

OFFICE MEMORANDUM

TO : C.W. Christenson DATE: Feb. 25, 1960.

FROM : J.P. Hutchinson

SUBJECT: TREATMENT OF IODIDE WASTE BY ACIDIFICATION.

SYMBOL :

It is essential that, if this waste is going to be treated at all, it be done in the near future. The drums, still containing about 11,000 gallons of the waste, will certainly not last another year. The waste in the 4,000 gallon tank at DPW can be held indefinitely but must be disposed of eventually.

Laboratory tests last year indicated a remarkable reduction in iodine content by simple acidification with  $HNO_3$ . (Rex reported raw waste iodide on one batch at 120,000 ppm and the filtrate, after acidification, at 200 ppm.) Nothing was done about it, plantwise, because, with the DPW facilities available at that time, fume problems could not be controlled.

With very minor modifications the raffinate plant could treat this waste with complete control of fuming.

After a month or so Christensen is going to shut down for 6 weeks or more for equipment modification. That would be an ideal time to try out the process.

The only modifications required would be replacement of the diaphragm valve and a few black iron fittings on the discharge line with a S.S. valve and fitting and an air line connection on the vent line.

The existing raffinate filling line could be used for filling from our tank trailer and the caustic line for acidification. The cooling coil and agitator would minimize fuming and expedite the reaction. Such fuming as there was would be absorbed by the water in the water-sealed vacuum filter pump or could be vented through the oil sealed vacuum pump. The mix would not affect stainless steel (A S.S. beaker was filled with such a mix and held until all the acid evaporated. There was absolutely no apparent effect on the beaker after nearly two months).

The precipitated iodine settles very rapidly and could be discharged with a minimum of liquid. A close-woven cloth bag on the discharge hose would filter out solid iodine and the liquid could be received in an S.S. or plastic container. The acid liquid in the neutralization tank, containing a few hundred instead of thousands of ppm of iodide, could be fed to flow at a very much higher rate than in the past or could be re-neutralized and stored in new drums for high rate feeding at our convenience. Filter bags containing solid iodine could be kept in covered plastic containers and, as often as necessary, disposed of by immersion in a cement mix made in a 55 gallon drum with the drum tumbler. (On checking my notebooks I find that, both with acid precipitated iodine suspended in water and straight iodide waste mixed with cement, only the cure water (1 day) contained substantial amounts of iodine. Leach water (15 day) contained a very small fraction of the amount of iodine in the cure water). A plastic container, completely surrounded by cement, would leach no iodine, radioactivity or anything else.

