

## DAFTAR ISI

|   |              |
|---|--------------|
| <b>LEMBAR PENGESAHAN .....</b>  | <b>iii</b>   |
| <b>PERNYATAAN KEASLIAN KARYA ILMIAH.....</b>  | <b>iv</b>    |
| <b>HALAMAN PERSEMBAHAN .....</b>  | <b>v</b>     |
| <b>PRAKATA.....</b>   | <b>vi</b>    |
| <b>RINGKASAN .....</b>  | <b>vii</b>   |
| <b>ABSTRACT .....</b>   | <b>viii</b>  |
| <b>DAFTAR ISI.....</b>  | <b>ix</b>    |
| <b>DAFTAR GAMBAR.....</b>   | <b>xiii</b>  |
| <b>DAFTAR TABEL .....</b>   | <b>xvi</b>   |
| <b>DAFTAR LAMPIRAN .....</b>  | <b>xviii</b> |
| <b>BAB I PENDAHULUAN.....</b>   | <b>1</b>     |
| I.1    Latar Belakang .....   | 1            |
| I.2    Tujuan .....   | 1            |
| I.3    Batasan Masalah.....   | 1            |
| I.4    Metodologi .....   | 2            |
| I.5    Sistematika Penulisan .....  | 3            |
| <b>BAB II TINJAUAN LAPANGAN.....</b>  | <b>4</b>     |
| II.1    Letak Geografis Cekungan Sumatra Selatan.....                                       | 4            |
| II.2    Stratigrafi Regional Cekungan Sumatra Selatan.....                                  | 6            |
| II.3    Petroleum System .....  | 9            |
| II.4    Profil Sumur <i>Existing</i> .....  | 10           |
| II.4.1 Profil Sumur Existing R-1.....   | 14           |
| II.4.2 Profil Sumur Existing R-2.....   | 12           |
| <b>BAB III DASAR TEORI .....</b>  | <b>14</b>    |
| III.1 <i>Directional Drilling</i> .....   | 14           |
| III.1.1 Tujuan dan Alasan <i>Directional Drilling</i> .....                                 | 14           |
| III.1.2 Tipe Sumur <i>Directional Drilling</i> .....  | 16           |
| III.1.3 Perencanaan Profil Sumur <i>Directional Drilling</i> .....                          | 18           |
| III.1.4 Metode Perhitungan Survey <i>Trajectory</i> Sumur <i>Directional Drilling</i> ..... | 26           |
| III.2 <i>Casing Setting Depth</i> .....   | 31           |

|  |     |
|--|-----|
| III.2.1 Penentuan Data-Data Bawah Permukaan .....                  | 31  |
| III.2.2 Penentuan Casing Setting Depth.....                        | 34  |
| III.2.3 <i>Hole Geometry</i> .....                                 | 39  |
| III.3 <i>Casing Design</i> .....                                   | 42  |
| III.3.1 Fungsi <i>Casing</i> .....                                 | 42  |
| III.3.2 Klasifikasi <i>Casing</i> .....                            | 44  |
| III.3.3 Pembebanan pada <i>Casing</i> .....                        | 46  |
| III.3.4 Spesifikasi <i>Casing</i> dan Kekuatan <i>Casing</i> ..... | 54  |
| III.4 <i>Mud Design</i> .....                                      | 60  |
| III.4.1 Komposisi Lumpur Pemboran .....                            | 60  |
| III.4.2 Komponen <i>Solid</i> (Padat).....                         | 62  |
| III.4.3 Komponen Aditif Lumpur .....                               | 62  |
| III.4.4 Sifat Fisik Lumpur .....                                   | 63  |
| III.4.5 Jenis Lumpur Pemboran .....                                | 66  |
| III.4.6 Perhitungan Volume Lumpur .....                            | 67  |
| III.5 <i>Cementing Design</i> .....                                | 68  |
| III.5.1 Jenis Penyemenan .....                                     | 69  |
| III.5.2 Komposisi dan Klasifikasi Semen Pemboran.....              | 70  |
| III.5.3 Sifat Semen Pemboran.....                                  | 71  |
| III.5.4 Aditif Semen .....   | 76  |
| III.5.5 Metode Penyemenan Primer.....                              | 78  |
| III.5.6 <i>Production Casing &amp; Liner</i> .....                 | 79  |
| III.5.7 Analisa Penyemenan Primer.....                             | 80  |
| III.6 <i>Bottom Hole Assembly</i> .....                            | 84  |
| III.6.1 Jenis Alat Pembelok.....                                   | 84  |
| III.6.2 <i>Bottom Hole Assembly</i> pada Pemboran Berarah.....     | 86  |
| III.6.3 <i>Drill String Design</i> .....                           | 86  |
| III.7 <i>Rig Selection</i> .....                                   | 94  |
| III.7.1 Sistem Angkat.....   | 94  |
| III.7.2 Sistem Putar .....   | 102 |
| III.7.3 Sistem Sirkulasi .....                                     | 103 |
| III.7.4 Perhitungan <i>Horse Power Total</i> .....                 | 108 |
| III.8 <i>Drilling Schedule</i> .....                               | 108 |
| III.8.1 <i>Drill Rate</i> .....                                    | 109 |

|   |            |
|---|------------|
| III.8.2 <i>Trip Time</i> .....  | 110        |
| III.8.3 <i>Hole Problem</i> .....   | 110        |
| III.8.4 <i>Running Casing and Cementing</i> .....                           | 110        |
| III.8.5 <i>Pemboran Directional</i> .....                                   | 110        |
| III.8.6 <i>Well Completion</i> .....  | 111        |
| <b>BAB IV PERENCANAAN <i>DESIGN</i> SUMUR USULAN “R-3” PADA</b>             |            |
| <b>LAPANGAN “R” .....</b>   | <b>112</b> |
| IV.1    Perencanaan <i>Trajectory</i> Sumur “R-3” .....                     | 112        |
| IV.1.1 Perencanaan Lokasi Sumur .....                                       | 112        |
| IV.1.2 Perencanaan Pembuatan <i>Wellpath</i> dengan Metode Tiga Dimensi ... | 113        |
| IV.1.3 Desain 3D <i>Trajectory</i> Sumur R-3.....                           | 115        |
| IV.1.4 Perencanaan <i>Casing Setting Depth</i> .....                        | 116        |
| IV.2    Pendesainan <i>Casing</i> .....                                     | 118        |
| IV.2.1 <i>Casing 20”</i> .....  | 118        |
| IV.2.2 <i>Casing 13 3/8”</i> .....  | 124        |
| IV.2.3 <i>Casing 9 5/8”</i> .....   | 130        |
| IV.2.4 <i>Casing 7”</i> .....   | 136        |
| IV.3    Perencanaan Desain Lumpur Pemboran .....                            | 142        |
| IV.3.1 Desain <i>Mud Weight</i> .....                                       | 142        |
| IV.3.2 Desain Komposisi Lumpur Pemboran.....                                | 144        |
| IV.3.3 Perencanaan Volume Lumpur Pemboran .....                             | 144        |
| IV.4    Perencanaan Desain Semen Pemboran .....                             | 147        |
| IV.4.1 Desain Komposisi Semen Pemboran.....                                 | 147        |
| IV.4.2 Perencanaan Volume Semen Pemboran .....                              | 148        |
| IV.5    Perencanaan <i>Bottom Hole Assembly</i> .....                       | 158        |
| IV.5.1 Perencanaan Desain <i>Bottom Hole Assembly</i> .....                 | 158        |
| IV.5.2 Perencanaan Desain <i>Drill String</i> .....                         | 162        |
| IV.6    Pemilihan Kapasitas <i>Rig</i> .....                                | 170        |
| IV.6.1 <i>Hoisting Capacity</i> .....                                       | 170        |
| IV.6.2 <i>Tripping Capacity</i> .....                                       | 170        |
| IV.6.3 <i>Drill Line Size</i> .....   | 171        |
| IV.6.4 <i>Pump Requirements</i> .....                                       | 171        |
| IV.6.5 BOP .....  | 172        |
| IV.6.6 <i>Pit Volume Estimation</i> .....                                   | 172        |

|   |            |
|---|------------|
| IV.7 Perencanaan <i>Drilling Schedule</i> ..... | 173        |
| <b>BAB V KESIMPULAN</b> .....                   | <b>175</b> |
| <b>DAFTAR RUJUKAN</b> .....                     | <b>177</b> |
| <b>LAMPIRAN</b> .....                           | <b>178</b> |