

RINGKASAN

PT. Berau Coal didirikan pada tahun 1983 dan merupakan Perusahaan pemegang izin PKP2B (Perjanjian Karya Pengusahaan Pertambangan Batubara) generasi pertama yang menghasilkan Batubara di wilayah Berau Kalimantan Timur. Dengan luas wilayah konsesi sekitar 1,200Km² di bagian utara Kalimantan Timur. Sistem penambangan yang dilakukan adalah dengan sistem tambang terbuka (*open pit*). Metode penyaliran yang diterapkan PT. Berau Coal pada *Pit East-2* adalah metode *mine drainage* dan *mine dewatering*. Setelah dilakukan analisis terhadap data curah hujan tahun 1999-2010 diperoleh curah hujan rencana dengan periode ulang 5 tahun yaitu sebesar 125,2783mm/hari dan intensitas curah hujan sebesar 42,0072mm/jam.

Rancangan sistem penyaliran yang dilakukan mencakup masalah paritan, sistem pemompaan, dimensi sumuran (*sump*), serta kolam pengendapan lumpur (*settling pond*). Saluran terbuka berada di sisi barat laut dan utara dari *Pit East-2*, dimensi saluran terbuka rancangan tahun pertama, saluran 1 : panjang sisi luar saluran (a) = 1,1m; lebar dasar saluran (b) = 1,1m; lebar permukaan (B) = 2,2m; kedalaman (h) = 1,1m. Saluran 2 : (a) = 1,2m; (b) = 1,2m; (B) = 2,5m; (h) = 1,2m. Saluran terbuka rancangan tahun ke-3, saluran 1 : (a) = 1,25m; (b) = 1,2m; (B) = 2,5m; (h) = 1,2m. Saluran 2 : (a) = 1,9m; (b) = 1,9m; (B) = 3,8m; (h) = 1,9m. Saluran terbuka rancangan tahun ke-5, saluran 1 : (a) = 1,95m; (b) = 1,9m; (B) = 3,9m; (h) = 1,9m. Saluran 2 : (a) = 1,4m; (b) = 1,4m; (B) = 2,7m; (h) = 1,4m.

Air yang masuk kedalam *pit* akan dibiarkan mengalir mengikuti gaya gravitasi, air yang masuk ke dalam area penambangan akan ditampung di dalam sumuran (*sump*) dan akan dikeluarkan dengan menggunakan pompa menuju *settling pond*. Analisis dimensi minimal sumuran (*sump*) yang dibutuhkan di *pit East-2* pada tahun pertama : (P_{atas}) = 100m, (l_{atas}) = 40m, (L₁) = 4.000m², (P_{bawah}) = 95m, (l_{bawah}) = 35m, (L₂) = 3.325m², (h) = 3m, Volume = 10.987,5m³; pada tahun ke-3 : (P_{atas}) = 262m, (l_{atas}) = 130m, (L₁) = 34.060m², (P_{bawah}) = 255m, (l_{bawah}) = 125m, (L₂) = 31.875m², (h) = 3m, Volume = 98.902,5m³; pada tahun ke-5 : (P_{atas}) = 255m, (l_{atas}) = 148m, (L₁) = 37.740m², (P_{bawah}) = 250m, (l_{bawah}) = 143m, (L₂) = 35.750m², (h) = 5m, Volume = 183.725m³. Berdasarkan analisis pada (*sump*) *pit East-2*, maka direkomendasikan menggunakan 2buah pompa untuk tahun pertama, 3buah pompa untuk rancangan tahun ke-3, dan 4buah pompa untuk rancangan tahun ke-5, jenis pompa yang digunakan yaitu Multiflow MFC-420 untuk memompa air dari (*sump*) ke *settling pond*. Kolam pengendapan (*settling pond*) yang direncanakan di lokasi penelitian yaitu menggunakan rancangan tahun ke-5 yang terdiri dari 3 kompartemen dan 2 penyekat dengan dimensi panjang = 40m, lebar 20m, luas 800m², kedalaman sump (h) = 5m, lebar penyekat = 4,8m, panjang penyekat = 11m. Dengan interval waktu pengerukan 9hari sekali.

ABSTRACT

PT. Berau Coal was founded in 1983 and the Company's licensees is PKP2B (Coal Mining Agreement) First Generation which produces coal in Berau, East Borneo. With total area concession are around 1,200Km² in the north of East Borneo. Mining system is done by the strip mine. PT. Berau Coal's drainage method at Pit East -2 applied by mine dewatering method. After analyzing the rainfall data of 1999-2010 precipitation plans obtained with 5-year return period is equal 125,2783mm/day and intensity of rainfall is 42,0072mm/h.

The design of the drainage system conducted covering problems: trenching, pumping system, the dimensions of the sump, and settling pond. The open dike located in northwest and the north side of the Pit East -2, dimensions open dike design in the first-year, 1st dike: length of the outer side of the dike (a) = 1,1m; dike base width (b) = 1,1m; surface width (B) = 2,2 m; depth (h) = 1,1m. 2nd dike: (a) = 1,2m; (b) = 1,2m; (B) = 2,5 m; (h) = 1,2m. The open dike design of 3rd year, 1st dike: (a) = 1,25m; (b) = 1,2m; (B) = 2,5 m; (h) = 1,2m. 2nd dike: (a) = 1,9m; (b) = 1,9m; (B) = 3,8m; (h) = 1,9m. The open dike design of 5th year, 1st dike : (a) = 1,95m; (b) = 1,9m; (B) = 3,9m; (h) = 1,9m. 2nd dike : (a) = 1,4m; (b) = 1,4m; (B) = 2,7m; (h) = 1,4m.

Water entering the pits will be allowed to flow by gravity, the water that comes into the mining area will be accommodated in the sump and it will be issued by using pumps to the settling pond. Analysis of minimal dimensions of sump is needed in the first year at pit East-2: (P_{atas}) = 100m, (l_{atas}) = 40m, (L_1) = 4.000m², (P_{bawah}) = 95m, (l_{bawah}) = 35m, (L_2) = 3.325m², (h) = 3m, Volume = 10.987,5m³; at the 3rd year: (P_{atas}) = 262m, (l_{atas}) = 130m, (L_1) = 34.060m², (P_{bawah}) = 255m, (l_{bawah}) = 125m, (L_2) = 31.875m², (h) = 3m, Volume = 98.902,5m³; at the 5th year: (P_{atas}) = 255m, (l_{atas}) = 148m, (L_1) = 37.740m², (P_{bawah}) = 250m, (l_{bawah}) = 143m, (L_2) = 35.750m², (h) = 5m, Volume = 183.725m³. The sump analysis from Pit East-2, it is recommended to use 2 pumps for the first year, 3 pumps for the design of 3rd year, and 4 pumps for the design of 5th year, the type of pump used is Multiflow MFC-420 for pumping of water from sump to the settling pond. Settling pond are planned at the study site using a 5th year design, consisting of 3 compartments and 2 divider with dimensions of length = 40m, width = 20m, area = 800m², sump depth (h) = 5m, divider width = 4,8m, divider length = 11m. With dredging intervals every 9 days.