



DESIGN  ENGINEER  MANAGE

BI-PRODUCT FEASIBILITY

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INTRODUCTION

The Client's facility in Rancho Cucamonga, California through the processing of fruit produces pulp which is determined as waste and disposed of at a high cost. An opportunity for pulp reclamation and oil recovery was realized.

This report outlines the capital investment cost of implementing new bi-product systems for pulp reclamation and oil recovery at the facility.

This report includes the capital cost estimate, utility impact, layout development, and process flow diagram (PFD).

OBJECTIVE

The objective of this analysis is to determine which system(s) can provide a return on capital investment.

There are 3 options for implementation:

Option 1 - Pulp Reclamation/Filler and Oil Recovery Systems

Option 2 - Oil Recover System (Stand Alone)

Option 3 - Pulp Reclamation/Filler System (Stand Alone)

Option 2 would be chosen if projected revenue from oil production can provide required return on system implementation investment.

Option 3 would be chosen if projected revenue from pulp production can provide required return on system implementation investment.

Option 1 would be chosen if projected revenue from both can provide the required return on investment.

CAPITAL ANALYSIS

The capital analysis identified the equipment and installation costs for all systems and we have provided the table below separated into (3) areas; combined systems or either of the systems as standalone, for scalability. These systems are designed with both purchase and lease items so the totals below reflect the capital purchase, estimated installation, and the first-year lease costs. For full equipment list see Attachment A – Equipment List.

	Pulp Reclamation and Oil Recovery Systems	Oil Recovery Stand Alone System	Pulp Reclamation/Filler Stand Alone/Platform
EQUIPMENT	\$3,290,000.00	\$380,000.00	\$2,910,000.00
MECHANICAL INSTALLATION	\$335,000.00	\$50,000.00	\$285,000.00
ELECTRICAL INSTALLATION	\$150,000.00	\$25,000.00	\$125,000.00
(CIP) INTEGRATION	\$80,000.00	\$20,000.00	\$60,000.00
ANNUAL LEASING COST (CIP)	\$51,797.00	\$25,465.00	\$26,332.00
ANNUAL LEASING COSTS (SKID)	**\$110,872.00	**\$110,872.00	
TOTAL	\$4,017,669.00	\$611,337.00	\$3,406,332.00

***Approximate annual cost minimum, based on processed pounds at \$0.0887/LB cost may increase.*

REVIEW / FINDINGS

UTILITY IMPACT ON THE FACILITY:

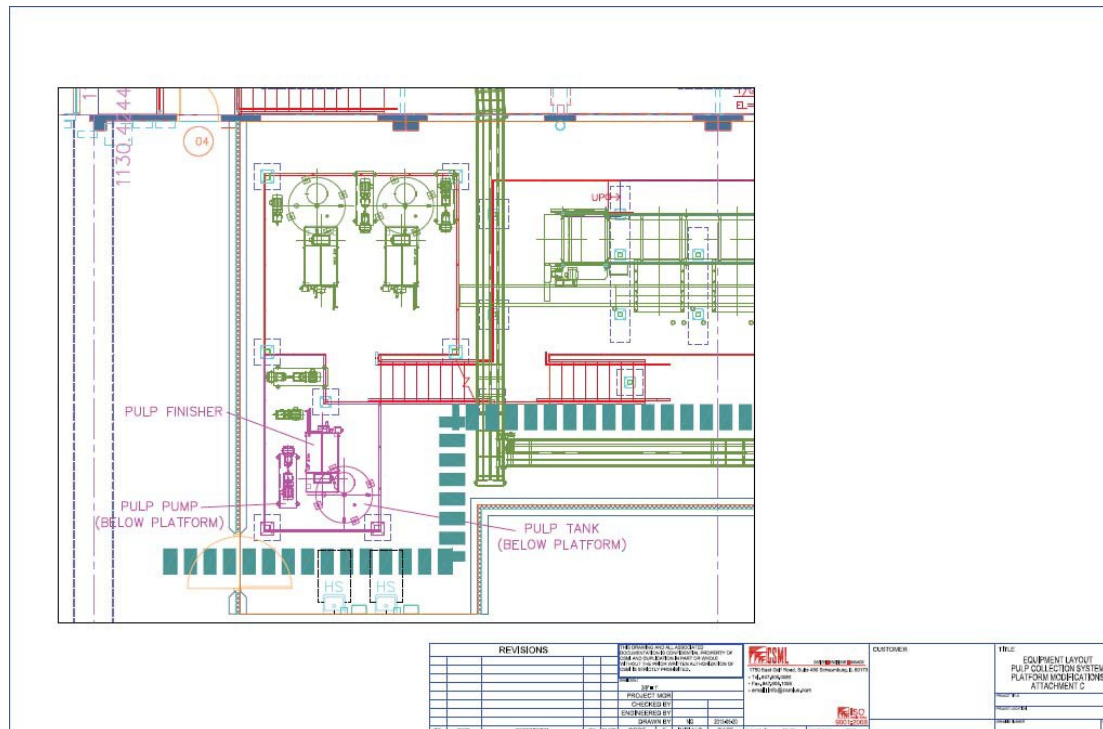
The utilities in the impact analysis are; water, steam, air, power, CIP, and Glycol (or chilled water) and additional requirement of each. The table illustrates the requirements by system and by utility so the information coincides with your determination of staging. See Attachment B – Utility Impact.

Major Equipment	Air		Steam		Water			Glycol			CIP	Electrical	
	Flow	Pressure	Flow	Pressure	Flow	Pressure	Max Temp	Flow	Pressure	Max Temp			
d-Limonene Skid and Water Recycle System	6 scfm	85 psi	5300 lb/hour	120-180 psi	450 gpm		80 °F				200 gal/cycle	14 kW	21 A @ 480 V
Oil Finisher												17.5 kW	26 A @ 480 V
Oil Transfer Pumps												30kW	45 A @ 480 V
Pump Finisher												30 kW	45 A @ 480 V
Pulp Sterilizer			1366 LB / HR	145 psi	8.8 gpm	74 psi		317 gpm	43 psi	21 °F		17.5 kW	26 A @ 480 V
Pulp Transfer Pumps												30 kW	45 A @ 480 V
Filler	3.6 Ncu ft/min	90-120 psi	441 lb/hr	120-150 psi	210 gal/hour							15kW	22.5 A @ 480 V

FINDINGS

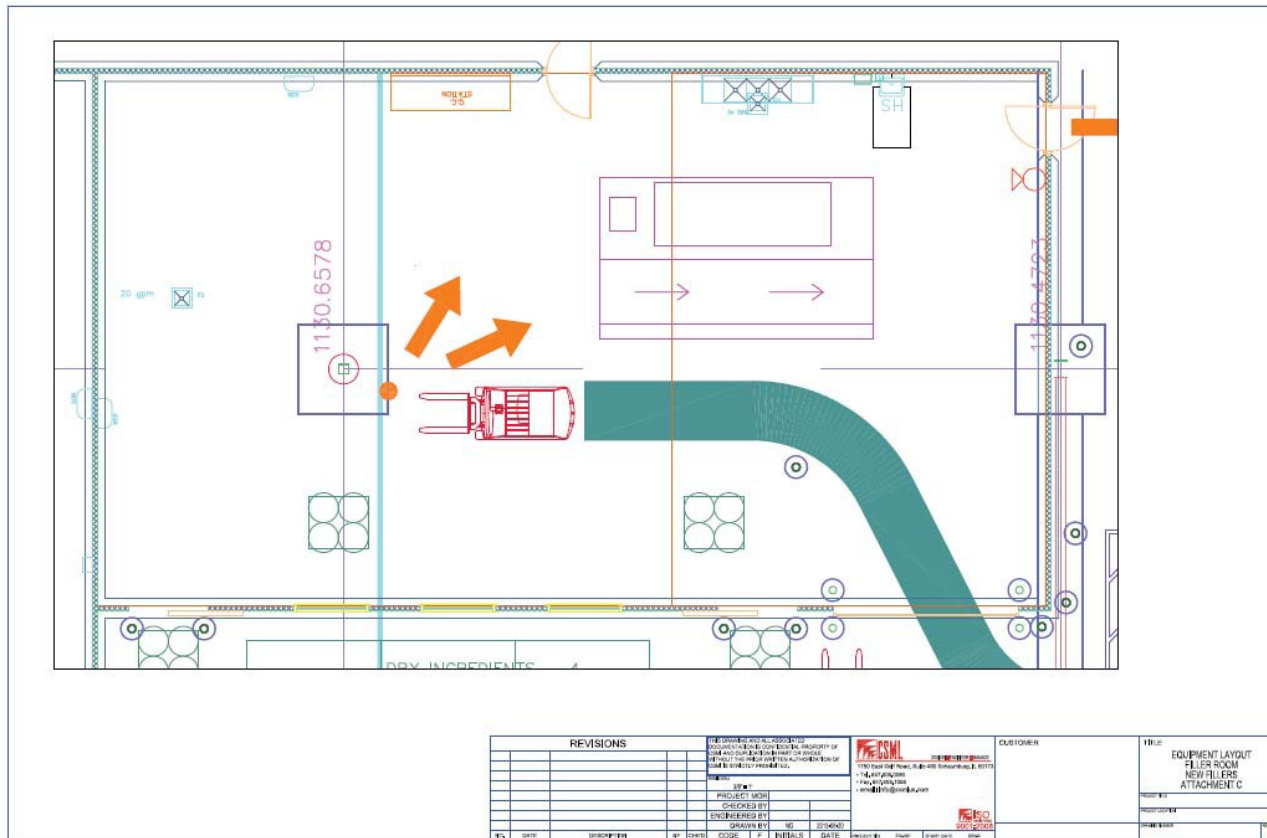
CONCEPT LAYOUTS:

The layout development includes the recommended physical equipment layout based on the facility specifications and the equipment dimensions provided by JBT Food Tech. The optimal location for the placement of the equipment is within the primary process area which is currently available space in the plant. See Attachment C – Concept Equipment Layouts.

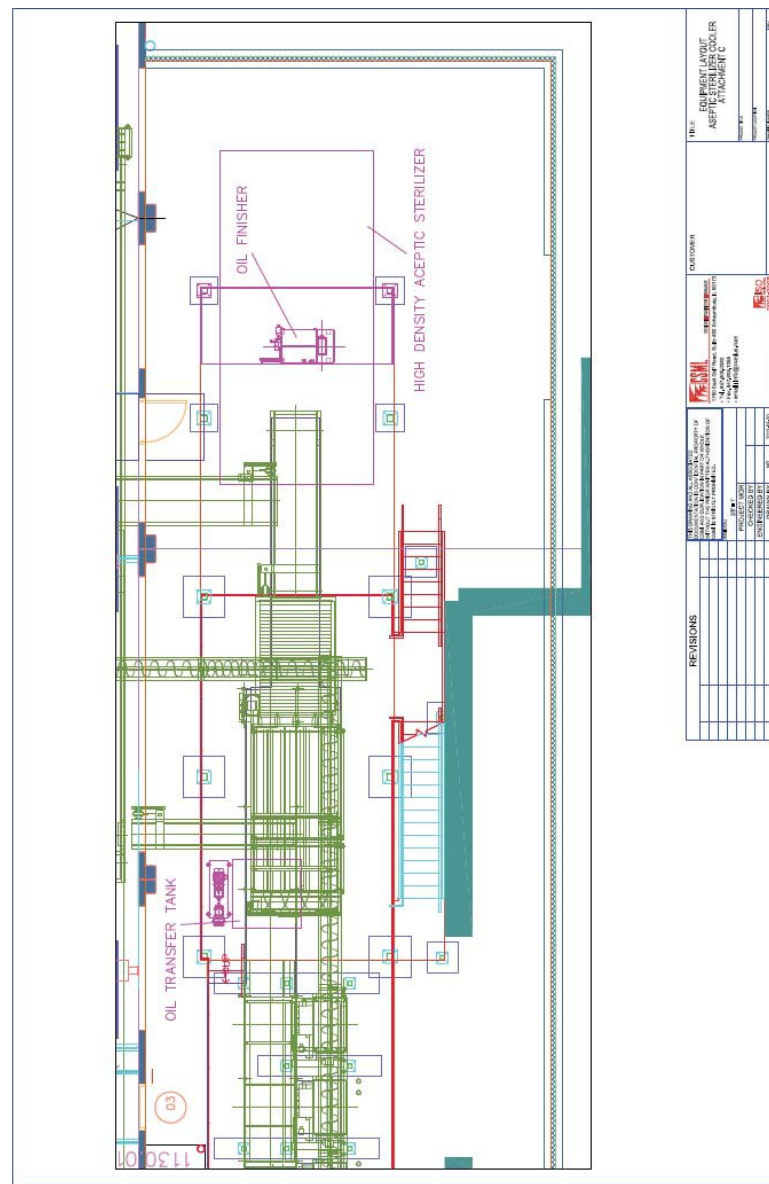


FINDINGS

CONCEPT LAYOUT: Cont'd.



CONCEPT LAYOUT: Cont'd.



PROCESS FLOW DIAGRAM:

[illegible]