Revision 2, July 2004

NATIONAL
ENRICHMENT
FACILITY

SAFETY ANALYSIS REPORT

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ACRONYMS and ABBREVIATIONS

AC	alternating current
ACI	American Concrete Institute
ADEM	Alabama Department of Environmental Management
AEA	Atomic Energy Act
AEP	American Electric Power
AEGL	Acute Exposure Guideline Level
AHU	air handling unit
AISC	American Institute of Steel Construction
ALARA	as low as reasonably achievable
ALI	Annual Limit on Intake
ANPR	Advance Notice of Proposed Rulemaking
ANS	American Nuclear Society
ANSI	American National Standards Institute
AP	air particulate
APE	area of potential effects
AQB	Air Quality Bureau
ASCE	American Society of Civil Engineers
ASLB	Atomic Safety and Licensing Board
ASME	American Society of Mechanical Engineers
ASNT	American Society of Nondestructive Testing
ASTM	American Society for Testing Materials
ATSDR	Agency for Toxic Substances and Disease Registry
AVLIS	Atomic Vapor Laser Isotope Separation
BDC	baseline design criteria
BEA	Bureau of Economic Analysis
BLM	Bureau of Land Management
BMP	Best Management Practices
BNFL	British Nuclear Fuels
BNFL-EL	British Nuclear Fuels – Enrichment Limited
BOD	biochemical oxygen demand
BS	Bachelor of Science
CA	Controlled Area
CAA	Clean Air Act
CAAS	Criticality Accident Alarm System
CAB	Centrifuge Assembly Building
CAM	Continuous Air Monitor
CAP	Corrective Action Program
CBG	Census Block Group
CEDE	Committed Effective Dose Equivalent
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFO	Chief Financial Officer
CFR	Code of Federal Regulations
CHP	certified health physicist
CIS	Commonwealth of Independent States
CM	configuration management

ACRONYMS and ABBREVIATIONS

COD	chemical oxygen demand
COO	Chief Operating Officer
CRDB	Cylinder Receipt and Dispatch Building
CUB	Central Utilities Building
CVRF	Central Volume Reduction Facility
CWA	Clean Water Act
D&D	decontamination and decommissioning
DAC	derived air concentration
DBA	design basis accident
DBE	design basis earthquake
DCF	dose conversion factor
DE	Dose Equivalent
DEIS	Draft Environmental Impact Statement
DI	deionized
DOC	United States Department of Commerce
DOE	United States Department of Energy
DOI	United States Department of Interior
DOT	United States Department of Transportation
E	east
EDE	Effective Dose Equivalent
EECP	Entry/Exit Control Point
EIA	Energy Information Administration
EIS	Environmental Impact Statement
EJ	Environmental Justice
EMS	Emergency Medical Services
EOC	Emergency Operations Center
EPA	United States Environmental Protection Agency
EPCRA	Emergency Planning and Community Right-to-Know Act
EPRI	Electric Power Research Institute
eqs.	equations
ER	Environmental Report
ERPG	Emergency Response Planning Guideline
ENE	east north east
ESE	east south east
ETTP	East Tennessee Technology Park
FEIS	Final Environmental Impact Statement
FEMA	Federal Emergency Management Agency
FHA	fire hazards analysis
FNMC	Fundamental Nuclear Material Control
FR	Federal Register
FWPCA	Federal Water Pollution Control Act
GDP	Gaseous Diffusion Plant
GET	General Employee Training
GEVS	Gaseous Effluent Vent System
GPS	Global Positioning System
HEPA	high efficiency particulate air
HEU	highly enriched uranium
HMTA	Hazardous Materials Transportation Act
HS&E	Health, Safety, and Environment

ACRONYMS and ABBREVIATIONS

HUD	United States Department of Housing and Urban Development
HVAC	heating, ventilating, and air conditioning
HWA	Hazardous Waste Act
HWB	Hazardous Waste Bureau
IAEA	International Atomic Energy Agency
ICRP	International Commission on Radiological Protection
INFL	International Nuclear Fuels Plc
I/O or I-O	input/output
IPD	Implicit Price Deflator
IROFS	items relied on for safety
ISA	Integrated Safety Analysis
ISO	International Organization for Standardization
JCIDA	Jackson County Industrial Development Authority
LAN	local area network
LCC	local control center
LCD	local climatic data
L_{dn}	Day-Night Average Sound Level
L_{eq}	Equivalent Sound Level
LES	Louisiana Energy Services
LEU	low enriched uranium
LLC	Limited Liability Company
LLD	lower limits of detection
LLNL	Lawrence Livermore National Laboratory
LLW	low-level waste
LOI	local operator interface
LQ	Location Quotients
LTA	lost time accident
LTC	load tap changer
LTTS	Low Temperature Take-off Station
M&TE	measuring and test equipment
MAPEP	Mixed Analyte Performance Evaluation Program
max.	maximum
MC&A	material control and accountability
MCL	maximum contaminant level
MCNP	Monte Carlo N-Particle
MDA	minimum detectable activity
MDC	minimum detectable concentration
ME&I	mechanical, electrical and instrumentation
min.	minimum
MM	modified mercalli
MMI	modified mercalli intensity
MOU	Memorandum of Understanding
MOX	mixed oxide fuel
MUA	multi-attribute utility analysis
N	north
NAAQS	National Ambient Air Quality Standards
NASA	National Aeronautic Space Administration
NCA	Noise Control Act
NCRP	National Council on Radiological Protection and Measurements

ACRONYMS and ABBREVIATIONS

NCS	nuclear criticality safety
NCSE	nuclear criticality safety evaluation
NDA	Non-destructive assessment
NE	Northeast
NEF	National Enrichment Facility
NEI	Nuclear Energy Institute
NEPA	National Environmental Policy Act
NESHAPS	National Emission Standards for Hazardous Air Pollutants
NFPA	National Fire Protection Association
NHPA	National Historic Preservation Act
NELAC	National Environmental Laboratory Accreditation Conference
NIOSH	National Institute of Occupational Safety and Health
NIST	National Institute of Standards and Technology
NM	New Mexico
NMAC	New Mexico Administrative Code
NMDGF	New Mexico Department of Game and Fish
NMED	New Mexico Environmental Department
NMHWB	New Mexico Hazardous Waste Bureau
NMRPR	New Mexico Radiation Protection Regulations
NMSA	New Mexico State Agency
NMSE	New Mexico State Engineer
NMSHPO	New Mexico State Historic Preservation Office
NMSLO	New Mexico State Land Office
NMSS	Nuclear Material Safety and Safeguards
NMWQB	New Mexico Water Quality Bureau
NMWQCC	New Mexico Quality Control Commission
NNE	north-northeast
NNW	north-northwest
No.	number
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NPDWS	National Primary Drinking Water Standard
NRC	United States Nuclear Regulatory Commission
NRHP	National Register of Historic Places
NSDWS	National Secondary Drinking Water Standard
NSPS	New Source Performance Standards
NSR	New Source Review
NTS	Nevada Test Site
NWS	National Weather Service
NW	northwest
OEPA	Ohio Environmental Protection Agency
ORNL	Oak Ridge National Laboratory
OSHA	Occupational Safety and Health Administration
OVEC	Ohio Valley Electric Corporation
P&IDs	piping and instrumentation diagrams
p.	page
PA	public address
PEL	Permissible Exposure Level

ACRONYMS and ABBREVIATIONS

PFPE	perfluorinated polyether
PGA	peak ground acceleration
pH	measure of the acidity or alkalinity
PHA	Process Hazard Analysis
Ph.D.	Doctor of Philosophy
PIA	Potentially Impacted Area
PLC	Programmable Logic Controllers
PM	preventive maintenance
$PM_{2.5}$	particulates $\leq$ 2.5μm
PM_{10}	particulates $\leq$ 10μm
PMF	probable maximum flood
PMP	Probable Maximum Precipitation
PMWP	Probable Maximum Winter Precipitation
PORTS	Portsmouth Gaseous Diffusion Plant
POTW	Publicly Owned Treatment Works
pp.	pages
PRC	Peoples Republic of China
PSAR	Preliminary Safety Analysis Report
PSP	Physical Security Plan
QA	quality assurance
QAPD	Quality Assurance Program Description
QC	Quality Control
RCB	Radiation Control Bureau
RCRA	Resource Conservation and Recovery Act
RCZ	radiation control zone
REIS	Regional Economic Information System
REMP	Radiological Environmental Monitoring Program
RIMS	Regional Input-Output Modeling System
ROI	Region of Interest or Radius of Influence
RTE	Rare Threatened and Endangered
RWP	radiation work permit
S	south
SAR	Safety Analysis Report
SB	Separations Building
Sc.D.	Doctor of Science
SCRAM	Support Center for Regulatory Air Models
SDWA	Safe Drinking Water Act
SE	southeast
SER	Safety Evaluation Report
SHPO	State Historic Preservation Officer
SILEX	Separation of Isotopes by Laser Excitation
SNM	special nuclear material
SPCC	spill prevention, control, and countermeasures
SPL	Sound Level Pressure
SRC	Safety Review Committee
SSC	structure, system, and component
SSE	safe shutdown earthquake
SSE	south-southeast
SSW	south-southwest

ACRONYMS and ABBREVIATIONS

STEL	short term exposure limits
STP	standard temperature and pressure
SVOC	semivolatile organic compounds
SW	southwest
SWPPP	Storm Water Pollution Prevention Plan
TDEC	Tennessee Department of Environment and Conservation
TDS	Total Dissolved Solids
TEDE	total effective dose equivalent
TLD	thermoluminescent dosimeter
TN	Tennessee
TSB	Technical Services Building
TSP	total suspended particulates
TVA	Tennessee Valley Authority
TWA	time weighted average
TWDB	Texas Water Development Board
TX	Texas
UBC	Uranium byproduct cylinder
UCL	Urenco Capenhurst Limited
UCN	Ultra-Centrifuge Netherlands NV
UNAMAP	Users Network for Applied Modeling of Air Pollution
UPS	uninterruptible power supply
US	United States
USACE	United States Army Corps of Engineers
UNSCEAR	United Nations Scientific Committee on the Effects of Atomic Radiation
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
UV	ultravoilet
VOC	volatile organic compound
W	West
WCS	Waste Control Specialists
WIPP	Waste Isolation Pilot Plant
WMA	wildlife management area
WNA	World Nuclear Association
WNW	west-northwest
WQB	Water Quality Bureau
WQCC	Water Quality Control Commission
WSW	west-southwest

UNITS OF MEASURE

Bq	Becquerel
BTU	british thermal unit
°C	degrees celsius
Ci	curie
cm	centimeter
d	day
dB	decibel
dBA	decibel A-weighted
dpm	disintegrations per minute
°F	degrees farenheit
ft	feet
g	gram
g_a	gravitational acceleration
gal	gallon
gpm	gallons per minute
Gy	Gray
ha	hectares
hp	horsepower
hr	hour
Hz	hertz (cycle per second)
in	inch
in. H_2O	inches of water (column)
J	Joule
kg	kilogram
km	kilometer
kWh	kilowatt-hour
L	liter
lb	pound
lbs	pounds
m	meter
mbar abs	millibar absolute
mbarg	millibar gauge
MBq	megabecquerel
mi	mile
min	minute
M_N	local magnitude
Mo	month
msl	mean sea level
MT or t	metric ton
MTU	Metric ton uranium
oz	ounce
Pa	pascal
ppb	parts per billion
ppm	parts per million
psia	pounds per square inch absolute
psig	pounds per square inch gauge
R	Roentgen
rad	radiation absorbed dose
rem	Roentgen equivalent man

UNITS OF MEASURE

scfm	standard cubic feet per minute
s	second
Sv	sievert
SWU	separative work unit
µmhos	micromhos
V	volt
VA	volt-ampere
W	watt
$^{w}/_{o}$	weight percent
χ/Q	atmospheric concentration per unit source
yd	yard
yr	year
σ	standard deviation

Pico (p)	X 10^{-12}
Nano (n)	X 10^{-9}
Micro (µ)	X 10^{-6}
Milli (m)	X 10^{-3}
Centi (c)	X 10^{-2}
Kilo (k)	X 10^{3}
Mega (M)	X 10^{6}

VALVES

1.3.1	IN-LINE MANUAL VALVE TYPE OR PATTERN NOT SPECIFIED (BASIC SYMBOL)
1.3.2	IN-LINE MANUAL VALVE TYPE OR PATTERN NOT SPECIFIED (BASIC SYMBOL FLANGED)
1.3.3	MANUAL GLOBE VALVE
1.3.4	MANUAL BALL VALVE
1.3.5	MANUAL NEEDLE VALVE
1.3.6	MANUAL ANGLE VALVE
1.3.7	MANUAL ANGLE VALVE WITH BELLOWS
1.3.8	MANUAL GATE VALVE
1.3.9	MANUAL DIAPHRAGM VALVE
1.3.10	MANUAL BUTTERFLY VALVE
1.3.11	MANUAL CONTROL VALVE (ARROW INDICATED CONTROL FUNCTION AND CAN BE ADDED TO ANY VALVE TYPE)
1.3.12	MANUAL CONTROL VALVE ANGLE TYPE
1.3.13	SPRING OPERATED ANGLE PRESSURE RELIEF VALVE
1.3.14	THREE WAY VALVE
1.3.15	FOUR WAY VALVE
1.3.16	FLOAT OPERATED VALVE
1.3.17	PRESSURE REDUCER
1.3.18	NON RETURN VALVE (FLOW LEFT TO RIGHT)
1.3.19	FLOW DIVERTER (BALL TYPE)
PR172	3-WAY BALL VALVE
PR173	4-WAY BALL VALVE
PR177	ANGLE GLOBE VALVE
PR181	PLUG VALVE
PR183	3-WAY PLUG VALVE
PR185	4-WAY PLUG VALVE
PR191	DELUGE VALVE
PR191	FUSIBLE LINK VALVE
PR191	HOSE VALVE
PR189	PINCH VALVE
PR187	QUICK OPEN VALVE
PR187	Y BLOW DOWN VALVE
PR197	Y GLOBE VALVE
PR196	WAFER CHECK VALVE
PR198	ANGLE CHECK VALVE
PR199	SWING CHECK VALVE
PR175	STOP CHECK - VALVE OPEN
PR184	ALARM CHECK
PR100	KNIFE GATE VALVE
PR100A	SLIDE GATE VALVE
PR141	DRY PIPE VALVE
PR211	BACKFLOW PREVENTER

VALVES (cont'd)

PR215	DIVERTER VALVE
PR148	TANDEM BLOWDOWN VALVE
PR101E	ROTARY VALVE
PR233	3-WAY MID PORT CLOSED (MIDCLOSE)
PR233A	3-WAY MID PORT CLOSED (SIDECLOSE)
PR234	CAMFLEX VALVE
PR235	TRIPLE DUTY VALVE
PR236	BALANCE/CIRCUIT SETTER VALVE
PR236	HIGH PURITY UPSTREAM PURGE POINTS
PR237A	HIGH PURITY DOWNSTREAM PURGE POINTS
PR237B	HIGH PURITY UPSTREAM AND DOWNSTREAM PURGE POINTS

PIPING LINE FEATURES & GENERAL EQUIPMENT

1.2.1	CONCENTRIC REDUCER
1.2.2	ECCENTRIC REDUCER (FLUSH TOP)
1.2.3	ECCENTRIC REDUCER (FLUSH BOTTOM)
1.2.4	FLEXIBLE PIPE OR BELLOWS (FLANGED)
1.2.5	SPRAY
1.2.6	SPRAY BAR
1.2.7	SIGHT FLOW INDICATOR
1.2.8	SIPHON DRAIN
1.2.9	VENT TO ATMOSPHERE
1.2.11	STRAINER OR FILTER (BASIC SYMBOL)
1.2.11	STRAINER 'Y' TYPE (FLANGED)
1.2.12	STRAINER BUCKET TYPE (FLANGED)
1.2.13	TRAP DRAIN (eg. CONDENSATE RELEASE)
1.2.14	TRAP VENT (eg. AUTOMATIC AIR VENT)
1.2.15	DRAIN
1.2.16	BURSTING DISC (FLANGE AND PIPE MAY BE ADDED TO OUTLET IF REQUIRED)
1.2.17	WEIGHING DEVICE (INCLUDING LOAD CELLS)
1.2.18	STACK
1.2.19	FLANGE
1.2.21	BLANK FLANGE
1.2.21	KLEIN COUPLING (KF FLANGE)

PIPING LINE FEATURES & GENERAL EQUIPMENT (cont'd)

1.2.22	VACUUM FLANGE (WITH TEST CONNECTION) UCL ONLY
1.2.23	VACUUM FLANGE UCL ONLY (WITHOUT TEST CONNECTION)
1.2.24	ORIFICE PLATE
1.2.25	VENTURI
1.2.26	SCREWED END CAP
1.2.27	WELDED END CAP
1.2.28	HOSE CONNECTOR
1.2.29	QUICK RELEASE COUPLING
1.2.30	POINT OF CHANGE OF MATERIAL OR SYSTEM RESPONSIBILITY
1.2.31	AREA OR PACKAGE BOUNDARY
1.2.32	ARROW FOR INLET OR OUTLET AT CONTINUATION INTERFACE
1.2.33	INTERFACE OF QUALITY REQUIREMENTS (QS) UD ONLY
1.2.34	INTERFACE OF SUB SYSTEM (F1) UD ONLY
1.2.35	INTERFACE OF FUNCTION UNIT (F3) UD ONLY
1.2.36	INTERFACE OF COMPONENT UD ONLY
1.2.37_LGE	LINE CONTINUATION
PR032	TEMPORARY STRAINER
PR033	GENERIC COMPONENT
PR034	FLAME ARRESTER
PR035	REMOVABLE SPOOL PIECE
PR053	ROTATING SPRAY BALL
PR054	FIXED SPRAY BALL
PR056B	SIGHT GLASS LIGHT
PR058	EXPANSION JOINT
PR188	DUST COLLECTION HOSE
PR184	START-UP STRAINER
PR063	SIMPLEX STRAINER
PR064	DUPLEX STRAINER
PR066	Y STRAINER WITH VALVE

PIPING LINE FEATURES & GENERAL EQUIPMENT (cont'd)

PR165A	T STRAINER
PR155	AIR INLET FILTER
PR157	BASKET FILTER
PR158	BASKET FILTER WITH DRAIN VALVE
PR241	LOOP SEAL
PR108	VORTEX BREAKER
PR142	VENT TO ATMOSPHERE
PR141	VENT THRU ROOF
PR143	VENT THRU ROOF WITH COVER
PR211	SAFETY SHOWER & EYE WASH
PR195	VESSEL INSULATION X" DENOTES THICKNESS
PR131A	INSULATION ELECTRIC TRACED
PR131B	INSULATION STEAM TRACED

PIPE LINES

1.1.1	PROCESS LINES
1.1.2	HEAT TRACED PROCESS LINE (A1 DENOTES TRACING SYSTEM)
1.1.3	INSTRUMENT SIGNAL LINE
1.1.4	LINE CONNECTION
1.1.5	LINE CROSSING - UNCONNECTED (SECONDARY LINE BROKEN, VERTICAL LINE BROKEN WHERE PRIMARY LINES CROSS)
1.1.6	DIRECTION OF FLOW
1.1.7	INDICATION OF FALL
1.1.8	INSULATED PROCESS LINE
1.1.9	VACUUM INSULATED LINE
1.1.11	STREAM NUMBER

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FIGURE LEGEND

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VESSEL & TANKS

1.6.1	PRESSURE VESSEL (BASIC SYMBOL)
1.6.2	PACKED VESSEL (BASIC SYMBOL)
1.6.3	AUTOCLAVE
1.6.4	OPEN TANK
1.6.5	TANK WITH REMOVABLE COVER
1.6.6	CLOSED TANK
1.6.7	INSULATED VESSEL
1.6.8	VACUUM INSULATED VESSEL
1.6.9	VESSEL WITH JACKET
1.6.11	BARREL OR DRUM
1.6.11	GAS CYCLINDER
1.6.12	STIRRING DEVICE
1.6.13	ION EXCHANGE FILTER
PR217	DISHED BOTTOM

HEAT TRANSFER EQUIPMENT

1.5.1	HEAT EXCHANGER (BASIC SYMBOL)
1.5.2	HEAT EXCHANGER (BASIC SYMBOL)
1.5.3	HEATING / COOLING COIL (BASIC SYMBOL)
1.5.4	HEATING ELEMENT (el DENOTES ELECTRICAL)
1.5.5	VESSEL WITH EXTERNAL HEATING / COOLING COIL
1.5.6	VESSEL WITH INTERNAL HEATING / COOLING COIL
1.5.7	VESSEL WITH HEATING / COOLING JACKET
1.5.8	SHELL AND TUBE HEAT EXCHANGER
1.5.9	PLATE HEAT EXCHANGER
1.5.11	HEATING / COOLING COIL
1.5.11	FINNED TUBE HEAT EXCHANGER
1.5.12	COOLING TOWER FORCED DRAUGHT FANS INCLUDED AS APPROPRIATE (BASIC SYMBOL)

TRANSPORT EQUIPMENT

PR136	TANK CAR
PR137	TANK TRUCK

OTHER EQUIPMENT

PR198	PULSATION DAMPENER
PR111	EJECTOR
PR126	SPRAY DESUPERHEATER
PR139	STATIC MIXER
PR140	EDUCTOR MIXER
1.7.6_LGE	FILTER PRESS

PUMPS & COMPRESSOR

1.7.1	PUMP (LIQUID) (BASIC SYMBOL)
1.7.2	COMPRESSOR (BASIC SYMBOL)
1.7.3	CENTRIFUGAL PUMP
3.1.1	VACUUM PUMP (TYPE NOT SPECIFIED)
3.1.2	SLIDING VANE ROTARY VACUUM PUMP
3.1.3	ROOTS VACUUM PUMP
3.1.4	HIGH PRESSURE COMPRESSOR
3.1.5	DIFFUSION PUMP
3.1.6	GETTER PUMP
PR102	CENTRIFUGAL (SIDE DISCHARGE)
PR103	ROTARY WITH PRESSURE RELIEF
PR104	SUMP
PR104A	SUMP WITH SUBMERSIBLE MOTOR
PR105	METERING
1.7.4_LGE	AIR DIAPHRAGM
PR134	SINGLE DIAPHRAGM

PUMPS & COMPRESSOR (cont'd)

PR110	ROTARY
PR133	RECIPROCATION COMPRESSOR
PR107	VACUUM PUMP
PR135	PROGRESSIVE CAVITY

VACUUM EQUIPMENT

3.2.1	OIL TRAP
3.2.2	ADSORPTION TRAP (BASIC SYMBOL)
3.2.3	UF6 CYLINDER 30" AND 48"
3.2.4	SAMPLE BOTTLE
3.2.5	LIQUID NITROGEN DEWAR
3.2.6	FILTER CARTRIDGE HOLDER
3.2.7	FILTER CARTRIDGE HOLDER WITH FILTER
3.2.8	MONOBED FILTER
3.2.9	MIXED-BED FILTER
3.2.10	ABSORPTION FILTER (OIL COLLECTION)
3.2.11	COLD TRAP

OTHER EQUIPMENT

2.1.9	ROLL AIR FILTER
2.1.11	SILENCER
2.1.11	AIR COOLER
2.1.12	AIR HEATER
2.1.13	FAN (BASIC SYMBOL)
2.1.14	AXIAL FAN
2.1.15	CENTRIFUGAL FAN
2.1.1	DAMPER SINGLE LEAF
2.1.2	DAMPER MULTI LEAF PARALLEL BLADE
2.1.3	DAMPER MULTI LEAF OPPOSED BLADE
2.1.4	NON RETURN DAMPER
2.1.5	AIR FILTER
2.1.6	HIGH EFFICIENCY AIR FILTER
2.1.7	ACTIVATED CARBON AIR FILTER
2.1.8	ELECTROSTATIC AIR FILTER
1.7.5_LGE	CENTRIFUGE

NOZZLES

1.7.5_LGE	SIDE ENTRY
PR101B	FLANGED
PR101C	FLANGED (6" AND GREATER)
PR101D	MANWAY

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FIGURE LEGEND

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INSTRUMENT VALVE ACTUATORS

1.4.1	MANUAL ACTUATING ELEMENT
1.4.2	PNEUMATICALLY OPERATED ACTUATING ELEMENT
1.4.3	PNEUMATICALLY OPERATED ACTUATING ELEMENT (VALVE CLOSES ON FAILURE OF ACTUATING ENERGY)
1.4.4	PNEUMATICALLY OPERATED ACTUATING ELEMENT (VALVE OPEN ON FAILURE OF ACTUATING ENERGY)
1.4.5	PNEUMATICALLY OPERATED ACTUATING ELEMENT (VALVE RETAINS POSITION ON FAILURE OF ACTUATING ENERGY)
1.4.6	PRESSURE REGULATOR SELF CONTAINED
1.4.6	BACK PRESSURE REDUCING REGULATOR (SELF CONTAINED)
1.4.7	MOTOR OPERATED ACTUATING ELEMENT
PR015	DIAPHRAGM ACTUATOR
PR016	DIAPHRAGM ACTUATOR AIR TO CLOSE
PR017	DIAPHRAGM ACTUATOR AIR TO OPEN
PR018	CYLINDER ACTUATOR
PR019	CYLINDER ACTUATOR AIR TO CLOSE
PR020	CYLINDER ACTUATOR AIR TO OPEN
PR021	PRESSURE REGULATOR VALVE (WITH EXTERNAL PRESSURE TAP)
PR023	DIAPHRAGM ACTUATOR WITH FLOAT
PR024	DIFFERENTIAL PRESSURE REGULATOR
PR025	3-WAY SOLENOID
PR193	FAIL ACTION DIRECTION ARROW
PR026	4-WAY SOLENOID
PR027	DIGITAL ACTUATOR
PR010	DIFFERENTIAL PRESSURE ACTUATOR
PR010	SPRING ACTUATOR
PR045	HAND ACTUATOR ON PNEUMATIC
PR151	ELECTROHYDRAULIC ACTUATOR
PR153	CAMFLEX ACTUATOR
PR152	ROTARY MOTOR

IN–LINE INSTRUMENTS

PR002	POSITIVE DISPLACEMENT FLOW INDICATOR
PR003	TURBINE OR PROPELLER TYPE PRIMARY ELEMENT
PR004	PITOT TYPE SENSOR
PR005	VORTEX SENSOR
PR013	RESTRICTION ORIFICE (FLANGED)
PR014	ORIFICE UNION (SCREWED)
PR174	QUICK CHANGE ORIFICE INSTRUMENT
PR174	SINGLE PORT PITOT TUBE INSTRUMENT
PR176	DOUBLE PORT PITOT TUBE INSTRUMENT
PR177	DIAPHRAGM SEAL
PR208	PIG TAIL
PR192	THERMOWELL
PR192	FLUME INSTRUMENT
PR179	WEIR INSTRUMENT
PR180	FLOW VANE INSTRUMENT
PR006	PRESSURE RELIEF RUPTURE DISK
PR006A	VACUUM RELIEF RUPTURE DISK
PR007	CHEMICAL SEAL
PR131A	PRESSURE RELIEF VALVE
PR131B	ANGLE VACUUM RELIEF VALVE
PR131C	PRESSURE & VACUUM RELIEF VALVE
PR011	PSV CONSERVATION VENT (PRESSURE SAFETY VACUUM)
PR181	XX VARIABLE FLOW INSTRUMENT (ROTAMETER)

INSTRUMENTS

4.1.1	DISPLAYED ON EQUIPMENT OR IN PROCESS LINE
4.1.2	DISPLAYED IN LOCAL PANEL
4.1.3	DISPLAYED IN CONTROL ROOM
4.2.1	DISPLAYED ON EQUIPMENT OR IN PROCESS LINE (VALVE)
4.2.2	DISPLAYED IN LOCAL PANEL (VALVE)
4.2.3	DISPLAYED IN CONTROL ROOM (VALVE)
4.1.4_LGE	PILOT LIGHT FIELD MOUNTED
4.1.5_LGE	GROUP CONTROL – REAR OF CONTROL ROOM PANEL

ISO LETTER CODE FOR IDENTIFICATION OF INSTRUMENT FUNCTIONS FROM ISO 3511 PT1

1	2	3	4
	FIRST LETTER		
	MEASURED OR INITIATING VARIABLE	MODIFIER	SUCCEEDING LETTER
A			ALARM
B			
C			CONTROLLING
D	DENSITY	DIFFERENCE	
E	ALL ELECTRICAL VARIAIBLES		
F	FLOW RATE	RATIO	
G	GAUGING, POSITION, OR LENGTH		
H	HAND (MANUALLY INITIATED) OPERATED		
I			INDICATING
J		SCAN	
K	TIME ORTIME PROGRAM		
L	LEVEL		
M	MOISTURE OR HUMIDITY		
N	USER'S CHOICE		
O	USER'S CHOICE		
P	PRESSURE OR VACUUM		
Q	QUANTITY FOR EXAMPLE ANALYSIS, CONCENTRATION, CONDUCTIVITY	INTEGRATE OR TOTALIZE	INTEGRATING OR SUMMATING
R	NUCLEAR RADIATION		RECORDING
S	SPEED OR FREQUENCY		SWITCHING
T	TEMPERATURE		TRANSMITTING
U	MULTIVARIABLE		
V	VISCOSITY		
W	WEIGHT OR FORCE		
X	USER'S CHOICE		
Y	USER'S CHOICE		
Z			
α		ALPHA	
β		BETA	
γ		GAMMA	

ALL LETTER CODES SHALL BE IN UPPER CASE WITH THE EXCEPTION OF MODIFIERS IN COLUMN 3, THESE SHALL BE IN LOWER CASE.

2

LOCKWOOD GREENE
A J.A. JONES COMPANY
ENGINEERING & CONSTRUCTION
Spartanburg, South Carolina

REFERENCE NUMBER
0000–M–0003

FIGURE LEGEND
PIPING AND INSTRUMENTATION DIAGRAM
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1.0 GENERAL INFORMATION

This section contains a general description and purpose of the Louisiana Energy Services (LES) National Enrichment Facility (NEF). The facility enriches uranium for producing nuclear fuel for use in commercial power plants. This Safety Analysis Report (SAR) follows the format recommended by NUREG-1520, Standard Review Plan for the Review of a License Application for a Fuel Cycle Facility (NRC, 2002). The level of detail provided in this chapter is appropriate for general familiarization and understanding of the facility and processes. The information is to be used as background for the more detailed descriptions provided in other chapters of the license application. Cross-references to the more detailed descriptions are provided in this chapter. This chapter also provides information on the corporate structure and economic qualifications of LES.

1.1 FACILITY AND PROCESS DESCRIPTION

The NEF, a state–of–the–art process plant, is located in southeastern New Mexico in Lea County approximately 0.8 km (0.5 mi) west of the Texas state border. This location is approximately 8 km (5 mi) due east of Eunice and 32 km (20 mi) south of Hobbs.

The geographic location of the facility is shown on Figures 1.1-1, State Map, and 1.1-2, County Map.

This uranium enrichment plant is based on a highly reliable gas centrifuge process. The plant is designed to separate a feed stream containing the naturally occurring proportions of uranium isotopes into a product stream - enriched in the uranium-235 (^{235}U) isotope and a tails stream - depleted in the ^{235}U isotope. The process, entirely physical in nature, takes advantage of the tendency of materials of differing density to segregate in the force field produced by a centrifuge. The chemical form of the working material of the plant, uranium hexafluoride (UF_6), does not require chemical transformations at any stage of the process. This process enriches natural UF_6, containing approximately 0.711% ^{235}U to a UF_6 product, containing ^{235}U enriched up to 5 $^{w}/_{o}$.

The nominal capacity of the facility is 3 million separative work units (SWU) per year. The maximum gross output of the facility is slightly greater than 3 million SWU thus allowing for a production margin for centrifuge failures and occasional production losses during the operational lifetime of the facility.

Feed is received at the plant in specially designed cylinders containing up to 12.7 MT (14 tons) of UF_6. The cylinders are inspected and weighed in the Cylinder Receipt and Dispatch Building (CRDB) and transferred to the main process facility, the Separations Building. Separation operations are divided among three Separations Building Modules, each capable of handling approximately one-third of plant capacity. Each Separations Building Module is divided into two Cascade Halls, and each Cascade Hall is comprised of eight cascades. Therefore, the total plant is comprised of 48 cascades. Each Cascade Hall produces enriched UF_6 at a specified assay ($^{w}/_{o}$ ^{235}U), so up to six different assays can be produced at one time.

The enrichment process, housed in the Separations Building, is comprised of four major elements: a UF_6 Feed System, a Cascade System, a Product Take-off System, and a Tails Take-off System. Other product related functions include the Product Liquid Sampling and Product Blending Systems. Supporting functions include sample analysis, equipment decontamination and rebuild, liquid effluent treatment and solid waste management.

The major equipment used in the UF_6 feed process are Solid Feed Stations. Feed cylinders are loaded into Solid Feed Stations; vented for removal of light gases, primarily air and hydrogen fluoride (HF), and heated to sublime the UF_6. The light gases and UF_6 gas generated during feed purification are routed to the Feed Purification Subsystem where the UF_6 is desublimed.

The major pieces of equipment in the Feed Purification Subsystem are UF_6 Cold Traps, a Vacuum Pump/Chemical Trap Set, and a Low Temperature Take-off Station (LTTS). The Feed Purification Subsystem removes any light gases such as air and HF from the UF_6 prior to introduction into the cascades. The UF_6 is captured in UF_6 Cold Traps and ultimately recycled as feed, while HF is captured on chemical traps.

After purification, UF_6 from the Solid Feed Stations is routed to the Cascade System. Pressure in all process lines is subatmospheric.

Gaseous UF_6 from the Solid Feed Stations is routed to the centrifuge cascades. Each centrifuge has a thin-walled, vertical, cylindrically shaped rotor that spins around a central post within an outer casing. Feed, product, and tails streams enter and leave the centrifuge through the central post. Control valves, restrictor orifices, and controllers provide uniform flow of product and tails.

Depleted UF_6 exiting the cascades is transported from the high vacuum of the centrifuge for desublimation into Uranium Byproduct Cylinders (UBCs) at subatmospheric pressure. The primary equipment of the Tails Take-off System is the vacuum pumps and the Tails Low Temperature Take-off Stations (LTTS). Chilled air flows over cylinders in the Tails LTTS to effect the desublimation. Filling of the cylinders is monitored with a load cell system, and filled cylinders are transferred to an outdoor storage area (UBC Storage Pad).

Enriched UF_6 from the cascades is desublimed in a Product Take-off System comprised of vacuum pumps, Product Low Temperature Take-off Stations (LTTS), UF_6 Cold Traps, and Vacuum Pump/Chemical Trap Sets. The pumps transport the UF_6 from the cascades to the Product LTTS at subatmospheric pressure. The heat of desublimation of the UF_6 is removed by cooling air routed through the LTTS. The product stream normally contains small amounts of light gases that may have passed through the centrifuges. Therefore, a UF_6 Cold Trap and Vacuum Pump/Trap Set are provided to vent these gases from the product cylinder. Any UF_6 captured in the cold trap is periodically transferred to another product cylinder for use as product or blending stock. Filling of the product cylinders is monitored with a load cell system, and filled cylinders are transferred to the Product Liquid Sampling System for sampling.

Sampling is performed to verify product assay level ($^{w}/_{o}$ ^{235}U). The Product Liquid Sampling Autoclave is an electrically heated, closed pressure vessel used to liquefy the UF_6 and allow collection of a sample. The autoclave is fitted with a hydraulic tilting mechanism that elevates one end of the autoclave so that liquid UF_6 pours into a sampling manifold connected to the cylinder valve. After sampling, the autoclave is brought back to the horizontal position and the cylinder is indirectly cooled by water flowing through coils located on the outer shell of the autoclave.

LES customers may require product at enrichment levels other than that produced by a single Cascade Hall. Therefore, the plant has the capability to blend enriched UF_6 from two donor cylinders of different assays into a product receiver cylinder. The Product Blending System is comprised of Blending Donor Stations for the two donor cylinders and a Blending Receiver Station for the receiver cylinder. The Donor Stations are similar to the Solid Feed Stations described earlier. The Receiver Station is similar to the Low-Temperature Take-off Stations described earlier.

Support functions, including sample analysis, equipment decontamination and rebuild, liquid effluent treatment and solid waste management are conducted in the Technical Services Building (TSB). Decontamination, primarily of pumps and valves, uses solutions of citric acid. Sampling includes a Chemical Laboratory for verifying product UF_6 assay, and an Environmental Monitoring Laboratory. Liquid effluent is collected and treated and monitored before discharge to the Treated Effluent Evaporation Basin, a double-lined evaporative basin with leak detection.

1.1.1 Facility Location, Site Layout, And Surrounding Characteristics

Site features are well suited for the location of a uranium enrichment facility as evidenced by its favorable conditions of hydrology, geology, seismology and meteorology as well as good transportation routes for transporting feed and product by truck.

The facility is located on approximately 220 ha (543 acres) of land in Section 32 of Lea County, New Mexico. The Separations Building Modules, Administration Building, Cylinder Receipt and Dispatch Building, Centrifuge Assembly Building, Central Utilities Building, Technical Services Building, and UBC Storage Pad are located approximately in the center of the Section on 73 ha (180 acres) of developed area. A Plot Plan of the facility is shown in Figure 1.1-3, Plot Plan (1 Mile Radius). The Facility Layout (Site Plan) depicting the Site Boundary and Controlled Area Boundary is shown in Figure 1.1-4, Facility Layout (Site Plan) with Site Boundary and Controlled Access Area Boundary.

The site lies along the north side of New Mexico Highway 234. It is relatively flat with slight undulations in elevation ranging from 1,033 to 1,061 m (3,390 to 3,430 ft) above mean sea level (msl). The overall slope direction is to the southwest. A barbed wire fence runs along the east, south and west property lines. The fence along the north property line has been dismantled. A 254-mm (10-in) diameter, underground carbon dioxide pipeline owned by Trinity Pipeline LLC, traverses the site from southeast to northwest. A 406-mm (16-in) diameter, underground natural gas pipeline, owned by the Sid Richardson Energy Services Company, is located along the south property line, paralleling New Mexico Highway 234.

The nearest community is Eunice, approximately 8 km (5 mi) from the site. There are no residences, schools, stores or other population centers within a 1.6 km (1 mi) radius of the site.

Additional details of proximity to nearby populations are provided in the Environmental Report.

1.1.2 Facilities Description

The major structures and areas of the facility are outlined below.

<u>Separations Building Modules</u>

The overall layout of a Separations Building Module is presented in Figures 1.1-5 through 1.1-7 and the UF_6 Handling Area is shown in Figure 1.1-8, UF_6 Handling Area Equipment Location. The facility includes three identical Separations Building Modules. Each module consists of two Cascade Halls, each having eight cascades with each cascade having hundreds of centrifuges. Each Cascade Hall is capable of producing approximately 500,000 SWU per year. The major functional areas of the Separations Building Modules are:

- Cascade Halls (2)
- Process Services Area
- UF_6 Handling Area

Source material and special nuclear material (SNM) are used or produced in this area. Additional details of the Separations Building Modules are provided in Chapter 3, Integrated Safety Analysis Summary.

Technical Services Building

The overall layout of the Technical Services Building (TSB) is presented in Figures 1.1-9, Technical Services Building First Floor, and 1.1-10, Technical Services Building Second Floor. The TSB contains support areas for the facility. It also acts as the secure point of entry to the Separations Building Modules and the Cylinder Receipt and Dispatch Building (CRDB). The major functional areas of the TSB are:

- Solid Waste Collection Room
- Vacuum Pump Rebuild Workshop
- Decontamination Workshop
- Ventilated Room
- Cylinder Preparation Room
- Mechanical, Electrical and Instrumentation (ME&I) Workshop
- Liquid Effluent Collection and Treatment Room
- Laundry
- TSB Gaseous Effluent Vent System (GEVS) Room
- Mass Spectrometry Laboratory
- Chemical Laboratory
- Environmental Monitoring Laboratory
- Truck Bay/Shipping and Receiving Area
- Medical Room
- Radiation Monitoring Control Room
- Break Room
- Control Room
- Training Room
- Security Alarm Center

Source material and SNM are found in this area. Additional details of the TSB are provided in Chapter 3, Integrated Safety Analysis Summary.

Centrifuge Assembly Building

This building is used to assemble centrifuges before they are moved into the Separations Building and installed in the cascades. The overall layout of the Centrifuge Assembly Building (CAB) is presented in Figures 1.1-11 through 1.1-13. The Centrifuge Assembly Building is located adjacent to the Cylinder Receipt and Dispatch Building. The major functional areas of the CAB are:

- Centrifuge Component Storage Area
- Centrifuge Assembly Area

- Assembled Centrifuge Storage Area
- Centrifuge Test Facility
- Centrifuge Post Mortem Facility

Source material and SNM are used and produced in this area. Additional details of the Centrifuge Assembly Building are provided in Chapter 3, Integrated Safety Analysis Summary.

Administration Building

The general office areas and Entrance Exit Control Point (EECP) are located in the Administration Building, Figure 1.1-14, Administration Building. All personnel access to the facility occurs at this location. Vehicular traffic passes through a security checkpoint before being allowed to park. Parking is located outside of the Controlled Access Area (CAA) security fence. Personnel enter the Administration Building and general office areas via the main lobby.

Personnel requiring access to facility areas or the CAA must pass through the EECP. The EECP is designed to facilitate and control the passage of authorized facility personnel and visitors.

Entry to the facility area from the Administration Building is only possible through the EECP. Additional details of the Administration Building are provided in Chapter 3, Integrated Safety Analysis Summary.

Security Building

The main site Security Building is located at the entrance to the plant. It functions as a security checkpoint for incoming and outgoing vehicular traffic. Employees, visitors and trucks that have access approval are screened at this location.

A guard house is located at the secondary site entrance on the west side of the site. Common carriers, such as mail delivery trucks, are screened at this location.

Additional details of the Security Building are provided in Chapter 3, Integrated Safety Analysis Summary.

Cylinder Receipt and Dispatch Building

The overall layout of the Cylinder Receipt and Dispatch Building (CRDB) is presented in Figures 1.1-15, Cylinder Receipt and Dispatch Building First Floor Part A, and 1.1-16, Cylinder Receipt and Dispatch Building First Floor Part B. The CRDB is located between two Separations Building Modules, adjacent to the Blending and Liquid Sampling Area. This building contains equipment to receive, inspect, weigh and temporarily store cylinders of feed UF_6 sent to the plant; temporarily store, inspect, weigh, and ship cylinders of enriched UF_6 to facility customers; receive, inspect, weigh, and temporarily store clean empty product and UBCs prior to being filled in the Separations Building; and inspect, weigh, and transfer filled UBCs to the UBC Storage Pad. The functions of the Cylinder Receipt and Dispatch Building are:

- Loading and unloading of cylinders
- Inventory weighing
- Storage of protective cylinder overpacks

- Storage of clean empty and empty UBCs
- Buffer storage of feed cylinders

Source and SNM are used in this area. Additional details of the Cylinder Receipt and Dispatch Building are provided in Chapter 3, Integrated Safety Analysis Summary.

Blending and Liquid Sampling Area

The Blending and Liquid Sampling Area is adjacent to the CRDB and is located between two Separations Building Modules. The Blending and Liquid Sampling Area is shown in Figure 1.1-17, Blending and Liquid Sampling Area First Floor.

The primary function of the Blending and Liquid Sampling Area is to provide means to fill ANSI N14.1 (ANSI, applicable version) Model 30B cylinders with UF_6 at a required ^{235}U enrichment level and to liquefy, homogenize and sample 30B cylinders prior to shipment to the customer. The area contains the major components associated with the Product Liquid Sampling System and the Product Blending System.

SNM is used in this area. Additional details on these systems are provided in Chapter 3, Integrated Safety Analysis Summary.

UBC Storage Pad

The facility utilizes an area outside of the CRDB, the UBC Storage Pad, for storage of cylinders containing UF_6 that is depleted in ^{235}U. The cylinder contents are stored under vacuum in corrosion-resistant ANSI N14.1 (ANSI, applicable version) Model 48Y cylinders. The UBC Storage Pad is described in detail in Chapter 3, Integrated Safety Analysis Summary.

The UBC storage area layout is designed for moving the cylinders with a small truck and a crane. A flatbed truck moves the UBCs from the CRDB to the UBC Storage Pad entrance. A double girder gantry crane removes the cylinders from the flatbed truck and places them in the UBC Storage Pad. The gantry crane is designed to double stack the cylinders in the storage area.

Source material is used in this area.

Central Utilities Building

The Central Utilities Building (CUB) is shown on Figure 1.1-18, Central Utilities Building. The Central Utilities Building houses two diesel generators, which provide the site with standby power. The rooms housing the diesel generators are constructed independent of each other with adequate provisions made for maintenance, equipment removal and equipment replacement, by including roll-up access doors. The Standby Diesel Generator System is discussed in Chapter 3.5.10. The building also contains Electrical Rooms, an Air Compressor Room, a Boiler Room and Cooling Water Facility.

Visitor Center

A Visitor Center is located outside of the Controlled Access area.

1.1.3 Process Descriptions

This section provides a description of the various processes analyzed as part of the Integrated Safety Analysis. A brief overview of the entire enrichment process is provided followed by an overview of each major process system. Additional details are provided in Chapter 3, Integrated Safety Analysis Summary.

1.1.3.1 Process Overview

The enrichment process at the NEF is basically the same process described in the SAR for the Claiborne Enrichment Center (LES, 1991). The Nuclear Regulatory Commission (NRC) staff documented its review of the Claiborne Enrichment Center license application and concluded that LES's application provided an adequate basis for safety review of facility operations and that construction and operation of the Claiborne Enrichment Center would not pose an undue risk to public health and safety (NRC, 1993). The design of the NEF incorporates the latest safety improvements and design enhancements from the Urenco enrichment facilities currently operating in Europe.

The primary function of the facility is to enrich natural uranium hexafluoride (UF_6) by separating a feed stream containing the naturally occurring proportions of uranium isotopes into a product stream enriched in ^{235}U and a tails stream depleted in the ^{235}U isotope. The feed material for the enrichment process is uranium hexafluoride (UF_6) with a natural composition of isotopes ^{234}U, ^{235}U, and ^{238}U. The enrichment process is a mechanical separation of isotopes using a fast rotating cylinder (centrifuge) based on a difference in centrifugal forces due to differences in molecular weight of the uranic isotopes. No chemical changes or nuclear reactions take place. The feed, product, and tails streams are all in the form of UF_6.

1.1.3.2 Process System Descriptions

An overview of the four enrichment process systems and the two enrichment support systems is discussed below.

Numerous substances associated with the enrichment process could pose hazards if they were released into the environment. Chapter 6, Chemical Process Safety, contains a discussion of the criteria and identification of the chemicals of concern at the NEF and concludes that uranium hexafluoride (UF_6) is the only chemical of concern that will be used at the facility. Chapter 6, Chemical Process Safety, also identifies the locations where UF_6 is stored or used in the facility and includes a detailed discussion and description of the hazardous characteristics of UF_6 as well as a detailed listing of other chemicals that are in use at the facility.

Additional details on each of the enrichment process systems are provided in Chapter 3, Integrated Safety Analysis Summary.

The enrichment process is comprised of the following major systems:

<u>UF_6 Feed System</u>

The first step in the process is the receipt of the feed cylinders and preparation to feed the UF_6 through the enrichment process.

Natural UF_6 feed is received at the NEF in 48Y or 48X cylinders from a conversion plant. Pressure in the feed cylinders is below atmospheric (vacuum) and the UF_6 is in solid form.

The function of the UF_6 Feed System is to provide a continuous supply of gaseous UF_6 from the feed cylinders to the cascades. There are six Solid Feed Stations per Cascade Hall; three stations in operation and three on standby. The maximum feed flow rate is 187 kg/hr (412 lb/hr) UF_6 based on a maximum capacity of 545,000 SWU per year per Cascade Hall.

<u>Cascade System</u>

The function of the Cascade System is to receive gaseous UF_6 from the UF_6 Feed System and enrich the ^{235}U isotope in the UF_6 to a maximum of 5 $^{w}/_{o}$.

Multiple gas centrifuges make up arrays called cascades. The cascades separate gaseous UF_6 feed with a natural uranium isotopic concentration into two process flow streams – product and tails. The product stream is the enriched UF_6 stream, from 2 - 5 $^{w}/_{o}\,^{235}U$, with an average of 4.5 $^{w}/_{o}\,^{235}U$. The tails stream is UF_6 that has been depleted of ^{235}U isotope to 0.20 – 0.34 $^{w}/_{o}\,^{235}U$, with an average of 0.32 $^{w}/_{o}\,^{235}U$.

<u>Product Take-off System</u>

The function of the Product Take-off System is to provide continuous withdrawal of the enriched gaseous UF_6 product from the cascades and to purge and dispose of light gas impurities from the enrichment process.

The product streams leaving the eight cascades are brought together into one common manifold from the Cascade Hall. The product stream is transported via a train of vacuum pumps to Product LTTS in the UF_6 Handling Area. There are five Product LTTS per Cascade Hall; two stations in operation and three stations on standby.

The Product Take-off System also contains a system to purge light gases (typically air and hydrogen fluoride) from the enrichment process. This system consists of UF_6 Cold Traps which capture UF_6 while leaving the light gas in a gaseous state. The cold trap is followed by product vent Vacuum Pump/Trap Sets, each consisting of a carbon trap, an alumina trap, and a vacuum pump. The carbon trap removes small traces of UF_6 and the alumina trap removes any hydrogen fluoride (HF) from the product gas.

<u>Tails Take-off System</u>

The primary function of the Tails Take-off System is to provide continuous withdrawal of the gaseous UF_6 tails from the cascades. A secondary function of this system is to provide a means for removal of UF_6 from the centrifuge cascades under abnormal conditions.

The tails stream exits each Cascade Hall via a primary header, goes through a pumping train, and then to Tails LTTS in the UF_6 Handling Area. There are ten Tails LTTS per Cascade Hall. Under normal operation, seven of the stations are in operation receiving tails and three are on standby.

In addition to the four primary systems listed above, there are two major support systems:

<u>Product Blending System</u>

The primary function of the Product Blending System is to provide a means to fill 30B cylinders with UF_6 at a specific enrichment of ^{235}U to meet customer requirements. This is accomplished by blending (mixing) UF_6 at two different enrichment levels to one specific enrichment level. The system can also be used to transfer product from a 30B or 48Y cylinder to another 30B cylinder without blending.

This system consists of Blending Donor Stations (which are similar to the Solid Feed Stations) and Blending Receiver Stations (which are similar to the Product LTTS) described under the primary systems.

Product Liquid Sampling System

The function of the Product Liquid Sampling System is to obtain an assay sample from filled product 30B cylinders. The sample is used to validate the exact enrichment level of UF_6 in the filled product cylinders before the cylinders are sent to the fuel processor.

This is the only system in the NEF that changes solid UF_6 to liquid UF_6.

1.1.4 Raw Materials, By-Products, Wastes, And Finished Products

The facility handles Special Nuclear Material of ^{235}U contained in uranium enriched above natural but less than or equal to 5.0 $^{w}/_{o}$ in the ^{235}U isotope. The ^{235}U is in the form of uranium hexafluoride (UF_6). The facility processes approximately 690 feed cylinders (Model 48Y or 48X), 350 product cylinders (Model 30B), and 625 UBCs (Model 48Y) per year.

LES does not propose possession of any reflectors or moderators with special characteristics.

Solid Waste Management

Solid waste generated at the NEF will be grouped into industrial (non-hazardous), radioactive, hazardous, and mixed waste categories. In addition, solid radioactive and mixed waste is further segregated according to the quantity of liquid that is not readily separable from the solid material. The solid waste management systems are comprised of a set of facilities, administrative procedures, and practices that provide for the collection, temporary storage, processing, and transportation for disposal of categorized solid waste in accordance with regulatory requirements. All solid radioactive wastes generated are Class A low-level wastes (LLW) as defined in 10 CFR 61 (CFR, 2003a).

Radioactive waste is collected in labeled containers in each Radiation Area and transferred to the Solid Waste Collection Room for processing. Suitable waste will be volume-reduced, and all radioactive waste will be disposed of at a licensed LLW disposal facility.

Hazardous waste and a small amount of mixed waste are generated at the NEF. These wastes are also collected at the point of generation and transferred to the Solid Waste Collection Room. Any mixed waste that may be processed to meet land disposal requirements may be treated in its original collection container and shipped as LLW for disposal.

Industrial waste, including miscellaneous trash, filters, resins and paper is shipped offsite for compaction and then sent to a licensed waste landfill.

Effluent Systems

The following NEF systems handle wastes and effluent. The effectiveness of each system for effluent control is discussed in detail in Chapter 3, Integrated Safety Analysis Summary.

- Separations Building Gaseous Effluent Vent System

- TSB Gaseous Effluent Vent System
- Liquid Effluent Collection and Treatment System
- Centrifuge Test and Post Mortem Facilities Exhaust Filtration System
- Septic System
- Solid Waste Collection System
- Decontamination System
- Fomblin Oil Recovery System
- Laundry System

Effluent Quantities

Quantities of radioactive and non-radioactive wastes and effluent are estimated and shown in the tables referenced in this section. The tables include quantities and average uranium concentrations. Portions of the waste considered hazardous or mixed are identified.

The following tables address plant effluents:

- Table 1.1-1, Estimated Annual Gaseous Effluent
- Table 1.1-2, Estimated Annual Radiological and Mixed Wastes
- Table 1.1-3, Estimated Annual Liquid Effluent
- Table 1.1-4, Estimated Annual Non-Radiological Wastes

Radioactive concentration limits and handling for liquid wastes and effluents are detailed in the Environmental Report.

The waste and effluent estimates described in the tables listed above were developed specifically for the NEF. Each system was analyzed to determine the wastes and effluents generated during operation. These values were analyzed and a waste disposal path was developed for each. LES considered the facility site, facility operation, applicable Urenco experience, applicable regulations, and the existing U.S. waste processing/disposal infrastructure during the development of the paths. The Liquid Effluent Collection and Treatment System and the Solid Waste Collection System were designed to meet these criteria.

Construction Wastes

During construction, efforts are made to minimize the environmental impact. Erosion, sedimentation, dust, smoke, noise, unsightly landscape, and waste disposal are controlled to practical levels and applicable regulatory limits. Wastes generated during site preparation and construction will be varied, depending on the activities in progress. The bulk of the wastes will consist of non-hazardous materials such as packing materials, paper and scrap lumber. These wastes will be transported off site to an approved landfill. It is estimated that the NEF will generate a non-compacted average waste volume of 3,058 m^3 (4,000 yd^3) annually.

Hazardous type wastes that may be generated during construction have been identified and annual quantities estimated are shown in Table 1.1-5, Annual Hazardous Construction Wastes.

Any of these wastes that are generated will be handled by approved methods and shipped off site to approved disposal sites.

Management and disposal of all wastes from the NEF site will be performed by personnel trained to properly identify, store, and ship wastes, audit vendors, direct and conduct spill cleanup, provide interface with state agencies, maintain inventories and provide annual reports.

A Spill Prevention, Control and Countermeasure Plan (SPCC) will be implemented during construction to minimize the possibility of spills of hazardous substances, minimize environmental impact of any spills and ensure prompt and appropriate remediation. The SPCC plan will identify sources, locations and quantities of potential spills and response measures. The plan will identify individuals and their responsibilities for implementation of the plan and provide for prompt notifications of state and local authorities.

1.2 INSTITUTIONAL INFORMATION

This section addresses the details of the applicant's corporate identity and location, applicant's ownership organization and financial information, type, quarterly, and form of licensed material to be used at the facility, and the type(s) of license(s) being applied for.

1.2.1 Corporate Identity

1.2.1.1 Applicant

The Applicant's name, address, and principal office are as follows:

Louisiana Energy Services, L.P.
100 Sun Avenue NE, Suite 204
Albuquerque, NM 87109

The Applicant also maintains an office in Washington, DC during the licensing period at the following location:

2600 Virginia Avenue NW, Suite 610
Washington, D.C. 20037

1.2.1.2 Organization and Management of Applicant

Louisiana Energy Services (LES), L.P. is a Delaware limited partnership. It has been formed solely to provide uranium enrichment services for commercial nuclear power plants. LES has one, 100% owned subsidiary, operating as a limited liability company, formed for the purpose of purchasing Industrial Revenue Bonds and no divisions. The general partners are as follows:

A. Urenco Investments, Inc. (a Delaware corporation and wholly-owned subsidiary of Urenco Limited, a corporation formed under the laws of the United Kingdom ("Urenco") and owned in equal shares by BNFL Enrichment Limited ("BNFL-EL"), Ultra-Centrifuge Nederland NV ("UCN"), and Uranit GmbH ("Uranit") companies formed under English, Dutch and German law, respectively; BNFL-EL is wholly-owned by British Nuclear Fuels plc, which is wholly-owned by the Government of the United Kingdom; UCN is 99% owned by the Government of the Netherlands, with the remaining 1% owned collectively by the Royal Dutch Shell Group, DSM, Koninklijke Philips Electronics N.V. and Stork N.V.; Uranit is owned by Eon Kernkraft GmbH (50%) and RWE Power AG (50%), which are corporations formed under laws of the Federal Republic of Germany); and

B. Westinghouse Enrichment Company, LLC (a Delaware limited liability company and wholly-owned subsidiary of Westinghouse Electric Company LLC, a Delaware limited liability company ("Westinghouse"), whose ultimate parent, through two intermediary Delaware corporations and one corporation formed under the laws of the United Kingdom, is British Nuclear Fuels plc, which is wholly-owned by the Government of the United Kingdom).

The names and addresses of the responsible officials for the general partners are as follows:

Urenco Investments, Inc.
Charles W. Pryor, President and CEO
2600 Virginia Avenue NW, Suite 610
Washington, DC 20037

Dr. Pryor is a citizen of the United States of America

Westinghouse Enrichment Company, LLC
Ian B. Duncan, President
4350 Northern Pike
Monroeville, PA 15146

Mr. Duncan is a citizen of the United Kingdom.

The limited partners are as follows:

A. Urenco Deelnemingen B.V. (a Netherlands corporation and wholly-owned subsidiary of Urenco Nederlands B.V. (UNL);

B. Westinghouse Enrichment Company, LLC (the Delaware limited liability company, wholly-owned by Westinghouse, that also is acting as a General Partner);

C. Entergy Louisiana, Inc. (a Louisiana corporation and wholly-owned subsidiary of Entergy Corporation, a publicly-held Delaware corporation and a public utility holding company);

D. Claiborne Energy Services, Inc. (a Louisiana corporation and wholly-owned subsidiary of Duke Energy Corporation, a publicly-held North Carolina corporation);

E. Cenesco Company, LLC (a Delaware limited liability company and wholly-owned subsidiary of Exelon Generation Company, LLC, a Pennsylvania limited liability company);

F. Penesco Company, LLC (a Delaware limited liability company and wholly-owned subsidiary of Exelon Generation Company, LLC, a Pennsylvania limited liability company).

Urenco owns 70.5% of the partnership while Westinghouse owns 19.5% of LES. The remaining 10% is owned by the companies representing the three electric utilities, i.e., Entergy Corporation, Duke Energy Corporation, and Exelon Generation Company, LLC.

The President of LES is E. James Ferland, a citizen of the United States of America. LES' principal location for business is Albuquerque, New Mexico. The facility will be located in Lea County near Eunice, New Mexico. No other companies will be present or operating on the NEF site other than services specifically contracted by LES.

Foreign Ownership, Control and Influence (FOCI) of LES is addressed in the NEF Standard Practice Procedures for the Protection of Classified Matter, Appendix 1 – FOCI Package. The NRC in their letter dated, March 24, 2003, has stated "…that while the mere presence of foreign ownership would not preclude grant of the application, any foreign relationship must be examined to determine whether it is inimical to the common defense and security [of the United States]". (NRC, 2003) The FOCI Package mentioned above provides sufficient information for this examination to be conducted.

1.2.1.3 Address of the Enrichment Plant and Legal Site Description

The NEF is physically located approximately 8 km (5 mi) east of Eunice, New Mexico adjacent to New Mexico Highway 234 in Lea County. The legal description is as follows:

A PARCEL OF LAND WITHIN SECTION 32, TOWNSHIP 21 SOUTH, RANGE 38 EAST, NEW MEXICO PRINCIPAL MERIDIAN, LEA COUNTY, NEW MEXICO,

BEGINNING at the one-quarter corner between Sections 31 and 32, (a found GLO brass cap on a 2-in iron pipe);

THENCE N00°38'22"W along the section line between Sections 31 and 32 a distance of 2638.37 feet to the corner of Sections 29, 32, 31 and 30, (a found GLO brass cap on a 2-in iron pipe);

THENCE N89°18'08"E along the section line between Sections 29 and 32 a distance of 2640.69 feet to a set 5/8-in rebar with a 2-in aluminum cap marked "MUTH PLS 13239";

THENCE N89°18'08"E along the section line between Sections 29 and 32 a distance of 2640.69 feet to the corner of Sections 28, 33, 32 and 29, (a found GLO brass cap on a 2-in iron pipe);

THENCE S00°39'20"E along the section line between Sections 32 and 33 a distance of 2640.49 feet to the one-quarter corner between Sections 32 and 33, (a found GLO brass cap on a 1-in iron pipe);

THENCE S00°41'56"E along the section line between Sections 32 and 33 a distance of 2324.52 feet to a found railroad iron marking the right-of-way for New Mexico State Highway No. 234; from whence the corner of Sections 33 and 32 of Township 21 South, Range 38 East, and Sections 4 and 5 of Township 22 South, Range 38 East (a found 1/2-in rebar) bears S00°41'56"E a distance of 340.08 ft;

THENCE N80°10'49"W along the observed northerly right-of-way line of New Mexico State Highway No. 234 a distance of 5377.12 ft to a point of intersection with the section line between Sections 31 and 32 (set 5/8-in rebar with a 2-in aluminum cap marked "MUTH PLS 13239"); from whence the corner of Sections 31 and 32 of Township 21 South, Range 38 East, and Sections 6 and 5 of Township 22 South, Range 38 East (a found GLO brass cap on a 2-in iron pipe) bears S00°35'16"E a distance of 1321.66 ft;

THENCE N00°35'16"W along the section line between Sections 31 and 32 a distance of 1345.14 to the POINT OF BEGINNING

Said Parcel CONTAINS 542.80 ACRES more or less

1.2.2 Financial Information

LES estimates the total cost of the NEF to be approximately $1.2 billion (in 2002 dollars), excluding escalation, contingency, interest, tails disposition, decommissioning, and any replacement equipment required during the life of the facility.

There are financial qualifications to be met before a license can be issued. LES acknowledges the use of the following Commission-approved criteria as described in Policy Issues Associated with the Licensing of a Uranium Facility; Issue 3, Financial Qualifications (LES, 2002) in determining if the project is financially feasible:

1. Construction of the facility shall not commence before funding is fully committed. Of this full funding (equity and debt), the applicant must have in place before constructing the associated capacity: (a) a minimum of equity contributions of 30% of project costs from the parents and affiliates of the partners; and (b) firm commitments ensuring funds for the remaining project costs.
2. LES shall not proceed with the project unless it has in place long-term enrichment contracts (i.e., five years) with prices sufficient to cover both construction and operation costs, including a return on investment, for the entire term of the contracts.

LES shall in accordance with 10 CFR 140.13b, (CFR, 2003l), prior to and throughout operation, have and maintain nuclear liability insurance in the amount of up to $300 million to cover liability claims arising out of any occurrence within the United States, causing, within or outside the United States, bodily injury, sickness, disease, or death, or loss of or damage to property, or loss of use of property, arising out of or resulting from the radioactive, toxic, explosive, or other hazardous properties of chemical compounds containing source or special nuclear material.

The amounts of nuclear energy liability insurance required may be furnished and maintained in the form of:

1. An effective facility form (non-indemnified facility) policy of nuclear energy liability insurance from American Nuclear Insurers and/or Mutual Atomic Energy Liability underwriters; or
2. Such other type of nuclear energy liability insurance as the Commission may approve; or
3. A combination of the foregoing.

If the form of liability insurance will be other than an effective facility form (non-indemnified facility) policy of nuclear energy liability insurance from American Nuclear Insurers and/or Mutual Atomic Energy Liability Underwriters, such form will be provided to the Nuclear Regulatory Commission by LES. The effective date of this insurance will be no later than the date that LES takes possession of licensed nuclear material.

Effective November 26, 2002, nuclear energy liability Facility Form policy number NF-0350 was issued to LES for the planned NEF with the limit of liability of $1,000,000. This standby limit will apply until the plant takes possession of source or special nuclear material, at which time it is anticipated that the liability insurance coverage limit will be increased to more closely approximate the $300 million limit. Until such time as LES takes possession of source or special nuclear material, the effects described in 10 CFR 140.13b involving source or special nuclear material are not possible. Therefore, the $1,000,000 standby liability policy, in addition to appropriate construction coverage, is considered to be sufficient for the construction phase. LES will provide proof of liability insurance of a type and in the amounts to cover liability claims required by 10 CFR 140.13b prior to taking possession of source or special nuclear material.

Information indicating how reasonable assurance will be provided that funds will be available to decommission the facility as required by 10 CFR 70.22(a)(9) (CFR, 2003b), 10 CFR 70.25 (CFR, 2003c), and 10 CFR 40.36 (CFR, 2003d) is described in detail in Chapter 10, Decommissioning.

1.2.3 Type, Quantity, and Form of Licensed Material

LES proposes to acquire, deliver, receive, possess, produce, use, transfer, and/or store special nuclear material (SNM) meeting the criteria of *special nuclear material of low strategic significance* as described in 10 CFR 70.4 (CFR, 2003e). Details of the SNM are provided in Table 1.2-1, Type, Quantity, and Form of Licensed Material. It is expected that other source materials and by-product materials will also be used for instrument calibration purposes. These materials will be identified during the design phase and the SAR will be revised, accordingly.

1.2.4 Requested Licenses and Authorized Uses

LES is engaged in the production and selling of uranium enrichment services to electric utilities for the purpose of manufacturing fuel to be used to produce electricity in commercial nuclear power plants.

This application is for the necessary licenses issued under 10 CFR 70 (CFR, 2003f), 10 CFR 30 (CFR, 2003g) and 10 CFR 40 (CFR, 2003h) to construct, own, use and operate the facilities described herein as an integral part of the uranium enrichment facility. This includes licenses for source, special nuclear material and byproduct material. The period of time for which the license is requested is 30 years.

See Section 1.1, Facility and Process Description for a summary, non-technical narrative description of the enrichment activities utilized in NEF.

1.2.5 Special Exemptions or Special Authorizations

No exemptions or special authorizations are required.

1.2.6 Security of Classified Information

Access to restricted data or national security information shall be controlled in accordance with 10 CFR 10 (CFR, 2003i), 25 (CFR, 2003j), and 95 (CFR, 2003k). This application does contain classified information that has been submitted under separate correspondence.

1.3 SITE DESCRIPTION

The NEF is located in southeastern New Mexico in Lea County near the border of Andrews County, Texas. The site consists of land north of New Mexico Highway 234 within Section 32 of Township 21 S, Range 38 E. The nearest communities are Eunice, about 8 km (5 mi) due west and Hobbs about 32 km (20 mi) north of the site. The area surrounding the site consists of vacant land and industrial properties. A railroad spur borders the site to the north. Further north is a sand/aggregate quarry operated by the Wallach Concrete Company. The quarry owner leases land space to a “produced water” reclamation company, Sundance Services, which maintains three small “produced water” lagoons. There is also a man-made pond stocked with fish on the quarry property.

A vacant parcel of land, Section 33, is immediately to the east. Section 33 borders the New Mexico/Texas state line that is 0.8 km (0.5 mi) east of the site. Several disconnected power poles are situated in front of Section 33, parallel to New Mexico Highway 234. Land further east, in Texas, is occupied by Waste Control Specialists (WCS), LLC. WCS possesses a radioactive materials license from Texas, an NRC Agreement state, and is licensed to treat and temporarily store low-level radioactive waste. Land east of WCS is occupied by the Letter B Ranch.

High powered utility lines run in a north-south direction near the property line of WCS, parallel to the New Mexico/Texas state line.

To the southeast, across New Mexico Highway 234, is the Lea County Landfill.

Land further north, south and west has mostly been developed by the oil and gas industry.

An underground CO_2 pipeline owned by Trinity Pipeline, LLC, running southeast-northwest, traverses the property. An underground natural gas pipeline owned by the Sid Richardson Energy Services Company is located along the south property line, paralleling New Mexico Highway 234.

An active railroad line, operated by the Texas-New Mexico Railroad, runs parallel to New Mexico Highway 18 and just east of Eunice within 8 km (5 mi) of Section 32. There is also an active railroad spur that runs from the Texas-New Mexico Railroad line, along the north boundary of Section 32 and terminates at the WCS facility.

Figure 1.3-1, Five Mile Radius, Radial Sectors, shows the physical features surrounding the facility to an 8 km (5 mi) radius.

1.3.1 Site Geography

Site features are well suited for the location of a uranium enrichment facility as evidenced by the favorable conditions of hydrology, geology, seismology and meteorology as well as good transportation routes for transporting feed and product by truck.

1.3.1.1 Site Location Specifics

The proposed 220 ha (543 acre) site is located within Section 32 of Township 21 S in southeastern New Mexico in Lea County approximately 0.8 km (0.5 mi) west of the Texas state border, 51 km (32 mi) west-north-west of Andrews, Texas and 523 km (325 mi) southeast of Albuquerque, New Mexico. This location is 8 km (5 mi) due east of Eunice and 32 km (20 mi) south of Hobbs. The geographic location of the facility is shown on Figures 1.1-1, State Map, and 1.1-2, County Map.

The approximate center of the NEF is at latitude 32 degrees, 26 minutes, 1.74 seconds North and longitude 103 degrees, 4 minutes, 43.47 seconds West. Section 32 is currently owned by the State of New Mexico and is being acquired by LES through a state land swap arrangement. Until the land swap is completed, LES has been granted a 35 year easement by the State of New Mexico for site access and control.

Figure 1.1-4, Facility Layout (Site Plan) with Site Boundary and Controlled Access Area Boundary, shows the site property boundary, including the Controlled Access Area and the general layout of the buildings.

1.3.1.2 Features of Potential Impact to Accident Analysis

The NEF site is located in the Pecos Plains Section of the Great Plains Province. Site topography is relatively level, with an overall gradual rise in elevation from the southwest to the northeast. An area comprised of small sand hills exists along the west property line. There are no mountain ranges in the immediate vicinity. Earthquakes in the region are isolated or occur in small clusters of low to moderate size events toward the Rio Grande Valley of New Mexico and southeast of the NEF site in Texas.

An underground natural gas pipeline owned by the Sid Richardson Energy Services Company is located along the south property line, paralleling New Mexico Highway 234.

An underground CO_2 pipeline owned by Trinity Pipeline, LLC, running southeast-northwest, currently traverses the property. This pipeline will be relocated to the NEF site property boundary.

New Mexico Highway 234 runs parallel to the southern property line. New Mexico Highway 234 intersects New Mexico Highway 18 about 4 km (2.5 mi) to the west.

An active railroad line operated by the Texas-New Mexico Railroad runs parallel to Highway 18 and just east of Eunice within 8 km (5 mi) of Section 32.

Refer to Chapter 3, Integrated Safety Analysis Summary, for a discussion on the impact of these features on accident analysis for the NEF.

1.3.2 Demographics

This section provides the census results for the facility site area, and includes specific information about populations, public facilities (schools, hospitals, parks, etc.) and land and water use near the site.

1.3.2.1 Latest Census Results

The combined population of the two counties in the NEF vicinity, based on the 2000 U.S. Census is 68,515, which represents a 2.3% decrease from the 1990 population of 70,130. This decrease is counter to the trends for the states of New Mexico and Texas which had population increases of 20.1% and 22.8%, respectively during the same decade. Over that 10 year period, Lea County, New Mexico, where the site is located, had a growth decrease of 0.5%. The growth decrease in Andrews County, Texas was 9.3%. Lea County experienced a sharp but short population increase in the mid-1980's due to an influx of petroleum industry jobs. That influx caused its population to increase to over 65,000 during that period.

Based on projections made using historic data, the population of Lea County, New Mexico and Andrews County, Texas is likely to grow more slowly than their respective states over the next 30 years (the anticipated license period of the NEF).

Based on U. S. census data the minority populations of the Lea County New Mexico and Andrews County Texas as of 2000 were 32.9% and 22.9%, respectively. These percentages are consistent with their respective state averages of 34.7% and 26.4%.

The low income population of Lea County, New Mexico and Andrews County, Texas are 21.1% and 16.4% respectively. These percentages are consistent with their respective state averages of 18.4% and 15.4%. Within the site area the percentage of population below the poverty level is significantly lower in both states.

Population information is provided in detail in the Environmental Report and Chapter 3, Integrated Safety Analysis Summary.

1.3.2.2 Description, Distance, And Direction To Nearby Population Areas

The NEF site is in Lea County, New Mexico near the border of Andrews County, Texas. The nearest community is Eunice, approximately 8 km (5 mi) east of the site. Other population centers are at distances from the site as follows:

- Hobbs, Lea County, New Mexico: 32 km (20 mi north)
- Jal, Lea County, New Mexico: 37 km (23 mi south)
- Lovington, Lea County New Mexico: 64 km (39 mi north-northwest)
- Andrews, Andrews County Texas: 51 km (32 mi east)
- Seminole, Gaines County Texas: 51 km (32 mi east-northeast)
- Denver City, Gaines County, Texas: 65 km (40 mi) north-northeast

Aside from these communities, the population density around the site is extremely low. The nearest large population center (>100,000) is Midland-Odessa, Texas which is approximately 103 km (64 mi) to the southeast.

1.3.2.3 Proximity to Public Facilities – Schools, Hospitals, Parks

The Eunice First Assembly of God Church is located about 9 km (5.4 mi) from the site.

There are two hospitals in the vicinity of the site. The Lea Regional Medical Center is located in Hobbs, New Mexico about 32 km (20 mi) north of the NEF site. This 250-bed hospital can handle acute and stable chronic care patients. In Lovington, New Mexico, 64 km (39 mi) north-

northwest of the site, Covenant Medical Systems manages Nor-Lea Hospital, a full-service, 27-bed facility.

Eunice Senior Center is located about 9 km (5.4 mi) from the site.

There are four educational facilities within about 8 km (5 mi) of the NEF site, all in Eunice, New Mexico. These include an elementary school, a middle school, a high school, and a private K-12 school.

Eunice Fire and Rescue and the Eunice Police Department are located approximately 8 km (5 mi) from the site.

The Eunice Golf Course is located approximately 14.7 km (9.4 mi) from the site.

1.3.2.4 Nearby Industrial Facilities (Includes Nuclear Facilities)

Nuclear Facilities

There are no nuclear production facilities located within 32 km (20 mi) of the site, therefore neither environmental nor emergency preparedness interactions between facilities is required.

Non-Nuclear Facilities

The site is bordered to the north by railroad tracks beyond which is a quarry operated by Wallach Concrete Company. The quarry owner leases land space to Sundance Services, a reclamation company, that maintains three small “produced water” lagoons.

Lea County operates a landfill on the south side of Section 33 across New Mexico State Highway 234, approximately 1 km (0.6 mi) from the center of the site.

A vacant parcel of land is immediately east of the site. Land further east, in Texas, is occupied by WCS. WCS possesses a radioactive materials license from Texas, an NRC Agreement state, and is licensed to treat and temporarily store low-level radioactive waste.

Dynegy’s Midstream Services Plant is located 6 km (4 mi) from the site. This facility is engaged in the gathering and processing of natural gas for the subsequent fractionation, storage, and transportation of natural gas liquids.

An underground CO_2 pipeline, running southeast-northwest, currently traverses the property.

An underground natural gas pipeline is located along the south property line, paralleling New Mexico Highway 234.

Eunice maintains water supply tanks approximately 8 km (5 mi) north and 8 km (5 mi) south of the site.

Land further north, south and west of the site has mostly been developed by the oil and gas industry.

The Eunice Airport is situated about 8 km (5 mi) west of the town center. The nearest commercial carrier airport is Lea County Regional Airport in Hobbs, New Mexico about 40 km (25 mi) north-northwest of the site. A major commercial airport in Midland-Odessa, Texas is approximately 103 km (64 mi) to the southeast.

1.3.2.5 Land Use Within Eight Kilometers (Five Mile) Radius, Uses Of Nearby Bodies Of Water

The site and vicinity are within the southern part of the Llano Estacado or Staked Plains, which is a remnant of the Southern High Plains. The site area overlies prolific oil and gas geologic formations of the Pennsylvanian and Permian age.

Onsite soils consist of fine sand, loamy fine sand and loose sands surrounding large barren sand dunes and are common to areas used for rangeland and wildlife habitat.

Surrounding property consists of vacant land and industrial developments. Gas and oil field operations are widespread in the area, but significant petroleum potential is absent within 5 to 8 km (3 to 5 mi) of the site.

More than 98% of the area within an 8 km (5 mi) radius of the NEF is an extensive area of open land on which livestock wander and graze. Built-up land (1.2%) and barren land (0.3%) constitute the other two land use classifications in the site vicinity.

Baker Spring, an intermittent surface water feature, is situated a little over 1.6 km (1 mi) northeast of the NEF site.

The facility will make no use of either surface water or groundwater supply from the site. A site Septic System and a Site Stormwater Detention Basin will discharge to the ground with a Groundwater Discharge Permit/Plan from the New Mexico Water Quality Bureau. No significant adverse changes are expected in site hydrology as a result of construction or operation of the NEF. Section 4, Environmental Impacts, of the Environmental Report addresses potential for impacts on site hydrology as a result of activities on the site.

1.3.3 Meteorology

In this section, data characterizing the meteorology (e.g., winds, precipitation, and severe weather) for the site are presented.

1.3.3.1 Primary Wind Directions And Average Wind Speeds

The meteorological conditions at the NEF have been evaluated and summarized in order to characterize the site climatology and to provide a basis for predicting the dispersion of gaseous effluents.

Meteorological data from the National Weather Service (NWS) site at Midland-Odessa, Texas, indicate an annual mean wind speed of 4.9 m/s (11.0 mi/hr). The prevailing wind direction is wind from the south. The maximum five-second wind speed is 31.3 m/sec (70 mph) from 200 degrees with respect to true north.

By comparison, the data from Roswell, New Mexico indicate the annual mean wind speed is 3.7 m/s (8.2 mi/hr) and the prevailing wind direction is wind from the south-southeast. The maximum five-second wind speed is 27.7 m/sec (62 mph) from 270 degrees with respect to true north.

These and additional data are discussed and further analyzed in the Environment Report.

1.3.3.2 Annual Precipitation – Amounts and Forms

The NEF site is located in the Southeast Plains of New Mexico near the Texas border. The climate is typical of a semi-arid region, with generally mild temperatures, low precipitation and humidity, and a high evaporation rate. Vegetation consists mainly of native grasses and some mesquite trees. During the winter, the weather is often dominated by a high-pressure system located in the central part of the western United States and a low-pressure system located in north-central Mexico. During the summer, the region is affected by a low-pressure system normally located over Arizona.

The normal annual total rainfall as measured in Hobbs, New Mexico is 46.1 cm (18.15 in). Precipitation amounts range from an average of 1.22 cm (0.48 in) in March to 7.95 cm (3.13 in) in September. Record maximum and minimum monthly totals are 35.13 cm (13.83 in) and zero respectively. (WRCC, 2003)

The normal annual total rainfall in Midland-Odessa, Texas, is 37.6 cm (14.8 in). Precipitation amounts range from an average of 1.1 cm (0.42 in) in March to 5.9 cm (2.31 in) in September. Record maximum and minimum monthly totals are 24.6 cm (9.70 in) and zero, respectively. The highest 24-hour precipitation total was 15.2 cm (5.99 in) in July 1968 (NOAA, 2002a).

The normal annual rainfall total as measured in Roswell, New Mexico, is 33.9 cm (13.34 in). Record maximum and minimum monthly totals are 17.50 cm (6.88 in) and zero , respectively (NOAA, 2002b, 2002a). The highest 24-hour precipitation total was 12.47 cm (4.91 in) in July 1981 (NOAA, 2002b).

Snowfall in Midland-Odessa, Texas, averages 13.0 cm (5.1 in) per year. Maximum monthly snowfall/ice pellets of 24.9 cm (9.8 in) fell in December 1998. The maximum amount of snowfall/ice pellets to fall in 24 hours was 24.9 cm (9.8 in) in December 1998 (NOAA, 2002a).

Snowfall in Roswell, New Mexico averages 30.2 cm (11.9 in) per year. Maximum monthly snowfall/ice pellets of 53.3 cm (21.0 in) fell in December 1997. The maximum amount of snowfall/ice pellets to fall in 24 hours was 41.91 cm (16.5 in) in February 1988 (NOAA, 2002b).

Additional details on rainfall and snowfall are provided in the Environmental Report.

The design basis snow load was developed using the methodology prescribed in the NRC Site Analysis Branch Position for Winter Precipitation Loads (NRC, 1975). The prescribed load to be included in the combination of normal live loads is based on the weight of the 100 year snowfall or snowpack whichever is greater. The winter precipitation load to be included in the combination of extreme live loads is based on the sum of the weight of the 100 year snowpack and the weight of the 48 hour Probable Maximum Winter Precipitation (PMWP) for the month corresponding to the selected snowpack.

The 100 year mean recurrence ground snow load was calculated to be 58.5 kg/m^2 (12 lb/ft^2), and the applicable PMWP was calculated to be 96.6 kg/m^2 (19.8 psf). The addition of these two figures results in a design load of 155.1 kg/m^2 (32 lb/ft^2).

Chapter 3, Integrated Safety Analysis Summary, provides additional details pertaining to precipitation.

1.3.3.3 Severe Weather

Tornadoes

Tornadoes occur infrequently in the vicinity of the NEF. Only two tornadoes were reported in Lea County, New Mexico, (Grazulis, 1993) from 1880-1989. Across the state line, only one tornado was reported in Andrews County, Texas, (Grazulis, 1993) from 1880-1989.

Tornadoes are commonly classified by their intensities. The F-Scale classification of tornados is based on the appearance of the damage that the tornado causes. There are six classifications, F0 to F5, with an F0 tornado having winds of 61-116 km/hr (40-72 mi/hr) and an F5 tornado having winds of 420-520 km/hr (261-318 mi/hr) (AMS, 1996). The two tornadoes reported in Lea County were estimated to be F2 tornadoes (Grazulis, 1993).

The design parameters applicable to the design tornado with a period of recurrence of 100,000 years are as follows:

Design Wind Speed	302 km/hr	188 mi/hr
Radius of damaging winds	130 m	425 ft
Atmospheric pressure change (APC)	390 kg/m^2	80 lb/ft^2
Rate of APC	146 $kg/m^2/s$	30 $lb/ft^2/s$

Hurricanes

Hurricanes, or tropical cyclones, are low-pressure weather systems that develop over the tropical oceans. Hurricanes are fueled by the relatively warm tropical ocean water and lose their intensity quickly once they make landfall. Since the NEF is located about 805 km (500 mi) from the coast, it is most likely that any hurricane that tracked towards the site would have dissipated to the tropical depression stage, that is, wind speeds less than 63 km/hr (39 mi/hr), before it reached the NEF. Hurricanes are therefore not considered a threat to the NEF.

Thunderstorms and Lightning Strikes

Thunderstorms occur during every month but are most common in the spring and summer months. Thunderstorms occur an average of 36.4 days/year in Midland/Odessa (based on a 54-year period of record (NOAA, 2002a). The seasonal averages are: 11 days in spring (March through May); 17.4 days in summer (June through August); 6.7 days in fall (September through November); and 1.3 days in winter (December through February).

The current methodology for estimating lightning strike frequencies includes consideration of the attractive area of structures (Marshall, 1973). This method consists of determining the number of lightning flashes to earth per year per square kilometer and then defining an area over which the structure can be expected to attract a lightning strike.

Using this methodology, the attractive area of the facility structures has been conservatively determined to be 0.071 km^2. Using 4 flashes to earth per year per square kilometer (2.1 flashes to earth per year per square mile) (NWS, 2003b) it can be estimated that the NEF will experience approximately 1.36 flashes to earth per year.

Additional details on thunderstorms and lightning are provided in Chapter 3, Integrated Safety Analysis Summary.

Sandstorms

Blowing sand or dust may occur occasionally in the area due to the combination of strong winds, sparse vegetation, and the semi-arid climate. High winds associated with thunderstorms are frequently a source of localized blowing dust. Dust storms that cover an extensive region are rare, and those that reduce visibility to less than 1.61 km (1 mile) occur only with the strongest pressure gradients such as those associated with intense extratropical cyclones which occasionally form in the area during winter and early spring (DOE, 2003).

1.3.4 Hydrology

The hydrology information included in this License Application was largely obtained from prior studies including extensive subsurface investigations for a nearby facility, WCS, located to the east of the NEF site. Other literature searches were also conducted to obtain reference material. A study of the site is in progress. Groundwater data collected to date is provided in Section 3.2.4.5, Groundwater Chemistry.

The NEF site itself contains no surface water bodies or surface drainage features. Essentially all the precipitation that occurs at the site is subject to infiltration and/or evapotranspiration. Groundwater was encountered at depths of 65 to 68 m (214 to 222 ft). Significant quantities of groundwater are only found at depths over 340 m (1,115 ft) where cover for that aquifer is provided by 323 to 333 m (1,060 to 1,092 ft) or more of clay. More information on the movement and fate of surface water and groundwater at the site is provided in Chapter 3, Integrated Safety Analysis Summary.

1.3.4.1 Characteristics Of Nearby Rivers, Streams, And Other Bodies Of Water

The climate in southeast New Mexico is semi-arid. Precipitation averages only 33 to 38 cm (13 to 15 in) a year. Evaporation and transpiration rates are high. This results in minimal, if any surface water occurrence or groundwater recharge.

The NEF site contains no surface drainage features, such as arroyos or buffalo wallows. The site topography is relatively flat. Some localized depressions exist, due to eolian processes, but the size of these features is too small to be of significance with respect to surface water collection.

1.3.4.2 Depth To The Groundwater Table

The site subsurface investigation performed during September 2003 had two main objectives: 1) to delineate the depth to the top of the Chinle Formation red bed clay that exists beneath the NEF site to assess the potential for saturated conditions above the red beds, and 2) to complete three monitoring wells in the siltstone layer beneath the red beds to monitor water level and water quality within this thin horizon of perched intermittent saturation. This work is in progress as discussed below.

The presence of the thick Chinle clay beneath the site essentially isolates the deep and shallow hydrologic systems. Groundwater occurring within the red bed clay occurs at three distinct and distant elevations. Approximately 65 to 68 m (214 to 222 ft) beneath the land surface, within the red bed unit, is a siltstone or silty sandstone unit with some saturation. It is a low permeability formation that does not yield groundwater very readily. This unit is under investigation as the first occurrence of groundwater beneath the NEF site.

The next water bearing unit below the saturated siltstone horizon is a saturated 30.5-meter (100-foot) thick sandstone horizon approximately 183 m (600 ft) below land surface, which overlies the Santa Rosa formation. The Santa Rosa formation is the third water bearing unit and is located about 340 m (1,115 ft) below land surface. Between the siltstone and sandstone saturated horizons and the Santa Rosa formation lie a number of layers of sandstones, siltstones, and shales. Hydraulic connection between the siltstone and sandstone saturated horizons and the Santa Rosa formation is non-existent.

No withdrawals or injection of groundwater will be made as a result of operation of the NEF facility. Thus, there will be no affect on any inter-aquifer water flow.

1.3.4.3 Groundwater Hydrology

The climate in southeast New Mexico is semi-arid, and evapotranspiration processes are significant enough to short-circuit any potential groundwater recharge. There is some evidence for shallow (near-surface) groundwater occurrence in areas to the north at the Wallach Concrete plant. These conditions are intermittent and limited. The typical geologic cross section at that location consists of a layer of caliche at the surface, referred to as the "caprock." In some areas the caprock is missing and the sand and gravel are exposed at the surface. The caprock is generally fractured and, following precipitation events may allow infiltration that quickly bypasses any roots from surface vegetation. In addition, there are areas where the sand and gravel outcrop may allow rapid infiltration of precipitation. These conditions have led to instances of minor amounts of perched groundwater at the base of the sand and gravel unit, atop the red beds of the Chinle Formation.

Conditions at the NEF site are different than at the Wallach Concrete site. The caprock is not present at the NEF site. Therefore, rapid infiltration through fractured caliche does not contribute to localized recharge at the NEF site.

Another instance of possible saturation above the Chinle clay may be seen at Baker Spring, just to the northeast of the NEF site where the caprock ends. The surface water is intermittent, and water typically flows from Baker Spring only after precipitation events. Some water may seep from the sand and gravel unit beneath the caprock, but deep infiltration of water is impeded by the low permeability of the Chinle clay in the area. This condition does not exist at the NEF site due to the absence of the caprock and the low permeability surface soils.

A third instance of localized shallow groundwater occurrence exists to the east of the NEF site where several windmills on the WCS property were formerly used to supply water for live stock tanks. These windmills tapped small saturated lenses above the Chinle Formation red beds, but the amount of groundwater in these zones was limited.

1.3.4.4 Characteristics Of The Uppermost Aquifer

The first occurrence of a well-defined aquifer is approximately 340 m (1,115 ft) below land surface, within the Santa Rosa formation. No impacts are expected to the aquifer from the NEF because of the depth of the Santa Rosa formation, the thick Chinle clay overburden, and the fact that the NEF will not consume surface or groundwater or discharge to the surrounding area. Treated liquid effluents are discharged to the onsite Treated Effluent Evaporative Basin, a double-lined evaporative basin with leak detection.

1.3.4.5 Design Basis Flood Events Used For Accident Analysis

The closest water conveyance is Monument Draw, a typically dry, intermittent stream located about 4 km (2.5 mi) west of the site. Since there are no bodies of water in the immediate vicinity of the site, flood is not a design basis event for the NEF. Additionally a diversion ditch is strategically located to deflect surface runoff from adjacent land away from the facility structures on the site.

The only potential flooding of the plant results from local intense rainfall. Flood protection against the local Probable Maximum Precipitation (PMP) is provided by establishing the facility floor level above the calculated depth of ponded water caused by the local PMP. Additional details are provided in Chapter 3, Integrated Safety Analysis Summary.

1.3.5 Geology

This section provides information about the characteristics of soil types and bedrock of the NEF site and its vicinity and design-basis earthquake magnitudes and return periods. The WCS site in Texas and the former proposed Atomic Vapor Laser Isotope Separation (AVLIS) site, located in Section 33, have both been thoroughly studied in recent years in preparation for construction of other facilities. A review of those documents and related materials provides a significant description of geological conditions pertinent to the NEF site. In addition, LES performed field confirmation, where necessary, in order to clarify any questions about regional or site-specific conditions.

The NEF site is located in New Mexico immediately west of the Texas border about 48 km (30 mi) from the extreme southeast corner of the state and about 96 km (80 mi) east of the Pecos River. The site is contained in the Eunice NE, Texas-New Mexico USGS topographic quadrangle (USGS, 1979). This location is near the boundary between the Pecos Plains Section to the west; and the Southern High Plains Section of the Great Plains province to the east. The boundary between the two sections is the Mescalero Escarpment, locally referred to as Mescalero Ridge.

NEF site elevations range between +1033 and +1045 m (+3390 and +3430 ft) (msl). The finished site grade is about +1041 m (+3415 ft) msl .

Surface exposures of geologic units at the site include surficial eolian deposits and Tertiary-aged alluvium. These overlie Triassic red-bed clay which overlies sedimentary rock. The principal underlying geologic structure is the Central Basin Platform which divides the Permian Basin into the Midland and Delaware sub-basins.

1.3.5.1 Characteristics Of Soil Types And Bedrock

The dominant subsurface structural feature of this region is the Permian Basin. This 250 million-year-old feature is the source of the Region's prolific oil and gas reserves.

The NEF site is located within the Central Permian Basin Platform area, where the top of the Permian deposits are approximately 434 to 480 m (1,425 to 1,575 ft) below ground surface. Overlying the Permian are the sedimentary rocks of the Triassic Age Dockum Group.

Soil development in the region is generally limited due to its semi-arid climate. The site has a minor thickness of soil (generally less than 0.4 m (1.4 ft)) developed from subaerial weathering. A small deposit of active dune sand is present at the southwest corner of the site. The U. S. Department of Agriculture soil survey for Lea County, New Mexico (USDA, 1974) categorizes site soils as hummocky loamy (silty) fine sand with moderately rapid permeability and slow runoff, well-drained non-calcareous loose sand, active dune sand and dune-associated sands.

Recent deposits are primarily dune sands derived from Permian and Triassic rocks of the Permian Basin. These Mescalero (dune) Sands cover over 80% of Lea County and are generally described as fine to medium-grained and reddish brown in color. The USDA Soil Survey of Lea County identifies the dune sands at the site as either the Brownsfield-Springer Association of reddish brown fine to loamy fine sands; or the Gomez series of brown to yellowish brown loamy fine sand (USDA, 1974).

Additional details are provided in Chapter 3, Integrated Safety Analysis Summary.

1.3.5.2 Earthquake Magnitudes And Return Periods

The majority of earthquakes in the United States are located in the tectonically active western portion of the country. However, areas within New Mexico and the southwestern United States also experience earthquakes, although at a lower rate and at lower intensities. Earthquakes in the region around the NEF site include isolated and small clusters of low to moderate size events toward the Rio Grande Valley of New Mexico and in Texas, southeast of the NEF site.

The largest earthquake within 322 km (200 mi) of the NEF is the August 16, 1931 earthquake located near Valentine, Texas. This earthquake has an estimated magnitude of 6.0 to 6.4 and produced a maximum epicentral intensity of VIII on the Modified Mercalli Intensity (MMI) Scale. The intensity observed at the NEF site is IV on the MMI scale.

A site-specific probabilistic seismic hazard analysis was performed for the NEF site using the seismic source zone geometries and earthquake recurrence models. The modeling included attenuation models suited for the regional and local seismic wave transmission characteristics.

Total seismic ground motion hazard to a site results from summation of ground motion effects from all distant and local seismically active areas. The 250-year and 475-year return period peak horizontal ground accelerations are estimated at 0.024 g and 0.036 g, respectively. The 10,000 year return period peak horizontal ground acceleration is estimated at 0.15 g. This return period is equivalent to a mean annual probability of E-4. The associated peak vertical ground motion is also estimated at 0.15 g. Details of the regional and local seismology studies, modeling techniques, and seismic hazard analyses are provided in Chapter 3, Integrated Safety Analysis Summary.

1.3.5.3 Other Geologic Hazards

There are no other known geologic hazards that would adversely impact the NEF site.

1.4 REFERENCES

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TABLES

Table 1.1-1 Estimated Annual Gaseous Effluent

Page 1 of 1

Area	Quantity	Discharge m^3 (ft^3)
Gaseous Effluent Vent Systems	NA	2.6×10^8 @ Standard Temperature and Pressure (STP) (9.18×10^9)
HVAC Systems		
Radiological Areas	NA	1.5×10^9 (5.17×10^{10})
Non-Radiological Areas	N/A	1.0×10^9 (3.54×10^{10})
Total Gaseous HVAC Discharge	NA	2.47×10^9 (8.71×10^{10})
Constituents:		
Helium	440 m^3 @ (STP) (15,536 ft^3)	NA
Nitrogen	52 m^3 @ (STP) (1,836 ft^3)	NA
Ethanol	40 L (10.6 gal)	NA
Laboratory Compounds	Traces (HF) (NA)	NA
Argon	190 m^3 (6,709 ft^3)	NA
Hydrogen Fluoride	< 1.0 kg (< 2.2 lb)	NA
Uranium	< 10 g (< 0.0221 lb)	NA
Methylene Chloride	610 L (161 gal)	NA

Table 1.1-2 Estimated Annual Radiological and Mixed Wastes

Page 1 of 1

Waste Type	Radiological Waste		Mixed Waste[1]	
	Total Mass kg (lb)	Uranium Content kg (lb)	Total Mass kg (lb)	Uranium Content kg (lb)
Activated Carbon	300 (662)	25 (55)	-	-
Activated Alumina	2160 (4763)	2.2 (4.9)	-	-
Fomblin Oil Recovery Sludge	20 (44)	5 (11)	-	-
Liquid Waste Treatment Sludge	400 (882)	57 (126)	-	-
Activated Sodium Fluoride[2]	-	-	-	-
Assorted Materials (paper, packing, clothing, wipes, etc.)	2100 (4,631)	30 (66)	-	-
Ventilation Filters	61,464 (135,506)	5.5 (12)		-
Non-Metallic Components	5000 (11,025)	Trace[3]	-	-
Miscellaneous Mixed Wastes (organic compounds)[4]			50 (110)	2 (4.4)
Combustible Waste	3,500 (7,718)	Trace[3]	-	-
Scrap Metal	12,000 (26,460)	Trace[3]	-	-

[1] A mixed waste is a low-level radioactive containing listed or characteristic of hazardous wastes as specified in 40 CFR 261, Subparts C and D.
[2] No sodium fluoride (NaF) wastes are produced on an annual basis. The contingency dump system NaF traps are not expected to saturate over the life of the plant.
[3] Trace is defined as not detectable above naturally occurring background concentrations.
[4] Representative organic compounds consist of acetone, toluene, ethanol, and petroleum ether.

Table 1.1-3 Estimated Annual Liquid Effluent
Page 1 of 1

Effluent	Typical Annual Quantities	Typical Uranic Content
Contaminated Liquid Process Effluents:	**m^3 (gal)**	**kg (lb)**
Laboratory Effluent/Floor Washings/Miscellaneous Condensates	23.14 (6,112)	16 (35)[1]
Degreaser Water	3.71 (980)	18.5 (41)[1]
Spent Citric Acid	2.72 (719)	22 (49)[1]
Laundry Effluent	405.8 (107,213)	0.2 (0.44)[2]
Hand Wash and Showers	2,100 (554,802)	None
Total Contaminated Effluent :	2,535 (669,884)	56.7 (125)[3]
Cooling Tower Blowdown:	19,123 (5,051,845)	None
Sanitary:	7,253 (1,916,250)	None
Stormwater Discharge:		
Gross Discharge[4]	174,100 (46 E+06)	None

[1]Uranic quantities are before treatment, values for degreaser water and spent citric acid include process tank sludge.
[2] Laundry uranic content is a conservative estimate.
[3] Uranic quantity is before treatment. After treatment approximately 1% or 0.57 kg (1.26 lb) of uranic material is expected to be discharged into the Treated Effluent Evaporative Basin.
[4]Maximum gross discharge is based on total annual rainfall on the site runoff areas contributing runoff to the Site Stormwater Detention Basin and the UBC Storage Pad Retention Basin neglecting evaporation and infiltration.

Table 1.1-4 Estimated Annual Non-Radiological Wastes

Page 1 of 1

Waste	Annual Quantity
Spent Blasting Sand*	125 kg (275 lbs)
Miscellaneous Combustible Waste*	9000 kg (19,800 lbs)
Cutting Machine Oils	45 L (11.9 gal)
Spent Degreasing Water (from ME&I workshop)	1 m^3 (264 gal)
Spent Demineralizer Water (from ME&I workshop)	200 L (53 gal)
Empty Spray Paint Cans*	20 ea
Empty Cutting Oil Cans	20 ea
Empty Propane Gas Cylinders*	5 ea
Acetone*	27 L (7.1 gal)
Toluene*	2 L (0.5 gal)
Degreaser Solvent SS25*	2.4 L (0.6 gal)
Petroleum Ether*	10 L (2.6 gal)
Diatomaceous Earth*	10 kg (22 lbs)
Miscellaneous Scrap metal	2,800 kg (6.147 lbs)
Motor Oils (For internal combustion. engines)	3,400 L (895 gal)
Oil Filters	250 ea
Air Filters (vehicles)	50 ea
Air Filters (building ventilation)	160,652 kg (354,200 lb)
Hydrocarbon Sludge*	10 kg (22 lbs)
Methylene Chloride*	1850 L (487 gal)

* Hazardous waste as defined in Title 40, Code of Federal Regulations, Part 261, Identification and listing of hazardous waste, 2003. (in part or whole)

Table 1.1-5 Annual Hazardous Construction Wastes

Page 1 of 1

Waste Type	Annual Quantity
Paint, Solvents, Thinners, Organics	1,134 L (3,000 gal)
Petroleum Products – Oils, Lubricants	1,134 L (3,000 gal)
Sulfuric Acid (Batteries)	380 L (100 gal)
Adhesives, Resins, Sealers, Caulking	910 kg (2,000 lbs)
Lead (Batteries)	91 kg (200 lbs)
Pesticide	380 L (100 gal)

Text removed under 10 CFR 2.390.

FIGURES

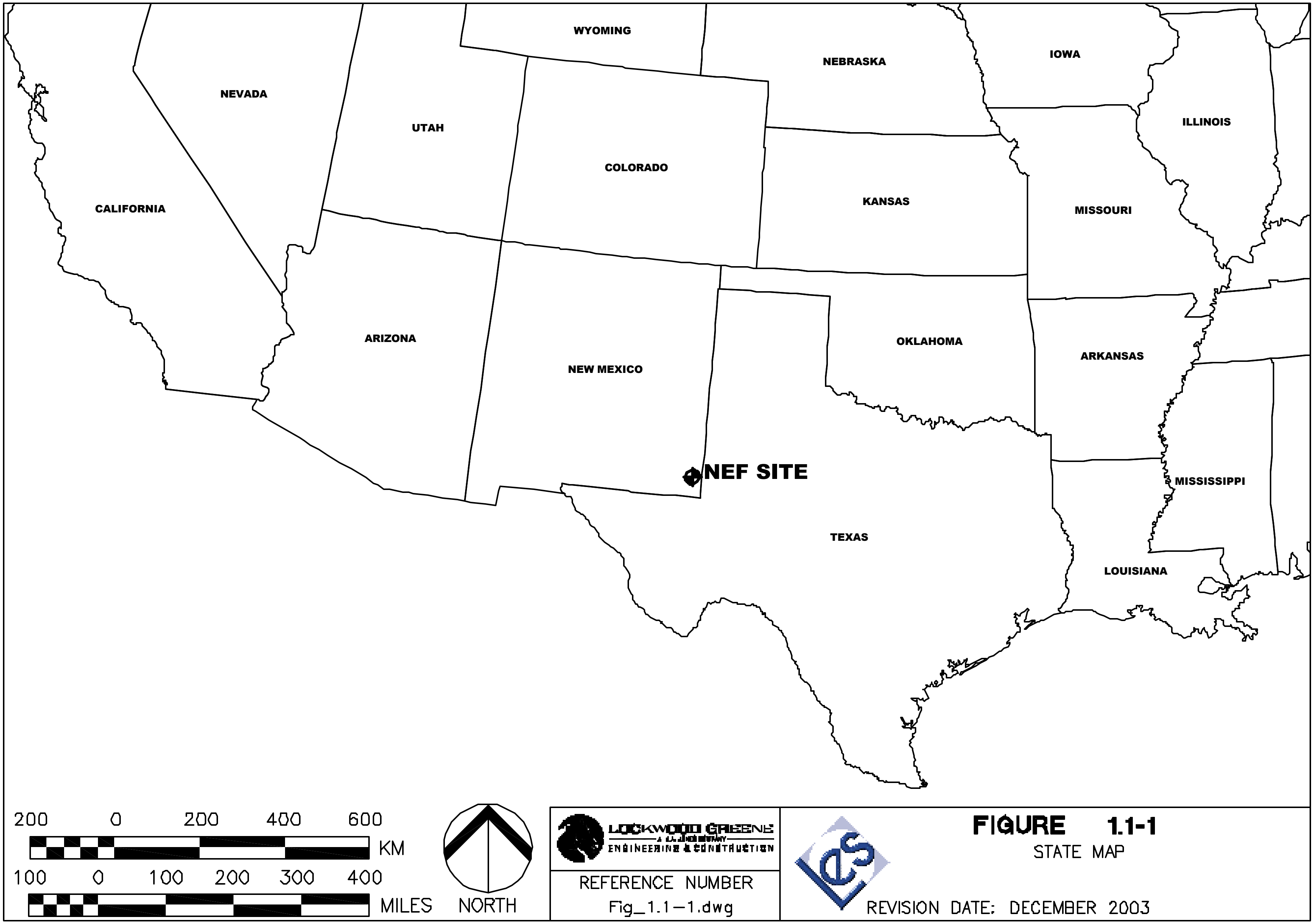

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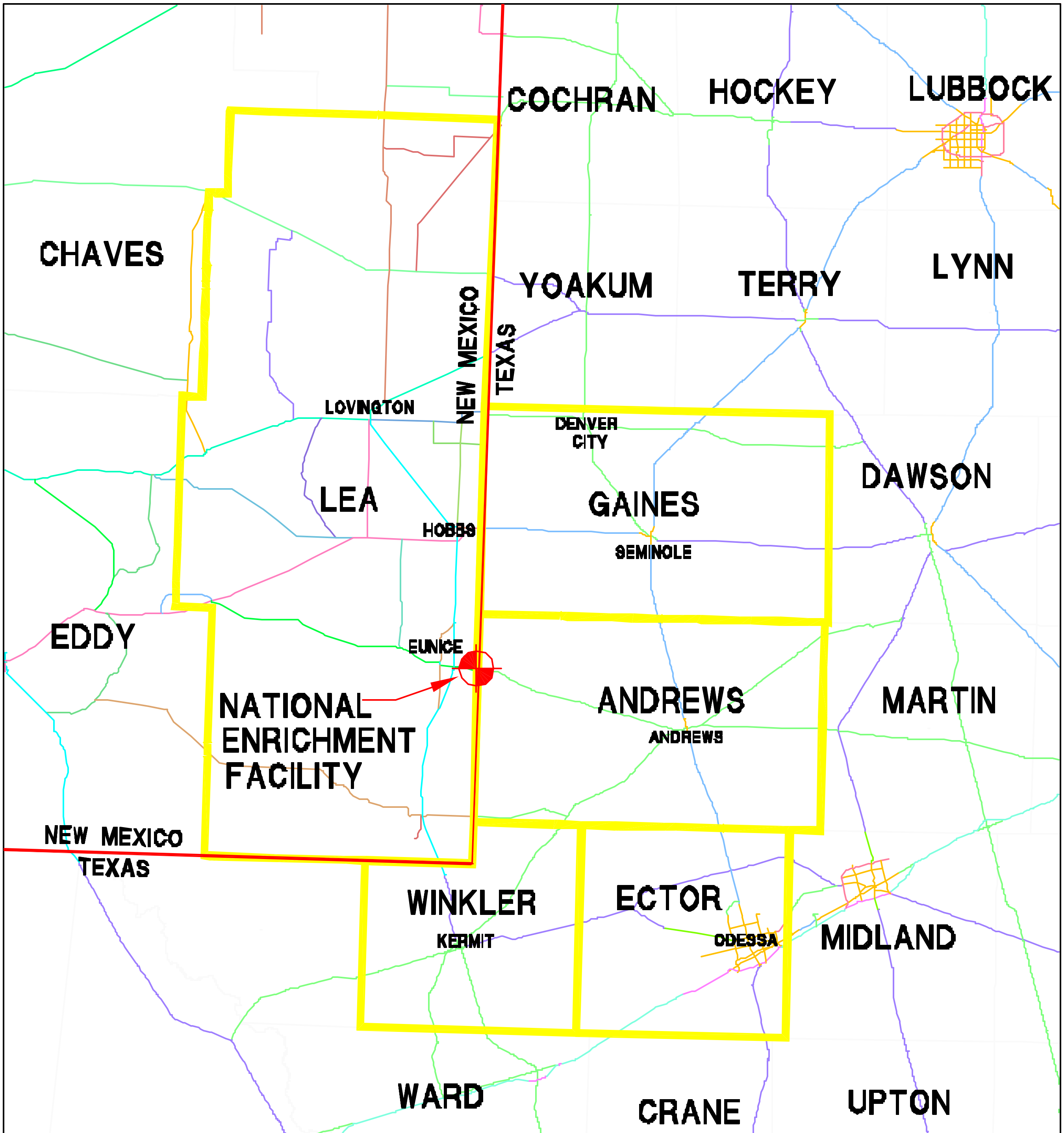
FIGURE 1.1-1
STATE MAP

REVISION DATE: DECEMBER 2003



14 0 14 28 42 56 70 KM

14 0 14 28 42 MILES

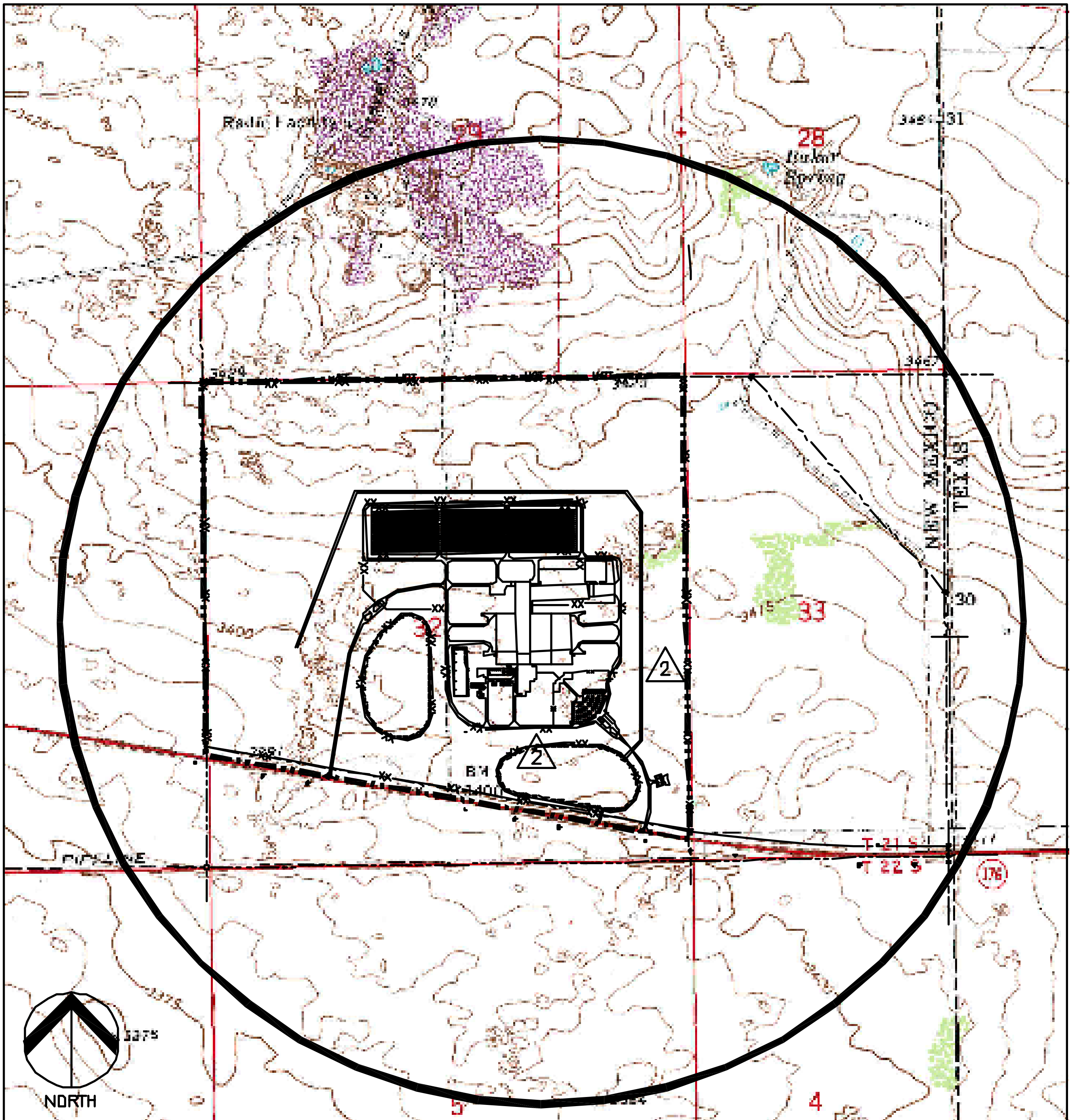
NORTH

MAP SOURCE:
U.S.CENSUS BUREAU
2000 INCORPORATED PLACES

REFERENCE NUMBER
Fig_1.1-2.dwg

FIGURE 1.1-2
COUNTY MAP

REVISION DATE: DECEMBER 2003



1000 0 1000 2000 3000 FEET

300 0 300 600 900 METERS

MAP SOURCE:
USGS 7.5 MINUTE
EUNICE NE QUADRANGLE
TEX.–N. MEX. 1:24000

CONTOUR INTERVAL:
5 FEET

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Figure_1.1–3.dwg

FIGURE 1.1-3

PLOT PLAN
(1 MILE RADIUS)

REVISION 2 DATE: JULY 2004

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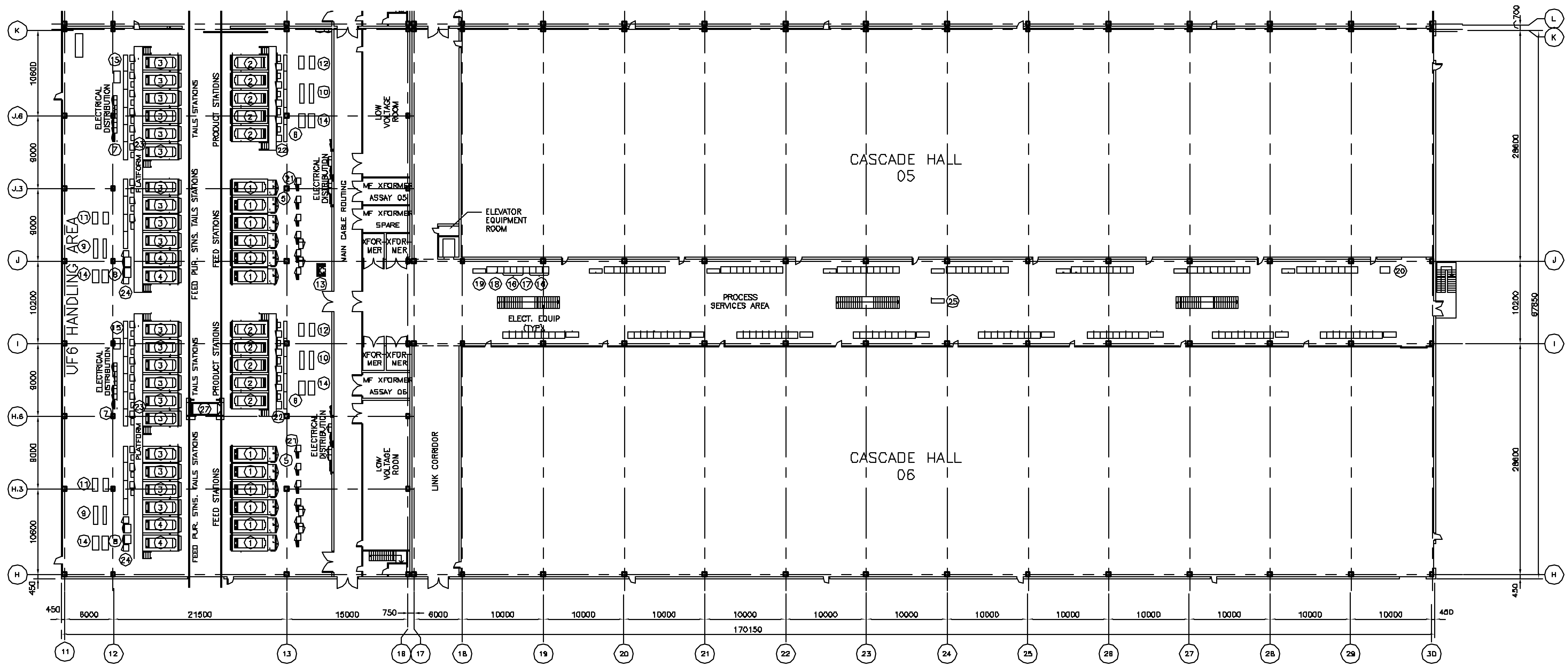
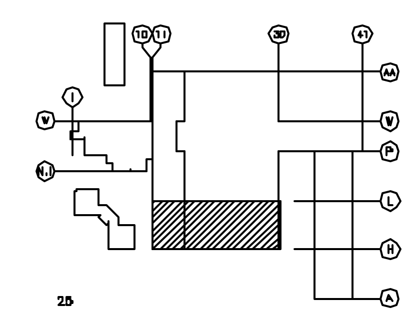
Figure 1.1-4
Facility Layout (Site Plan) With
Site Boundary and Controlled Access Area Boundary





SCALE 1 : 250

KEYPLAN

EQUIPMENT LIST PER 1,000,000 SWU MODULE

1	SOLID FEED STATION	21	FEED STATION LOCAL CONTROL CENTER
2	PRODUCT LOW TEMPERATURE TAKE-OFF STATION	22	PRODUCT STATION LOCAL CONTROL CENTER
3	TAILS LOW TEMPERATURE TAKE-OFF STATION	23	TAILS STATION LOCAL CONTROL CENTER
4	FEED PURIFICATION LOW TEMP. TAKE OFF STATION	24	FEED PURIFICATION STATION LOCAL CONTROL CENTER
5	FEED STATION HOTBOX	25	PROCESS SERVICES AREA LOCAL CONTROL CENTER
6	PRODUCT STATION VALVE FRAME	26	*
7	TAILS STATION VALVE FRAME	27	RAIL TRANSPORTER
8	FEED PURIFICATION HOTBOX	28	CASCADE VALVE STATION
9	FEED PURIFICATION COLD TRAP	29	PRODUCT PUMPING TRAIN
10	PRODUCT VENT COLD TRAP	30	TAILS PUMPING TRAIN
11	FEED PURIFICATION VACUUM PUMP/ TRAP SET	31	CONTINGENCY DUMP VACUUM PUMP/ TRAP SET
12	PRODUCT VACUUM PUMP/ TRAP SET	32	MOBILE CASCADE EVACUATION UNIT
13	FOOT & HAND MONITOR	33	MOBILE CASCADE SAMPLING UNIT
14	COLD TRAP HEAT/ CHILLER UNIT	34	PRODUCT PUMP STARTER PANEL
15	TAILS VACUUM PUMP/ TRAP SET	35	TAILS PUMP STARTER PANEL
16	MEDIUM FREQUENCY DISTRIBUTION CABINET	36	SODIUM FLUORIDE DUMP TRAPS
17	MAIN MEDIUM FREQUENCY DISTRIBUTION CABINET	37	CASCADE COOLING WATER PUMPING UNIT
18	RUN VARIABLE FREQUENCY DRIVE	38	CCW LOCAL CONTROL PANEL
19	CASCADE LOCAL CONTROL CENTER	39	HVAC UNIT
20	RUN UP VARIABLE FREQUENCY DRIVE		

NOTE: * ITEM NOT USED

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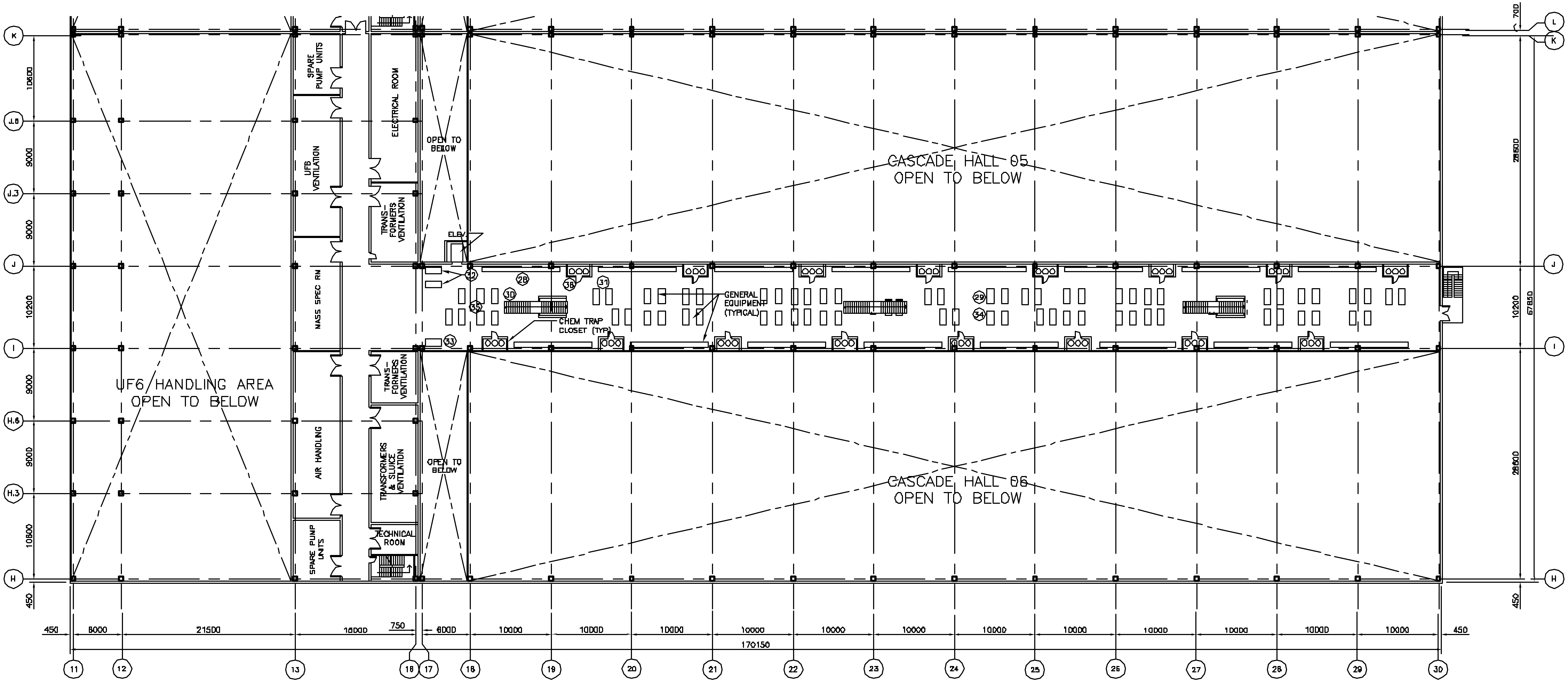
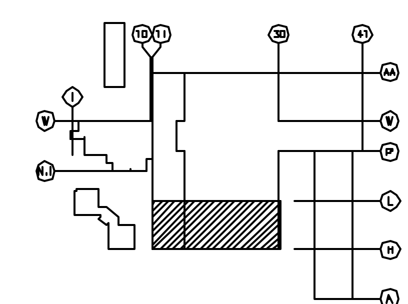
FIGURE 1.1-5

SEPARATIONS BUILDING MODULE FIRST FLOOR

REVISION DATE: DECEMBER 2003





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KEYPLAN

EQUIPMENT LIST PER 1,000,000 SWU MODULE

1 SOLID FEED STATION
2 PRODUCT LOW TEMPERATURE TAKE-OFF STATION
3 TAILS LOW TEMPERATURE TAKE-OFF STATION
4 FEED PURIFICATION LOW TEMP. TAKE OFF STATION
5 FEED STATION HOTBOX
6 PRODUCT STATION VALVE FRAME
7 TAILS STATION VALVE FRAME
8 FEED PURIFICATION HOTBOX
9 FEED PURIFICATION COLD TRAP
10 PRODUCT VENT COLD TRAP
11 FEED PURIFICATION VACUUM PUMP/ TRAP SET
12 PRODUCT VACUUM PUMP/ TRAP SET
13 FOOT & HAND MONITOR
14 COLD TRAP HEAT/ CHILLER UNIT
15 TAILS VACUUN PUMP/ TRAP SET
16 MEDIUM FREQUENCY DISTRIBUTION CABINET
17 MAIN MEDIUM FREQUENCY DISTRIBUTION CABINET
18 RUN VARIABLE FREQUENCY DRIVE
19 CASCADE LOCAL CONTROL CENTER
20 RUN UP VARIABLE FREQUENCY DRIVE
21 FEED STATION LOCAL CONTROL CENTER
22 PRODUCT STATION LOCAL CONTROL CENTER
23 TAILS STATION LOCAL CONTROL CENTER
24 FEED PURIFICATION STATION LOCAL CONTRDL CENTER
25 PROCESS SERVICES AREA LOCAL CONTROL CENTER
26 *
27 RAIL TRANSPORTER
28 CASCADE VALVE STATION
29 PRODUCT PUMPING TRAIN
30 TAILS PUMPING TRAIN
31 CONTINGENCY DUMP VACUUM PUMP/ TRAP SET
32 MOBILE CASCADE EVACUATION UNIT
33 MOBILE CASCADE SAMPLING UNIT
34 PRODUCT PUMP STARTER PANEL
35 TAILS PUMP STARTER PANEL
36 SODIUM FLUORIDE DUMP TRAPS
37 CASCADE COOLING WATER PUMPING UNIT
38 CCW LOCAL CONTROL PANEL
39 HVAC UNIT

NOTE: * ITEM NOT USED

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1000A2100

FIGURE 1.1-6

SEPARATIONS BUILDING MODULE
SECOND FLOOR

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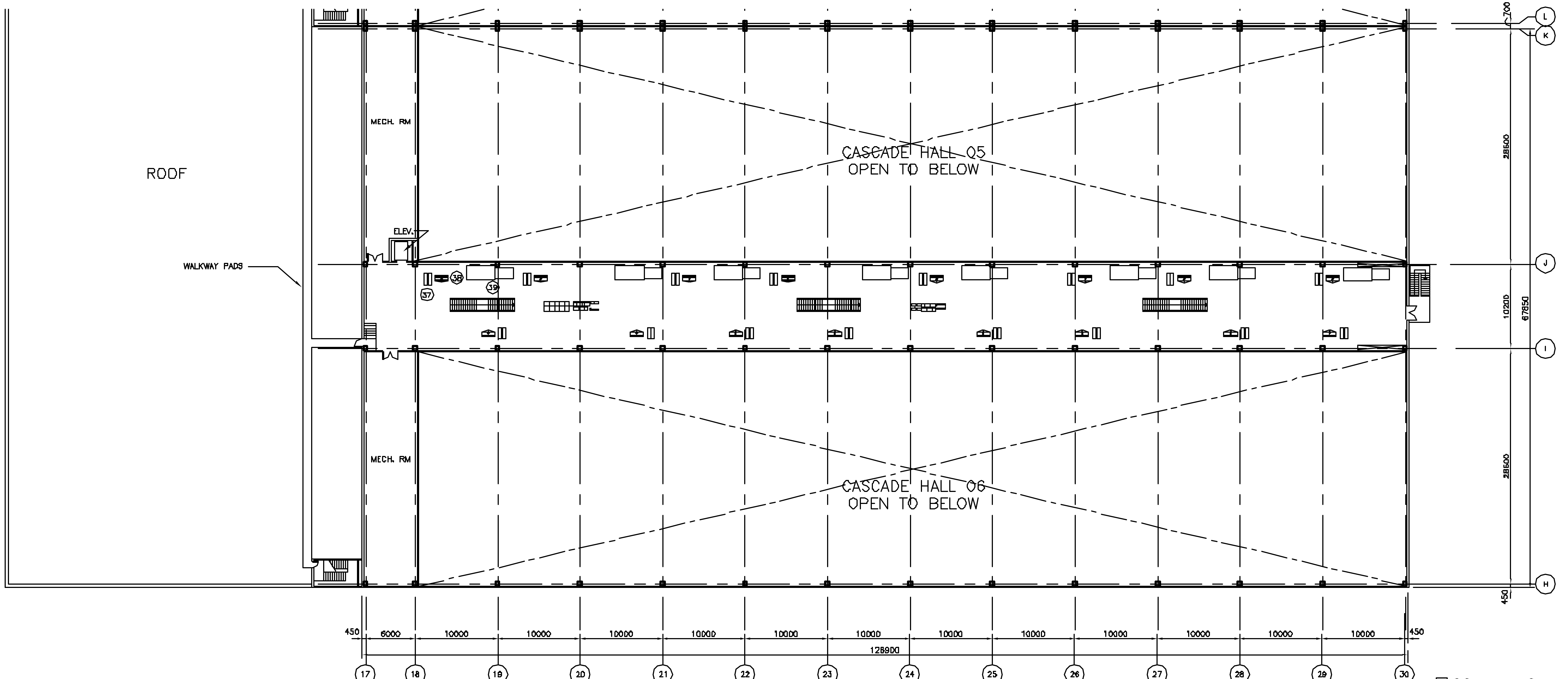

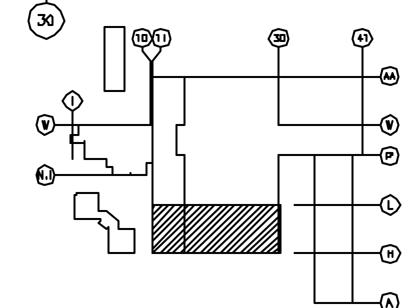

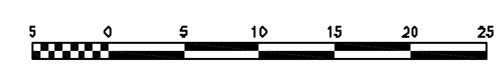

EQUIPMENT LIST PER 1,000,000 SWU MODULE

1	SOLID FEED STATION	21	FEED STATION LOCAL CONTROL CENTER
2	PRODUCT LOW TEMPERATURE TAKE-OFF STATION	22	PRODUCT STATION LOCAL CONTROL CENTER
3	TAILS LOW TEMPERATURE TAKE-OFF STATION	23	TAILS STATION LOCAL CONTROL CENTER
4	FEED PURIFICATION LOW TEMP. TAKE OFF STATION	24	FEED PURIFICATION STATION LOCAL CONTROL CENTER
5	FEED STATION HOTBOX	25	PROCESS SERVICES AREA LOCAL CONTROL CENTER
6	PRODUCT STATION VALVE FRAME	26	*
7	TAILS STATION VALVE FRAME	27	RAIL TRANSPORTER
8	FEED PURIFICATION HOTBOX	28	CASCADE VALVE STATION
9	FEED PURIFICATION COLD TRAP	29	PRODUCT PUMPING TRAIN
10	PRODUCT VENT COLD TRAP	30	TAILS PUMPING TRAIN
11	FEED PURIFICATION VACUUM PUMP/ TRAP SET	31	CONTINGENCY DUMP VACUUM PUMP/ TRAP SET
12	PRODUCT VACUUM PUMP/ TRAP SET	32	MOBILE CASCADE EVACUATION UNIT
13	FOOT & HAND MONITOR	33	MOBILE CASCADE SAMPLING UNIT
14	COLD TRAP HEAT/ CHILLER UNIT	34	PRODUCT PUMP STARTER PANEL
15	TAILS VACUUM PUMP/ TRAP SET	35	TAILS PUMP STARTER PANEL
16	MEDIUM FREQUENCY DISTRIBUTION CABINET	36	SODIUM FLUORIDE DUMP TRAPS
17	MAIN MEDIUM FREQUENCY DISTRIBUTION CABINET	37	CASCADE COOLING WATER PUMPING UNIT
18	RUN VARIABLE FREQUENCY DRIVE	38	CCW LOCAL CONTROL PANEL
19	CASCADE LOCAL CONTROL CENTER	39	HVAC UNIT
20	RUN UP VARIABLE FREQUENCY DRIVE		

NOTE: *ITEM NOT USED

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1000A2200

FIGURE 1.1-7
SEPARATIONS BUILDING MODULE
THIRD FLOOR

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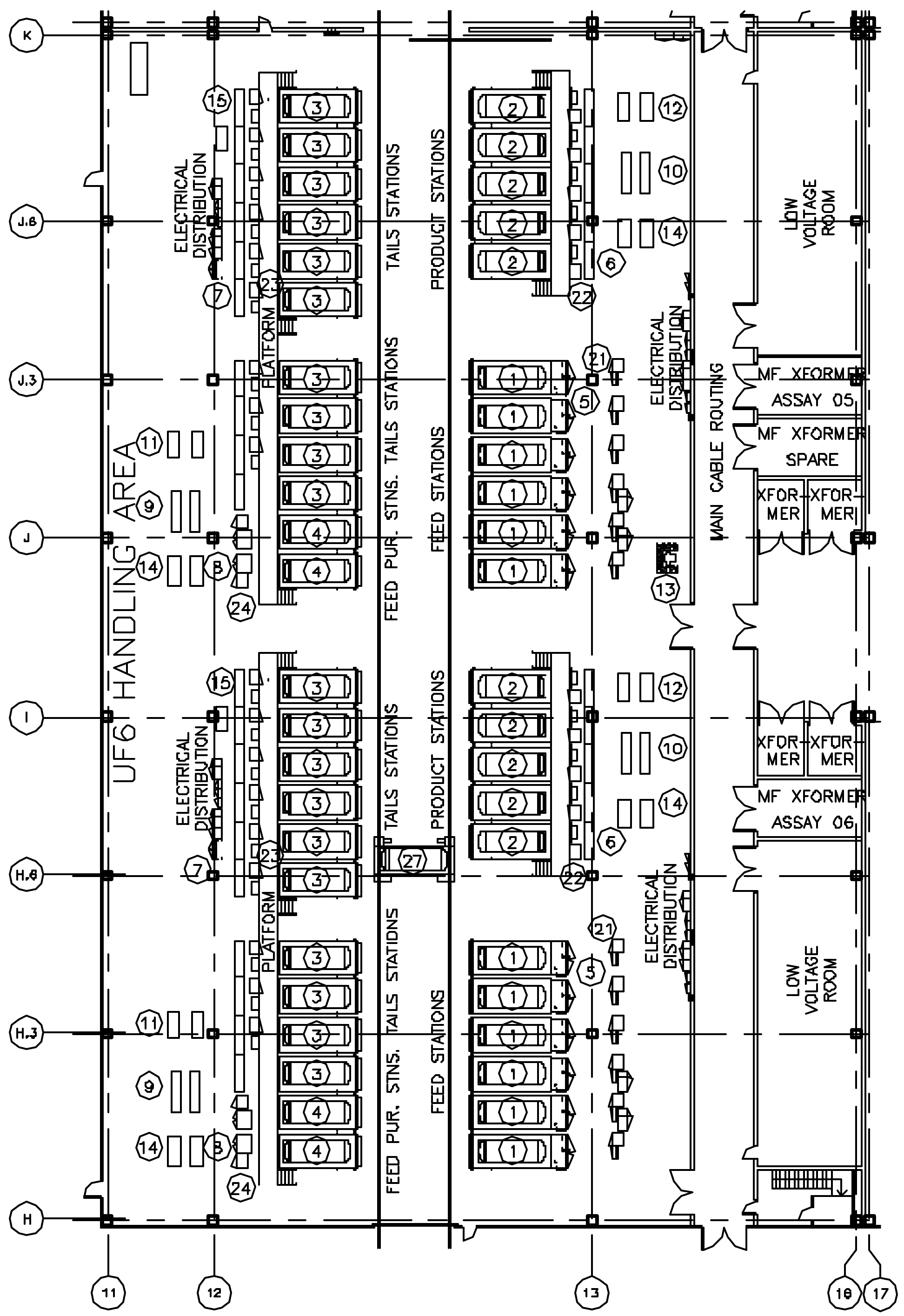

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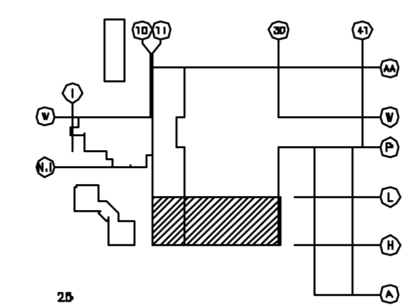

KEYPLAN

EQUIPMENT LIST PER 1,000,000 SWU MODULE

1	SOLID FEED STATION	21	FEED STATION LOCAL CONTROL CENTER
2	PRODUCT LOW TEMPERATURE TAKE-OFF STATION	22	PRODUCT STATION LOCAL CONTROL CENTER
3	TAILS LOW TEMPERATURE TAKE-OFF STATION	23	TAILS STATION LOCAL CONTROL CENTER
4	FEED PURIFICATION LOW TEMP. TAKE OFF STATION	24	FEED PURIFICATION STATION LOCAL CONTROL CENTER
5	FEED STATION HOTBOX	25	PROCESS SERVICES AREA LOCAL CONTROL CENTER
6	PRODUCT STATION VALVE FRAME	26	*
7	TAILS STATION VALVE FRAME	27	RAIL TRANSPORTER
8	FEED PURIFICATION HOTBOX	28	CASCADE VALVE STATION
9	FEED PURIFICATION COLD TRAP	29	PRODUCT PUMPING TRAIN
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18	RUN VARIABLE FREQUENCY DRIVE	38	CCW LOCAL CONTROL PANEL
19	CASCADE LOCAL CONTROL CENTER	39	HVAC UNIT
20	RUN UP VARIABLE FREQUENCY DRIVE		

NOTE: * ITEM NOT USED

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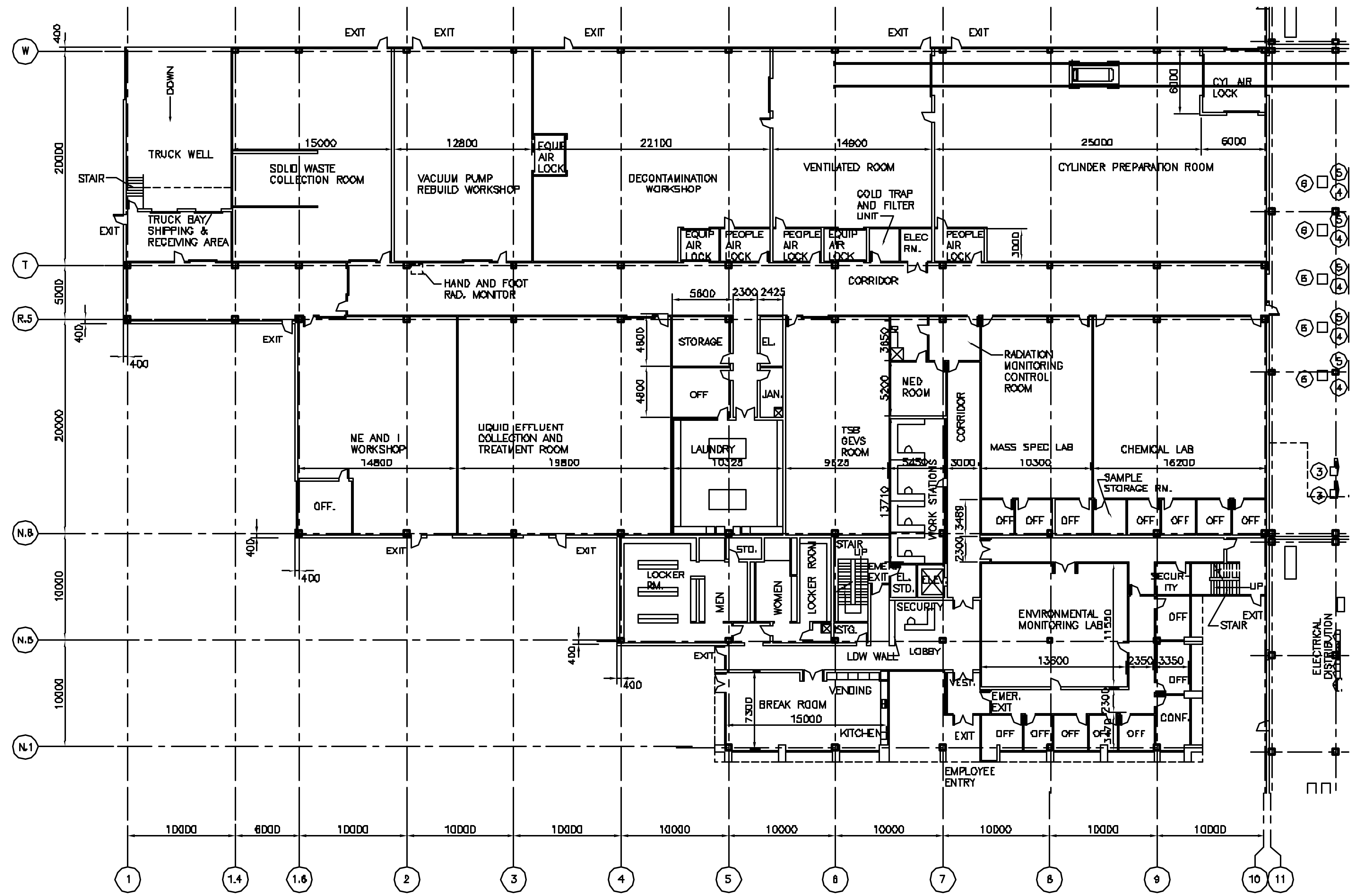
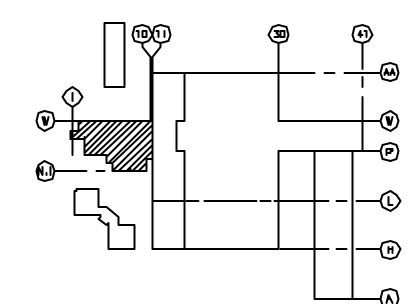
REFERENCE NUMBER
1000A2000

FIGURE 1.1-8
UF_6 HANDLING AREA
EQUIPMENT LOCATION

REVISION DATE: DECEMBER 2003





KEYPLAN

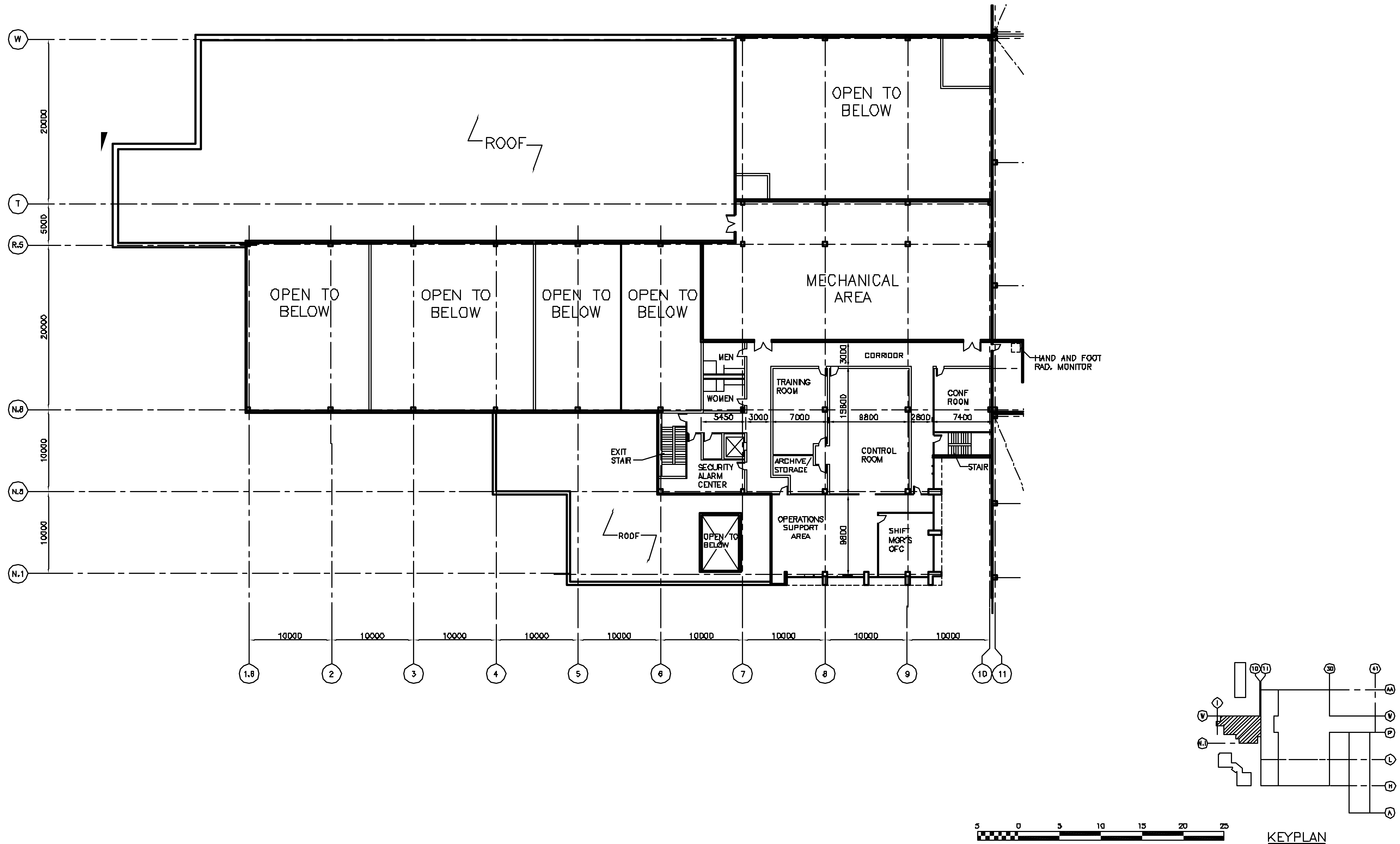
LOCKWOOD GREENE ENGINEERING & CONSTRUCTION

REFERENCE NUMBER
1500A2000

FIGURE 1.1-9

TECHNICAL SERVICES BUILDING
FIRST FLOOR

REVISION DATE: DECEMBER 2003



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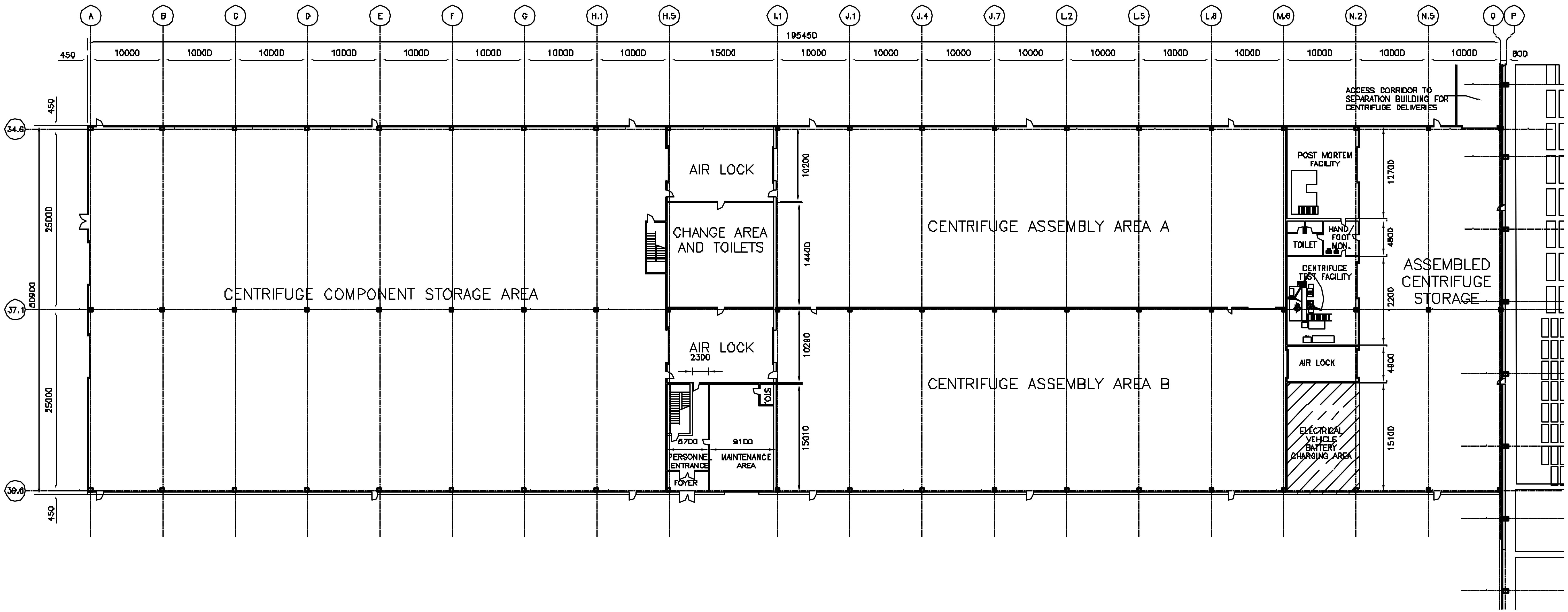
REFERENCE NUMBER 1500A2100

FIGURE 1.1-10

TECHNICAL SERVICES BUILDING SECOND FLOOR

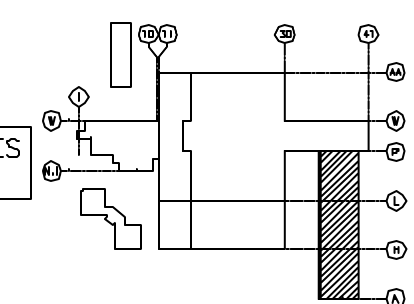
REVISION DATE: DECEMBER 2003



ROTATED CLOCKWISE 90 DEGREES FOR CLARITY

10 0.5 0 10 20 30

SCALE 1 : 300



KEYPLAN

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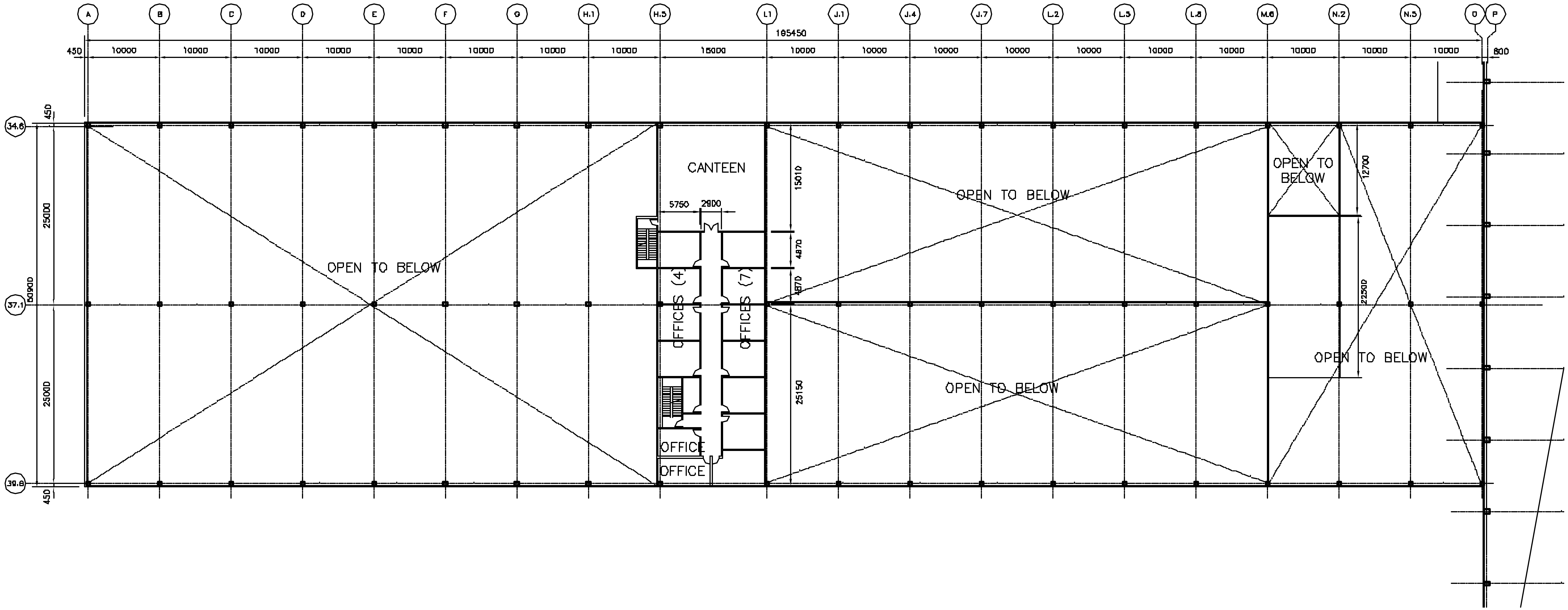
REFERENCE NUMBER 1300A2000

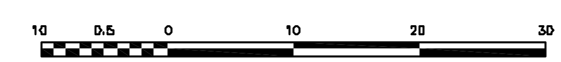
FIGURE 1.1-11

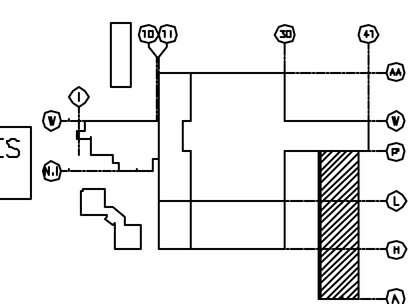
CENTRIFUGE ASSEMBLY BUILDING FIRST FLOOR

REVISION DATE: DECEMBER 2003



ROTATED CLOCKWISE 90 DEGREES
FOR CLARITY





KEYPLAN

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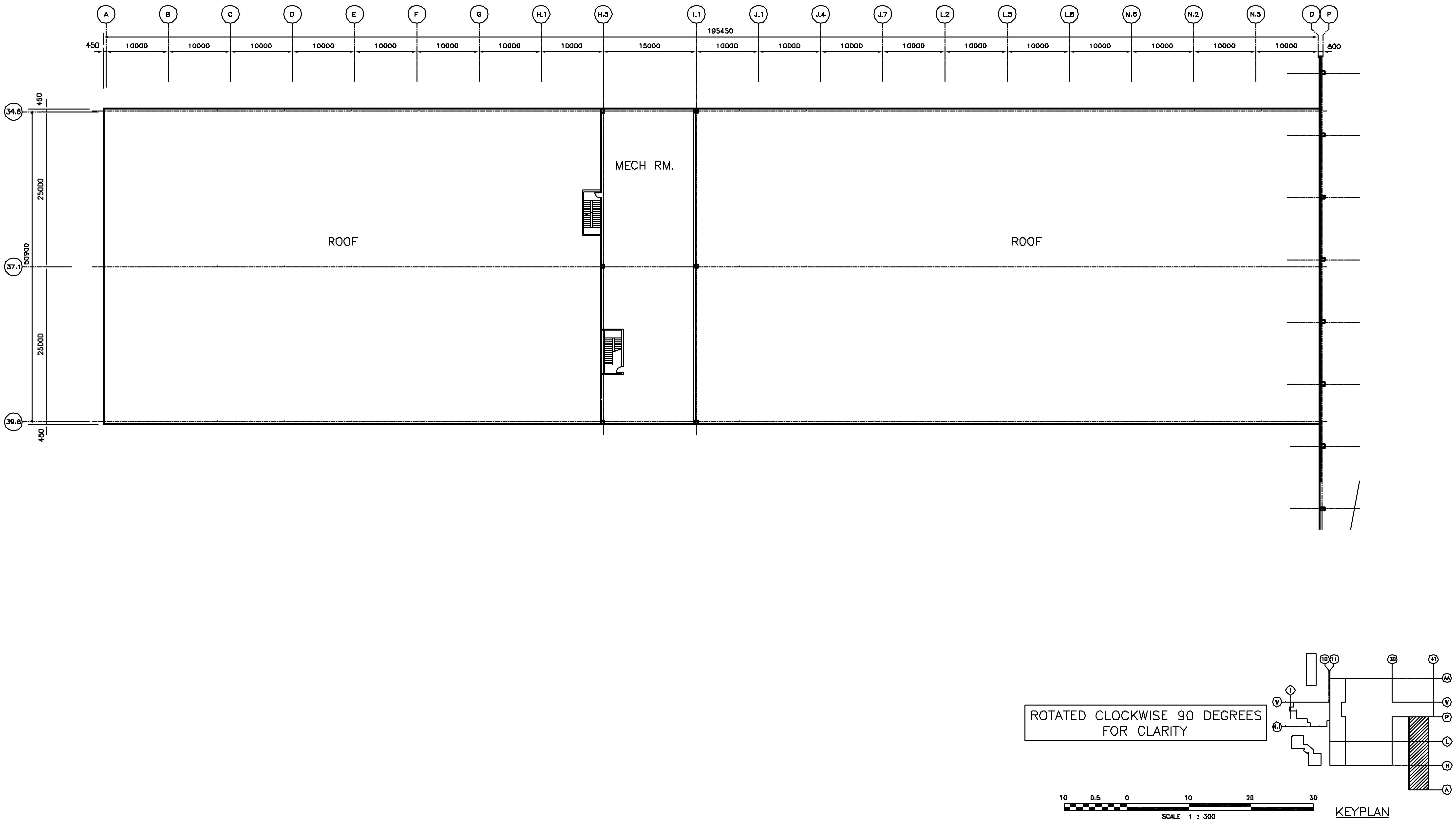
REFERENCE NUMBER
1300A2100

FIGURE 1.1-12
CENTRIFUGE ASSEMBLY BUILDING
SECOND FLOOR

REVISION DATE: DECEMBER 2003



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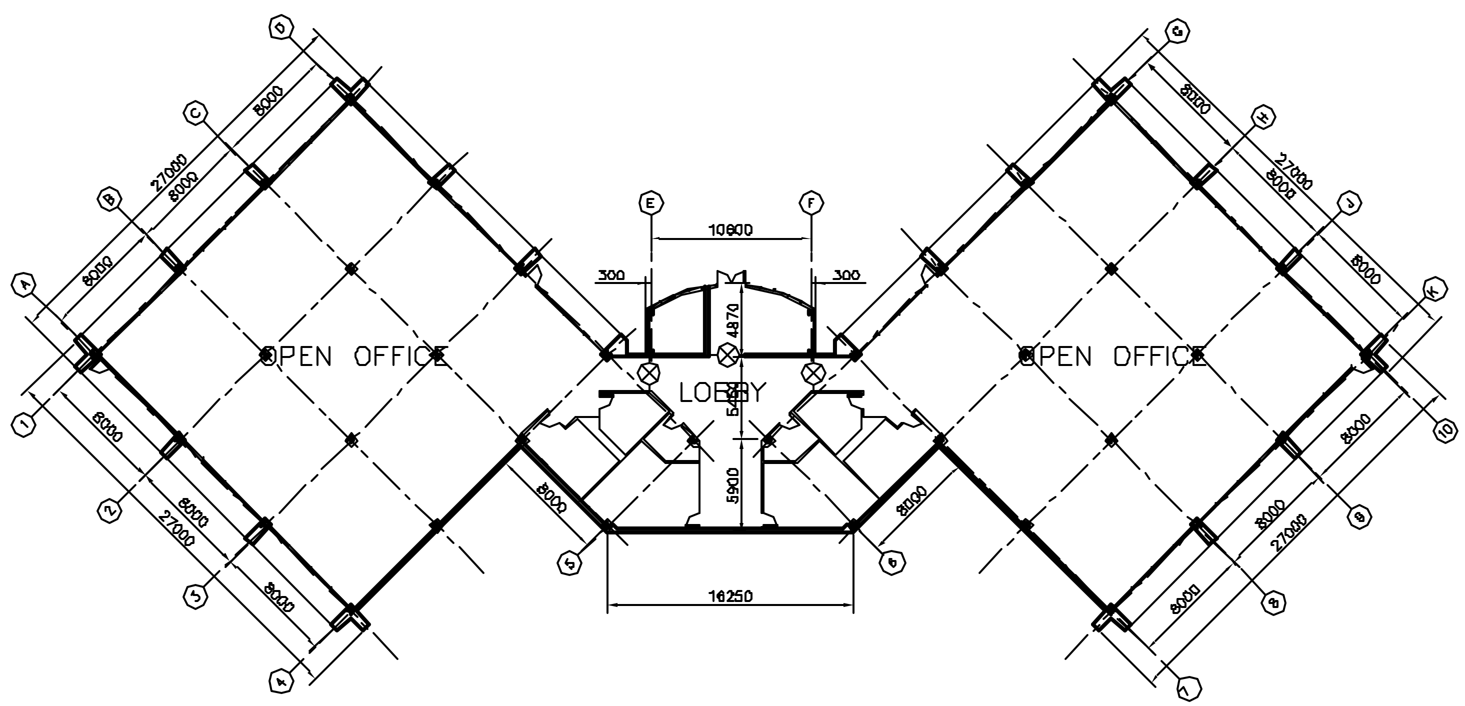
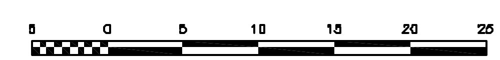
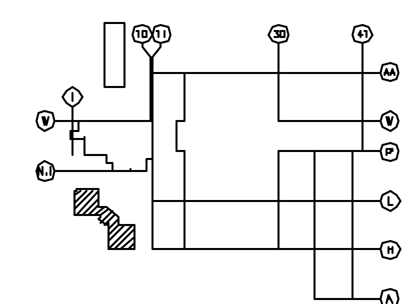
REFERENCE NUMBER
1300A2200

FIGURE 1.1-13
CENTRIFUGE ASSEMBLY BUILDING PENTHOUSE

REVISION DATE: DECEMBER 2003







KEYPLAN

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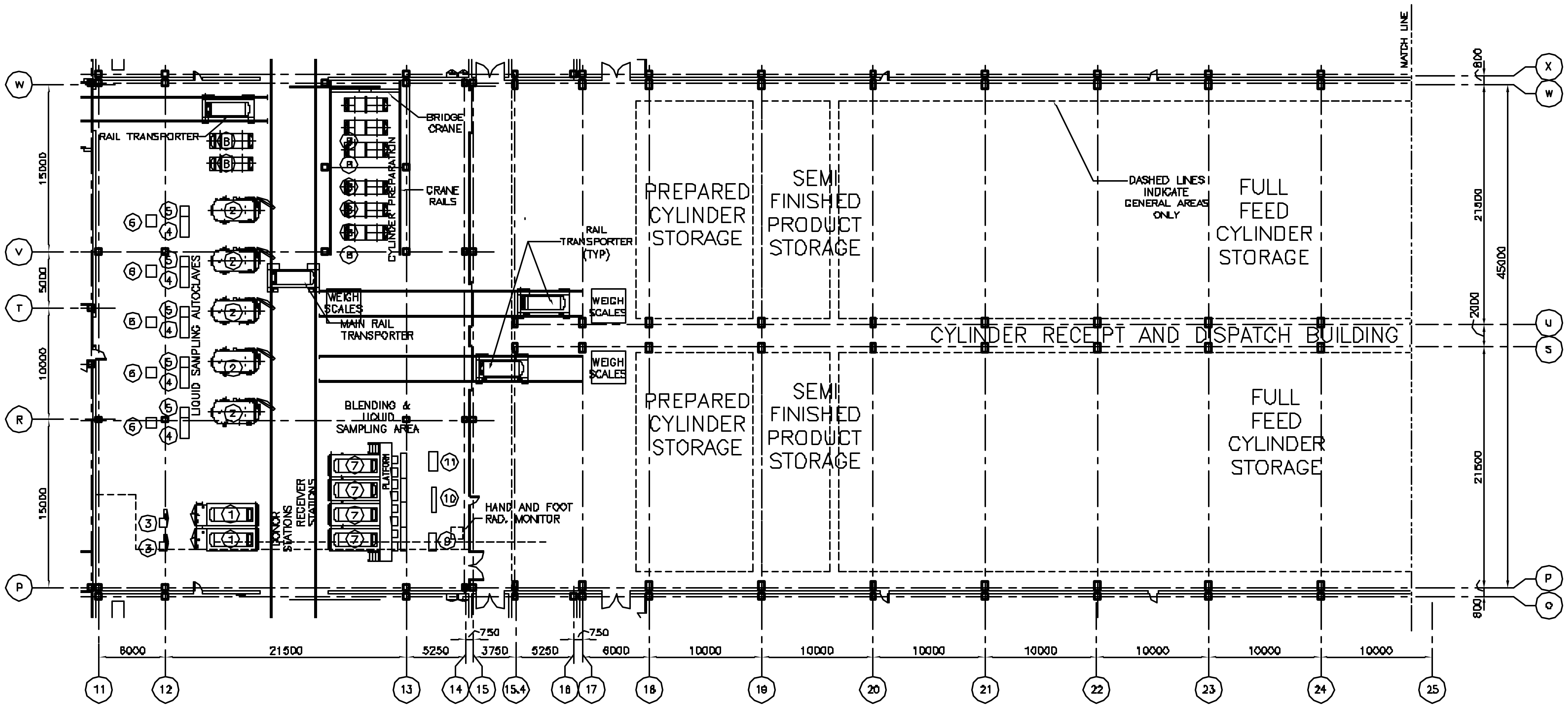
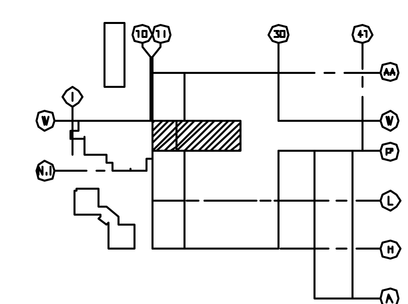
ENGINEERING & CONSTRUCTION

REFERENCE NUMBER
1700A2000

FIGURE 1.1-14
ADMINISTRATION BUILDING

REVISION DATE: DECEMBER 2003





5 0 5 10 15 20 25

SCALE 1 : 250

EQUIPMENT LIST

1	PRODUCT BLENDING DONOR STATION
2	PRODUCT LIQUID SAMPLING AUTOCLAVE
3	DONOR STATION CONTROL CABINET
4	AUTOCLAVE CONTROL CABINET
5	AUTOCLAVE LOCAL CONTROL CENTER
6	HYDRAULIC POWER PACK
7	PRODUCT BLENDING RECEIVER STATIONS
8	48Y CYLINDERS
9	VACUUM PUMP / TRAP SET
10	UF_6 COLD TRAP
11	COLD TRAP HEAT / CHILLER UNIT

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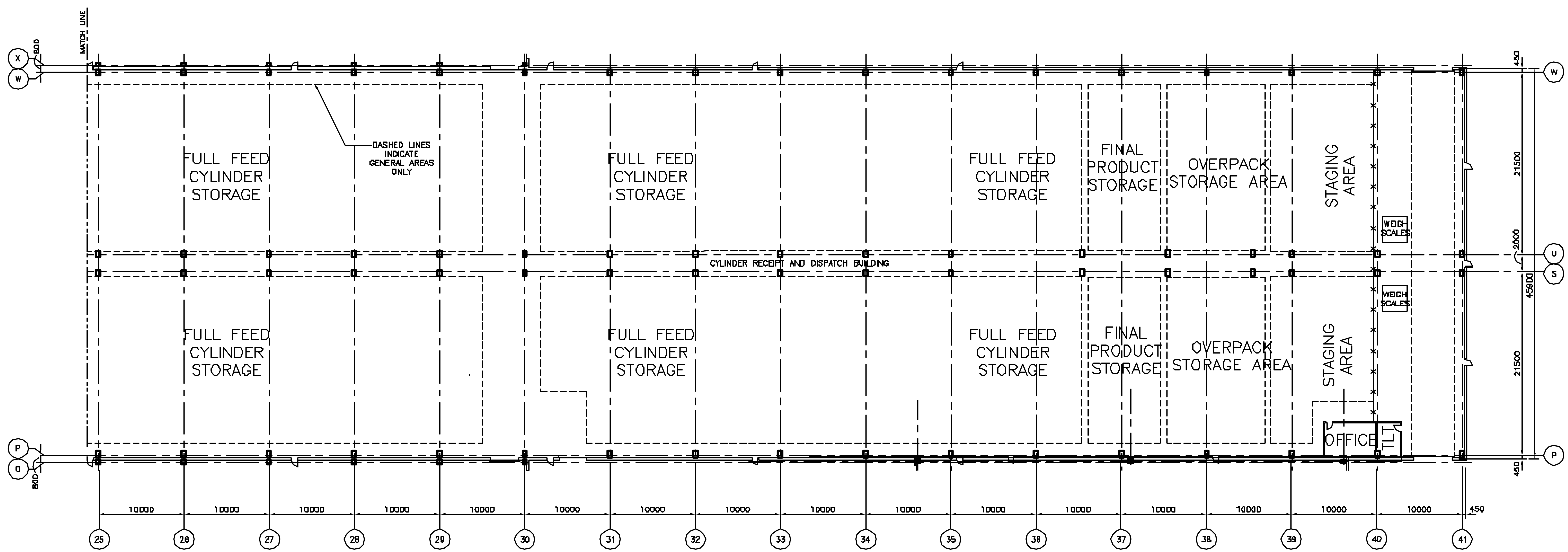
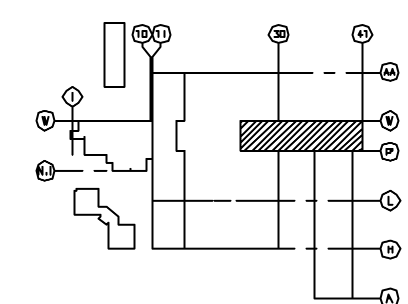
ENGINEERING & CONSTRUCTION

REFERENCE NUMBER
1100A2000a

FIGURE 1.1-15
CYLINDER RECEIPT AND DISPATCH BUILDING FIRST FLOOR
PART A
REVISION DATE: DECEMBER 2003





KEYPLAN

SCALE 1 : 250

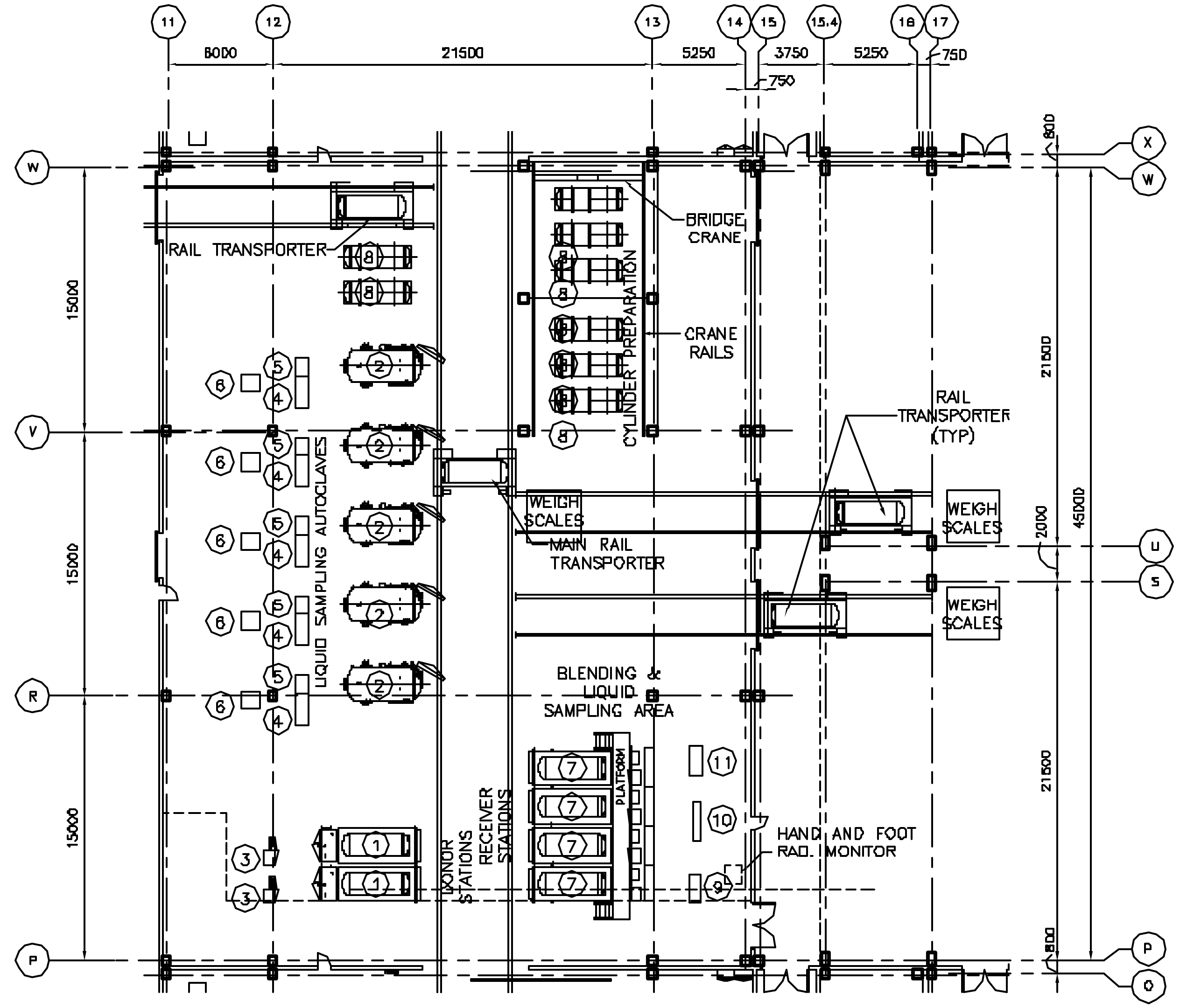
LOCKWOOD GREENE ENGINEERING & CONSTRUCTION

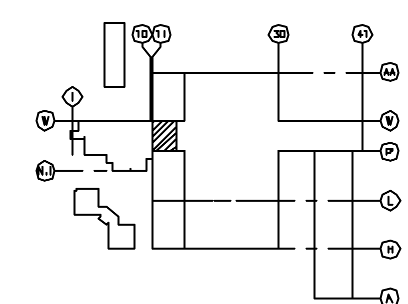
REFERENCE NUMBER
1100A2000b

FIGURE 1.1-16

CYLINDER RECEIPT AND DISPATCH BUILDING FIRST FLOOR PART B

REVISION DATE: DECEMBER 2003





KEYPLAN

EQUIPMENT LIST

1 PRODUCT BLENDING DONOR STATION
2 PRODUCT LIQUID SAMPLING AUTOCLAVE
3 DONOR STATION CONTROL CABINET
4 AUTOCLAVE CONTROL CABINET
5 AUTOCLAVE LOCAL CONTROL CENTER
6 HYDRAULIC POWER PACK
7 PRODUCT BLENDING RECEIVER STATIONS
8 48Y CYLINDERS
9 VACUUM PUMP / TRAP SET
10 UF_6 COLD TRAP
11 COLD TRAP HEAT / CHILLER UNIT

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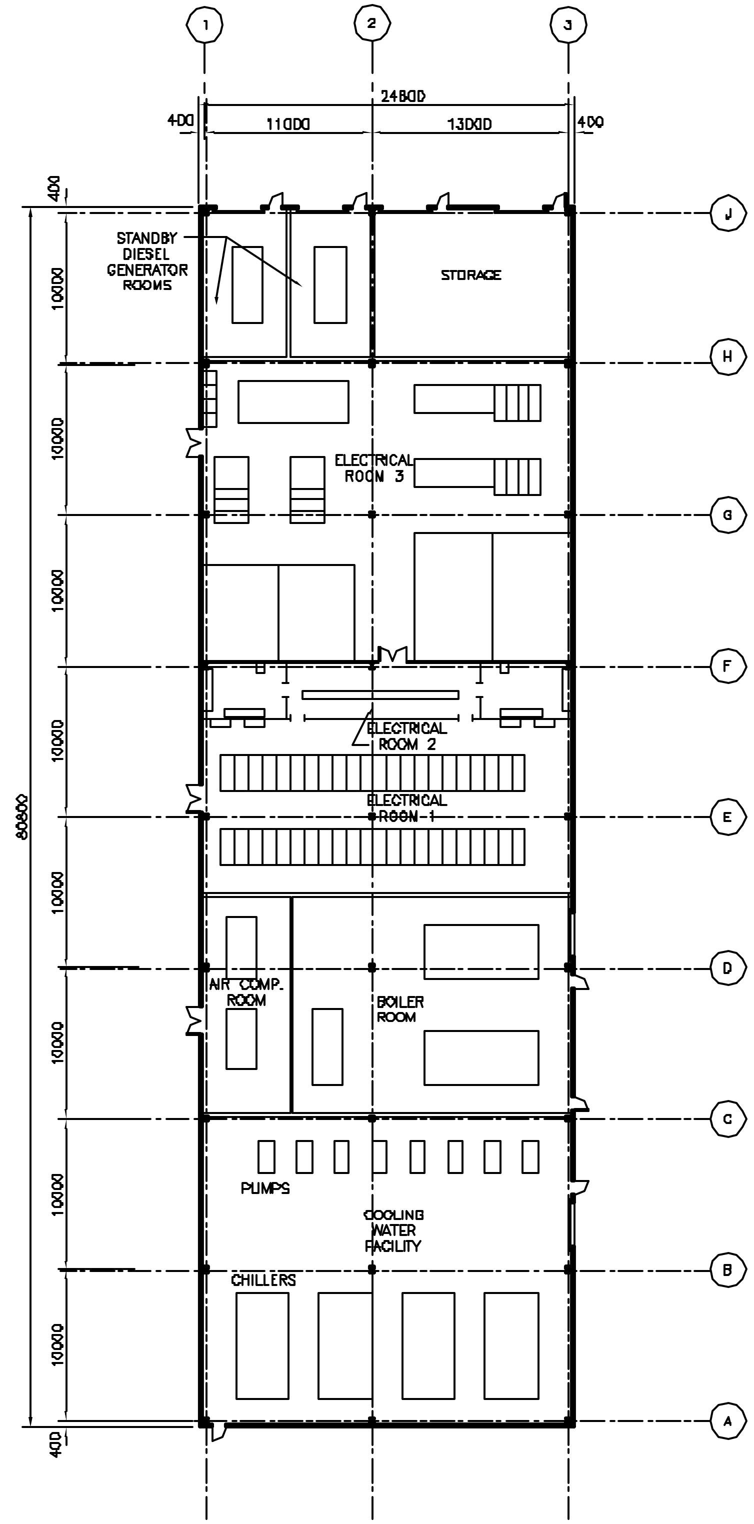
ENGINEERING & CONSTRUCTION

REFERENCE NUMBER
1200A2000

FIGURE 1.1-17
BLENDING AND LIQUID SAMPLING AREA
FIRST FLOOR

REVISION DATE: DECEMBER 2003



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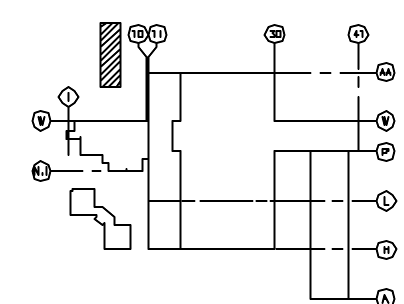
SCALE 1 : 250



KEYPLAN

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ENGINEERING & CONSTRUCTION

REFERENCE NUMBER
1600A2000

FIGURE 1.1-18

CENTRAL UTILITIES BUILDING

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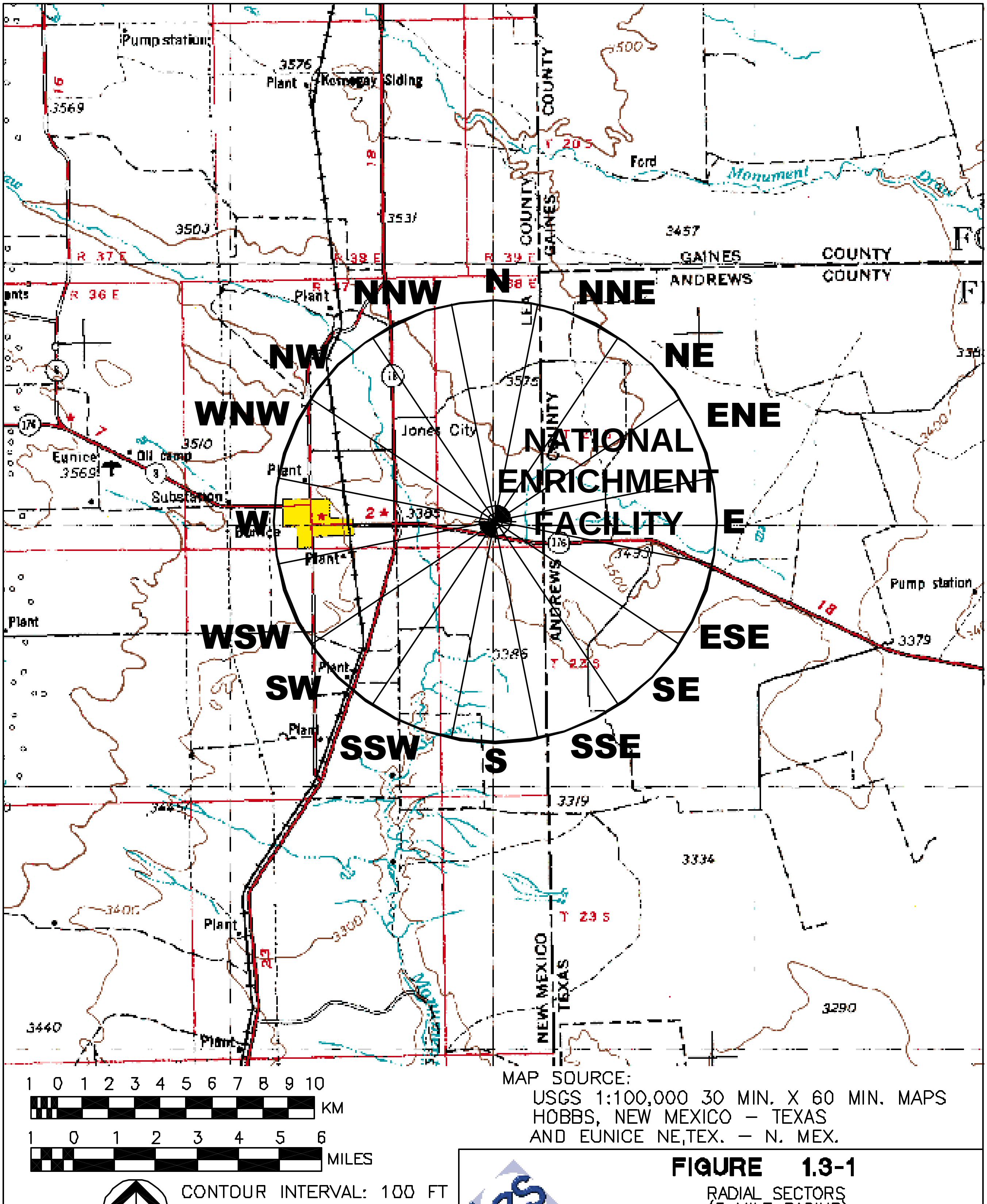

MAP SOURCE:
USGS 1:100,000 30 MIN. X 60 MIN. MAPS
HOBBS, NEW MEXICO – TEXAS
AND EUNICE NE,TEX. – N. MEX.

REFERENCE NUMBER
15Min Figures.dwg

FIGURE 1.3-1
RADIAL SECTORS
(5 MILE RADIUS)

REVISION DATE: DECEMBER 2003

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LIST OF FIGURES

2.0 ORGANIZATION AND ADMINISTRATION

This chapter describes the management system and administrative procedures for the effective implementation of Health, Safety, and Environmental (HS&E) functions at the Louisiana Energy Services (LES) enrichment facility. The chapter presents the organizations responsible for managing the design, construction, operation, and decommissioning of the facility. The key management and supervisory positions and functions are described including the personnel qualifications for each key position at the facility.

The facility organization, technical qualifications, procedures, and management controls in this license application are similar to those submitted for Nuclear Regulatory Commission (NRC) review in the LES license application for the Claiborne Enrichment Center (LES, 1993). The NRC staff evaluated the proposed organization and administrative procedures and concluded that they were adequate and met the requirements specified in 10 CFR 40 (CFR, 2003b) and 70 (CFR, 2003c) concerning organizational structure; staff technical qualifications, functions, and responsibilities; and management controls (NRC, 1994). LES has modified the facility operating organization from the one previously accepted to better reflect lessons learned and operating experience at Uranium Enrichment Company (Urenco) facilities and United States nuclear facilities. Although some position titles and scope of responsibility have been changed, the functions to be performed by the operating organization remain the same as the Claiborne Enrichment Center submittal.

The LES policy is to maintain a safe work place for its employees and to assure operational compliance within the terms and conditions of the license and applicable regulations. The Plant Manager has overall responsibility for safety and compliance to this policy. In particular, LES employs the principle of keeping radiation and chemical exposures to employees and the general public as low as reasonably achievable (ALARA).

The information provided in this chapter, the corresponding regulatory requirement, and the section of NUREG-1520 (NRC, 2002), Chapter 2 in which the NRC acceptance criteria are presented is summarized below.

Information Category and Requirement	10 CFR 70 Citation	NUREG-1520 Chapter 2 Reference
Section 2.1 Organizational Structure		
• Functional description of specific organization groups responsible for managing the design, construction, and operation of the facility	70.22(a)(6)	2.4.3(1) & 2.4.3(7)
• Management controls and communications among organizational units	70.22(a)(8)	2.4.3(2)
• Startup and transition to operations	70.22(a)(6)	2.4.3(4)
Section 2.2 Key Management Positions		
• Qualifications, responsibilities, and authorities for key management personnel	70.22(a)(6)	2.4.3(3) & 2.4.3(4)
Section 2.3 Administration		
• Effective implementation of HS&E functions using written procedures	70.22(a)(8)	2.4.3(5)
• Reporting of unsafe conditions or activities	70.62(a)	2.4.3(6)
• Commitment to establish formal management measures to ensure availability of IROFS	70.62(d)	2.4.3(8)
• Written agreements with offsite emergency resources	70.22(i)	2.4.3(9)

2.1 ORGANIZATIONAL STRUCTURE

The LES organizational structure is described in the following sections. The organizational structure indicates the lines of communication and management control of activities associated with the design, construction, operation, and decommissioning of the facility.

2.1.1 Corporate Functions, Responsibilities, and Authorities

LES is a registered limited partnership formed solely to provide uranium enrichment services for commercial nuclear power plants. The LES partnership is described in Chapter 1, Section 1.2, Institutional Information.

LES has presented to Lea County, New Mexico a proposal to develop the NEF. Lea County would issue its Industrial Revenue Bond (National Enrichment Facility Project) Series 2004 in the maximum aggregate principal amount of $1,800,000,000 to accomplish the acquisition, construction and installation of the project pursuant to the County Industrial Revenue Bond Act, Chapter 4, Article 59 NMSA 1978 Compilation, as amended. The Project is comprised of the land, buildings, and equipment.

Under the Act, Lea County is authorized to acquire industrial revenue projects to be located within Lea County but outside the boundaries of any incorporated municipality for the purpose of promoting industry and trade by inducing manufacturing, industrial and commercial enterprises to locate or expand in the State of New Mexico, and for promoting a sound and proper balance in the State of New Mexico between agriculture, commerce, and industry. Lea County will lease the project to LES, and LES will be responsible for the construction and operation of the facility. Upon expiration of the Bond after 30 years, LES will purchase the project.

The County has no power under the Act to operate the project as a business or otherwise or to use or acquire the project property for any purpose, except as lessor thereof under the terms of the lease.

In the exercise of any remedies provided in the lease, the County shall not take any action at law or in equity that could result in the Issuer obtaining possession of the project property or operating the project as a business or otherwise.

LES is responsible for the design, quality assurance, construction, operation, and decommissioning of the enrichment facility. The President of LES reports to the LES Management Committee. This committee is composed of representatives from the general partners of LES.

The President receives policy direction from the LES Management Committee. Reporting to the President are the Engineering and Contracts Manager, the Corporate Communications Manager, Chief Financial Officer (CFO), the Quality Assurance (QA) Director, Chief Operating Officer (COO), and the Health, Safety & Environment Director. Figure 2.1-1, LES Corporate, Design and Construction Organization shows the authority and lines of communication.

2.1.2 Design and Construction Organization

As the owner of the enrichment technology and operator of the enrichment facilities in Europe, LES has contracted Urenco Limited to prepare the reference design for the facility, while an architect/engineering (A/E) has been contracted to further specify structures and systems of the facility, and ensure the reference design meets all applicable U.S. codes and standards. A contractor specializing in site evaluations has been contracted to perform the site selection evaluation. A nuclear consulting company has been contracted to conduct the site characterization, perform the Integrated Safety Analysis and to support development of the license application.

During the construction phase, preparation of construction documents and construction itself are contracted to qualified contractors. The Engineering and Contracts Manager is responsible for managing the design, construction, initial startup and procurement activities. Contractor QA Programs will be reviewed by LES QA and must be approved before work can start.

Urenco will design, manufacture and deliver to the site the centrifuges necessary for facility operation. In addition, Urenco is supplying technical assistance and consultation for the facility. Urenco has extensive experience in the gas centrifuge uranium enrichment process since it operates three gas centrifuge uranium enrichment plants in Europe. Urenco is conducting technical reviews of the design activities to ensure the design of the enrichment facility is in accordance with the Urenco reference design information.

For procurement involving the use of vendors located outside the U.S., LES selects vendors only after a determination that their quality assurance programs meet the LES requirements. Any components supplied to LES are designed to meet applicable domestic industry code requirements or their equivalents as stated by the equipment specifications.

As shown in Figure 2.1-1, the Engineering and Contracts Manager is responsible for managing the work and contracts with the Technology Supplier (Urenco) and a select group of Project Managers. These Project Managers will be responsible for the areas of Procurement, Construction, Engineering, Project Engineering, Project Controls and Start-up. The lines of communication of key management positions within the engineering and construction organization are shown in Figure 2.1-1.

Position descriptions of key management personnel in the design and construction organization will be accessible to all affected personnel and the NRC.

2.1.3 Operating Organization

The operating organization for LES is shown in Figures 2.1-1, and 2.1-2, LES National Enrichment Facility Operating Organization. LES has direct responsibility for preoperational testing, initial start-up, operation and maintenance of the facility.

The Plant Manager reports to the COO and is responsible for the overall operation and administration of the enrichment facility. He is also responsible for ensuring the facility complies with all applicable regulatory requirements. In the discharge of these responsibilities, he directs the activities of the following groups:

- Health, Safety, and Environment

- Operations
- Uranium Management
- Technical Services
- Human Resources
- Quality Assurance.

The responsibilities, authorities and lines of communication of key management positions within the operating organization are discussed in Section 2.2, Key Management Positions.

During the Operations Phase the QA Manager reports to the Plant Manager. However, the QA Manager has the authority and responsibility to contact directly the LES President, through the QA Director, with any Quality Assurance concerns during operation.

2.1.4 Transition From Design and Construction to Operations

LES is responsible for the design, quality assurance, construction, testing, initial startup, operation, and decommissioning of the facility.

Towards the end of construction, the focus of the organization will shift from design and construction to initial start-up and operation of the facility. As the facility nears completion, LES will staff the facility to ensure smooth transition from construction activities to operation activities. Urenco, which has been operating gas centrifuge enrichment facilities in Europe for over 30 years, will have personnel integrated into the LES organization to provide technical support during startup of the facility and transition into the operations phase.

As the construction of systems is completed, the systems will undergo acceptance testing as required by procedure, followed by turnover from the construction organization to the operations organization by means of a detailed transition plan. The turnover will include the physical systems and corresponding design information and records. Following turnover, the operating organization will be responsible for system maintenance and configuration management. The design basis for the facility is maintained during the transition from construction to operations through the configuration management system described in Chapter 11, Management Measures.

2.2 KEY MANAGEMENT POSITIONS

This section describes the functional positions responsible for managing the operation of the facility. The facility is staffed at sufficient levels prior to operation to allow for training, procedure development, and other pre-operational activities.

The responsibilities, authorities and lines of communication for each key management position are provided in this section. Responsible managers have the authority to delegate tasks to other individuals; however, the responsible manager retains the ultimate responsibility and accountability for implementing the applicable requirements. Management responsibilities, supervisory responsibilities, and the criticality safety engineering staff responsibilities related to nuclear criticality safety are in accordance with ANSI/ANS-8.19-1996, Administrative Practices for Nuclear Criticality Safety (ANSI, 1996).

The LES Corporate Organization and lines of communication are shown in Figure 2.1-1.

2.2.1 Operating Organization

The functions and responsibilities of key facility management are described in the following paragraphs. Additional detailed responsibilities related to nuclear criticality safety for key management positions and remaining supervisory and criticality safety staff are in accordance with ANSI/ANS-8.19-1996 (ANSI, 1996). The basic functions and responsibilities are the same as that previously accepted by the NRC Staff in NUREG-1491, Section 10 (NRC, 1994). Some position titles have been changed to better reflect the actual responsibilities of the position. Similarly, some operating functions have been assigned to different managers to better reflect the operating organization presently used at Urenco and U. S. nuclear facilities.

A. Chief Operating Officer

The Chief Operating Officer (COO) is appointed by the President and is responsible for ensuring the facility complies with all applicable regulatory requirements. The COO directs these responsibilities through the Plant Manager.

B. Plant Manager

The Plant Manager shall be appointed by, and report to, the Chief Operating Officer of LES. The Plant Manager has direct responsibility for operation of the facility in a safe, reliable and efficient manner. The Plant Manager is responsible for proper selection of staff for all key positions including positions on the Safety Review Committee. The Plant Manager is responsible for the protection of the facility staff and the general public from radiation and chemical exposure and/or any other consequences of an accident at the facility and also bears the responsibility for compliance with the facility license. The Plant Manager or designee(s) have the authority to approve and issue procedures.

C. Quality Assurance Director

The Quality Assurance Director is appointed by and reports to the President and has overall responsibility for development, management and implementation of the LES QA Program.

D. Quality Assurance Manager

The Quality Assurance (QA) Manager reports to the Plant Manager and is responsible for establishing and maintaining the Quality Assurance Program for the facility. The facility line managers and their staff who are responsible for performing quality-affecting work are responsible for ensuring implementation of and compliance with the QA Program. The QA Manager position is independent from other management positions at the facility to ensure the QA Manager has access to the Plant Manager for matters affecting quality. In addition, the QA Manager has the authority and responsibility to contact the LES President through the QA Director with any Quality Assurance concerns.

E. Health, Safety, and Environment Manager

The Health, Safety, and Environment (HS&E) Manager reports to the Plant Manager and has the responsibility for assuring safety at the facility through activities including maintaining compliance with safeguards, appropriate rules, regulations, and codes and has responsibility for implementation and control of the Fundamental Nuclear Material Control (FNMC) Plan. This includes HS&E activities associated with nuclear criticality safety, radiation protection, chemical safety, environmental protection, emergency preparedness and industrial safety. The HS&E Manager works with the other facility managers to ensure consistent interpretations of HS&E requirements, performs independent reviews, and supports facility and operations change control reviews.

This position is independent from other management positions at the facility to ensure objective HS&E audit, review, and control activities. The HS&E Manager has the authority to shut down operations if they appear to be unsafe, and must consult with the Plant Manager with respect to restart of shutdown operations after the deficiency, or unsatisfactory condition, has been resolved.

F. Operations Manager

The Operations Manager reports to the Plant Manager and has the responsibility of directing the day-to-day operation of the facility. This includes such activities as ensuring the correct and safe operation of UF_6 processes, proper handling of UF_6, and the identification and mitigation of any off normal operating conditions. In the event of the absence of the Plant Manager, the Operations Manager may assume the responsibilities and authorities of the Plant Manager.

G. Uranium Management Manager

The Uranium Management Manager reports to the Plant Manager and has the responsibility for UF_6 cylinder management (including transportation licensing) and directing the scheduling of enrichment operations to ensure smooth production. This includes activities such as ensuring proper feed material and maintenance equipment are available for the facility. In the event of the absence of the Plant Manager, the Uranium Management Manager may assume the responsibilities and authorities of the Plant Manager.

H. Technical Services Manager

The Technical Services Manager reports to the Plant Manager and has the responsibility of providing technical support to the facility. This includes technical support for facility modifications (including administration of the configuration management system), engineering support for operations and maintenance, performance, operation of the chemistry laboratory, maintenance activities, and computer support. In the event of the absence of the Plant Manager, the Technical Services Manager may assume the responsibilities and authorities of the Plant Manager.

I. Human Resources Manager

The Human Resource Manager reports to the Plant Manager and has the responsibility for community relations, ensuring adequate staffing, ensuring training is provided for facility employees, providing administrative support services to the facility including document control, and for the physical security of the facility.

J. Quality Assurance Inspectors

The Quality Assurance Inspectors report to the Quality Assurance Manager (via a designated supervisory position, if applicable) and have the responsibility for performing inspections related to the implementation of the LES QA Program.

K. Quality Assurance Auditors

The Quality Assurance Auditors report to the Quality Assurance Manager (via a designated supervisory position, if applicable) and have the responsibility for performing audits related to the implementation of the LES QA Program.

L. Quality Assurance Technical Support

The Quality Assurance Technical Support personnel report to the Quality Assurance Manager (via a designated supervisory position, if applicable) and have the responsibility for providing technical support related to the implementation of the LES QA Program.

M. Emergency Preparedness Manager

The Emergency Preparedness Manager reports to the HS&E Manager and has the responsibility for ensuring the facility remains prepared to react and respond to any emergency situation that may arise. This includes emergency preparedness training of facility personnel, facility support personnel, the training of, and coordination with, offsite emergency response organizations (EROs), and conducting periodic drills to ensure facility personnel and offsite response organization personnel training is maintained up to date.

N. Licensing Manager

The Licensing Manager reports to the HS&E Manager and has the responsibility for coordinating facility activities to ensure compliance is maintained with applicable Nuclear Regulatory Commission (NRC) requirements. The Licensing Manager is also responsible for ensuring abnormal events are reported to the NRC in accordance with NRC regulations.

O. Environmental Compliance Manager

The Environmental Compliance Manager reports to the HS&E Manager and has the responsibility for coordinating facility activities to ensure all local, state and federal environmental regulations are met. This includes submission of periodic reports to appropriate regulating organizations of effluents from the facility.

P. Radiation Protection Manager

The Radiation Protection Manager reports to the HS&E Manager and has the responsibility for implementing the Radiation Protection program. These duties include the training of personnel in use of equipment, control of radiation exposure of personnel, continuous determination of the radiological status of the facility, and conducting the radiological environmental monitoring program.

During emergency conditions the Radiation Protection Manager's duties may also include:

- Providing Emergency Operations Center personnel information and recommendations concerning chemical and radiation levels at the facility
- Gathering and compiling onsite and offsite radiological and chemical monitoring data
- Making recommendations concerning actions at the facility and offsite deemed necessary for limiting exposures to facility personnel and members of the general public
- Taking prime responsibility for decontamination activities.

In matters involving radiological protection, the Radiation Protection Manager has direct access to the Plant Manager.

Q. Industrial Safety Manager

The Industrial Safety Manager reports to the HS&E Manager and has the responsibility for the implementation of facility industrial safety programs and procedures. This shall include programs and procedures for training individuals in safety and maintaining the performance of the facility fire protection systems.

R. Criticality Safety Engineer

Criticality Safety Engineers report to the HS&E Manager (via a designated supervisory position, if applicable) and are responsible for the preparation and/or review of nuclear criticality safety evaluations and analyses, and conducting and reporting periodic nuclear criticality safety assessments. Nuclear criticality safety evaluations and analyses require independent reviews by a Criticality Safety Engineer.

S. Chemical Safety Engineer

The Chemical Safety Engineer reports to the HS&E Manager (via a designated supervisory position, if applicable) and is responsible for the preparation and/or review of chemical safety programs and procedures for the facility.

T. Shift Managers

The Shift Managers report to the Operations Manager and have the responsibility for ensuring safe operation of enrichment equipment and support equipment. Each Shift Manager directs assigned personnel in order to provide enrichment services in a safe, efficient manner.

U. Production Scheduling Manager

The Production Scheduling Manager reports to the Uranium Management Manager and has the responsibility for developing and maintaining production schedules for enrichment services.

V. Cylinder Management Manager

The Cylinder Management Manager reports to the Uranium Management Manager and has the responsibility for ensuring that cylinders of uranium hexafluoride are received and routed correctly at the facility, and is responsible for all transportation licensing.

W. Warehouse and Materials Manager

The Warehouse and Materials Manager reports to the Uranium Management Manager and has the responsibility for ensuring spare parts and other materials needed for operation of the facility are ordered, received, inspected and stored properly.

X. Safeguards Manager

The Safeguards Manager reports to the HS&E Manager and has the responsibility for ensuring the proper implementation of the FNMC Plan. This position is separate from and independent of the Operations, Technical Services, HS&E, and Human Resources departments to ensure a definite division between the safeguards group and the other departments. In matters involving safeguards, the Safeguards Manager has direct access to the Plant Manager.

Y. Chemistry Manager

The Chemistry Manager reports to the Technical Services Manager and has the responsibility for the implementation of chemistry analysis programs and procedures for the facility. This includes effluent sample collection, chemical analysis of effluents, comparison of effluent analysis results to limits, and reporting of chemical analysis of effluents to appropriate regulatory agencies.

Z. Performance Manager

The Performance Manager reports to the Technical Services Manager and has the responsibility for coordinating and maintaining testing programs for the facility. This includes testing of systems and components to ensure the systems and components are functioning as specified in design documents.

AA. Projects Manager

The Projects Manager reports to the Technical Services Manager and has the responsibility for the implementation of facility modifications and for maintaining the configuration management system. The Projects Manager also provides engineering support as needed to support facility operation and maintenance, and support of performance testing of systems and equipment.

BB. Engineering Manager

The Engineering Manager reports to the Technical Services Manager and has the responsibility for providing engineering support at the facility. This includes ensuring the safe operation of enrichment equipment and support equipment, providing maintenance support for equipment and systems, and developing operating and maintenance procedures for the facility. The Engineering Manager is responsible for the development of all design changes to the plant.

CC. Maintenance Manager

The Maintenance Manager reports to the Technical Services Manager and has the responsibility of directing and scheduling maintenance activities to ensure proper operation of the facility, including preparation and implementation of maintenance procedures. This includes activities such as repair and preventive maintenance of facility equipment. The Maintenance Manager also has the responsibility for coordinating and maintaining testing programs for the facility. This includes testing of systems and components to ensure the systems and components are functioning as specified in design documents.

DD. Administration Manager

The Administration Manager reports to the Human Resources Manager and has the responsibility for ensuring support functions such as accounting, word processing and general office management are provided for the facility.

EE. Community Relations Manager

The Community Relations Manager reports to the Human Resources Manager and has the responsibility for providing information about the facility and LES to the public and media. During an abnormal event at the facility, the Community Relations Manager ensures that the public and media receive accurate and up-to-date information.

FF. Security Manager

The Security Manager reports to the Human Resources Manager and has the responsibility for directing the activities of security personnel to ensure the physical protection of the facility. The Security Manager is also responsible for the protection of classified matter at the facility and obtaining security clearances for facility personnel and support personnel. In matters involving physical protection of the facility or classified matter, the Security Manager has direct access to the Plant Manager.

GG. Document Control Manager

The Document Control Manager reports to the Human Resources Manager and has the responsibility for adequately controlling documents at the facility.

HH. Training Manager

The Training Manager reports to the Human Resources Manager and has the responsibility for conducting training and maintaining training records for personnel at the facility.

2.2.2 Shift Crew Composition

The minimum operating shift crew consists of a Shift Manager (or Deputy Shift Manager in the absence of the Shift Manager), one Control Room operator, one Radiation Protection technician, one operator for each Cascade Hall and associated UF_6 handling systems, and security personnel. When only one Cascade Hall is in operation, a minimum of two operators is required.

At least one criticality safety engineer will be available, with appropriate ability to be contacted by the Shift Manager, to respond to any routine request or emergency condition. This availability may be offsite if adequate communication ability is provided to allow response as needed.

2.2.3 Safety Review Committee

The facility maintains a Safety Review Committee (SRC) to assist with the safe operation of the facility. The SRC shall report to the Plant Manager and shall provide technical and administrative review and audit of operations that could impact plant worker, public safety and environmental impacts. The scope of activities reviewed and audited by the SRC shall, as a minimum, include the following:

- Radiation protection
- Nuclear criticality safety
- Hazardous chemical safety
- Industrial safety including fire protection
- Environmental protection
- ALARA policy implementation
- Changes in facility design or operations.

The SRC shall conduct at least one facility audit per year for the above areas.

The Safety Review Committee shall be composed of at least five members, including the Chairman. Members of the SRC may be from the LES corporate office or technical staff. The five members shall include experts on operations and all safety disciplines (criticality, radiological, chemical, industrial). The Chairman, members and alternate members of the Safety Review Committee shall be formally appointed by the Plant Manager, shall have an academic degree in an engineering or physical science field; and, in addition, shall have a minimum of five years of technical experience, of which a minimum of three years shall relate directly to one or more of the safety disciplines (criticality, radiological, chemical, industrial).

The Safety Review Committee shall meet at least once per calendar quarter.

Review meetings shall be held within 30 days of any incident that is reportable to the NRC. These meetings may be combined with regular meetings. Following a reportable incident, the

SRC shall review the incident's causes, the responses, and both specific and generic corrective actions to ensure resolution of the problem is implemented.

A written report of each SRC meeting and audit shall be forwarded to the Plant Manager and appropriate Managers within 30 days and be retained in accordance with the records management system.

2.2.4 Personnel Qualification Requirements

The minimum qualification requirements for the facility functions that are directly responsible for its safe operation shall be as outlined below. These minimum qualifications were previously reviewed by the NRC staff and found to be acceptable (NRC, 1994).

The nuclear experience of each individual shall be determined to be acceptable by the Plant Manager. "Responsible nuclear experience" for these positions shall include (a) responsibility for and contributions towards support of facility(s) in the nuclear fuel cycle (e.g., design, construction, operation, and/or decommissioning), and (b) experience with chemical materials and/or processes. The Plant Manager may approve different experience requirements for key positions. Approval of different requirements shall be done in writing and only on a case-by-case basis.

The assignment of individuals to the Manager positions reporting directly to the Plant Manager, and to positions on the SRC, shall be approved by the Plant Manager. Assignments to all other staff positions shall be made within the normal administrative practices of the facility.

The actual qualifications of the individuals assigned to the key facility positions described in Section 2.2.1, Operating Organization will be maintained in the employee personnel files or other appropriate file at the facility. Development and maintenance of qualification records and training programs are the responsibility of the Human Resources Manager.

A. Chief Operating Officer

The President of LES, based on the individual’s experience, proven ability in management of large-scale facilities, proven knowledge of regulatory and QA requirements, and overall leadership qualities, appoints the Chief Operating Officer.

B. Plant Manager

The Chief Operating Officer of LES shall appoint the Plant Manager as the overall manager of the facility. This appointment reflects confidence in the individual's ability as an effective programs and business manager. The Plant Manager shall be knowledgeable of the enrichment process, enrichment process controls and ancillary processes, criticality safety control, chemical safety, industrial safety, and radiation protection program concepts as they apply to the overall safety of a nuclear facility. The Plant Manager shall have, as a minimum, a bachelor's degree (or equivalent) in an engineering or scientific field and ten years of responsible nuclear experience.

C. Quality Assurance Director

The Quality Assurance Director shall have, as a minimum, a bachelor’s degree (or equivalent) in an engineering or scientific field and at least six years of responsible nuclear experience in the implementation of a quality assurance program. The QA Director shall have at least four years experience in a QA organization at a nuclear facility.

D. Quality Assurance Manager

The Quality Assurance (QA) Manager shall have, as a minimum, a bachelor's degree (or equivalent) in an engineering or scientific field and at least five years of responsible nuclear experience in the implementation of a quality assurance program. The QA Manager shall have at least two years experience in a QA organization at a nuclear facility.

E. Health, Safety, and Environment Manager

The Health, Safety, and Environment (HS&E) Manager shall have, as a minimum, a bachelor's degree (or equivalent) in an engineering or scientific field and at least five years of responsible nuclear experience in HS&E or related disciplines. The HS&E Manager shall also have at least one year of direct experience in the administration of nuclear criticality safety evaluations and analyses.

F. Operations Manager

The Operations Manager shall have, as a minimum, a bachelor's degree (or equivalent) in an engineering or scientific field and four years of responsible nuclear experience.

G. Uranium Management Manager

The Uranium Management Manager shall have, as a minimum, a bachelor's degree (or equivalent) in an engineering or scientific field and four years of responsible nuclear experience.

H. Technical Services Manager

The Technical Services Manager shall have, as a minimum, a bachelor's degree (or equivalent) in an engineering or scientific field and four years of responsible nuclear experience.

I. Human Resource Manager

The Human Resource Manager shall have as a minimum, a bachelor’s degree in Personnel Management, Business Administration or related field, and three years of appropriate, responsible experience in implementing and supervising human resource responsibilities at an industrial facility.

J. Emergency Preparedness Manager

The Emergency Preparedness Manager shall have a minimum of five years of experience in the implementation and supervision of emergency plans and procedures at a nuclear facility. No credit for academic training may be taken toward fulfilling this experience requirement.

K. Licensing Manager

The Licensing Manager shall have a minimum of five years of appropriate, responsible experience in implementing and supervising a nuclear licensing program.

L. Environmental Compliance Manager

The Environmental Compliance Manager shall have a minimum of five years of appropriate, responsible experience in implementing and supervising a nuclear environmental compliance program.

M. Radiation Protection Manager

The Radiation Protection Manager shall have, as a minimum, a bachelor's degree (or equivalent) in an engineering or scientific field and three years of responsible nuclear experience associated with implementation of a Radiation Protection program. At least two years of experience shall be at a facility that processes uranium, including uranium in soluble form.

N. Industrial Safety Manager

The Industrial Safety Manager shall have, as a minimum, a bachelor's degree (or equivalent) in either an engineering or a scientific field and three years of appropriate, responsible nuclear experience associated with implementation of a facility safety program.

O. Criticality Safety Engineer

Criticality Safety Engineers shall have a minimum of two years experience in the implementation of a criticality safety program. These individuals shall hold a bachelor's degree (or equivalent) in an engineering or scientific field and have successfully completed a training program, applicable to the scope of operations, in the physics of criticality and in associated safety practices.

Should a change to the facility require a nuclear criticality safety evaluation or analysis, an individual who, as a minimum, possesses the equivalent qualifications of the Criticality Safety Engineer shall perform the evaluation or analysis. In addition, this individual shall have at least two years of experience performing criticality safety analyses and implementing criticality safety programs. An independent review of the evaluation or analysis, shall be performed by a qualified Criticality Safety Engineer.

P. Chemical Safety Engineer

The Chemical Safety Engineer shall have a minimum of two years experience in the preparation and/or review of chemical safety programs and procedures. This individual shall hold a bachelor's degree (or equivalent) in an engineering or scientific field and have successfully completed a training program, applicable to the scope of operations, in chemistry and in associated safety practices.

Q. Shift Managers

Shift Managers shall have a minimum of five years of appropriate, responsible experience in implementing and supervising a nuclear operations program.

R. Production Scheduling Manager

The Production Scheduling Manager shall have a minimum of three years of appropriate, responsible experience in implementing and supervising a continuous production scheduling program.

S. Cylinder Management Manager

The Cylinder Management Manager shall have a minimum of three years of appropriate, responsible experience in implementing and supervising a continuous production scheduling program.

T. Warehouse and Materials Manager

The Warehouse and Materials Manager shall have a minimum of three years of appropriate, responsible experience in implementing and supervising a purchasing and inventory program.

U. Safeguards Manager

The Safeguards Manager shall have as a minimum, a bachelor’s degree in an engineering or scientific field, and five years of experience in the management of a safeguards program for Special Nuclear Material, including responsibilities for material control and accounting. No credit for academic training may be taken toward fulfilling this experience requirement.

V. Chemistry Manager

The Chemistry Manager shall have, as a minimum, a bachelor’s degree (or equivalent) in either an engineering or a scientific field and three years of appropriate, responsible nuclear experience associated with implementation of a facility chemistry program.

W. Projects Manager

The Projects Manager shall have, as a minimum, a bachelor's degree (or equivalent) in an engineering or scientific field and have a minimum of five years of appropriate, responsible nuclear experience.

X. Engineering Manager

The Engineering Manager shall have, as a minimum, a bachelor’s degree (or equivalent) in an engineering or scientific field and have a minimum of five years of appropriate, responsible experience in implementing and supervising a nuclear engineering program.

Y. Maintenance Manager

The Maintenance Manager shall have, as a minimum, a bachelor's degree (or equivalent) in an engineering or scientific field and four years of responsible nuclear experience.

Z. Administration Manager

The Administration Manager shall have a minimum of three years of appropriate, responsible experience in implementing and supervising administrative responsibilities at an industrial facility.

AA. Community Relations Manager

The Community Relations Manager shall have as a minimum, a bachelor's degree in Public Relations, Political Science or Business Administration and three years of appropriate, responsible experience in implementing and supervising a community relations program.

BB. Security Manager

The Security Manager shall have as a minimum, a bachelor's degree in an engineering or scientific field, and five years of experience in the responsible management of physical security at a facility requiring security capability similar to that required for the facility. No credit for academic training may be taken toward fulfilling this experience requirement.

CC. Document Control Manager

The Document Control Manager shall have a minimum of three years of appropriate, responsible experience in implementing and supervising a document control program.

DD. Training Manager

The Training Manager shall have a minimum of five years of appropriate, responsible experience in implementing and supervising a training program.

2.3 ADMINISTRATION

This section summarizes how the activities that are essential for implementation of the management measures and other HS&E functions are documented in formally approved, written procedures, prepared in compliance with a formal document control program. The mechanism for reporting potentially unsafe conditions or activities to the HS&E organization and facility management is also summarized.

The management measures summarized below are the same management measures LES submitted in the license application for the Claiborne Enrichment Center (LES, 1993). The NRC staff documented their review and acceptance of these management measures in NUREG-1491 (NRC, 1994). Details of the management measures are provided in Chapter 11, Management Measures.

2.3.1 Configuration Management

Configuration management is provided for Items Relied On For Safety (IROFS) throughout facility design, construction, testing, and operation. Configuration management provides the means to establish and maintain a technical baseline for the facility based on clearly defined requirements. During design and construction, the Engineering and Contracts Manager has responsibility for configuration management through the design control process. Selected documentation is controlled under the configuration management system in accordance with appropriate QA procedures associated with design control, document control, and records management. Design changes to IROFS undergo formal review, including interdisciplinary reviews as appropriate, in accordance with these procedures.

Configuration management provides the means to establish and maintain the essential features of the design basis of IROFS. As the project progresses from design and construction to operation, configuration management is maintained by the facility engineering organization as the overall focus of activities changes.

Additional details on Configuration Management are provided in Chapter 11, Management Measures.

2.3.2 Maintenance

The maintenance program will be implemented for the operations phase of the facility. Preventive maintenance activities, surveillance, and performance trending provide reasonable and continuing assurance that IROFS will be available and reliable to perform their safety functions.

The purpose of planned and scheduled maintenance for IROFS is to ensure that the equipment and controls are kept in a condition of readiness to perform the planned and designed functions when required. Appropriate plant management is responsible for ensuring the operational readiness of IROFS under this control. For this reason, the maintenance function is administratively closely coupled to operations. The maintenance organization plans, schedules, tracks, and maintains records for maintenance activities.

Maintenance activities generally fall into the following categories:

- Corrective maintenance
- Preventive maintenance
- Surveillance/monitoring
- Functional testing.

These maintenance categories are discussed in detail in Chapter 11, Management Measures.

2.3.3 Training and Qualifications

Formal planned training programs shall be established for facility employees. Indoctrination training shall be provided to employees within 30 days of reporting to work, and shall address safety preparedness for all safety disciplines (criticality, radiological, chemical, industrial), ALARA practices, and emergency procedures. In-depth training programs shall be provided to individuals depending on job requirements in the areas of radiological safety (for all personnel with access to the Restricted Area) and in criticality safety control. Nuclear criticality safety training shall satisfy the recommendations of ANSI/ANS-8.20 - 1991, Nuclear Criticality Safety Training (ANSI, 1991). Retraining of personnel previously trained shall be performed for radiological and criticality safety at least annually, and shall include updating and changes in required skills. The training program shall include methods for verifying training effectiveness, such as written tests, actual demonstration of skills, and where required by regulation, maintaining a current and valid license demonstrating qualification. Changes to training shall be implemented if indicated due to incidents potentially compromising safety, or if changes are made to facilities or processes.

The training programs and maintenance of the training program records at the facility are the responsibility of the Human Resources Manager. Accurate records are maintained on each employee's qualifications, experience, training and retraining. The employee training file shall include records of all general employee training, technical training, and employee development training conducted at the facility. The employee training file shall also contain records of special company sponsored training conducted by others. The training records for each individual are maintained so that they are accurate and retrievable. Training records are retained in accordance with the records management system.

Additional details on the facility training program are provided in Chapter 11, Management Measures.

2.3.4 Procedures

Activities involving licensed materials will be conducted through the use of approved, written procedures. Applicable procedure and training requirements will be satisfied before use of the procedure. Procedures will be used to control activities in order to ensure the activities are carried out in a safe manner.

Generally, four types of plant procedures are used to control activities: operating procedures, administrative procedures, maintenance procedures, and emergency procedures. Operating procedures, developed for workstation and control room operators, are used to directly control process operations. Administrative procedures are written by each department as necessary to control activities that support process operations, including management measures (e.g. configuration management, training and record-keeping). Maintenance procedures address preventive and corrective maintenance, surveillance (includes calibration, inspection, and other surveillance testing), functional testing following maintenance, and requirements for pre-maintenance activity involving reviews of the work to be performed and reviews of procedures. Emergency procedures address the preplanned actions of operators and other plant personnel in the event of an emergency.

Policies and procedures will be developed to ensure that there are ties between major plant safety functions such as the ISA, management measures for items relied on for safety (IROFS), radiation safety, nuclear criticality safety, fire safety, chemical safety, environmental monitoring, and emergency planning.

Chapter 11 details the use of procedures, including development, revision, and distribution and control.

2.3.5 Audits and Assessments

The LES QA Program requires periodic audits to confirm that activities affecting quality comply with the QA Program and that the QA Program is being implemented effectively. The assessment function includes audits and other independent assessments to verify performance. These assessments provide a comprehensive independent evaluation of activities, including activities delegated to others under the LES QA Program, and procedures. Personnel who do not have direct responsibility in the area being assessed conduct these assessments.

An assessment and audit program for operational quality assurance of the enrichment facility is established, and periodically reviewed by management, to:

- verify that the configuration and operation of the facility are consistent with LES company policy, approved procedures and license provisions
- review important proposed facility modifications, tests and procedures
- verify that reportable occurrences are investigated and corrected in a manner which reduces the probability of recurrence of such events
- to detect trends which may not be apparent to a day-to-day observer.

The organizational structure for conducting the operational reviews and audit program includes:

- The Safety Review Committee appointed by the Plant Manager
- Regular audits conducted by the Quality Assurance Department.

Each of the above shall have the authority necessary to discharge its responsibilities adequately. Implicit in this authority shall be access to facility records and personnel as required in order to perform reviews and audits properly.

Additional details on audits and assessments are provided in Chapter 11, Management Measures.

2.3.5.1 Safety Review Committee

The Safety Review Committee (SRC) provides technical and administrative review of facility operations that could impact plant worker and public safety. Details on the SRC and the scope of activities reviewed by the SRC are provided in Section 2.2.3, Safety Review Committee.

2.3.5.2 Quality Assurance Department

The Quality Assurance Department conducts periodic audits of activities associated with the facility, in order to verify the facility's compliance with established procedures. The LES Quality Assurance Program Description is included in Chapter 11,Management Measures as Appendix A.

2.3.5.3 Facility Operating Organization

The facility operating organization shall provide, as part of the normal duties of supervisory personnel, timely and continuing monitoring of operating activities to assist the Plant Manager in keeping abreast of general facility conditions and to verify that the day-to-day operating activities are conducted safely and in accordance with applicable administrative controls.

These continuing monitoring activities are considered to be an integral part of the routine supervisory function and are important to the safety of the facility operation.

2.3.5.4 Audited Organizations

Audited organizations shall assure that deficiencies identified are corrected in a timely manner.

Audited organizations shall transmit a response to each audit report within the time period specified in the audit. For each identified deficiency, the response shall identify the corrective action taken or to be taken. For each identified deficiency, the response shall also address whether or not the deficiency is considered to be indicative of other problems (e.g., a specific audit finding may indicate a generic problem) and the corrective action taken or to be taken for any such problems determined.

Copies of audit reports and responses are maintained in accordance with the records management system.

2.3.6 Incident Investigations

Abnormal events that potentially threaten or lessen the effectiveness of health, safety or environmental protection are identified and reported to the HS&E Manager or designee through the Corrective Action Program (CAP) which is described in more detail in Chapter 11, Management Measures. Each event is considered in terms of its requirements for reporting in accordance with regulations and is evaluated to determine the level of investigation required. These evaluations and investigations are conducted in accordance with approved CAP procedures. The depth of the investigation depends upon the severity of the incident in terms of the levels of uranium released and/or the degree of potential for exposure of workers, the public or the environment.

The HS&E Manager, or designee is responsible for:

- maintaining a list of agencies to be notified
- determining if a report to an agency is required
- notifying the agency when required.

The licensing function has the responsibility for continuing communications with government agencies and tracking corrective actions to completion.

The process of incident identification, investigation, root cause analysis, environmental protection analysis, recording, reporting, and follow-up shall be addressed in and performed in accordance with written procedures. Radiological, criticality, hazardous chemical, and industrial safety requirements shall be addressed. Guidance for classifying incidents shall be contained in facility procedures, including a list of threshold off-normal incidents.

The HS&E Manager or designee shall, through implementation of the CAP, maintain a record of corrective actions to be implemented as a result of off-normal investigations. These corrective actions shall include documenting lessons learned, and implementing worker training where indicated, and shall be tracked to completion by the HS&E Manager or designee within the CAP.

Additional details on incident investigations are provided in Chapter 11, Management Measures.

2.3.7 Employee Concerns

Employees who feel that safety or quality is being compromised have the right and responsibility to initiate the "stop work" process in accordance with the applicable project or facility procedures to ensure the work environment is placed in a safe condition.

Employees also have access to various resources to ensure their safety or quality concerns are addressed, including:

- line management or other facility management (e.g., HS&E Manager, Plant Manager, QA Manager)
- the facility safety organization (i.e., any of the safety engineers or managers)
- NRC's requirements under 10 CFR 19, Notices, Instructions and Reports to Workers: Inspection and Investigations (CFR, 2003a)
- LES CAP - a simple mechanism available for use by any person at the NEF site for reporting unusual events and potentially unsafe conditions or activities.

2.3.8 Records Management

Procedures are established which control the preparation and issuance of documents such as manuals, instructions, drawings, procedures, specifications, and supplier-supplied documents, including any changes thereto. Measures are established to ensure documents, including revisions, are adequately reviewed, approved, and released for use by authorized personnel.

Document control procedures require documents to be transmitted and received in a timely manner at appropriate locations including the location where the prescribed activity is to be performed. Controlled copies of these documents and their revisions are distributed to and used by the persons performing the activity.

Superseded documents are destroyed or are retained only when they have been properly labeled. Indexes of current documents are maintained and controlled.

The QA Program assigns responsibility for verifying QA record retention to the QA Manager. Applicable design specifications, procurement documents, or other documents specify the QA records to be generated by, supplied to, or held, in accordance with approved procedures. QA records are not considered valid until they are authenticated and dated by authorized personnel.

Additional details on the records management program are provided in Chapter 11, Management Measures.

2.3.9 Written Agreements with Offsite Emergency Resources

The plans for coping with emergencies at the facility are presented in detail in the Emergency Plan. The Emergency Plan includes a description of the facility emergency response organization and interfaces with off-site EROs. Written agreements between the facility and off-site EROs, including the local fire department, the local law enforcement agency, ambulance/rescue units, and medical services and facilities have been established.

Coordination with participating government agencies (State, Counties) is vital to the safety and health of plant personnel and the general public. The principal state and local agencies/organizations having responsibilities for radiological or other hazardous material emergencies for the facility are:

A. New Mexico Department of Public Safety, Office of Emergency Management

B. Eunice Emergency Response Services

C. Hobbs Emergency Response Services

Details of the interfaces with these agencies are provided in Section 4 of the Emergency Plan.

2.4 REFERENCES

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FIGURES

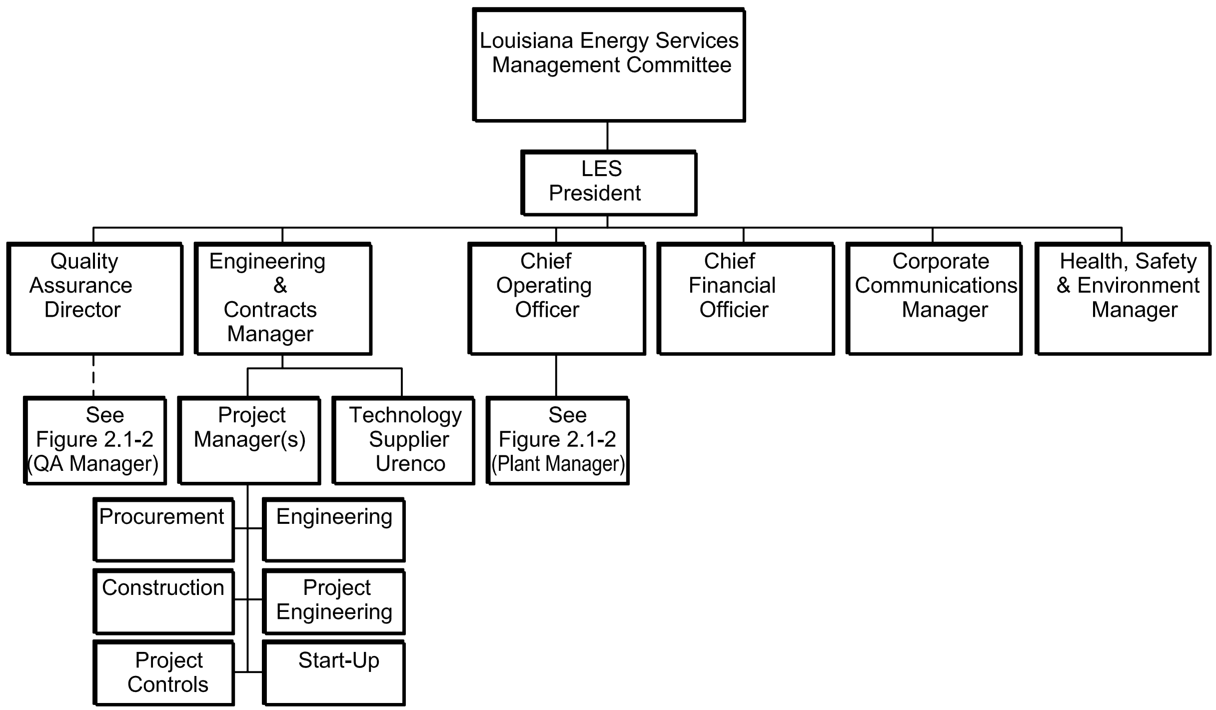

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Figure 2.1–1.dwg

FIGURE 2.1-1
LES CORPORATE, DESIGN AND CONSTRUCTION ORGANIZATION

REVISION 2 DATE: JULY 2004

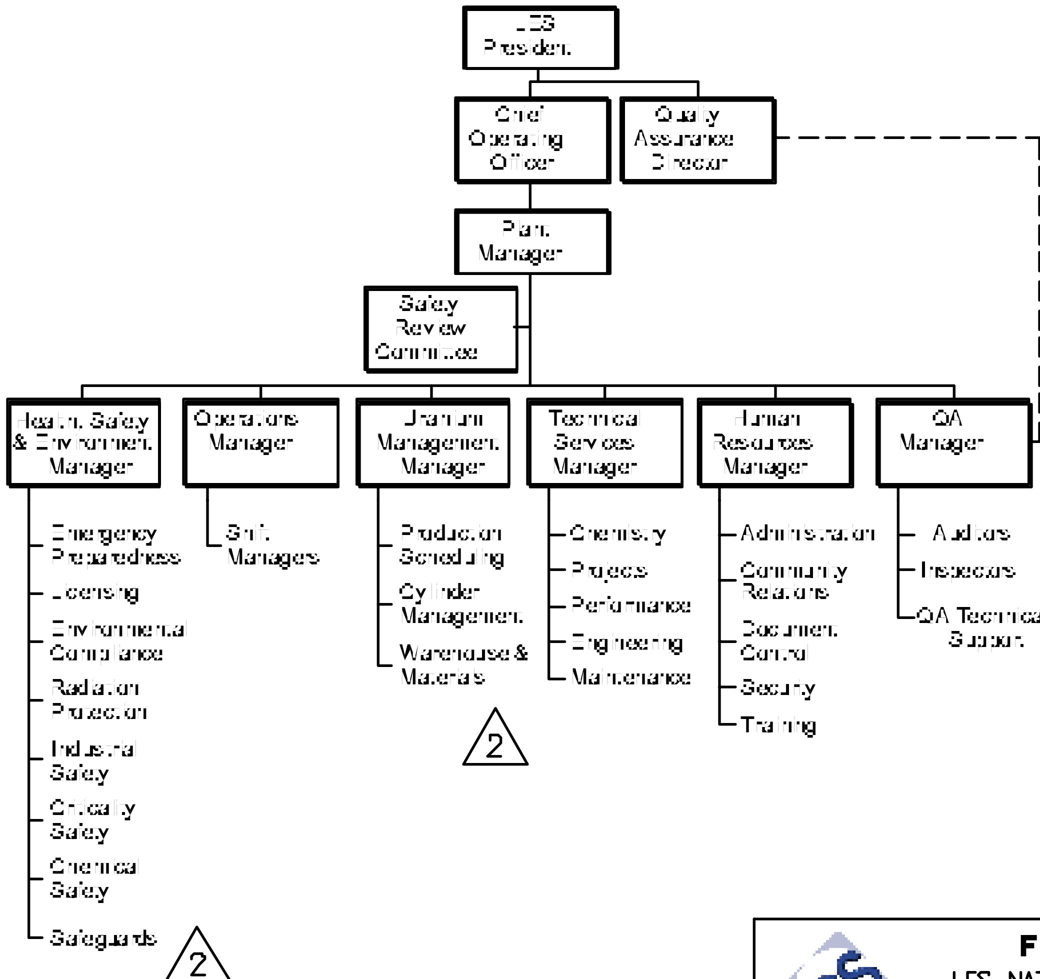

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Figure 2.1-2.dwg

FIGURE 2.1-2

LES NATIONAL ENRICHMENT FACILITY
OPERATING ORGANIZATION

REVISION 2 DATE: JULY 2004