

## DAFTAR ISI

<b>PERNYATAAN BEBAS PLAGIASI.....</b>	<b>i</b>
<b>HALAMAN PERSEMBAHAN.....</b>	<b>ii</b>
<b>KATA PENGANTAR.....</b>	<b>iii</b>
<b>DAFTAR ISI .....</b>	<b>vi</b>
<b>DAFTAR GAMBAR .....</b>	<b>viii</b>
<b>DAFTAR TABEL .....</b>	<b>ix</b>
<b>DAFTAR LAMPIRAN.....</b>	<b>x</b>
<b>INTISARI.....</b>	<b>xi</b>
<b>ABSTRACT .....</b>	<b>xii</b>
<b>BAB I PENDAHULUAN .....</b>	<b>12</b>
I.1 Latar Belakang.....	2
I.2 Rumusan Masalah.....	3
I.3 Tujuan Penelitian .....	3
I.4 Pertanyaan Penelitian .....	3
I.5 Ruang Lingkup .....	4
I.6 Manfaat Penelitian .....	4
I.7 Tinjauan Pustaka.....	4
I.8 Hipotesis .....	6
<b>BAB II DASAR TEORI .....</b>	<b>7</b>
II.1 Pertambangan Batubara.....	7
II.2 <i>Stockpile</i> Batubara.....	8
II.3 Terrestrial Laser Scanner (TLS).....	9
II.3.1 Metode <i>target-to-target</i> .....	10
II.3.2 Metode <i>cloud-to-cloud</i> .....	10
II.3.3 Metode Kombinasi .....	11
II.4 <i>Multi Station Adjustment</i> (MSA).....	11
II.5 <i>Direct Georeferencing</i> .....	12
II.6 Global Navigation Satellite System (GNSS) .....	13
II.7 <i>Digital Terrain Model</i> (DTM).....	14
II.7.1 <i>Grid-based Modeling</i> .....	15
II.7.2 <i>Triangle-based Modeling</i> .....	15

II.8 Perhitungan Volume.....	16
II.8.1 Metode Unit area .....	16
II.8.2 Metode Prismoidal.....	17
II.9 Standar <i>American Society for Testing and Materials</i> (ASTM).....	18
II.10 Uji Statistik t Berpasangan.....	19
<b>BAB III PELAKSANAAN PENELITIAN .....</b>	<b>21</b>
III.1 Lokasi Penelitian.....	21
III.2 Peralatan dan Bahan.....	22
II.2.1 Peralatan Penelitian .....	22
II.2.2 Bahan Penelitian .....	23
III.3 Tahapan Penelitian.....	24
III.3.1 Pengukuran TLS.....	25
III.3.2 Pengukuran GNSS.....	27
III.3.3 <i>Registration dan Filtering Point Cloud</i> .....	28
III.3.4 Pembagian Area <i>Stockpile</i> Berdasarkan Luas.....	31
III.3.5 Perhitungan Volume Metode Unit Area dengan Global Mapper.....	33
III.3.6 Perhitungan Volume Metode Prismoidal dengan 12d Model .....	35
III.3.7 Analisis Perbandingan.....	37
<b>BAB IV HASIL DAN PEMBAHASAN .....</b>	<b>39</b>
IV.1 Hasil Akuisisi Data di Lapangan .....	39
IV.2 Hasil Perbandingan Volume berdasarkan Standar <i>American Society for Testing and Materials</i> (ASTM).....	40
IV.3 Hasil Uji Statistik t Berpasangan 95 %.....	44
IV.3 Grafik Pola Standar Deviasi dan Rata-Rata Selisih Volume.....	46
<b>BAB V KESIMPULAN DAN SARAN.....</b>	<b>48</b>
V.1 Kesimpulan .....	48
V.2 Saran.....	48
<b>DAFTAR PUSTAKA .....</b>	<b>50</b>
<b>LAMPIRAN .....</b>	<b>53</b>