

METALS FEED RATES POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
ulfide	0.18	0.4122	0.0000	0.3538	743	0.00	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.28	0.6412	0.0000	0.3762	(459)	0.00	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3.898	8.9264	0.0000	6.8412	10,131	0.00	0.00	0.00	0.00	6.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.601	1.3763	0.0000	0.6559	3,102	0.00	0.00	0.00	0.00	0.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.07	0.1603	0.0000	0.0000	190	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5.029	11.5164	0.0000	8.2271	13,707	0.00	0.30	0.34	0.00	6.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R : 127
Fuze,Point Detonating–M48
ATE: 3,163 items/hr
3 : 6.17 grains/item

						METALS FEED RATES								POTENTIAL POHC FEED RATES				
T	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
sulfide	0.39	0.1762	0.0000	0.1512	318	0.00	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
mate	0.42	0.1898	0.0000	0.1898	(94)	0.00	0.00	0.10	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.06	0.0271	0.0000	0.0159	(19)	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.08	0.0361	0.0000	0.1164	909	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4.672	2.1111	0.0000	1.6179	2,396	0.00	0.00	0.00	0.00	1.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ate	0.12	0.0542	0.0000	0.0258	122	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
hlorate	0.34	0.1536	0.0444	0.0703	69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
de	0.06	0.0271	0.0000	0.0271	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.02	0.0090	0.0000	0.0000	11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Acetate Resin	0.01	0.0045	0.0000	0.0000	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	6.172	2.7889	0.0444	2.2145	3,711	0.00	0.13	0.12	0.04	1.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R : 128
Fuze,Base Detonating–M66A1/A2
ATE: 660 items/hr
: 107.39 grains/item

						METALS FEED RATES								POTENTIAL POHC FEED RATES				
	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
	0.6	0.0566	0.0000	0.0232	136	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3.49	0.3291	0.0000	0.2522	373	0.00	0.00	0.00	0.00	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
owder	9.79	0.9231	0.0000	1.5307	9,833	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
oride	5.95	0.5610	0.3183	0.0000	5,003	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ate	19.251	1.8151	0.0000	0.8887	(1,427)	0.00	0.00	0.00	0.00	0.00	0.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	68.306	6.4403	0.0000	0.0000	33,882	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	107.387	10.1251	0.3183	2.6948	47,801	0.00	0.00	0.00	0.00	0.23	0.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R : 129
Fuze,Point Detonating--M78A1 (w/booster)
ATE: 3,954 items/hr
: 9.71 grains/item

METALS FEED RATES | POTENTIAL POHC FEED RATES

T	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
ulfide	0.41	0.2316	0.0000	0.1988	417	0.00	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
nate	0.33	0.1864	0.0000	0.1864	(93)	0.00	0.00	0.10	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.06	0.0339	0.0000	0.0199	(24)	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.06	0.0339	0.0000	0.1091	852	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
n	0.06	0.0339	0.0000	0.0339	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	8.274	4.6736	0.0000	3.5819	5,305	0.00	0.00	0.00	0.00	3.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	0.12	0.0678	0.0000	0.0323	153	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
lorate	0.37	0.2090	0.0605	0.0957	94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.02	0.0113	0.0000	0.0000	13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Acetate Resin	0.004	0.0023	0.0000	0.0000	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	9.708	5.4836	0.0605	4.2579	6,717	0.00	0.17	0.12	0.04	3.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R : 130
Fuze,Grenade--M204A2,M206,M213,M214
TE: 579,305 items/hr
: 0.38 grains/item

METALS FEED RATES / POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
wder	0.043	3.5586	0.0000	6.7240	47,372	3.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ulfide	0.043	3.5586	0.0000	3.0540	6,413	0.00	2.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.086	7.1172	0.0000	4.1756	(5,096)	0.00	0.00	3.77	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.1915	15.8481	0.0000	7.5532	35,722	0.00	0.00	0.00	0.00	6.97	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.021	1.7379	0.0000	0.0000	2,058	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.3845	31.8204	0.0000	21.5068	86,468	3.56	2.56	3.77	0.00	6.97	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R : 131
Fuze,MTSQ−M502
ATE: 440 items/hr
a : 331.93 grains/item

						METALS FEED RATES								POTENTIAL POHC FEED RATES				
T	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
ulfide	0.33	0.0207	0.0000	0.0178	37	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.13	0.0062	0.0000	0.0048	(6)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
n	0.03	0.0019	0.0000	0.0019	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	6.14	0.3859	0.0000	0.2958	438	0.00	0.00	0.00	0.00	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ate	0.3	0.0189	0.0000	0.0090	43	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
hlorate	0.27	0.0170	0.0049	0.0078	8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.03	0.0019	0.0000	0.0000	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	324.702	20.4098	0.0000	0.0000	107,376	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	331.932	20.8643	0.0049	0.3370	107,896	0.00	0.01	0.00	0.00	0.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R: 132
Fuze,Point Detonating–Base Detonating–M509A1
TE: 11,000 items/hr
: 125.39 grains/item

METALS FEED RATES

POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
	1.934	3.0391	0.0000	2.3292	3,449	0.00	0.00	0.00	0.00	2.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2.856	4.4880	0.0000	0.0000	15,847	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	120.603	189.5188	0.0000	0.0000	997,059	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	125.393	197.0460	0.0000	2.3292	1,016,355	0.00	0.00	0.00	0.00	2.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R : 133
Fuze,Proximity–M513A1 (w/booster)
ATE: 3,600 items/hr
3 : 388.30 grains/item

METALS FEED RATES

POTENTIAL POHC FEED RATES

T	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
	2.201	1.1319	0.0000	0.8675	1,285	0.00	0.00	0.00	0.00	0.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.6	0.3086	0.0000	0.0000	1,090	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	385.503	198.2587	0.0000	0.0000	1,043,039	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	388.304	199.6992	0.0000	0.8675	1,045,413	0.00	0.00	0.00	0.00	0.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R: 134
Fuze,Point Detonating--M521
ATE: 13,859 items/hr
: 7.76 grains/item

										METALS FEED RATES					POTENTIAL POHC FEED RATES			
	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
ulfide	0.39	0.7721	0.0000	0.6627	1,391	0.00	0.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.651	1.2889	0.0000	0.5293	3,095	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.06	0.1188	0.0000	0.1188	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4.889	9.6795	0.0000	7.4184	10,986	0.00	0.00	0.00	0.00	6.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
nate	0.06	0.1188	0.0000	0.0820	249	0.00	0.00	0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
lorate	0.47	0.9305	0.2692	0.4260	418	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.232	2.4392	0.0000	0.0000	12,833	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.01	0.0198	0.0000	0.0000	129	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	7.762	15.3677	0.2692	9.2372	29,101	0.00	0.56	0.00	0.00	6.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R : 135
Fuze,Point Detonating–M525(w/booster)
ATE: 5,000 items/hr
: 270.01 grains/item

										METALS FEED RATES						POTENTIAL POHC FEED RATES			
T	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
ulfide	0.3	0.2143	0.0000	0.1839	386	0.00	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3.153	2.2521	0.0000	1.7260	2,556	0.00	0.00	0.00	0.00	1.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
lorate	0.3	0.2143	0.0620	0.0981	96	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	260.303	185.9306	0.0000	0.0000	767,150	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
le	0.05	0.0357	0.0000	0.0357	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5.906	4.2186	0.0000	0.0000	22,194	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	270.012	192.8656	0.0620	2.0438	792,382	0.00	0.15	0.00	0.00	1.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

: 136
Fuze,Point Detonating–M557,M572(w/booster)
TE: 440 items/hr
: 28.57 grains/item

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	METALS FEED RATES AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	POTENTIAL POHC FEED RATES DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
ulfide	0.39	0.0245	0.0000	0.0210	44	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
nate	0.42	0.0264	0.0000	0.0264	(13)	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.06	0.0038	0.0000	0.0022	(3)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	7.44	0.4677	0.0000	0.1018	6,468	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.08	0.0050	0.0000	0.0162	126	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ate	7.44	0.4677	0.0000	0.0432	7,501	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	7.52	0.4727	0.0000	0.0000	6,663	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4.67	0.2935	0.0000	0.2250	333	0.00	0.00	0.00	0.00	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	0.12	0.0075	0.0000	0.0036	17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
lorate	0.34	0.0214	0.0062	0.0098	10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.06	0.0038	0.0000	0.0038	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.02	0.0013	0.0000	0.0000	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Acetate Resin	0.005	0.0003	0.0000	0.0000	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	28.565	1.7955	0.0062	0.4530	21,147	0.00	0.02	0.07	0.01	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R : 137

Fuze,Point Detonating—M564(w/booster)

ATE: 3,800 items/hr

: 361.72 grains/item

						METALS FEED RATES								POTENTIAL POHC FEED RATES				
T	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
ulfide	1.311	0.7117	0.0000	0.6108	1,282	0.00	0.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.06	0.0326	0.0000	0.0191	(23)	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	7.165	3.8896	0.0000	2.9810	4,415	0.00	0.00	0.00	0.00	2.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	0.12	0.0651	0.0000	0.0310	147	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
nate	2.001	1.0863	0.0000	0.7498	2,278	0.00	0.00	0.00	0.00	0.77	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
lorate	4.243	2.3033	0.6664	1.0545	1,034	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	320.403	173.9328	0.0000	0.0000	717,647	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.02	0.0109	0.0000	0.0000	13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	26.4021	14.3326	0.0000	0.0000	75,404	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	361.725	196.3648	0.6664	5.4462	802,196	0.00	0.51	0.02	0.00	3.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R: 138
Mine Activator,Anti-tank-M1
ATE: 13,850 items/hr
: 47.20 grains/item

METALS FEED RATES

POTENTIAL POHC FEED RATES

T	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
	0.741	1.4661	0.0000	0.0000	20,665	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3.947	7.8094	0.0000	5.9851	8,864	0.00	0.00	0.00	0.00	5.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
nate	1.102	2.1804	0.0000	1.5051	4,572	0.00	0.00	0.00	0.00	1.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
lorate	1.342	2.6552	0.7682	1.2156	1,192	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	40.0679	79.2772	0.0000	0.0000	417,077	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	47.1999	93.3884	0.7682	8.7058	452,371	0.00	0.00	0.00	0.00	7.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R : 139
Ejection Ctg., Bomb−CCU−1/B
ATE: 6,600 items/hr
G : 8.56 grains/item

					METALS FEED RATES								POTENTIAL POHC FEED RATES					
T	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
te	0.03	0.0283	0.0000	0.0000	427	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	4.914	4.6332	0.0000	0.0000	20,099	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.281	1.2078	0.0000	0.0000	8,240	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.21
ulfate	0.05	0.0471	0.0000	0.0304	(33)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.541	1.4529	0.0000	0.0000	5,995	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
orus	0.74	0.6977	0.0000	1.5987	7,127	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	8.556	8.0671	0.0000	1.6291	41,854	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.21

BTU, CHLORINE, AND ASH FEED RATES

R: 140
Booster – M21A4
TE: 440 items/hr
: 321.30 grains/item

						METALS FEED RATES								POTENTIAL POHC FEED RATES				
	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
	3.53	0.2219	0.0000	0.1701	252	0.00	0.00	0.00	0.00	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	317.772	19.9742	0.0000	0.0000	105,084	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	321.302	20.1961	0.0000	0.1701	105,336	0.00	0.00	0.00	0.00	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R : 141
Booster, Fuze-M125A1
ATE: 3,600 items/hr
l : 379.45 grains/item

METALS FEED RATES | POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
ate	7.446	3.8294	0.0000	0.8337	52,960	0.00	0.00	0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	7.446	3.8294	0.0000	0.0000	53,975	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	364.563	187.4895	0.0000	0.0000	986,382	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	379.455	195.1482	0.0000	0.8337	1,093,317	0.00	0.00	0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

::	142
	Booster – MK39 Mod 0
TE:	3,400 items/hr
:	415.80 grains/item

METALS FEED RATES

POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
	415.803	201.9615	0.0000	0.0000	1,062,519	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	415.803	201.9615	0.0000	0.0000	1,062,519	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R : 143
Ignition Ctg. – M5A2
ATE: 19,416 items/hr
: 40.01 grains/item

METALS FEED RATES

POTENTIAL POHC FEED RATES

T	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
te	0.3	0.8321	0.0000	0.0000	12,559	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	23.1064	64.0906	0.0000	0.0000	278,025	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	16.0044	44.3916	0.0000	0.0000	302,840	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	44.39
trate	0.601	1.6670	0.0000	0.9250	(477)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	40.0118	110.9813	0.0000	0.9250	592,947	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	44.39

BTU, CHLORINE, AND ASH FEED RATES

R: 144
Ignition Element, Electric–M91 (1377–00–007–4880)
ATE: 660 items/hr
): 13.97 grains/item

METALS FEED RATES

POTENTIAL POHC FEED RATES

T	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
	2.56	0.2414	0.0000	0.0000	3,402	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
quer	1.44	0.1358	0.0000	0.0000	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
nate	4.46	0.4205	0.0000	0.2903	882	0.00	0.00	0.00	0.00	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
lorate	5.51	0.5195	0.1503	0.2378	233	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	13.97	1.3172	0.1503	0.5281	4,517	0.00	0.00	0.00	0.00	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R: 145

Delay Plunger, 0.5sec–M1

ATE: 40,099 items/hr

3: 2.21 grains/item

METALS FEED RATES

POTENTIAL POHC FEED RATES

T	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
sulfide	0.04	0.2291	0.0000	0.1966	413	0.00	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
r	0.321	1.8388	0.0000	0.7552	4,415	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.659	9.5035	0.0000	7.2835	10,786	0.00	0.00	0.00	0.00	6.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
nate	0.06	0.3437	0.0000	0.2373	721	0.00	0.00	0.00	0.00	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
hlorate	0.12	0.6874	0.1989	0.3147	309	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.01	0.0573	0.0000	0.0000	373	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2.21	12.6598	0.1989	8.7873	17,017	0.00	0.16	0.00	0.00	6.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R: 146
Detent
ATE: 22,500 items/hr
: 10.00 grains/item

METALS FEED RATES

POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
	10.0032	32.1531	0.0000	0.0000	169,158	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	10.0032	32.1531	0.0000	0.0000	169,158	0.00	0.00	0:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R : 147

Impulse Ctg. – MK15 Mod 0

ATE: 45,000 items/hr

: 0.27 grains/Item

METALS FEED RATES

POTENTIAL POHC FEED RATES

T	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
	0.02	0.1286	0.0000	0.0000	1,812	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	0.12	0.7714	0.0000	0.3677	1,739	0.00	0.00	0.00	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
rate	0.11	0.7071	0.0000	0.3924	(202)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.02	0.1286	0.0000	0.0000	512	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.27	1.7357	0.0000	0.7601	3,861	0.00	0.00	0.00	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R : 148
ATE: Cutter Ctg. – M21,M22
2,460 items/hr
: 2.23 grains/item

METALS FEED RATES — POTENTIAL POHC FEED RATES

T	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
wder	0.05	0.0176	0.0000	0.0332	234	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ulfide	0.1	0.0351	0.0000	0.0302	63	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.22	0.0773	0.0000	0.0454	(55)	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
onate	0.01	0.0035	0.0000	0.0020	(3)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.01	0.0035	0.0000	0.0000	58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ate	0.25	0.0879	0.0000	0.0419	198	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.38	0.4850	0.0000	0.0000	2,104	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.14	0.0492	0.0000	0.0000	336	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05
	0.04	0.0141	0.0000	0.0000	50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	0.002	0.0007	0.0000	0.0004	(0)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.03	0.0105	0.0000	0.0000	12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2.232	0.7844	0.0000	0.1530	2,996	0.02	0.03	0.04	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05

BTU, CHLORINE, AND ASH FEED RATES

R : 149
Fin Assembly w/primer for an 81mm Mortar
ATE: 2,460 items/hr
I : 100.23 grains/item

						METALS FEED RATES								POTENTIAL POHC FEED RATES				
T	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
ulfide	0.05	0.0176	0.0000	0.0151	32	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.01	0.0035	0.0000	0.0000	50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.75	0.2636	0.0000	0.0000	4,316	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.00	0.00
nate	0.16	0.0562	0.0000	0.0388	118	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	57.5621	20.2290	0.0000	0.0000	87,753	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	39.8715	14.0120	0.0000	0.0000	95,590	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14.01
lorate	0.17	0.0597	0.0173	0.0274	27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
trate	1.5	0.5271	0.0000	0.2925	(151)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.01	0.0035	0.0000	0.0000	14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.15	0.0527	0.0000	0.0000	343	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	100.234	35.2250	0.0173	0.3738	188,092	0.00	0.01	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.26	0.00	14.01

BTU, CHLORINE, AND ASH FEED RATES

R: 150
Primer – A216 (Primer Mix 5061)
TE: 126,515 items/hr
: 2.30 grains/item

METALS FEED RATES

POTENTIAL POHC FEED RATES

T	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
ulfide	0.20003	3.6153	0.0000	3.1026	6,515	0.00	2.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.99002	17.8931	0.0000	10.4979	(12,811)	0.00	0.00	9.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
de	0.17003	3.0730	0.0000	5.6271	18,438	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.01	0.1807	0.0000	0.0000	1,236	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	0.87002	15.7243	0.0000	7.4942	35,443	0.00	0.00	0.00	0.00	6.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.06001	1.0846	0.0000	0.0000	1,284	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2.3001	41.5711	0.0000	26.7218	50,104	0.00	2.60	9.48	0.00	6.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R : 151
Primer – A216 (Primer Mix #5074)
ATE: 6,016 items/hr
3 : 2.28 grains/item

METALS FEED RATES

POTENTIAL POHC FEED RATES

T	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
ulfide	0.27	0.2320	0.0000	0.1991	418	0.00	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.87	0.7477	0.0000	0.4387	(535)	0.00	0.00	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Aluminum Powder	0.16	0.1375	0.0000	0.1086	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.01	0.0086	0.0000	0.0000	59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ate	0.87	0.7477	0.0000	0.3564	1,685	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.1	0.0859	0.0000	0.0000	102	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2.28	1.9595	0.0000	1.1028	1,729	0.00	0.17	0.40	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R: 152
Primer – M1BA2
ATE: 20,000 items/hr
: 21.80 grains/item

METALS FEED RATES | POTENTIAL POHC FEED RATES

T	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
ulfide	0.17	0.4857	0.0000	0.4168	875	0.00	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	12.4801	35.6573	0.0000	0.0000	502,589	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
nate	0.25	0.7143	0.0000	0.4931	1,498	0.00	0.00	0.00	0.00	0.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
hlorate	0.53001	1.5143	0.4361	0.6933	680	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	8.32003	23.7715	0.0000	0.0000	94,682	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.05	0.1429	0.0000	0.0000	931	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	21.8001	62.2860	0.4361	1.6032	601,255	0.00	0.35	0.00	0.00	0.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R : 153
Primer -- M22A3
ATE: 21,000 items/hr
: 66.00 grains/item

METALS FEED RATES | POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
ulfide	0.17	0.5100	0.0000	0.4377	919	0.00	0.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	10.1401	30.4202	0.0000	0.0000	428,772	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
nate	0.25001	0.7500	0.0000	0.5177	1,573	0.00	0.00	0.00	0.00	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
lorate	0.53002	1.5901	0.4600	0.7279	714	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
rate	48.1	144.3001	0.0000	80.0721	(41,270)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	6.76003	20.2801	0.0000	0.0000	80,776	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.05	0.1500	0.0000	0.0000	977	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	66.0001	198.0004	0.4600	81.7555	472,461	0.00	0.37	0.00	0.00	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

:	154
	Primer – M23A1/A2
TE:	66,000 items/hr
:	21.00 grains/item

						METALS FEED RATES								POTENTIAL POHC FEED RATES				
	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
ulfide	0.17002	1.6030	0.0000	1.3757	2,889	0.00	1.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3.12004	29.4176	0.0000	0.0000	414,640	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
nate	0.25003	2.3574	0.0000	1.6273	4,944	0.00	0.00	0.00	0.00	1.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
lorate	0.53007	4.9978	1.4459	2.2880	2,244	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
rate	14.8	139.5430	0.0000	77.4324	(39,909)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2.08003	19.6117	0.0000	0.0000	78,113	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.05	0.4714	0.0000	0.0000	3,072	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	21.0002	198.0020	1.4459	82.7235	465,993	0.00	1.15	0.00	0.00	1.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R : 155
Primer Stab – M26
ATE: 75,000 items/hr
3 : 1.80 grains/item

						METALS FEED RATES								POTENTIAL POHC FEED RATES				
T	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
ulfide	0.31006	3.3221	0.0000	2.8510	5,986	0.00	2.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.09001	0.9644	0.0000	0.7391	1,095	0.00	0.00	0.00	0.00	0.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
nate	0.45008	4.8223	0.0000	3.3288	10,112	0.00	0.00	0.00	0.00	3.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
lorate	0.95002	10.1788	2.9447	4.6598	4,570	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.80017	19.2875	2.9447	11.5788	21,764	0.00	2.39	0.00	0.00	4.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R: 156
Primer – M31
ATE: 10,000 items/hr
: 51.00 grains/item

T	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)
ulfide	0.17	0.2429	0.0000	0.2084	438
	23.4001	33.4286	0.0000	0.0000	471,177
nate	0.25	0.3571	0.0000	0.2465	749
hlorate	0.53001	0.7572	0.2190	0.3466	340
trate	11	15.7143	0.0000	8.7199	(4,494)
	15.6	22.2858	0.0000	0.0000	88,764
e	0.05	0.0714	0.0000	0.0000	465
	51.0001	72.8573	0.2190	9.5215	557,439

T	METALS FEED RATES: AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	POTENTIAL POHC FEED RATES: DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
ulfide	0.00	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
nate	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
hlorate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
trate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.17	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

ER : 157
Primer – M31A2/B2
ATE: 10,000 items/hr
G : 51.00 grains/item

METALS FEED RATES

POTENTIAL POHC FEED RATES

T	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT RATE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
sulfide	0.17	0.2429	0.0000	0.2084	438	0.00	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	23.4001	33.4286	0.0000	0.0000	471,177	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
anate	0.25	0.3571	0.0000	0.2465	749	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
hlorate	0.53001	0.7572	0.2190	0.3466	340	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
itrate	11	15.7143	0.0000	8.7199	(4,494)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	15.6	22.2858	0.0000	0.0000	88,764	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.05	0.0714	0.0000	0.0000	465	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	51.0001	72.8573	0.2190	9.5215	557,439	0.00	0.17	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R: 158
Primer – M32
ATE: 330,000 items/hr
: 2.09 grains/item

METALS FEED RATES · POTENTIAL POHC FEED RATES

T	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT RATE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
ulfide	0.07006	3.3028	0.0000	2.8345	5,952	0.00	2.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.27003	12.7298	0.0000	0.0000	179,426	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
nate	0.10009	4.7185	0.0000	3.2572	9,895	0.00	0.00	0.00	0.00	3.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
lorate	0.21002	9.9009	2.8643	4.5327	4,446	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
rate	1.26001	59.4006	0.0000	32.9614	(16,989)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.16002	7.5436	0.0000	0.0000	30,046	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.02001	0.9433	0.0000	0.0000	6,147	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2.09023	98.5396	2.8643	43.5857	218,923	0.00	2.38	0.00	0.00	3.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R : 159
Primer – No.34
ATE: 500,309 items/hr
3 : 0.59 grains/item

											METALS FEED RATES				POTENTIAL POHC FEED RATES			
T	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT RATE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
wder	0.04002	2.8603	0.0000	5.4046	38,077	2.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ulfide	0.09006	6.4368	0.0000	5.5241	11,599	0.00	4.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.19001	13.5807	0.0000	7.9678	(9,724)	0.00	0.00	7.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ate	0.22002	15.7251	0.0000	7.4946	35,444	0.00	0.00	0.00	0.00	6.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.03002	2.1456	0.0000	0.0000	7,576	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.02001	1.4302	0.0000	0.0000	1,693	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.59014	42.1788	0.0000	26.3911	84,666	2.86	4.63	7.20	0.00	6.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R: 160
Primer -- FA34
ATE: 500,309 items/hr
l: 0.59 grains/item

										METALS FEED RATES					POTENTIAL POHC FEED RATES			
T	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT RATE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
wder	0.04002	2.8603	0.0000	5.4046	38,077	2.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ulfide	0.09006	6.4368	0.0000	5.5241	11,599	0.00	4.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.19001	13.5807	0.0000	7.9678	(9,724)	0.00	0.00	7.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	0.22002	15.7251	0.0000	7.4946	35,444	0.00	0.00	0.00	0.00	6.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.03002	2.1456	0.0000	0.0000	7,576	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.02001	1.4302	0.0000	0.0000	1,693	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.59014	42.1788	0.0000	26.3911	84,666	2.86	4.63	7.20	0.00	6.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R: 161
Primer – M28B2
ATE: 2,640 items/hr
l: 300.98 grains/item

METALS FEED RATES — POTENTIAL POHC FEED RATES

T	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT RATE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
ulfide	0.17	0.0641	0.0000	0.0550	116	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	46.8017	17.6509	0.0000	0.0000	248,790	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
nate	0.25	0.0943	0.0000	0.0651	198	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
lorate	0.53	0.1999	0.0578	0.0915	90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
trate	222.008	83.7288	0.0000	46.4611	(23,946)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	31.2011	11.7673	0.0000	0.0000	46,869	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
s	0.02	0.0075	0.0000	0.0000	49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	300.981	113.5129	0.0578	46.6728	272,165	0.00	0.05	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R : 162
Primer -- M34
ATE: 22,500 items/hr
: 0.59 grains/item

METALS FEED RATES — POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT RATE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
wder	0.04	0.1286	0.0000	0.2429	1,712	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ulfide	0.09	0.2893	0.0000	0.2483	521	0.00	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.19	0.6107	0.0000	0.3583	(437)	0.00	0.00	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	0.22	0.7071	0.0000	0.3370	1,594	0.00	0.00	0.00	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.03	0.0964	0.0000	0.0000	340	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.02	0.0643	0.0000	0.0000	76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.59	1.8964	0.0000	1.1865	3,806	0.13	0.21	0.32	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

ER : 163

Primer – M40A2

ATE: 1,320 items/hr

G : 271.02 grains/item

											METALS FEED RATES				POTENTIAL POHC FEED RATES			
T	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT RATE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
sulfide	0.17	0.0321	0.0000	0.0275	58	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	42.127	7.9439	0.0000	0.0000	111,970	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
nate	0.25	0.0471	0.0000	0.0325	99	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
hlorate	0.53	0.0999	0.0289	0.0458	45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
itrate	199.804	37.6773	0.0000	20.9071	(10,776)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	28.085	5.2960	0.0000	0.0000	21,094	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.05	0.0094	0.0000	0.0000	61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	271.016	51.1058	0.0289	21.0129	122,551	0.00	0.02	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R: 164
Primer – M57
ATE: 660 items/hr
G : 56.87 grains/item

METALS FEED RATES

POTENTIAL POHC FEED RATES

T	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT RATE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA - RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
sulfide	0.17	0.0160	0.0000	0.0138	29	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.01	0.0952	0.0000	0.0000	1,342	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
nate	0.25	0.0236	0.0000	0.0163	49	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
hlorate	0.53	0.0500	0.0145	0.0229	22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
trate	48.104	4.5355	0.0000	2.5168	(1,297)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	6.76	0.6374	0.0000	0.0000	2,539	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.05	0.0047	0.0000	0.0000	31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	56.874	5.3624	0.0145	2.5697	2,715	0.00	0.01	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R : 165
Primer – M71
ATE: 22,500 items/hr
3 : 3.53 grains/item

METALS FEED RATES — POTENTIAL POHC FEED RATES

T	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT RATE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
sulfide	0.07	0.2250	0.0000	0.1931	405	0.00	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.491	1.5782	0.0000	0.0000	22,245	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
nate	0.1	0.3214	0.0000	0.2219	674	0.00	0.00	0.00	0.00	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
hlorate	0.21	0.6750	0.1953	0.3090	303	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
trate	2.317	7.4475	0.0000	4.1326	(2,130)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.321	1.0318	0.0000	0.0000	4,110	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.02	0.0643	0.0000	0.0000	419	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3.529	11.3432	0.1953	4.8566	26,026	0.00	0.16	0.00	0.00	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R : 166
Primer – M82
ATE: 22,500 items/hr
: 0.63 grains/item

						METALS FEED RATES								POTENTIAL POHC FEED RATES				
	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT RATE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
ulfide	0.0031	0.0100	0.0000	0.0086	18	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.0964	0.3099	0.0000	0.0000	4,367	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
nate	0.0031	0.0100	0.0000	0.0069	21	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
lorate	0.0093	0.0299	0.0086	0.0137	13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
rate	0.45421	1.4600	0.0000	0.8101	(418)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.0622	0.1999	0.0000	0.0000	796	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
nol	0.0031	0.0100	0.0000	0.0000	33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.63141	2.0295	0.0086	0.8392	4,831	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R: 167
Primer, Percussion—M26
ATE: 75,000 items/hr
G: 1.82 grains/item

METALS FEED RATES

POTENTIAL POHC FEED RATES

T	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT RATE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
ulfide	0.316	3.3857	0.0000	2.9056	6,101	0.00	2.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.091	0.9750	0.0000	0.7472	1,107	0.00	0.00	0.00	0.00	0.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
nate	0.458	4.9071	0.0000	3.3874	10,290	0.00	0.00	0.00	0.00	3.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
hlorate	0.9518	10.1979	2.9502	4.6686	4,579	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.8168	19.4657	2.9502	11.7088	22,077	0.00	2.44	0.00	0.00	4.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R: 168
Primer, Percussion–M47 & M68
ATE: 4,500 items/hr
: 301.01 grains/item

METALS FEED RATES

POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT RATE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
ulfide	0.17	0.1093	0.0000	0.0938	197	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	46.8046	30.0887	0.0000	0.0000	424,100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
nate	0.25	0.1607	0.0000	0.1109	337	0.00	0.00	0.00	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
lorate	0.53	0.3407	0.0986	0.1560	153	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
rate	222.002	142.7157	0.0000	79.1929	(40,817)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	31.2031	20.0591	0.0000	0.0000	79,896	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.05	0.0321	0.0000	0.0000	209	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	301.01	193.5064	0.0986	79.5537	464,075	0.00	0.08	0.00	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R : 169
Primer, Percussion--M79
ATE: 3,700 items/hr
: 381.01 grains/item

METALS FEED RATES · POTENTIAL POHC FEED RATES

T	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT RATE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
ulfide	0.17	0.0899	0.0000	0.0771	162	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	59.2846	31.3361	0.0000	0.0000	441,683	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
nate	0.25	0.1321	0.0000	0.0912	277	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
lorate	0.53	0.2801	0.0810	0.1282	126	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
trate	281.202	148.6354	0.0000	82.4778	(42,510)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	39.5231	20.8908	0.0000	0.0000	83,208	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.05	0.0264	0.0000	0.0000	172	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	381.01	201.3909	0.0810	82.7744	483,118	0.00	0.06	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R : 170
Primer, Electric–M80A1
ATE: 1,600 items/hr
: 872.98 grains/item

						METALS FEED RATES								POTENTIAL POHC FEED RATES				
T	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT RATE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
	80.0427	18.2955	0.0000	0.0000	257,875	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	4.351	0.9945	0.0000	0.0000	15,010	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.04	0.0091	0.0000	0.0000	63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
nate	0.92	0.2103	0.0000	0.1452	441	0.00	0.00	0.00	0.00	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	348.001	79.5431	0.0000	0.0000	345,058	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
lorate	1.14	0.2606	0.0754	0.1193	117	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
rate	384.541	87.8952	0.0000	48.7730	(25,138)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	53.9418	12.3296	0.0000	0.0000	49,109	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	872.978	199.5378	0.0754	49.0375	642,534	0.00	0.00	0.00	0.00	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R : 171
Primer – M35
ATE: 355,000 items/hr
: 0.37 grains/item

METALS FEED RATES

POTENTIAL POHC FEED RATES

T	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT RATE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
ulfide	0.06006	3.0459	0.0000	2.6140	5,489	0.00	2.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
nate	0.09009	4.5689	0.0000	3.1539	9,581	0.00	0.00	0.00	0.00	3.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
lorate	0.20002	10.1439	2.9346	4.6439	4,555	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.02002	1.0153	0.0000	0.0000	6,616	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.37019	18.7739	2.9346	10.4117	26,240	0.00	2.19	0.00	0.00	3.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R: 172
Primer – M28/M28A2/M28B1/M28
TE: 2,460 items/hr
: 101.00 grains/item

METALS FEED RATES | POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT RATE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
ulfide	0.17	0.0597	0.0000	0.0513	108	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	46.8	16.4469	0.0000	0.0000	231,819	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
nate	0.25	0.0879	0.0000	0.0606	184	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
lorate	0.53	0.1863	0.0539	0.0853	84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
rate	22.0001	7.7315	0.0000	4.2902	(2,211)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	31.2	10.9646	0.0000	0.0000	43,672	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.05	0.0176	0.0000	0.0000	114	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	101	35.4943	0.0539	4.4874	273,769	0.00	0.04	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R : 173
Primer – M29A1 (NOL 60)
ATE: 366,893 items/hr
3 : 0.51 grains/item

METALS FEED RATES — POTENTIAL POHC FEED RATES

T	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT RATE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
ulfide	0.05002	2.6217	0.0000	2.2500	4,724	0.00	1.89	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.13006	6.8169	0.0000	3.9995	(4,881)	0.00	0.00	3.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ate	0.30002	15.7248	0.0000	7.4944	35,444	0.00	0.00	0.00	0.00	6.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.03001	1.5729	0.0000	0.0000	1,862	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.51011	26.7363	0.0000	13.7438	37,149	0.00	1.89	3.61	0.00	6.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R: 174
Primer – M29A1 (#5061)
ATE: 579,305 items/hr
: 0.50 grains/item

METALS FEED RATES — POTENTIAL POHC FEED RATES

T	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT RATE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
ulfide	0.04003	3.3128	0.0000	2.8430	5,970	0.00	2.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	0.22002	18.2082	0.0000	10.6828	(13,037)	0.00	0.00	9.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
de	0.04003	3.3128	0.0000	6.0661	19,877	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	0.19002	15.7252	0.0000	7.4946	35,445	0.00	0.00	0.00	0.00	6.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.01	0.8276	0.0000	0.0000	980	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.50009	41.3866	0.0000	27.0865	49,234	0.00	2.39	9.65	0.00	6.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R: 175
Relay – M5
ATE: 49,157 items/hr
: 1.39 grains/item

METALS FEED RATES

POTENTIAL POHC FEED RATES

T	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT RATE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
	1.39009	9.7618	0.0000	7.4814	11,080	0.00	0.00	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.39009	9.7618	0.0000	7.4814	11,080	0.00	0.00	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R: 176
Relay – M7
ATE: 44,369 items/hr
: 1.54 grains/item

METALS FEED RATES

POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT RATE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
	1.54009	9.7618	0.0000	7.4814	11,080	0.00	0.00	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.54009	9.7618	0.0000	7.4814	11,080	0.00	0.00	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R : 177
Relay – XM9
ATE: 30,641 items/hr
3 : 2.23 grains/item

METALS FEED RATES

POTENTIAL POHC FEED RATES

T	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT RATE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
	2.23009	9.7617	0.0000	7.4814	11,080	0.00	0.00	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2.23009	9.7617	0.0000	7.4814	11,080	0.00	0.00	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R: 178
Igniter, Rocket Motor–M20A1
ATE: 24,000 items/hr
: 58.17 grains/item

METALS FEED RATES · POTENTIAL POHC FEED RATES

T	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT RATE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
y	57.1029	195.7815	0.0000	80.4075	470,071	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.19	0.6514	0.0000	0.0000	9,182	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
quer	0.11	0.3771	0.0000	0.0000	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
nate	0.341	1.1691	0.0000	0.8071	2,452	0.00	0.00	0.00	0.00	0.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
lorate	0.422	1.4469	0.4186	0.6624	650	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	58.1659	199.4261	0.4186	81.8769	482,355	0.00	0.00	0.00	0.00	0.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R: 179
Igniter, Rocket Motor--MK117,MK118
ATE: 2,280 items/hr
3 : 30.01 grains/item

METALS FEED RATES — POTENTIAL POHC FEED RATES

T	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT RATE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
r	30.009	9.7744	0.0000	4.0143	23,468	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	30.009	9.7744	0.0000	4.0143	23,468	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R: 180
Igniter, Rocket Motor–MK125–5
ATE: 6,600 items/hr
: 10.01 grains/item

METALS FEED RATES — POTENTIAL POHC FEED RATES

T	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT RATE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
	10.009	9.4371	0.0000	3.8758	22,658	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	10.009	9.4371	0.0000	3.8758	22,658	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R : 181
Rocket, 3.5 inch—M29A2
ATE: 347 items/hr
3 : 2578.18 grains/item

METALS FEED RATES — POTENTIAL POHC FEED RATES

T	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT RATE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
r	57.102	2.8306	0.0000	1.1625	6,796	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
k	30.241	1.4991	0.0000	0.0000	21,130	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.19	0.0094	0.0000	0.0000	133	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
quer	0.11	0.0055	0.0000	0.0000	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	22.681	1.1243	0.0000	0.0000	16,970	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
nate	0.34	0.0169	0.0000	0.0116	35	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	1375.93	68.2067	0.0000	0.0000	295,881	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	894.604	44.3468	0.0000	0.0000	302,534	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	44.35
hlorate	0.42	0.0208	0.0060	0.0095	9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
erchlorate	196.569	9.7442	2.4935	3.9464	2,572	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2578.18	127.8043	2.4996	5.1301	646,060	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	44.35

BTU, CHLORINE, AND ASH FEED RATES

R: 182
Rocket Motor, 3.5 inch
ATE: 240 items/hr
: 2520.01 grains/item

METALS FEED RATES — POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT RATE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)
	30.24	1.0368	0.0000	0.0000	14,614	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
e	22.68	0.7776	0.0000	0.0000	11,736	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1375.93	47.1746	0.0000	0.0000	204,643	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	894.603	30.6721	0.0000	0.0000	209,245	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	30.67
rchlorate	196.566	6.7394	1.7246	2.7295	1,779	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2520.01	86.4005	1.7246	2.7295	442,018	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	30.67

BTU, CHLORINE, AND ASH FEED RATES

R : 183

Signal, Ground Illuminating(Red) – M158

ATE: 1,600 items/hr

: 538.512 grains/item

						METALS FEED RATES								POTENTIAL POHC FEED RATES					
	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
ulfide	0.17	0.0389	0.0000	0.0333	70	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
	0.04	0.0091	0.0000	0.0054	(7)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	47.6425	10.8897	0.0000	4.4724	26,146	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.09
onate	3.511	0.8025	0.0000	0.4496	(632)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	46.8024	10.6977	0.0000	0.0000	150,784	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
nate	0.25	0.0571	0.0000	0.0394	120	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
	72.2037	16.5037	0.0000	27.3681	175,814	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
oride	0.33	0.0754	0.0426	0.0000	673	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
lorate	0.53	0.1211	0.0350	0.0555	54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
rate	222.001	50.7431	0.0000	28.1574	(14,513)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ate	105.026	24.0058	0.0000	11.7533	(18,869)	0.00	0.00	0.00	0.00	0.00	9.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	31.2016	7.1318	0.0000	0.0000	26,406	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.13
	0.05	0.0114	0.0000	0.0000	74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Acetate Resin	8.754	2.0009	0.0000	0.0000	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	538.512	123.0884	0.0778	72.3344	348,122	0.00	0.03	0.00	0.00	0.04	9.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.24

BTU, CHLORINE, AND ASH FEED RATES

: 184
Squib – XC9/MK 1 Mod 0
TE: 950,000 items/hr
: 1.47008 grains/item

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
						METALS FEED RATES								POTENTIAL POHC FEED RATES					
	1.39003	188.6467	0.0000	77.4772	452,941	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	18.86
	0.06001	8.1445	0.0000	0.0000	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
lorate	0.02004	2.7197	0.7868	1.2451	1,221	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.47008	199.5109	0.7868	76.7223	454,162	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	18.86

BTU, CHLORINE, AND ASH FEED RATES

R : 185
Tracer – M5A2B1/B2
ATE: 8,000 items/hr
: 35.0002 grains/item

METALS FEED RATES | POTENTIAL POHC FEED RATES

T	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
wder	0.60002	0.6857	0.0000	1.2957	9,129	0.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	12.3001	14.0572	0.0000	23.3111	149,751	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
oride	2.50001	2.8572	1.6209	0.0000	25,480	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
ate	19.6001	22.4001	0.0000	10.9671	(17,606)	0.00	0.00	0.00	0.00	0.00	9.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	35.0002	40.0002	1.6209	35.5738	166,754	0.69	0.00	0.00	0.00	0.00	9.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0

BTU, CHLORINE, AND ASH FEED RATES

I: 186
Tracer – M10/XM10
TE: 7,500 items/hr
: 63.0003 grains/item

METALS FEED RATES — POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
ate	5.70002	6.1072	0.0000	0.5325	90,722	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	17.0001	16.2143	0.0000	30.2048	194,037	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
ate	20.8001	22.2858	0.0000	10.9111	(17,517)	0.00	0.00	0.00	0.00	0.00	9.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
late	3.10008	3.3215	0.0000	0.0000	0	0.00	0.00	0.00	0.00	0.00	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
xide	18.4001	17.5715	0.0000	17.5715	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	63.0003	67.5003	0.0000	59.2200	267,243	0.00	0.00	0.00	0.00	0.00	9.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0

BTU, CHLORINE, AND ASH FEED RATES

R : 187
Tracer – M12
ATE: 1,800 items/hr
: 62.9002 grains/item

METALS FEED RATES — POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
de	25	6.4286	0.0000	0.0000	0	0.00	0.00	5.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ate	0.6	0.1543	0.0000	0.0135	2,292	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.3	0.0771	0.0000	0.0000	1,087	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2.50005	0.8429	0.0000	1.0661	6,848	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
acyclodecane	16.2001	4.1657	2.7494	0.0000	20,874	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ate	2.10005	0.5400	0.0000	0.2644	(424)	0.00	0.00	0.00	0.00	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Acetate Resin	16.2001	4.1657	0.0000	0.0000	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	62.9002	16.1743	2.7494	1.3439	30,678	0.00	0.00	5.21	0.00	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

:	188
	Tracer – M13
TE:	4,500 items/hr
:	110.9 grains/item

METALS FEED RATES

POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
de	21.1	13.5643	0.0000	0.0000	0	0.00	0.00	10.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ate	0.5	0.3214	0.0000	0.0280	4,775	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.3	0.1929	0.0000	0.0000	2,718	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	39.9001	25.6500	0.0000	42.5354	273,250	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
acyclodecane	5.90007	3.7929	2.5033	0.0000	19,006	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ate	37.3001	23.9786	0.0000	11.7399	(18,847)	0.00	0.00	0.00	0.00	0.00	9.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Acetate Resin	5.90007	3.7929	0.0000	0.0000	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	110.9	71.2930	2.5033	54.3034	280,902	0.00	0.00	10.99	0.00	0.00	9.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R : 189
Tracer – No. 1/No. 2 (75–14–333)
ATE: 6,000 items/hr
: 48.9002 grains/item

						METALS FEED RATES								POTENTIAL POHC FEED RATES					
	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
wder	0.90002	0.7714	0.0000	1.4576	10,269	0.77	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	17.2001	14.7429	0.0000	24.4482	157,056	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ride	3.40001	2.9143	1.6533	0.0000	25,990	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ate	27.4001	23.4858	0.0000	11.4986	(18,460)	0.00	0.00	0.00	0.00	0.00	9.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	48.9002	41.9144	1.6533	37.4044	174,855	0.77	0.00	0.00	0.00	0.00	9.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

: 190
20MM HE–T(MK4) (w/single base propellant)
TE: 900 items/hr
: 722.52 grains/item

						METALS FEED RATES								POTENTIAL POHC FEED RATES					
	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
	6.2	0.7971	0.0000	0.0000	13,054	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.80	0.00	0.00	0.00
	3.7	0.4757	0.0000	0.3646	540	0.00	0.00	0.00	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	613.8	78.9171	0.0000	0.0000	342,343	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	98.82	12.7054	0.0000	0.0000	66,843	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	722.52	92.8954	0.0000	0.3646	422,780	0.00	0.00	0.00	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.80	0.00	0.00	0.00

BTU, CHLORINE, AND ASH FEED RATES

R : 191
Grenade Fuze (M215)
ATE: 1,175 items/hr
S : 0.37 grains/item

						METALS FEED RATES								POTENTIAL POHC FEED RATES					
T	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
owder	0.04	0.0067	0.0000	0.0127	89	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
sulfide	0.04	0.0067	0.0000	0.0058	12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
e	0.08	0.0134	0.0000	0.0079	(10)	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
ate	0.19	0.0319	0.0000	0.0152	72	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	0.02	0.0034	0.0000	0.0000	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	0.37	0.0621	0.0000	0.0415	168	0.01	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0

BTU, CHLORINE, AND ASH FEED RATES

R : 192

Fuze, Time M65A1

ATE: 7,300 items/hr

: 51.99 grains/item

METALS FEED RATES

POTENTIAL POHC FEED RATES

T	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
r	6.09	6.3510	0.0000	2.6084	15,249	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.6
	45.9	47.8671	0.0000	0.0000	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	51.99	54.2181	0.0000	2.6084	15,249	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.6

BTU, CHLORINE, AND ASH FEED RATES

ER : 193

Fuze, Base Detonating(M91A1 w/booster)

ATE: 1,900 items/hr

G : 353.401 grains/item

METALS FEED RATES

POTENTIAL POHC FEED RATES

T	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RAT (lb/hr
owder	0.6480	0.1759	0.0000	1.2244	2,341	0.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
isulfide	0.5660	0.1536	0.0000	0.3844	903	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.1
m	0.085	0.0231	0.0000	0.0850	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	0.4810	0.1306	0.0000	0.3686	148	0.00	0.00	0.00	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	12.3030	3.3394	0.0000	20.4021	35,574	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
oride	2.4500	0.6650	1.3899	0.0000	5,930	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
hlorate	0.5660	0.1542	0.1643	0.2600	69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	1.0000	0.2714	0.0000	0.0000	1,120	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
trate	19.6000	5.3200	0.0000	9.5962	(4,182)	0.00	0.00	0.00	0.00	0.00	8.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	315.7000	85.6900	0.0000	0.0000	450,815	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	353.401	95.9231	1.5542	32.3207	492,720	0.85	0.00	0.00	0.00	0.34	8.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.1

BTU, CHLORINE, AND ASH FEED RATES

R : 194
Fuze, Point Detonating(M564 w/booster)
ATE: 1,900 items/hr
: 381.71 grains/item

						METALS FEED RATES								POTENTIAL POHC FEED RATES					
T	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
ulfide	1.31	0.3556	0.0000	0.3052	641	0.00	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
e	0.06	0.0163	0.0000	0.0096	(12)	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	7.16	1.9434	0.0000	1.4894	2,206	0.00	0.00	0.00	0.00	1.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
te	0.12	0.0326	0.0000	0.0155	73	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
nate	2	0.5429	0.0000	0.3747	1,138	0.00	0.00	0.00	0.00	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.1
lorate	4.24	1.1509	0.3329	0.5269	517	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	320.4	86.9657	0.0000	0.0000	358,821	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	0.02	0.0054	0.0000	0.0000	6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	26.4	7.1657	0.0000	0.0000	37,699	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	381.71	98.1784	0.3329	2.7213	401,089	0.00	0.26	0.01	0.00	1.78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.1

BTU, CHLORINE, AND ASH FEED RATES

R : 195
Simulator Projectile M74
ATE: 500 items/hr
: 557.84 grains/item

						METALS FEED RATES								POTENTIAL POHC FEED RATES					
T	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
wder	54.69	3.9064	0.0000	7.3812	52,002	3.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	503.15	35.9393	0.0000	14.7603	86,290	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.5
	557.84	39.8457	0.0000	22.1415	138,293	3.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.5

BTU, CHLORINE, AND ASH FEED RATES

l : 196
5.56mm Blank Cartridge (M200)
TE: 22,500 items/hr
: 7.96782 grains/item

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	METALS FEED RATES: AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	POTENTIAL POHC FEED RATES: DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
wder	0.02799	0.0900	0.0000	0.1700	1,198	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ulfide	0.05909	0.1899	0.0000	0.1630	342	0.00	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
e	0.23014	0.7397	0.0000	0.4340	(530)	0.00	0.00	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
onate	0.02177	0.0700	0.0000	0.0392	(55)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.02799	0.0900	0.0000	0.0000	1,268	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00311	0.0100	0.0000	0.0000	68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5.79393	18.6233	0.0000	0.0000	80,788	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.01866	0.0600	0.0000	0.0000	212	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
rate	0.03421	0.1100	0.0000	0.0610	(31)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.01866	0.0600	0.0000	0.0000	71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	0.14928	0.4798	0.0000	0.2287	1,082	0.00	0.00	0.00	0.00	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ate	0.07153	0.2299	0.0000	0.0000	3,037	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.00	0.00	0.00	0.00	0.00
	0.07153	0.2299	0.0000	0.0000	1,937	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.00	0.00	0.00	0.00
e	0.10574	0.3399	0.0000	0.0000	5,566	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.34	0.00	0.00	0.00
	1.32797	4.2685	0.0000	0.0000	29,120	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.27	0.00
lorate	0.00622	0.0200	0.0058	0.0092	9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	7.96782	25.6108	0.0058	1.1051	124,081	0.09	0.14	0.39	0.00	0.21	0.00	0.00	0.00	0.23	0.23	0.34	0.00	4.27	0.03

BTU, CHLORINE, AND ASH FEED RATES

R : 197
20mm Cartridge HEI–Single base
ATE: 900 items/hr
: 991.483 grains/item

						METALS FEED RATES								POTENTIAL POHC FEED RATES					
T	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
ck	0.0778	0.0100	0.0000	0.0000	141	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
wder	52.7484	6.7619	0.0000	12.6145	90,281	6.78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	1.4004	0.1801	0.0000	0.0000	3,151	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
ulfide	0.5446	0.0700	0.0000	0.0601	126	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
e	14.4708	1.8605	0.0000	1.0916	(1,332)	0.00	0.00	0.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
de	0.5446	0.0700	0.0000	0.1282	420	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
nate	0.9336	0.1200	0.0000	0.0105	1,783	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
rate	0.0778	0.0100	0.0000	0.0009	180	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	3.9678	0.5101	0.0000	0.0000	7,191	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	0.0778	0.0100	0.0000	0.0000	88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	7.002	0.9003	0.0000	0.0000	3,828	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
luminum Alloy	18.2052	2.3407	0.0000	4.0746	27,156	0.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	605.362	77.8322	0.0000	0.0000	337,636	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	0.1556	0.0200	0.0000	0.0000	71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
rchlorate	19.9946	2.5707	0.6579	1.0411	679	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
lfate	6.5352	0.8402	0.0000	0.5410	(587)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17
	97.0166	12.4736	0.0000	0.0000	51,466	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	0.0778	0.0100	0.0000	0.0000	12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	84.413	10.8531	0.0000	0.0000	57,098	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	2.6452	0.3401	0.0000	0.3401	0	0.00	0.00	0.00	0.00	0.00	0.00	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.0
nol	0.0778	0.0100	0.0000	0.0000	33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	0.3112	0.0400	0.0000	0.0000	410	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	2.9564	0.3601	0.0000	0.0000	7,602	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	0.0778	0.0100	0.0000	0.0013	154	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
te	1.556	0.2001	0.0000	0.0953	451	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	61.7732	7.9423	0.0000	0.0000	66,906	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.94	0.00	0.00	0.00	0.0
e	8.4802	1.0903	0.0000	0.0000	17,855	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.09	0.00	0.00	0.0
	991.483	127.4764	0.6579	20.1993	672,759	7.62	0.05	0.99	0.00	0.09	0.00	0.27	0.00	0.00	7.94	1.09	0.00	0.00	0.1

BTU, CHLORINE, AND ASH FEED RATES

:	198
	20mm Cart API M53
TE:	1,200 items/hr
:	748.747 grains/item

						METALS FEED RATES								POTENTIAL POHC FEED RATES					
	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
trate	12.7677	2.1887	0.0000	0.0000	(100)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	13.5256	2.3187	0.0000	1.3604	(1,660)	0.00	0.00	1.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
onate	6.1215	1.0494	0.0000	0.5880	(826)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
de	0.4664	0.0800	0.0000	0.1464	480	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
nate	0.583	0.0999	0.0000	0.0087	1,485	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
te	57.6004	9.8744	0.0000	0.0000	130,440	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.87	0.00	0.00	0.00	0.00	0.0
	2.4486	0.4198	0.0000	0.0000	5,917	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	0.0583	0.0100	0.0000	0.0000	68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	66.6952	11.4335	0.0000	0.0000	77,999	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.43	0.0
luminum Alloy	27.7508	4.7573	0.0000	8.2815	55,194	1.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	515.664	88.3995	0.0000	0.0000	383,477	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
rate	9.0948	1.5591	0.0000	0.8651	(446)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
rchlorate	16.4406	2.8164	0.7212	1.1414	744	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
te	3.0316	0.5197	0.0000	0.2927	(366)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.1
nol	0.0583	0.0100	0.0000	0.0000	33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	0.0583	0.0100	0.0000	0.0013	154	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
te	1.166	0.1999	0.0000	0.0953	451	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	6.1215	1.0494	0.0000	0.0000	8,840	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.05	0.00	0.00	0.00	0.0
e	9.0946	1.5591	0.0000	0.0000	25,532	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.56	0.00	0.00	0.0
	748.747	128.3566	0.7212	12.7808	687,415	1.71	0.00	1.23	0.00	0.09	0.00	0.00	0.00	9.87	1.05	1.56	0.00	11.43	0.1

BTU, CHLORINE, AND ASH FEED RATES

R : 199
20mm Cart INC M96
ATE: 900 items/hr
: 635.47 grains/item

T	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
						METALS FEED RATES								POTENTIAL POHC FEED RATES					
ck	0.0778	0.0100	0.0000	0.0000	141	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
ulfide	0.2334	0.0300	0.0000	0.0258	54	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
nate	3.1898	0.4101	0.0000	0.0358	6,092	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
e	3.7344	0.4801	0.0000	0.0000	7,863	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.48	0.00	0.00	0.0
anate	0.5446	0.0700	0.0000	0.0483	147	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
luminum Alloy	78.1112	10.0429	0.0000	17.4826	116,517	3.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	459.331	59.0569	0.0000	0.0000	256,189	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	0.1556	0.0200	0.0000	0.0000	71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
lorate	1.3226	0.1700	0.0492	0.0778	76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
erchlorate	85.2688	10.9631	2.8055	4.4401	2,894	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
lfate	3.501	0.4501	0.0000	0.2898	(315)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	635.47	81.7033	2.8547	22.4002	389,730	3.62	0.02	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.48	0.00	0.00	0.1

BTU, CHLORINE, AND ASH FEED RATES

l: 200
Fuze M501
TE: 220 items/hr
: 1060 grains/item 6.15152

METALS FEED RATES POTENTIAL POHC FEED RATES

	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
ulfide	54.06	1.6990	0.0000	1.4581	3,062	0.00	1.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25
)	21.412	0.6729	0.0000	0.3948	(482)	0.00	0.00	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4.24	0.1333	0.0000	0.0000	158	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	188.044	5.9100	0.0000	0.0000	31,092	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
lorate	45.686	1.4358	0.4154	0.6573	645	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	6.89	0.2165	0.0000	0.2165	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	688.364	21.6343	0.0000	16.5805	24,555	0.00	0.00	0.00	0.00	15.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
te	51.304	1.6124	0.0000	0.7685	3,634	0.00	0.00	0.00	0.00	0.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1060	33.3143	0.4154	20.0758	62,664	0.00	1.22	0.36	0.00	16.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25

BTU, CHLORINE, AND ASH FEED RATES

ER : 201
Signal, Illuminating–AN–M37A2
ATE: 25,971 items/hr
G : 80.7 grains/item

METALS FEED RATES POTENTIAL POHC FEED RATES

T	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RAT (lb/h
	0.23	0.8533	0.0000	0.0000	14,933	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
te	0.04	0.1484	0.0000	0.0871	(106)	0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
r	77.1829	286.3596	0.0000	117.6079	687,549	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	28.[illegible]
	0.02	0.0742	0.0554	0.0000	239	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.0
anate	0.15	0.5565	0.0000	0.3842	1,167	0.00	0.00	0.00	0.00	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.[illegible]
	0.02	0.0742	0.0000	0.0000	1,135	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	0.602	2.2335	0.0000	3.7038	23,794	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
hlorate	0.15	0.5565	0.1610	0.2548	250	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
erchlorate	0.802	2.9755	0.7614	1.2051	786	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
trate	1.485	5.5096	0.0000	2.6975	(4,331)	0.00	0.00	0.00	0.00	0.00	2.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
e	0.02	0.0742	0.0000	0.0000	484	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	80.7019	299.4156	0.9779	125.9403	725,899	0.00	0.00	0.08	0.00	0.40	2.26	0.00	0.00	0.00	0.00	0.00	0.07	0.00	28.7

BTU, CHLORINE, AND ASH FEED RATES

R : 202
Signal, Illuminating–AN–M43A2
ATE: 32,941 items/hr
S : 63.77 grains/item

METALS FEED RATES

POTENTIAL POHC FEED RATES

T.	COMP QUANT (gr/item)	COMP RATE (lb/hr)	CL RATE (lb/hr)	ASH RATE (lb/hr)	HEAT VALUE (BTU/hr)	AL RATE (lb/hr)	SB RATE (lb/hr)	BA RATE (lb/hr)	CR RATE (lb/hr)	LEAD RATE (lb/hr)	SR RATE (lb/hr)	TIN RATE (lb/hr)	ZINC RATE (lb/hr)	DBA RATE (lb/hr)	DNT RATE (lb/hr)	DPA RATE (lb/hr)	HCB RATE (lb/hr)	NG RATE (lb/hr)	S RATE (lb/hr)
	0.12	0.5647	0.0000	0.0000	9,882	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
e	0.04	0.1882	0.0000	0.1104	(135)	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.(
r	61.7329	290.5062	0.0000	119.3109	697,505	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	29.0
	0.1	0.4706	0.3515	0.0000	1,516	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.47	0.00	0.0
anate	0.15	0.7059	0.0000	0.4873	1,480	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.1
	0.01	0.0471	0.0000	0.0000	720	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	0.301	1.4165	0.0000	2.3489	15,090	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
hlorate	0.401	1.8870	0.5459	0.8639	847	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
erchlorate	0.15	0.7059	0.1806	0.2859	186	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
rate	0.743	3.4965	0.0000	1.7119	(2,748)	0.00	0.00	0.00	0.00	0.00	1.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
e	0.02	0.0941	0.0000	0.0000	613	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	63.7679	300.0826	1.0780	125.1192	724,957	0.00	0.00	0.10	0.00	0.50	1.43	0.00	0.00	0.00	0.00	0.00	0.47	0.00	29.