



CHUNXING

USED LEAD ACID BATTERY (ULAB) RECYCLING FACILITY



LOCATION:

The proposed Used Lead Acid Battery (ULAB) Recycling Facility will be located on Crown Allotment CA 2047 Hazelwood North 13 Ha (33 Acres). Previously used as the Lurgi Brown Coal Gasification Plant, decommissioned in 1969. The land was remediated during the period 2002 to 2008 and classified as Industrial 2 Zone (IN2Z)



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BACKGROUND:

Chunxing Corporation Pty Ltd saw an opportunity to recycle Used Lead Acid Batteries in Victoria, utilizing the patented Chinese Breaker and Processing System. The facility will process at full operation 50,000 Tonnes of Used Lead Acid Batteries to produce 28,000 Tonnes of refined lead and other saleable by-products.

The land in Hazelwood North was chosen as it fitted the size, location and zoning for the Facility. The surrounding area is part of a Heavy Industry Precinct approximately 1.3 kilometres southeast of the township of Morwell. Nearby uses include the Morwell Transfer Station, fertilizer manufacturing, warehousing, and logistics.

Community consultation was undertaken as part of the EPA Works Approval Application (WAA Submission). The EPA has granted a Works Approval to design, build and operate the facility within the most stringent environmental controls and requirements of any similar facility in Australia and most likely in the world.

Chunxing Corporation are committed to meeting all the requirements of our EPA Works Approval.



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CHUNXING ULAB RECYCLING FACILITY IN HAZELWOOD NORTH

- UTILIZING THE LATEST TECHNICAL DESIGN AND PROCESS
- SECONDARY SMELTING TO PRODUCE REFINED LEAD PRODUCTS
- DUST AND GAS COLLECTION AND TREATMENT
- POLLUTION MONITORING AND CONTROLS
- NEGATIVE PRESSURIZED BUILDING
- RECYCLING FOR RE-USE 96% of BATTERY COMPONENTS
- MINIMAL WASTE PRODUCTS
- CONTAINMENT AND PROCESSING OF ALL RAIN FALLING ON THE BUNDED SITE
- NIL HEALTH EFFECTS TO THE COMMUNITY
- AIR MONITORING (2 SITES), BEFORE CONSTRUCTION, INCLUDING OPERATION
- DUST MONITORING AND ANALYSIS

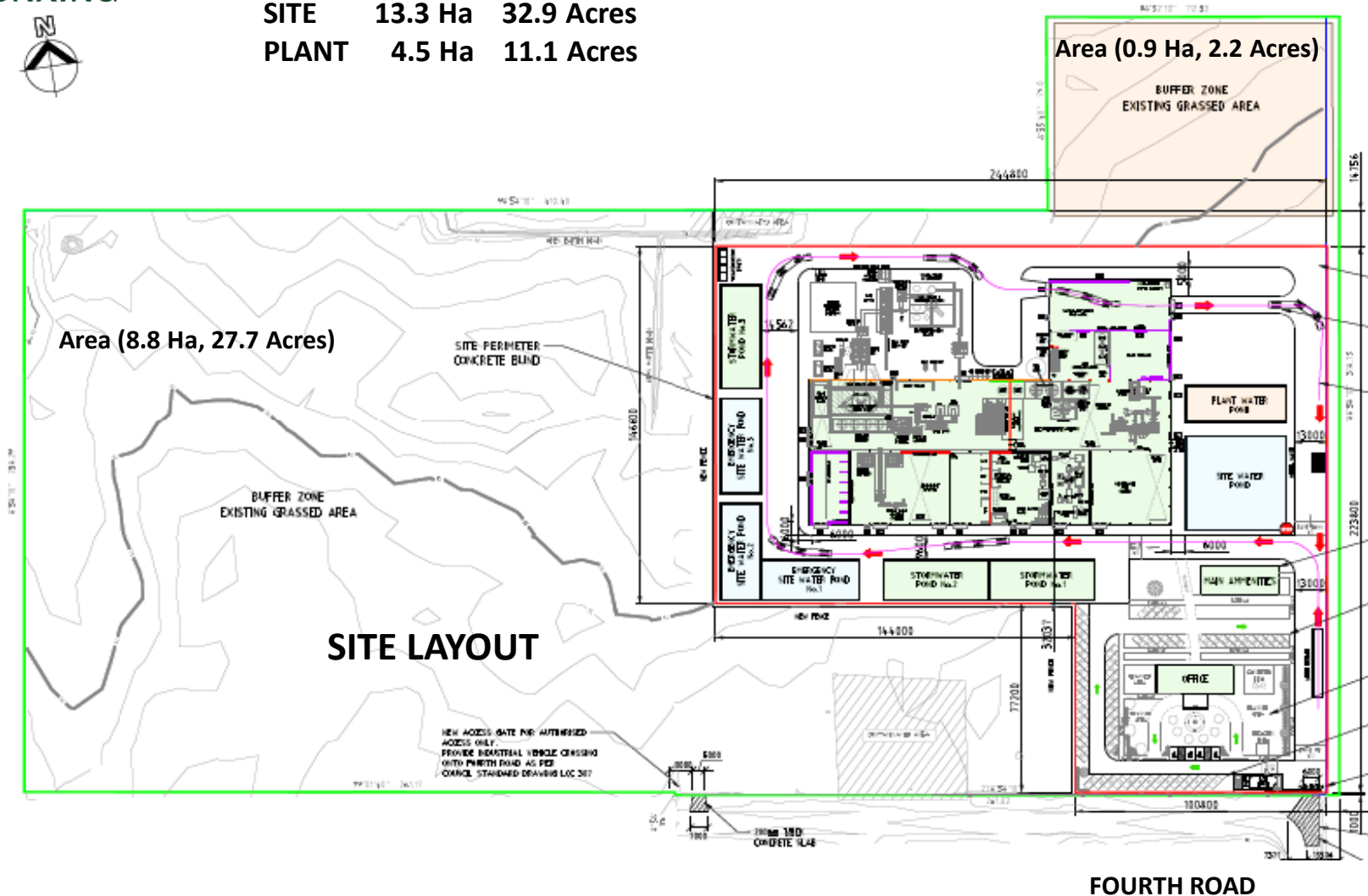


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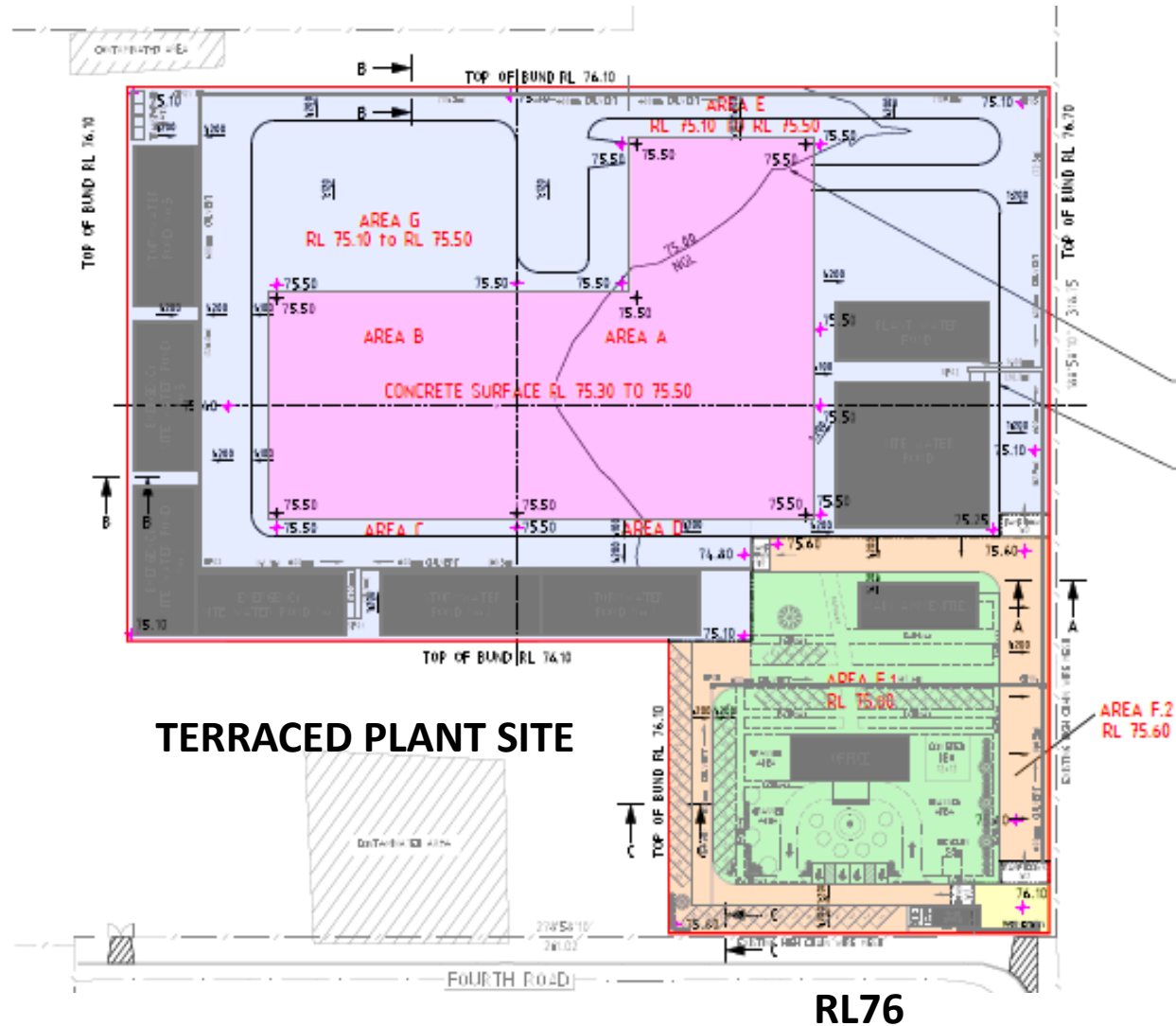
SITE 13.3 Ha 32.9 Acres
 PLANT 4.5 Ha 11.1 Acres





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WATER MANAGEMENT

ALL RAIN THAT FALLS ON THE SITE IS COLLECTED AND WILL BE UTILIZED WITHIN THE PROCESS. THE PROCESS IS A NET USER OF WATER AND WILL REQUIRE TOWN WATER SUPPLY TO MAKE-UP SHORTFALL IN REQUIREMENTS.

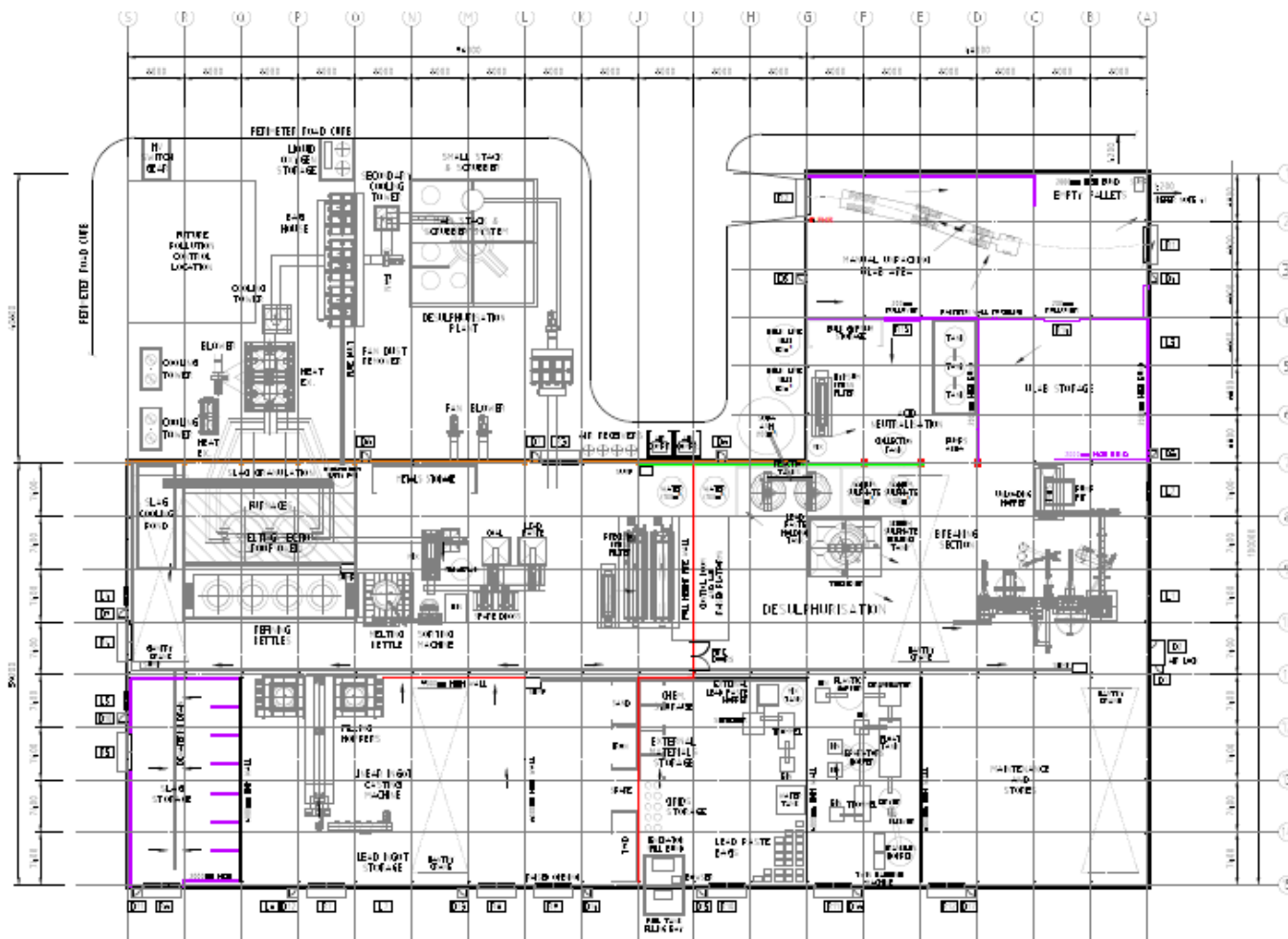
THE SITE IS SURROUNDED BY A SEALED CONCRETE WALL TO CONTAIN ALL WATER

STORAGE PONDS (7 OFF) HAVE BEING SIZED TO STORE A 1:100YR RAIN EVENT AND PROCESS WATER

PROCESS WATER AFTER SEVERAL RE-USES IN THE PROCESS MAY BECOME WASTEWATER. WASTEWATER IS DISCHARGED TO SEWER UNDER A TRADE WASTE AGREEMENT WITH GIPPSLAND WATER



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PLANT LAYOUT



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BATTERY CONSTRUCTION

BATTERIES are made up of the following COMPONENTS

▪ BATTERY CELL (Lead Grids, 95% Lead Metal)	25%
▪ (Lead Paste filled, Lead Sulphate $PbSO_4$)	45%
▪ SPACERS (Rubber and Hard Plastic Sheet)	3%
▪ ELECTROLYTE (4% Sulphuric Acid H_2SO_4)	19%
▪ CASING (Polypropylene, Polyethylene, Paper)	7%
▪ ELECTRODES (Lead, Copper Metal)	1%
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	100%

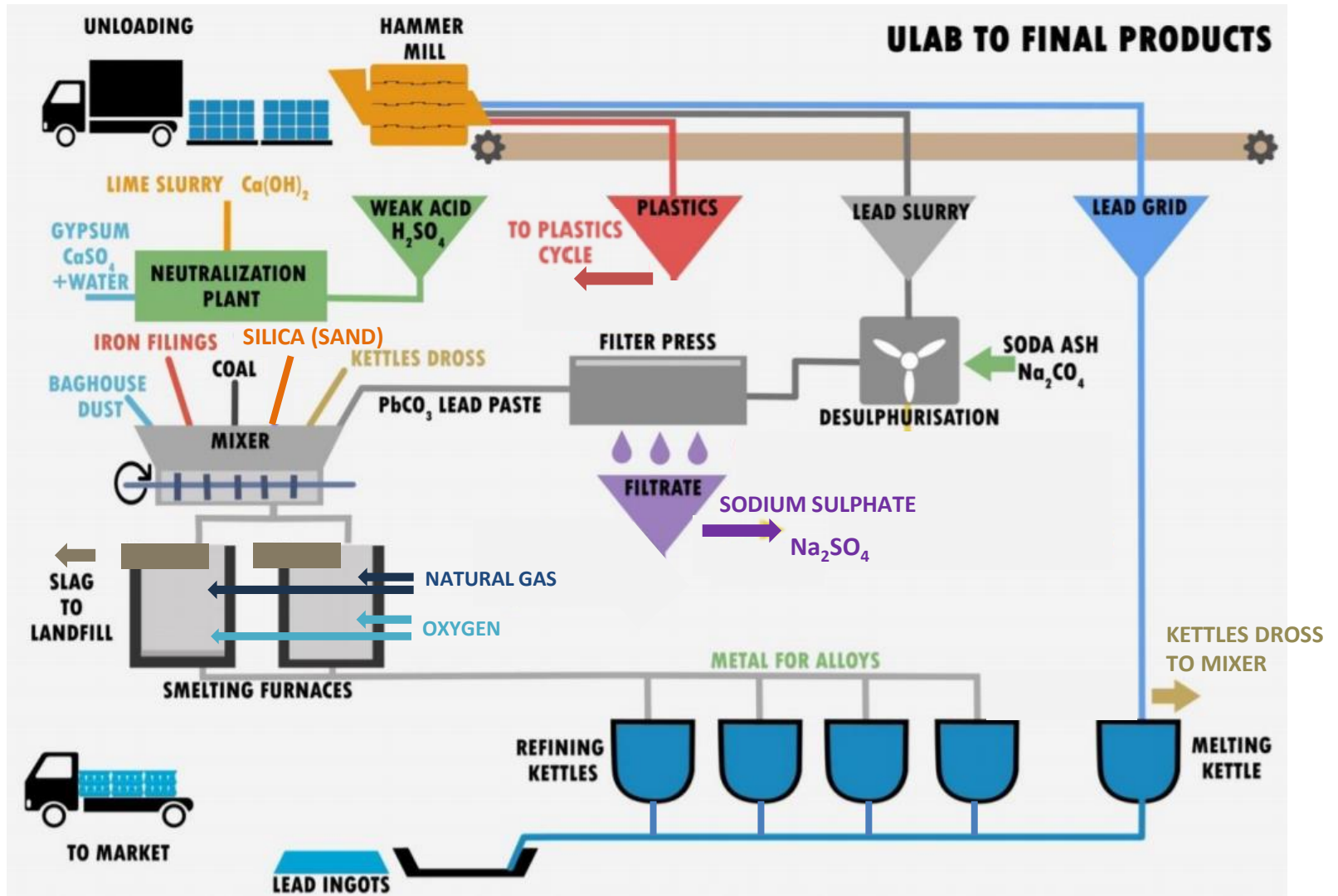
BREAKING THE BATTERY INTO SMALL PIECES, EACH OF THE COMPONENTS CAN BE THEN SEPARATED

BATTERY COMPONENTS CAN BE SEPARATED BY GRAVITY AND SIZING



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ELECTROLYTE (4% Sulphuric Acid - H_2SO_4) NEUTRALIZATION

ALL LIQUID collected and used in the BREAKER PROCESS is NEUTRALIZED

LIQUID IS FILTERED TO REMOVE PARTICLES

MIXED with LIME SLURRY ($Ca(OH)_2$) to produce GYPSUM ($CaSO_4$) and water

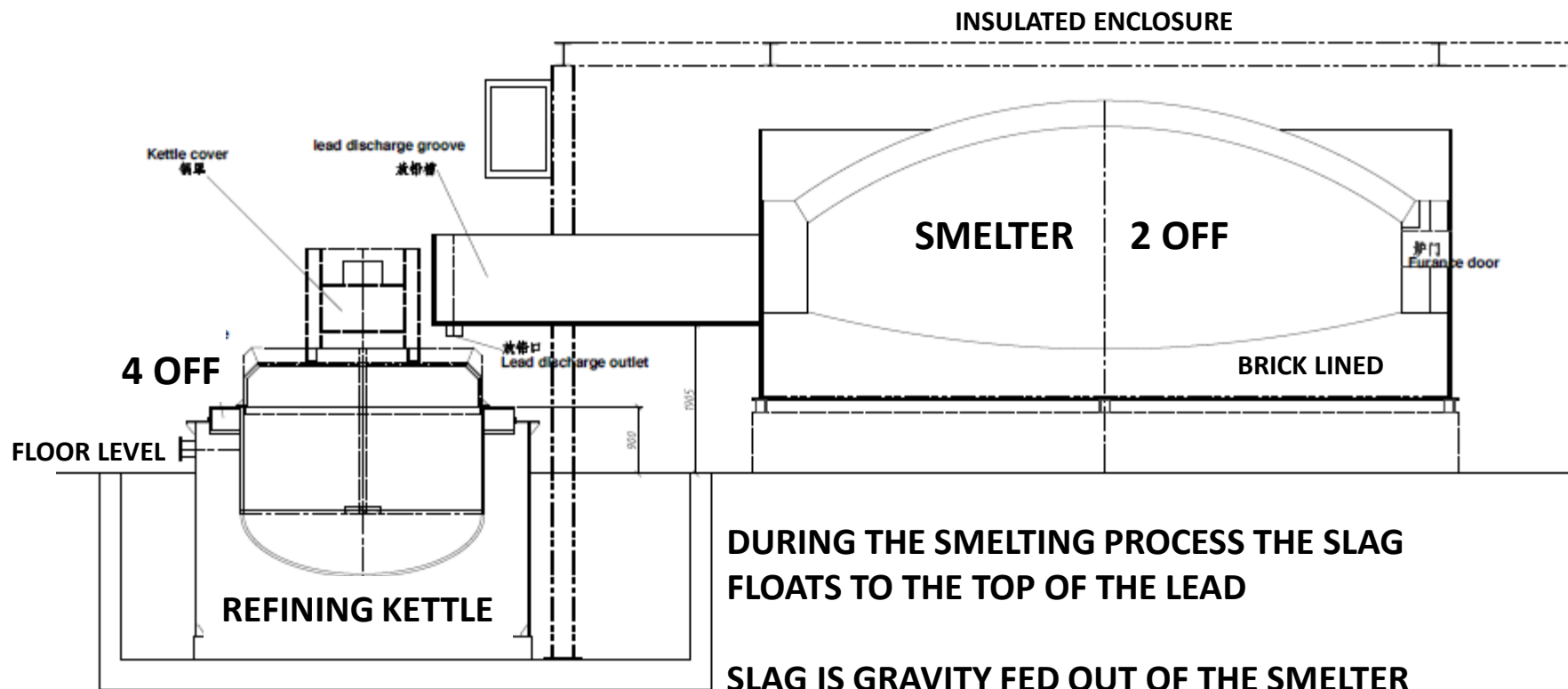
LEAD PASTE (Lead Sulphate - $PbSO_4$) SEPARATION

THE LEAD PASTE IS A FINE GRAIN PRODUCT PRESSED INTO THE LEAD GRID

BREAKING UP THE LEAD GRID RELEASES THE LEAD PASTE

LEAD PASTE IS SEPARATED BY WASHING AND PASSING THROUGH A ROTARY SCREEN

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DURING THE SMELTING PROCESS THE SLAG FLOATS TO THE TOP OF THE LEAD

SLAG IS GRAVITY FED OUT OF THE SMELTER AND GRANULATED – SENT TO LANDFILL

LEAD IS GRAVITY FED INTO THE REFINING KETTLES



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LEAD PASTE (Lead Sulphate - $PbSO_4$) PROCESSING

EPA REQUIREMENT IS TO MINIMISE SULPHUR CONTENT TO 1% OF SMELTER FEED AND IN TURN REDUCED SULPHUR EMISSIONS

CONVERTING the LEAD SULPHATE ($PbSO_4$) to LEAD CARBONATE ($PbCO_3$) by mixing with SODA ASH (Na_2CO_3) produces SODIUM SULPHATE (Na_2SO_4)

LEAD CARBONATE IS AN INSOLUBLE SALT AND CAN BE RECOVERED IN A FILTER PRESS TO REDUCE MOISTURE CONTENT AND RECOVER ALL THE MATERIAL

LEAD CARBONATE IS NOW DIRECTLY ADDED TO THE SMELTER FEED THROUGH A MIXER

SMELTER FEED MATERIALS

LEAD PASTE, COAL, IRON FILLINGS, BAGHOUSE DUST, SILICA(SAND),
REFINERY KETTLE DROSS

BY-PRODUCTS

MOLTEN LEAD to REFINERY KETTLES
SLAG to LANDFILL
SMELTER COMBUSTION FUME AND DUST



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LEAD GRIDS (Lead Metal 95%) PROCESSING

BATTERY CELLS ARE FORMED BY AN OPEN LATTICE LEAD GRID FILLED WITH LEAD PASTE

LEAD GRIDS ARE 95% LEAD METAL AND CAN BE EASILY BROKEN INTO NEEDLE LIKE PIECES AND GRAVITY SEPARATED

THESE LEAD NEEDLES CAN BE DIRECTLY FED TO A REFINERY KETTLE TO MELT AND RECOVER THE LEAD

PLASTICS SEPARATION AND PROCESSING

THERE ARE TWO AREAS OF PLASTIC COMPONENTS IN BATTERIES

CASINGS ARE USUALLY POLYPROPYLENE OR POLYETHYLENE
THESE CAN BE RECOVERED, GRANULATED FOR SALE

SPACERS ARE PLASTIC SHEETS WITH RUBBER CONNECTORS
DUE TO POSSIBLE LEAD CONTAMINATION THESE ARE WASTE PRODUCTS

PAPER IS A WASTE PRODUCT



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REFINING KETTLES

MOLTEN LEAD IS GRAVITY TRANSFERRED FROM THE SMELTERS TO THE REFINING KETTLES

CHEMICAL ADDITIVES CAUSE THE LEAD IMPURITIES TO FLOAT AS DROSS

DROSS CONTAINING LEAD IS SCOOPED OFF THE TOP OF THE LEAD AND SENT TO THE MIXER FOR PROCESSING

REFINED LEAD IS PUMP TRANSFERRED TO A MOULDING MACHINE TO PRODUCE LEAD INGOTS, ROBOTICALLY STACKED AFTER PASSING THROUGH A COOLING TROUGH

REFINING KETTLES FEED

MOLTEN LEAD

CHEMICAL ADDITIVES

BY-PRODUCTS

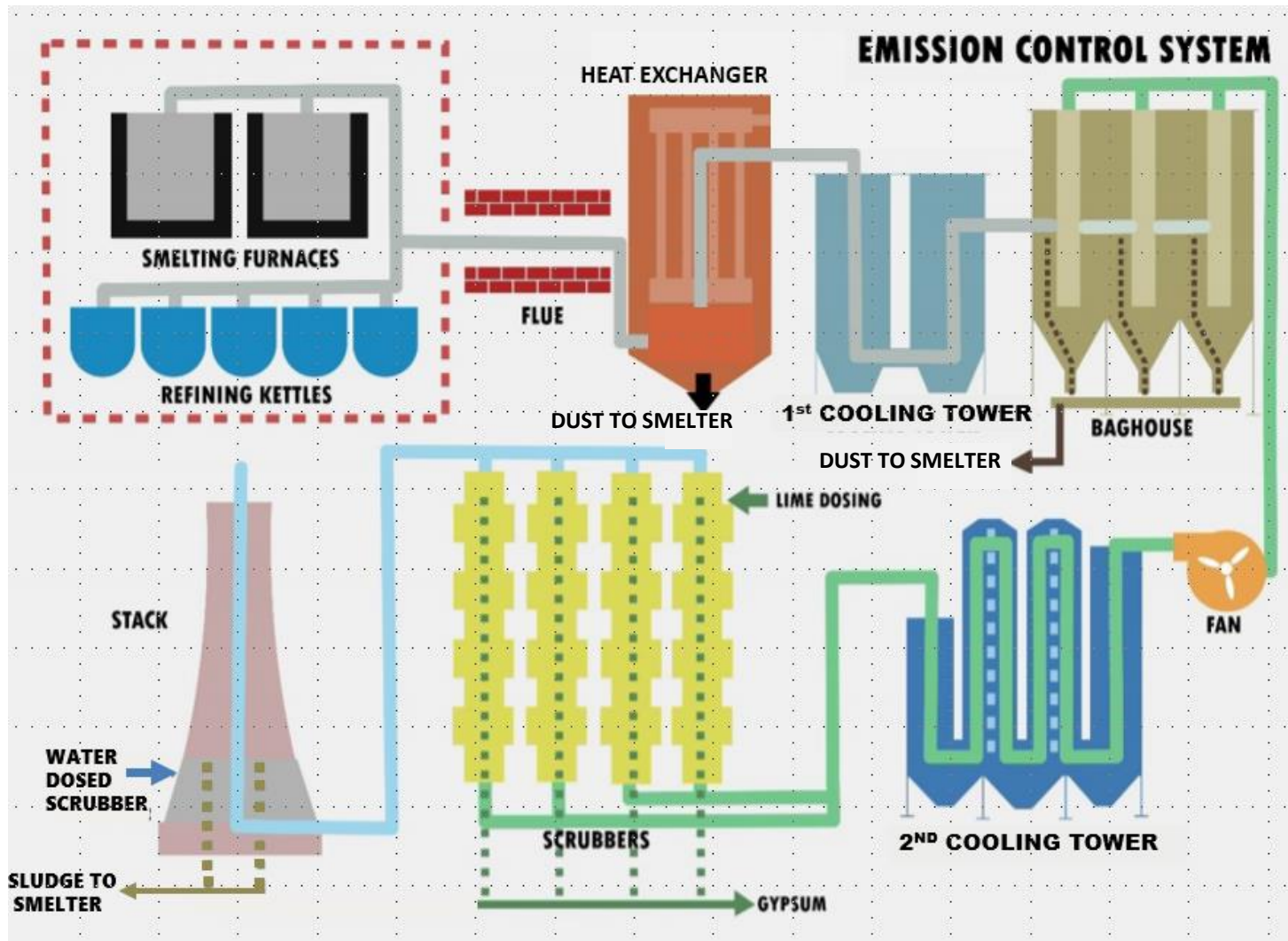
REFINED LEAD INGOTS

DROSS SENT TO MIXER



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EMISSIONS CONTROL

FUMES AND DUST FROM COMBUSTION IN THE SMELTER AND REFINING KETTLES IS COLLECTED

6 (SIX) STAGES OF POLLUTION CONTROL

HEAT EXCHANGER

1ST STAGE COOLING TOWER

BAGHOUSE (3 CHAMBERS) 50% BACKUP CAPACITY

2ND COOLING TOWER

SCRUBBERS (2 SETS) 2in Series (Total 4) 100% BACK UP CAPACITY

WATER DOSED SCRUBBER IN BOTTOM OF STACK

HEAT EXCHANGER

FORCED AIR COOLED

COOLS FUME & DUST AND HEATS THE COOLING AIR, DISCHARGE AIR TO ATMOSPHERE

AIR BLOWERS REMOVE DUST COLLECTED ON TUBES AND DEPOSITS IN HOPPERS

DUST IS RETURNED TO THE SMELTER FOR PROCESSING



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1ST COOLING TOWER

TUBED HEAT EXCHANGER

FURTHER COOLS FUMES AND DUST TO PREVENT FIRES IN THE BAGHOUSE

BAGHOUSE

FUMES AND DUST ENTER BAGHOUSE. FUME PASSES THROUGH THE BAGS AND DUST COLLECTS ON OUTSIDE OF THE BAGS

DUST IS REMOVED BY AIR PULSE INTO INSIDE BAG

BAGHOUSE DUST IS RETURNED TO THE SMELTER FOR PROCESSING

2ND COOLING TOWER

TUBED HEAT EXCHANGER

FUMES ARE FURTHER COOLED TO FACILITATE THE SCRUBBER PROCESS



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SCRUBBERS (SERIES)

COOLED FUME ENTERS THE BOTTOM OF THE SERIES SCRUBBERS

LIME SLURRY ($\text{Ca}(\text{OH})_2$) IS SPRAYED INTO THE FUME AT THE TOP OF THE SCRUBBER AND CASCADES OVER ANGLED PLATES IN THE SCRUBBER

CONVERTS THE SULPHUR DIOXIDE GAS (SO_2) TO GYPSUM (CaSO_4) AND WATER

A SECOND SERIES SCRUBBERS IS USED FOR 100% BACKUP TO MITIGATE MAINTENANCE WORK

STACK

GAS THAT PASSES THROUGH THE SCRUBBERS THEN ENTERS THE STACK

WATER DOSED SCRUBBER IN THE BOTTOM OF THE STACK COLLECTS ANY FINE DUST IN THE FUME BEFORE EXITING THE STACK

STACK SLUDGE IS SENT TO THE SMELTER FOR PROCESSING

MONITORING OF GAS AND DUST FOR ADJUSTING THE EFFICIENCY OF THE PROCESS AND DETECTING ANY POLLUTION ISSUES