

**DATA-C**  
**RIVERBED MATERIALS**



RESULT OF LABORATORY TEST  
SANDBAR - RIVERBANK SURVEY  
IN LIMBOTO - BOLANGO - BONE BASIN

SANDBAR (S)

| NO | Name of River | Location | Coordinate    |                | Spesific Gravity<br>(t/m <sup>3</sup> ) | Grain Size Analysis |                |                    |
|----|---------------|----------|---------------|----------------|---|---------------------|----------------|--------------------|
|    |               |          | North         | East           |   | Gravel<br>(%)       | Sand<br>(%)    | Silt + Clay<br>(%) |
|    |               |          | 1             | Bone           | A-B 1                                   | 00° 31, 553 '       | 123° 03, 855 ' | 2.587              |
| 2  | Bone          | A-B 2    | 00° 31, 472 ' | 123° 03, 756 ' | 2.634                                   | 27.33               | 66.4           | 6.27               |
| 3  | Bone          | A-B 3    | 00° 31, 299 ' | 123° 03, 774 ' | 2.652                                   | 63.46               | 32.78          | 3.76               |
| 4  | Bone          | B-C 1    | 00° 31, 513 ' | 123° 07, 945 ' | 2.641                                   | 68.76               | 25.34          | 5.9                |
| 5  | Bone          | B-C 2    | 00° 31, 527 ' | 123° 07, 514 ' | 2.599                                   | 64.03               | 32.07          | 3.9                |
| 6  | Bone          | B-C 3    | 00° 31, 689 ' | 123° 06, 891 ' | 2.373                                   | 65.42               | 30.96          | 3.62               |
| 7  | Bone          | B-C 4    | 00° 32, 081 ' | 123° 06, 302 ' | 2.613                                   | 16.7                | 75.78          | 7.52               |
| 8  | Bone          | B-C 5    | 00° 31, 878 ' | 123° 04, 230 ' | 2.639                                   | 63.29               | 32.85          | 3.86               |
| 9  | Tamalate      | D-E 1    | 00° 33, 364 ' | 123° 06, 162 ' | 2.477                                   | 2.37                | 25.14          | 72.49              |
| 10 | Tamalate      | D-E 2    | 00° 33, 243 ' | 123° 05, 745 ' | 2.646                                   | 2.95                | 26.36          | 70.69              |
| 11 | Tamalate      | D-E 3    | 00° 33, 189 ' | 123° 05, 243 ' | 2.567                                   | 11.82               | 70.37          | 17.81              |
| 12 | Tamalate      | D-E 4    | 00° 32, 994 ' | 123° 04, 697 ' | 2.637                                   | 1.73                | 21.76          | 76.51              |
| 13 | Tamalate      | D-E 5    | 00° 32, 310 ' | 123° 04, 083 ' | 2.616                                   | 1.24                | 13.18          | 85.58              |
| 14 | Bolango       | F-G 1    | 00° 32, 788 ' | 123° 02, 155 ' | 2.708                                   | 45.72               | 49.11          | 5.17               |
| 15 | Bolango       | F-G 2    | 00° 32, 731 ' | 123° 02, 313 ' | 2.576                                   | 14.58               | 82.94          | 2.48               |
| 16 | Bolango       | F-G 3    | 00° 32, 700 ' | 123° 02, 298 ' | 2.708                                   | 10.51               | 81.06          | 8.43               |
| 17 | Topodu        | G-H 1    | 00° 33, 171 ' | 123° 01, 238 ' | 2.605                                   | 24.46               | 72.43          | 3.11               |
| 18 | Topodu        | G-H 2    | 00° 32, 891 ' | 123° 01, 749 ' | 2.609                                   | 13.66               | 72.92          | 13.42              |
| 19 | Bolango       | G-I 1    | 00° 34, 974 ' | 123° 03, 052 ' | 2.700                                   | 54.2                | 39.52          | 6.28               |
| 20 | Bolango       | G-I 2    | 00° 34, 851 ' | 123° 02, 922 ' | 2.697                                   | 48.86               | 37.96          | 13.18              |
| 21 | Bolango       | G-I 3    | 00° 34, 528 ' | 123° 02, 692 ' | 2.679                                   | 16.6                | 66.45          | 16.95              |
| 22 | Bolango       | G-I 4    | 00° 33, 760 ' | 123° 01, 587 ' | 2.614                                   | 52.39               | 43.68          | 3.93               |
| 23 | Bolango       | G-I 5    | 00° 33, 537 ' | 123° 01, 476 ' | 2.675                                   | 54.8                | 39.7           | 5.5                |
| 24 | Biyonga       | J-K 1    | 00° 39, 760 ' | 122° 59, 085 ' | 2.674                                   | 76.19               | 20.95          | 2.86               |
| 25 | Biyonga       | J-K 2    | 00° 39, 488 ' | 122° 58, 824 ' | 2.648                                   | 74.24               | 21.12          | 4.64               |
| 26 | Biyonga       | J-K 3    | 00° 37, 225 ' | 122° 58, 693 ' | 2.717                                   | 8.57                | 80.56          | 10.87              |
| 27 | Biyonga       | J-K 4    | 00° 36, 414 ' | 122° 58, 776 ' | 2.676                                   | 9.34                | 86.12          | 4.54               |
| 28 | Biyonga       | J-K 5    | 00° 36, 257 ' | 122° 58, 760 ' | 2.734                                   | 10.47               | 82.98          | 6.55               |
| 29 | Meluopo       | L-M 1    | 00° 37, 787 ' | 122° 57, 330 ' | 2.715                                   | 6.57                | 29.74          | 63.69              |
| 30 | Meluopo       | L-M 2    | 00° 37, 271 ' | 122° 57, 560 ' | 2.684                                   | 28.79               | 64.5           | 6.71               |
| 31 | Meluopo       | L-M 3    | 00° 37, 120 ' | 122° 57, 555 ' | 2.697                                   | 7.4                 | 32.27          | 60.33              |
| 32 | Marisa        | N-O 1    | 00° 37, 646 ' | 122° 56, 594 ' | 2.619                                   | 42.39               | 51.17          | 6.44               |
| 33 | Marisa        | N-O 2    | 00° 37, 428 ' | 122° 56, 979 ' | 2.627                                   | 20.96               | 61.68          | 17.36              |
| 34 | Marisa        | N-O 3    | 00° 37, 152 ' | 122° 56, 975 ' | 2.630                                   | 37.49               | 54.39          | 8.12               |
| 35 | Alopohu       | P-Q 1    | 00° 36, 693 ' | 122° 55, 331 ' | 2.577                                   | 7.03                | 79.22          | 13.75              |
| 36 | Alopohu       | P-Q 2    | 00° 36, 537 ' | 122° 55, 773 ' | 2.574                                   | 11.44               | 81.69          | 6.87               |
| 37 | Alopohu       | P-Q 3    | 00° 36, 455 ' | 122° 55, 987 ' | 2.592                                   | 2.09                | 86.23          | 11.68              |
| 38 | Alopohu       | P-Q 4    | 00° 36, 356 ' | 122° 56, 317 ' | 2.614                                   | 29.69               | 62.75          | 7.56               |
| 39 | Alopohu       | P-Q 5    | 00° 36, 331 ' | 122° 56, 395 ' | 2.605                                   | 2.05                | 91.83          | 6.12               |
| 40 | Rintenga      | R-S 1    | 00° 35, 388 ' | 122° 55, 660 ' | 2.442                                   | 2.89                | 18.45          | 78.66              |
| 41 | Rintenga      | R-S 2    | 00° 35, 457 ' | 122° 55, 732 ' | 2.371                                   | 0.05                | 1.99           | 97.96              |
| 42 | Rintenga      | R-S 3    | 00° 35, 445 ' | 122° 55, 802 ' | 2.270                                   | 0.95                | 7.33           | 91.72              |
| 43 | Rintenga      | R-S 4    | 00° 35, 495 ' | 122° 55, 963 ' | 2.290                                   | 2.03                | 24.37          | 73.6               |
| 44 | Rintenga      | R-S 5    | 00° 35, 591 ' | 122° 56, 146 ' | 2.374                                   | 1.93                | 5.69           | 92.38              |
| 45 | Rintenga      | T-U 1    | 00° 36, 246 ' | 122° 53, 712 ' | 2.672                                   | 77.54               | 18.59          | 3.87               |
| 46 | Rintenga      | T-U 2    | 00° 36, 476 ' | 122° 53, 830 ' | 2.665                                   | 73.85               | 21.69          | 4.46               |
| 47 | Alo           | V-W 1    | 00° 38, 849 ' | 122° 52, 098 ' | 2.643                                   | 52.4                | 43.05          | 4.55               |
| 48 | Alo           | V-W 2    | 00° 38, 483 ' | 122° 52, 270 ' | 2.628                                   | 28.71               | 62.96          | 8.33               |
| 49 | Pohu          | V-X 1    | 00° 37, 127 ' | 122° 53, 373 ' | 2.636                                   | 80.79               | 16.76          | 2.45               |
| 50 | Pohu          | V-X 2    | 00° 37, 359 ' | 122° 53, 461 ' | 2.653                                   | 48.53               | 46.02          | 5.45               |

RESULT OF LABORATORY TEST  
SANDBAR - RIVERBANK SURVEY  
IN LIMBOTO - BOLANGO - BONE BASIN

RIVERBANK ( R )

| NO | Name of River | Location | Coordinate    |                | Spesific Gravity<br>(t/m <sup>3</sup> ) | Grain Size Analysis |             |                    |
|----|---------------|----------|---------------|----------------|---|---------------------|-------------|--------------------|
|    |               |          | North         | East           |   | Gravel<br>(%)       | Sand<br>(%) | Silt + Clay<br>(%) |
|    |               |          |               |                |   |                     |             |                    |
| 1  | Bone          | A-B 1    | 00° 31, 551 ' | 123° 03, 856 ' | 2.636                                   | 12.01               | 56.82       | 31.17              |
| 2  | Bone          | A-B 2    | 00° 31, 495 ' | 123° 03, 841 ' | 2.671                                   | 26.1                | 56.59       | 17.31              |
| 3  | Bone          | A-B 3    | 00° 31, 289 ' | 123° 03, 797 ' | 2.639                                   | 56.89               | 31.54       | 11.57              |
| 4  | Bone          | B-C 1    | 00° 31, 567 ' | 123° 07, 986 ' | 2.624                                   | 0                   | 87.93       | 12.07              |
| 5  | Bone          | B-C 2    | 00° 31, 677 ' | 123° 07, 516 ' | 2.637                                   | 5.49                | 84.3        | 10.21              |
| 6  | Bone          | B-C 3    | 00° 31, 891 ' | 123° 06, 890 ' | 2.640                                   | 8.42                | 50.49       | 41.09              |
| 7  | Bone          | B-C 4    | 00° 32, 130 ' | 123° 06, 310 ' | 2.642                                   | 12.37               | 74.99       | 12.64              |
| 8  | Bone          | B-C 5    | 00° 31, 787 ' | 123° 04, 129 ' | 2.651                                   | 2.3                 | 20.54       | 77.16              |
| 9  | Tamalate      | D-E 1    | 00° 33, 364 ' | 123° 06, 162 ' | 2.645                                   | 1.64                | 44.8        | 53.56              |
| 10 | Tamalate      | D-E 2    | 00° 33, 243 ' | 123° 05, 745 ' | 2.653                                   | 1.87                | 39.35       | 58.78              |
| 11 | Tamalate      | D-E 3    | 00° 33, 189 ' | 123° 05, 243 ' | 2.504                                   | 2.41                | 52.37       | 45.22              |
| 12 | Tamalate      | D-E 4    | 00° 32, 994 ' | 123° 04, 697 ' | 2.610                                   | 2.13                | 42.14       | 55.73              |
| 13 | Tamalate      | D-E 5    | 00° 32, 310 ' | 123° 04, 083 ' | 2.664                                   | 2.59                | 80.63       | 16.78              |
| 14 | Bolango       | F-G 1    | 00° 32, 788 ' | 123° 02, 155 ' | 2.563                                   | 12.8                | 74.18       | 13.02              |
| 15 | Bolango       | F-G 2    | 00° 32, 731 ' | 123° 02, 313 ' | 2.464                                   | 7.36                | 85.11       | 7.53               |
| 16 | Bolango       | F-G 3    | 00° 32, 712 ' | 123° 02, 297 ' | 2.492                                   | 5.36                | 78.89       | 15.75              |
| 17 | Topodu        | G-H 1    | 00° 33, 171 ' | 123° 01, 238 ' | 2.551                                   | 29.04               | 55.21       | 15.75              |
| 18 | Topodu        | G-H 2    | 00° 32, 891 ' | 123° 01, 749 ' | 2.605                                   | 9.25                | 73.79       | 16.96              |
| 19 | Bolango       | G-I 1    | 00° 34, 974 ' | 123° 03, 052 ' | 2.332                                   | 13.51               | 72.4        | 14.09              |
| 20 | Bolango       | G-I 2    | 00° 34, 851 ' | 123° 02, 922 ' | 2.438                                   | 4.28                | 65.72       | 30                 |
| 21 | Bolango       | G-I 3    | 00° 34, 528 ' | 123° 02, 692 ' | 2.260                                   | 12.28               | 68.41       | 19.31              |
| 22 | Bolango       | G-I 4    | 00° 33, 760 ' | 123° 01, 587 ' | 2.347                                   | 13.8                | 72          | 14.2               |
| 23 | Bolango       | G-I 5    | 00° 33, 537 ' | 123° 01, 476 ' | 2.435                                   | 9.69                | 72.76       | 17.55              |
| 24 | Biyonga       | J-K 1    | 00° 39, 760 ' | 122° 59, 085 ' | 2.603                                   | 18.24               | 67.63       | 14.13              |
| 25 | Biyonga       | J-K 2    | 00° 39, 488 ' | 122° 58, 510 ' | 2.606                                   | 20.56               | 71.02       | 8.42               |
| 26 | Biyonga       | J-K 3    | 00° 37, 225 ' | 122° 58, 693 ' | 2.664                                   | 11.35               | 82.21       | 6.44               |
| 27 | Biyonga       | J-K 4    | 00° 36, 414 ' | 122° 58, 776 ' | 2.564                                   | 1.95                | 84.47       | 13.58              |
| 28 | Biyonga       | J-K 5    | 00° 36, 257 ' | 122° 58, 760 ' | 2.648                                   | 2.26                | 83.58       | 14.16              |
| 29 | Meluopo       | L-M 1    | 00° 37, 787 ' | 122° 57, 330 ' | 2.571                                   | 24.39               | 68.12       | 7.49               |
| 30 | Meluopo       | L-M 2    | 00° 37, 271 ' | 122° 57, 560 ' | 2.635                                   | 12.67               | 73.57       | 13.76              |
| 31 | Meluopo       | L-M 3    | 00° 37, 120 ' | 122° 57, 555 ' | 2.639                                   | 19.24               | 67.49       | 13.27              |
| 32 | Marisa        | N-O 1    | 00° 37, 646 ' | 122° 56, 594 ' | 2.635                                   | 36.65               | 52.29       | 11.06              |
| 33 | Marisa        | N-O 2    | 00° 37, 428 ' | 122° 56, 979 ' | 2.610                                   | 17.15               | 73.31       | 9.54               |
| 34 | Marisa        | N-O 3    | 00° 37, 152 ' | 122° 56, 975 ' | 2.619                                   | 38.27               | 50.26       | 11.47              |
| 35 | Alopohu       | P-Q 1    | 00° 36, 693 ' | 122° 55, 331 ' | 2.590                                   | 26.22               | 63.24       | 10.54              |
| 36 | Alopohu       | P-Q 2    | 00° 36, 537 ' | 122° 55, 773 ' | 2.585                                   | 3.32                | 85.92       | 10.76              |
| 37 | Alopohu       | P-Q 3    | 00° 36, 455 ' | 122° 55, 987 ' | 2.567                                   | 6.46                | 85.4        | 8.14               |
| 38 | Alopohu       | P-Q 4    | 00° 36, 356 ' | 122° 56, 317 ' | 2.626                                   | 22.81               | 64.63       | 12.56              |
| 39 | Alopohu       | P-Q 5    | 00° 36, 331 ' | 122° 56, 395 ' | 2.648                                   | 5.48                | 81.77       | 12.75              |
| 40 | Rintenga      | R-S 1    | 00° 35, 388 ' | 122° 55, 660 ' | 2.408                                   | 0.62                | 8.51        | 90.87              |
| 41 | Rintenga      | R-S 2    | 00° 35, 457 ' | 122° 55, 732 ' | 2.399                                   | 1.62                | 21.96       | 76.42              |
| 42 | Rintenga      | R-S 3    | 00° 35, 445 ' | 122° 55, 802 ' | 2.513                                   | 0.94                | 24.88       | 74.18              |
| 43 | Rintenga      | R-S 4    | 00° 35, 495 ' | 122° 55, 963 ' | 2.412                                   | 1.34                | 12.55       | 86.11              |
| 44 | Rintenga      | R-S 5    | 00° 35, 591 ' | 122° 56, 146 ' | 2.457                                   | 0.42                | 1.28        | 98.3               |
| 45 | Rintenga      | T-U 1    | 00° 36, 246 ' | 122° 53, 712 ' | 2.508                                   | 1.82                | 16.66       | 81.52              |
| 46 | Rintenga      | T-U 2    | 00° 36, 476 ' | 122° 53, 830 ' | 2.522                                   | 2.11                | 26.8        | 71.09              |
| 47 | Alo           | V-W 1    | 00° 38, 849 ' | 122° 52, 098 ' | 2.656                                   | 14.74               | 72.95       | 12.31              |
| 48 | Alo           | V-W 2    | 00° 38, 483 ' | 122° 52, 270 ' | 2.539                                   | 23.72               | 62.84       | 13.44              |
| 49 | Pohu          | V-X 1    | 00° 37, 127 ' | 122° 53, 373 ' | 2.570                                   | 2.72                | 24.62       | 72.66              |
| 50 | Pohu          | V-X 2    | 00° 37, 359 ' | 122° 53, 461 ' | 2.596                                   | 2.14                | 87.18       | 10.68              |