

## ABSTRAK

### PRARANCANGAN PABRIK KALIUM NITRAT ( $\text{KNO}_3$ ) DARI ASAM NITRAT ( $\text{HNO}_3$ ) DAN KALIUM KLORIDA ( $\text{KCl}$ ) DENGAN KAPASITAS 75.000 TON/TAHUN (Perancangan Crystallizer 301 (CR-301))

Oleh

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Kalium nitrat merupakan garam anorganik dengan rumus kimia  $\text{KNO}_3$ . Kalium nitrat termasuk senyawa ionik yang disusun oleh kation  $\text{K}^+$  dan  $\text{NO}_3^-$  dan merupakan sumber nitrogen paling penting di alam. Kalium Nitrat dapat diproduksi dengan beberapa cara antara lain: 1) Proses pembuatan Kalium Nitrat ( $\text{KNO}_3$ ) dari Kalsium Nitrat ( $\text{Ca}(\text{NO}_3)_2$ ) dan Kalium Klorida ( $\text{KCl}$ ) dan 2) Proses pembuatan Kalium Nitrat ( $\text{KNO}_3$ ) dari Asam Nitrat ( $\text{HNO}_3$ ) dan Kalium Klorida ( $\text{KCl}$ ). Penyediaan kebutuhan utilitas pabrik berupa sistem pengolahan dan penyediaan air, sistem penyediaan *steam*, *cooling water*, penyedia udara dan instrumentasi, dan sistem pembangkit tenaga listrik.

Kapasitas produksi pabrik kalium nitrat direncanakan sebesar 75.000 ton/tahun dengan 330 hari kerja dalam 1 tahun. Lokasi pabrik direncanakan didirikan di Daerah Cipaisan, Purwakarta, Jawa Barat. Tenaga kerja yang dibutuhkan sebanyak 154 orang dengan bentuk badan usaha Perseroan Terbatas (PT) dengan struktur organisasi *line and staff*.

Dari analisis ekonomi diperoleh:

<i>Fixed Capital Investment</i>	(FCI)	= Rp 530.927.446.040
<i>Working Capital Investment</i>	(WCI)	= Rp 93.693.078.713
<i>Total Capital Investment</i>	(TCI)	= Rp 624.620.524.753
<i>Break Even Point</i>	(BEP)	= 39,56%
<i>Shut Down Point</i>	(SDP)	= 20,56%
<i>Pay Out Time before taxes</i>	(POT) <sub>b</sub>	= 2,10 years
<i>Pay Out Time after taxes</i>	(POT) <sub>a</sub>	= 2,41 years
<i>Return on Investment before taxes</i>	(ROI) <sub>b</sub>	= 48,05%
<i>Return on Investment after taxes</i>	(ROI) <sub>a</sub>	= 38,44%
<i>Discounted cash flow</i>	(DCF)	= 21,84%

Berdasarkan beberapa paparan di atas, maka pendirian pabrik kalium nitrat ini layak untuk dikaji lebih lanjut, karena merupakan pabrik yang menguntungkan dari sisi ekonomi dan mempunyai prospek yang relatif cukup baik.

## ABSTRACT

### PREDESIGN OF POTASSIUM NITRATE (KNO<sub>3</sub>) FROM NITRIC ACID (HNO<sub>3</sub>) AND POTASSIUM CHLORIDE (KCl) WITH CAPACITY 75.000 TONS/YEARS (Crystallizer 301 Design (CR-301))

By

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Potassium nitrate is an inorganic salt with the chemical formula KNO<sub>3</sub>. Potassium nitrate is an ionic compound composed by K<sup>+</sup> and NO<sub>3</sub><sup>-</sup> cations and is the most important source of nitrogen in nature. Potassium Nitrate can be produced in several ways, including: 1) The process of making Potassium Nitrate (KNO<sub>3</sub>) from Calcium Nitrate (Ca(NO<sub>3</sub>)<sub>2</sub>) and Potassium Chloride (KCl) and 2) The process of making Potassium Nitrate (KNO<sub>3</sub>) from Nitric Acid (HNO<sub>3</sub>) and Potassium Chloride (KCl). Provision of utility plant needs a treatment system and water supply, cooling water, air and instrumentation providers, dan Generator electrical power system.

Capacity of the plant is planned to production potassium nitrate is 75.000 tons/year with 330 working days in a year. The location of plant is planned in Cipaisan, Purwakarta, West Java. Labor needed in this plant as many as 154 people with a business entity form Limited Liability Company (PT) with line and staff organizational structure.

From teh economic analysis is obtained :

<i>Fixed Capital Investment</i>	(FCI)	= Rp 530.927.446.040
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<i>Discounted cash flow</i>	(DCF)	= 21,84%

By considering above the summary, it is proper establishment of potassium nitrate plant for studied further, because the plant is profitable and has good prospects future.