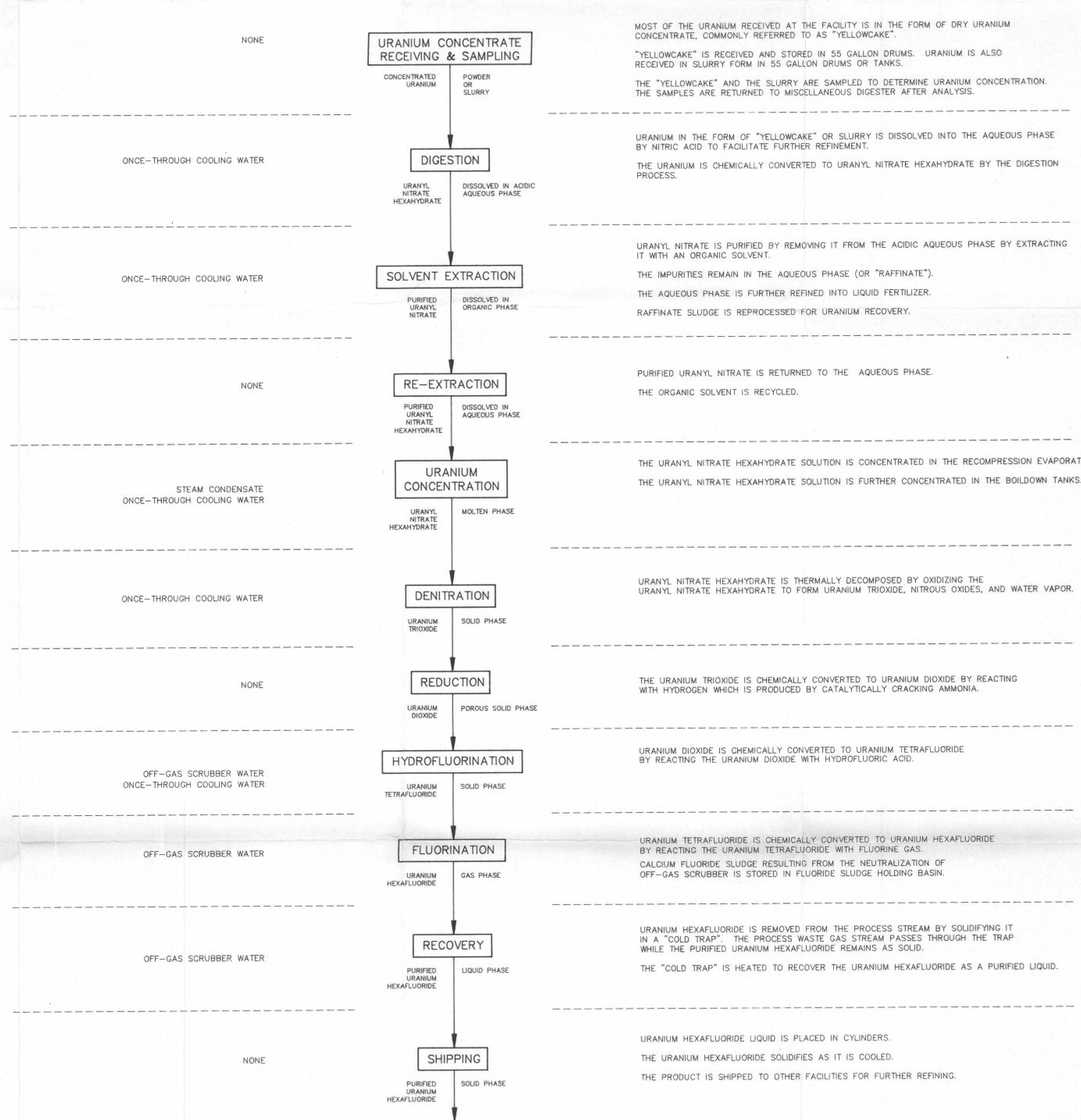


**FACILITY WASTE WATER PRODUCED**

**PROCESS**

**PROCESS DESCRIPTION**



MOST OF THE URANIUM RECEIVED AT THE FACILITY IS IN THE FORM OF DRY URANIUM CONCENTRATE, COMMONLY REFERRED TO AS "YELLOWCAKE".

"YELLOWCAKE" IS RECEIVED AND STORED IN 55 GALLON DRUMS. URANIUM IS ALSO RECEIVED IN SLURRY FORM IN 55 GALLON DRUMS OR TANKS.

THE "YELLOWCAKE" AND THE SLURRY ARE SAMPLED TO DETERMINE URANIUM CONCENTRATION. THE SAMPLES ARE RETURNED TO MISCELLANEOUS DIGESTER AFTER ANALYSIS.

URANIUM IN THE FORM OF "YELLOWCAKE" OR SLURRY IS DISSOLVED INTO THE AQUEOUS PHASE BY NITRIC ACID TO FACILITATE FURTHER REFINEMENT.

THE URANIUM IS CHEMICALLY CONVERTED TO URANYL NITRATE HEXAHYDRATE BY THE DIGESTION PROCESS.

URANYL NITRATE IS PURIFIED BY REMOVING IT FROM THE ACIDIC AQUEOUS PHASE BY EXTRACTING IT WITH AN ORGANIC SOLVENT.

THE IMPURITIES REMAIN IN THE AQUEOUS PHASE (OR "RAFFINATE").

THE AQUEOUS PHASE IS FURTHER REFINED INTO LIQUID FERTILIZER.

RAFFINATE SLUDGE IS REPROCESSED FOR URANIUM RECOVERY.

PURIFIED URANYL NITRATE IS RETURNED TO THE AQUEOUS PHASE.

THE ORGANIC SOLVENT IS RECYCLED.

THE URANYL NITRATE HEXAHYDRATE SOLUTION IS CONCENTRATED IN THE RECOMPRESSION EVAPORATOR.

THE URANYL NITRATE HEXAHYDRATE SOLUTION IS FURTHER CONCENTRATED IN THE BLOWDOWN TANKS.

URANYL NITRATE HEXAHYDRATE IS THERMALLY DECOMPOSED BY OXIDIZING THE URANYL NITRATE HEXAHYDRATE TO FORM URANIUM TRIOXIDE, NITROUS OXIDES, AND WATER VAPOR.

THE URANIUM TRIOXIDE IS CHEMICALLY CONVERTED TO URANIUM DIOXIDE BY REACTING WITH HYDROGEN WHICH IS PRODUCED BY CATALYTICALLY CRACKING AMMONIA.

URANIUM DIOXIDE IS CHEMICALLY CONVERTED TO URANIUM TETRAFLUORIDE BY REACTING THE URANIUM DIOXIDE WITH HYDROFLUORIC ACID.

URANIUM TETRAFLUORIDE IS CHEMICALLY CONVERTED TO URANIUM HEXAFLUORIDE BY REACTING THE URANIUM TETRAFLUORIDE WITH FLUORINE GAS.

CALCIUM FLUORIDE SLUDGE RESULTING FROM THE NEUTRALIZATION OF OFF-GAS SCRUBBER IS STORED IN FLUORIDE SLUDGE HOLDING BASIN.

URANIUM HEXAFLUORIDE IS REMOVED FROM THE PROCESS STREAM BY SOLIDIFYING IT IN A "COLD TRAP". THE PROCESS WASTE GAS STREAM PASSES THROUGH THE TRAP WHILE THE PURIFIED URANIUM HEXAFLUORIDE REMAINS AS SOLID.

THE "COLD TRAP" IS HEATED TO RECOVER THE URANIUM HEXAFLUORIDE AS A PURIFIED LIQUID.

URANIUM HEXAFLUORIDE LIQUID IS PLACED IN CYLINDERS.

THE URANIUM HEXAFLUORIDE SOLIDIFIES AS IT IS COOLED.

THE PRODUCT IS SHIPPED TO OTHER FACILITIES FOR FURTHER REFINING.

NOTE: OTHER POTENTIAL SOURCES OF WASTEWATER: ROOF DRAINS  
 MISCELLANEOUS ONCE-THROUGH COOLING WATER  
 COOLING TOWER EQUALIZATION PIT OVERFLOW  
 COOLING TOWER BLOWDOWN  
 BOILER BLOWDOWN  
 WATER SOFTENER BLOWDOWN  
 UTILITY ROOM DRAIN  
 FLUORINE CELL ROOM DRAIN  
 CARLILE ENVIRONMENTAL LAB WASTEWATER  
 SEDIMENTATION SUMP BLOWDOWN  
 NORTH DRIVE AREA STORMWATER RUNOFF  
 SULFURIC ACID PAD STORMWATER RUNOFF  
 TANK FARM STORMWATER  
 BURIAL GROUND STORMWATER RUNOFF  
 LAUNDRY WASTEWATER  
 SHOWERS  
 LAVATORIES  
 TOILETS  
 PROCESS LAB WASTEWATER

NOTE: THE URANIUM TETRAFLUORIDE PLANT IS NOT CONSIDERED IN THIS PROCESS FLOW DIAGRAM. THE ONLY WASTEWATER PRODUCED AT THE URANIUM TETRAFLUORIDE PLANT IS COOLING WATER AND STEAM CONDENSATE.

DOI

Drawing Title: SIMPLIFIED PROCESS DESCRIPTION OF URANIUM HEXAFLUORIDE PRODUCTION FROM YELLOWCAKE	Client: SEQUOYAH FUELS CORPORATION
Document Title: FEI FINDINGS REPORT	Location: GORE, OKLAHOMA
ROBERTS/SCHORNICK & ASSOCIATES, INC. Environmental Consultants 3700 West Oklahoma, Suite 200 Kempes, Oklahoma 73742 (405) 521-5555	DATE: JULY 1991 SCALE: N.T.S. PROJECT NO: 90067M85 PREPARED BY: W.R.S. CHECKED BY: P.D.W. DRAFTED BY: DRAWING NO: 1