

max  $E/V \approx 4.4$  / Deck  $Unit^{+}$  shut off, restarted for surface sample

$$FIV_{0,t} \max \approx 0.4$$

| VESSEL                  |               | PROJECT & LEG |            |            |                                   | STATION DESIGNATION |               |                         |             |                    |          |           |            |               |              |             |      |         |                 |                 |  |
|-------------------------|---------------|---------------|------------|------------|-----------------------------------|---------------------|---------------|-------------------------|-------------|--------------------|----------|-----------|------------|---------------|--------------|-------------|------|---------|-----------------|-----------------|--|
| NOAA R/V MILLER FREEMAN |               | MF02-11       |            |            |                                   |                     |               |                         |             |                    |          |           |            |               |              |             |      |         |                 |                 |  |
| CONSC<br>CAST #         | LATITUDE      |               | LONGITUDE  |            | DATE JD=                          |                     | TIME<br>(GMT) |                         | DRY<br>BULB | WET<br>BULB        | PRESSURE | SEA STATE | VISIBILITY | WIND<br>DIRN. | WIND<br>SPD. | CLOUD (amt) | TYPE | WEATHER | BOTTOM<br>DEPTH | STA.<br>NAME/ID |  |
|                         | DEG           | MIN           | DEG        | MIN        | DAY                               | MO                  | YR            | HR                      | MIN         | (°C)               | (°C)     | (mb)      | *          | *             | (deg)        | (m/s)       | *    | *       | (m)             |                 |  |
| 4485805                 | 15            | 03            | 5          | 79         | W                                 | 65                  | OCT           | 02                      | 16          | 54                 | 16.4     | 46        | 44         | 4             | 23           | 87          | 4    | 144     | 3614            |                 |  |
| CTD                     | TIMES         |               | JD/TIME    |            | DATA LOCATION                     |                     |               |                         |             |                    |          |           |            |               |              |             |      |         |                 |                 |  |
| TYPE & SN               | 9+ S/N 91220  |               | DATA ON    |            | Tape/Diskette ID File Name/Header |                     |               |                         |             |                    |          |           |            |               |              |             |      |         |                 |                 |  |
| PRESS SN                | 80020         |               | START DOWN |            |                                   |                     |               |                         |             |                    |          |           |            |               |              |             |      |         |                 |                 |  |
| TEMP SN                 | 710/884       |               | AT DEPTH   |            |                                   |                     |               |                         |             |                    |          |           |            |               |              |             |      |         |                 |                 |  |
| COND SN                 | 915/530       |               | AT SURFACE |            |                                   |                     |               |                         |             |                    |          |           |            |               |              |             |      |         |                 |                 |  |
|                         |               | PAR 4242      |            | FLUOR 153  | CHLOR 109                         | TRANSMISSOMETER     |               | Cleaned air bleed valve |             | SAMPLE BOTTLE DATA |          |           |            |               |              |             |      |         |                 |                 |  |
| POS.                    | TRIP<br>DEPTH | PRESSURE      | PRI. TEMP. | SEC. TEMP. | PRI. SALINITY                     | SEC. SALINITY       | SALINITY      | SAMPLE BOTTLE NUMBER    |             |                    |          |           |            |               |              |             |      |         |                 |                 |  |
| 1                       | 140           |               |            |            |                                   |                     |               |                         |             |                    |          |           |            |               |              |             |      |         |                 |                 |  |
| 2                       | 125           |               |            |            |                                   |                     |               |                         |             |                    |          |           |            |               |              |             |      |         |                 |                 |  |
| 3                       | 100           |               |            |            |                                   |                     |               |                         |             |                    |          |           |            |               |              |             |      |         |                 |                 |  |
| 4                       | 75            |               |            |            |                                   |                     |               |                         |             |                    |          |           |            |               |              |             |      |         |                 |                 |  |
| 5                       | 60            |               |            |            |                                   |                     |               |                         |             |                    |          |           |            |               |              |             |      |         |                 |                 |  |
| 6                       | 50            |               |            |            |                                   |                     |               |                         |             |                    |          |           |            |               |              |             |      |         |                 |                 |  |
| 7                       | 40            |               |            |            |                                   |                     |               |                         |             |                    |          |           |            |               |              |             |      |         |                 |                 |  |
| 8                       | 30            |               |            |            |                                   |                     |               |                         |             |                    |          |           |            |               |              |             |      |         |                 |                 |  |
| 9                       | 20            |               |            |            |                                   |                     |               |                         |             |                    |          |           |            |               |              |             |      |         |                 |                 |  |
| 10                      | 10            |               |            |            |                                   |                     |               |                         |             |                    |          |           |            |               |              |             |      |         |                 |                 |  |
| 11                      | 0             |               |            |            |                                   |                     |               |                         |             |                    |          |           |            |               |              |             |      |         |                 |                 |  |
| 12                      |               |               |            |            |                                   |                     |               |                         |             |                    |          |           |            |               |              |             |      |         |                 |                 |  |

flvd max  $\approx$  4.4

| VESSEL                  |            | PROJECT & LEG |     |            |   | STATION DESIGNATION               |    |               |   |               |    |            |    |           |    |             |    |         |    |              |    |              |  |
|-------------------------|------------|---------------|-----|------------|---|-----------------------------------|----|---------------|---|---------------|----|------------|----|-----------|----|-------------|----|---------|----|--------------|----|--------------|--|
| NOAA RV MILLER FREEMAN  |            | MF02-11       |     |            |   | G811                              |    |               |   |               |    |            |    |           |    |             |    |         |    |              |    |              |  |
| CONSC                   | 58         | LATITUDE      |     | 156 31     |   | DATE JD=                          |    | TIME (GMT)    |   | WET BULB      |    | WIND DIRN. |    | WIND SPD. |    | CLOUD (amt) |    | WEATHER |    | BOTTOM DEPTH |    | STA. NAME/ID |  |
| CAST #                  | 049        | DEG           | MIN | 23         | N | 156                               | 31 | 04            | W | 05            | 00 | 02         | 18 | 06        | 10 | 04          | 18 | 07      | 14 | 15           | 60 | G811         |  |
| CTD                     |            | TIMES         |     | JD/TIME    |   | DATA LOCATION                     |    |               |   |               |    |            |    |           |    |             |    |         |    |              |    |              |  |
| TYPE & SN               |            | 9+ S/N 91220  |     | DATA ON    |   | Tape/Diskette ID File Name/Header |    |               |   |               |    |            |    |           |    |             |    |         |    |              |    |              |  |
| PRESS SN                |            | 80020         |     | START DOWN |   |                                   |    |               |   |               |    |            |    |           |    |             |    |         |    |              |    |              |  |
| TEMP SN                 |            | 710/884       |     | AT DEPTH   |   |                                   |    |               |   |               |    |            |    |           |    |             |    |         |    |              |    |              |  |
| COND SN                 |            | 915/530       |     | AT SURFACE |   |                                   |    |               |   |               |    |            |    |           |    |             |    |         |    |              |    |              |  |
| MAX. DEPTH =            |            | m             |     |            |   |                                   |    |               |   |               |    |            |    |           |    |             |    |         |    |              |    |              |  |
| CLEANED AIR BLEED VALVE |            | 160 W/B       |     |            |   |                                   |    |               |   |               |    |            |    |           |    |             |    |         |    |              |    |              |  |
| SAMPLE BOTTLE NUMBER    |            | 152 max 2     |     |            |   |                                   |    |               |   |               |    |            |    |           |    |             |    |         |    |              |    |              |  |
| POS.                    | TRIP DEPTH | PRESSURE      |     | PRI. TEMP. |   | SEC. TEMP.                        |    | PRI. SALINITY |   | SEC. SALINITY |    | SALINITY   |    | SAL.      |    | NUTR.       |    | CHL.    |    | WHIT'S NUTR. |    |              |  |
| 1                       | 156        | 156           |     |            |   |                                   |    |               |   |               |    |            |    | 17        |    | 740         |    |         |    |              |    |              |  |
| 2                       | 175        |               |     |            |   |                                   |    |               |   |               |    |            |    |           |    | 741         |    |         |    |              |    |              |  |
| 3                       | 106        |               |     |            |   |                                   |    |               |   |               |    |            |    |           |    | 742         |    |         |    |              |    |              |  |
| 4                       | 85         |               |     |            |   |                                   |    |               |   |               |    |            |    |           |    | 743         |    |         |    |              |    |              |  |
| 5                       | 60         |               |     |            |   |                                   |    |               |   |               |    |            |    |           |    | 744         |    |         |    |              |    |              |  |
| 6                       | 50         |               |     |            |   |                                   |    |               |   |               |    |            |    |           |    | 745         |    |         |    |              |    |              |  |
| 7                       | 40         |               |     |            |   |                                   |    |               |   |               |    |            |    |           |    | 746         |    |         |    |              |    |              |  |
| 8                       | 30         |               |     |            |   |                                   |    |               |   |               |    |            |    |           |    | 747         |    |         |    |              |    |              |  |
| 9                       | 20         |               |     |            |   |                                   |    |               |   |               |    |            |    |           |    | 748         |    |         |    |              |    |              |  |
| 10                      | 10         |               |     |            |   |                                   |    |               |   |               |    |            |    |           |    | 749         |    |         |    |              |    |              |  |
| 11                      | 0          |               |     |            |   |                                   |    |               |   |               |    |            |    |           |    | 750         |    |         |    |              |    |              |  |
| 12                      |            |               |     |            |   |                                   |    |               |   |               |    |            |    |           |    |             |    |         |    |              |    |              |  |

Fluor max  $\approx 0.5$  / Rosette didn't fire on 1 bottle of 11  
 we took samples assuming surface bottle misfired - see other side

| VESSEL                 |               | PROJECT & LEG                |           |            |          | STATION DESIGNATION               |               |               |             |               |           |                      |               |              |             |           |                 |                 |        |                 |  |  |  |                         |  |  |  |  |  |
|------------------------|---------------|------------------------------|-----------|------------|----------|-----------------------------------|---------------|---------------|-------------|---------------|-----------|----------------------|---------------|--------------|-------------|-----------|-----------------|-----------------|--------|-----------------|--|--|--|-------------------------|--|--|--|--|--|
| NOAA RV MILLER FREEMAN |               | MF02-11                      |           |            |          |                                   |               |               |             |               |           |                      |               |              |             |           |                 |                 |        |                 |  |  |  |                         |  |  |  |  |  |
| CONSC<br>CAST #        | LATITUDE      |                              | LONGITUDE |            | DATE JD= |                                   | TIME<br>(GMT) |               | DRY<br>BULB | WET<br>BULB   | SEA STATE | VISIBILITY           | WIND<br>DIRN. | WIND<br>SPD. | CLOUD (amt) | WEATHER   | BOTTOM<br>DEPTH | STA.<br>NAME/ID |        |                 |  |  |  |                         |  |  |  |  |  |
|                        | DEG           | MIN                          | DEG       | MIN        | DAY      | MO                                | YR            | HR            | MIN         | (°C)          | (°C)      | (mb)                 | *             | (deg)        | (m/s)       | *         | (m)             |                 |        |                 |  |  |  |                         |  |  |  |  |  |
| 0545752.75N            | 15027.96W     | 05                           | OCT       | 02         | 19       | 29                                | 10            | 4             |             |               | 4         | 4                    | 2             | 1            | 7           | 8         | 7               | 2               | PA 112 |                 |  |  |  |                         |  |  |  |  |  |
| CTD                    |               | TIMES                        |           | JD/TIME    |          | DATA LOCATION                     |               |               |             |               |           |                      |               |              |             |           |                 |                 |        |                 |  |  |  |                         |  |  |  |  |  |
| TYPE & SN              |               | 9+ SN 91220                  |           | DATA ON    |          | Tape/Diskette ID File Name/Header |               |               |             |               |           |                      |               |              |             |           |                 |                 |        |                 |  |  |  |                         |  |  |  |  |  |
| PRESS SN               |               | 80020                        |           | START DOWN |          |                                   |               |               |             |               |           |                      |               |              |             |           |                 |                 |        |                 |  |  |  |                         |  |  |  |  |  |
| TEMP SN                |               | 710/884                      |           | AT DEPTH   |          |                                   |               |               |             |               |           |                      |               |              |             |           |                 |                 |        |                 |  |  |  |                         |  |  |  |  |  |
| COND SN                |               | 915/530                      |           | AT SURFACE |          | MAX. DEPTH = m                    |               |               |             |               |           |                      |               |              |             |           |                 |                 |        |                 |  |  |  |                         |  |  |  |  |  |
| POS.                   | TRIP<br>DEPTH | CTD CONVERTED MONITOR VALUES |           |            |          |                                   |               |               |             |               |           |                      |               |              |             |           |                 |                 |        |                 |  |  |  |                         |  |  |  |  |  |
|                        |               | PAR 4242                     |           |            |          |                                   |               |               |             |               |           | FLUOR 153            |               |              |             | CHIAM 109 |                 |                 |        | TRANSMISSOMETER |  |  |  | Cleaned air bleed valve |  |  |  |  |  |
|                        |               | SAMPLE BOTTLE DATA           |           |            |          |                                   |               |               |             |               |           | SAMPLE BOTTLE NUMBER |               |              |             |           |                 |                 |        |                 |  |  |  |                         |  |  |  |  |  |
|                        |               | PRESSURE                     |           | PRI. TEMP. |          | SEC. TEMP.                        |               | PRI. SALINITY |             | SEC. SALINITY |           | SALINITY             |               | SAL.         |             | NUTR.     |                 | CHL.            |        | WHIT'S<br>NUTR. |  |  |  |                         |  |  |  |  |  |
| 1                      | 107           |                              |           |            |          |                                   |               |               |             |               |           |                      |               | ✓            |             | 750       |                 |                 |        |                 |  |  |  |                         |  |  |  |  |  |
| 2                      | 100           |                              |           |            |          |                                   |               |               |             |               |           |                      |               |              |             | 751       |                 |                 |        |                 |  |  |  |                         |  |  |  |  |  |
| 3                      | 75            |                              |           |            |          |                                   |               |               |             |               |           |                      |               |              |             | 752       |                 |                 |        |                 |  |  |  |                         |  |  |  |  |  |
| 4                      | 60            |                              |           |            |          |                                   |               |               |             |               |           |                      |               |              |             | 753       |                 | ✓               |        |                 |  |  |  |                         |  |  |  |  |  |
| 5                      | 50            |                              |           |            |          |                                   |               |               |             |               |           |                      |               |              |             | 754       |                 | ✓               |        |                 |  |  |  |                         |  |  |  |  |  |
| 6                      | 40            |                              |           |            |          |                                   |               |               |             |               |           |                      |               |              |             | 755       |                 | ✓               |        |                 |  |  |  |                         |  |  |  |  |  |
| 7                      | 30            |                              |           |            |          |                                   |               |               |             |               |           |                      |               |              |             | 756       |                 | ✓               |        |                 |  |  |  |                         |  |  |  |  |  |
| 8                      | 20            |                              |           |            |          |                                   |               |               |             |               |           |                      |               |              |             | 757       |                 | ✓               |        |                 |  |  |  |                         |  |  |  |  |  |
| 9                      | 10            |                              |           |            |          |                                   |               |               |             |               |           |                      |               |              |             | 758       |                 | ✓               |        |                 |  |  |  |                         |  |  |  |  |  |
| 10                     | 0             |                              |           |            |          |                                   |               |               |             |               |           |                      |               |              |             | 759       |                 | ✓               |        |                 |  |  |  |                         |  |  |  |  |  |
| 11                     |               |                              |           |            |          |                                   |               |               |             |               |           |                      |               |              |             |           |                 |                 |        |                 |  |  |  |                         |  |  |  |  |  |
| 12                     |               |                              |           |            |          |                                   |               |               |             |               |           |                      |               |              |             |           |                 |                 |        |                 |  |  |  |                         |  |  |  |  |  |

Fl Volt max  $\approx 0.55$



| VESSEL                 |               | PROJECT & LEG                |            |              |               | STATION DESIGNATION |               |                       |                      |                         |           |                 |               |              |             |         |                 |                 |      |
|------------------------|---------------|------------------------------|------------|--------------|---------------|---------------------|---------------|-----------------------|----------------------|-------------------------|-----------|-----------------|---------------|--------------|-------------|---------|-----------------|-----------------|------|
| NOAA RV MILLER FREEMAN |               | MF02-11                      |            |              |               |                     |               |                       |                      |                         |           |                 |               |              |             |         |                 |                 |      |
| CONSC<br>CAST #        | LATITUDE      |                              | LONGITUDE  |              | DATE JD=      |                     | TIME<br>(GMT) |                       | DRY<br>BULB          | WET<br>BULB             | SEA STATE | VISIBILITY      | WIND<br>DIRN. | WIND<br>SPD. | CLOUD (amt) | WEATHER | BOTTOM<br>DEPTH | STA.<br>NAME/ID |      |
| DEG                    | MIN           | DEG                          | MIN        | DAY          | MO            | YR                  | HR            | MIN                   | (°C)                 | (°C)                    | (mb)      | *               | (deg)         | (m/s)        | *           | *       | (m)             |                 |      |
| 052                    | 58            | 01                           | 45         | N            | 15            | 02                  | 5             | 78                    | W                    | 05                      | 01        | 02              | 21            | 18           | 11          | 18      | 72              | 178             | PB10 |
| CTD                    |               | TIMES                        |            | JD/TIME      |               | DATA LOCATION       |               |                       |                      |                         |           |                 |               |              |             |         |                 |                 |      |
|                        |               | DATA ON                      |            | 21:18:00 GMT |               | File Name/Header    |               |                       |                      |                         |           |                 |               |              |             |         |                 |                 |      |
| TYPE & SN              |               | 9+ S/N 91220                 |            |              |               |                     |               |                       |                      |                         |           |                 |               |              |             |         |                 |                 |      |
| PRESS SN               |               | 80020                        |            | 21:18:00 GMT |               |                     |               |                       |                      |                         |           |                 |               |              |             |         |                 |                 |      |
| TEMP SN                |               | 710/884                      |            | 21:24:00 GMT |               |                     |               |                       |                      |                         |           |                 |               |              |             |         |                 |                 |      |
| COND SN                |               | 915/530                      |            | 21:35:00 GMT |               |                     |               |                       |                      |                         |           |                 |               |              |             |         |                 |                 |      |
|                        |               | PAR 4242                     |            | FLUOR 153    |               | CHIAM 109           |               | TRANSMISSOMETER       |                      | Cleaned air bleed valve |           |                 |               |              |             |         |                 |                 |      |
| POS.                   | TRIP<br>DEPTH | CTD CONVERTED MONITOR VALUES |            |              |               |                     |               |                       |                      |                         |           |                 |               |              |             |         |                 |                 |      |
|                        |               | PRESSURE                     | PRI. TEMP. | SEC. TEMP.   | PRI. SALINITY | SEC. SALINITY       | SALINITY      | SAMPLE BOTTLE<br>DATA | SAMPLE BOTTLE NUMBER |                         |           |                 |               |              |             |         |                 |                 |      |
|                        |               |                              |            |              |               |                     |               |                       | SAL.                 | NUTR.                   | CHL.      | WHIT'S<br>NUTR. |               |              |             |         |                 |                 |      |
| 1                      | 166           |                              |            |              |               |                     |               |                       | ✓                    | 771                     |           |                 |               |              |             |         |                 |                 |      |
| 2                      | 150           |                              |            |              |               |                     |               |                       |                      | 772                     |           |                 |               |              |             |         |                 |                 |      |
| 3                      | 126           |                              |            |              |               |                     |               |                       |                      | 773                     |           |                 |               |              |             |         |                 |                 |      |
| 4                      | 100           |                              |            |              |               |                     |               |                       |                      | 774                     |           |                 |               |              |             |         |                 |                 |      |
| 5                      | 74            |                              |            |              |               |                     |               |                       |                      | 775                     |           |                 |               |              |             |         |                 |                 |      |
| 6                      | 50            |                              |            |              |               |                     |               |                       |                      | 776                     | ✓         |                 |               |              |             |         |                 |                 |      |
| 7                      | 40            |                              |            |              |               |                     |               |                       |                      | 777                     | ✓         |                 |               |              |             |         |                 |                 |      |
| 8                      | 31            |                              |            |              |               |                     |               |                       |                      | 778                     | ✓         |                 |               |              |             |         |                 |                 |      |
| 9                      | 21            |                              |            |              |               |                     |               |                       |                      | 779                     | ✓         |                 |               |              |             |         |                 |                 |      |
| 10                     | 10            |                              |            |              |               |                     |               |                       |                      | 780                     | ✓         |                 |               |              |             |         |                 |                 |      |
| 11                     | 4             |                              |            |              |               |                     |               |                       |                      | (901)                   | ✓         |                 |               |              |             |         |                 |                 |      |
| 12                     |               |                              |            |              |               |                     |               |                       |                      |                         |           |                 |               |              |             |         |                 |                 |      |

WRONG label  
sheet based

MAX FLO = 0.6V

| VESSEL                 |  |            |  | PROJECT & LEG |  |           |  | STATION DESIGNATION |  |                 |  |                         |  |                    |  |                      |  |         |  |              |  |              |  |              |  |
|------------------------|--|------------|--|---------------|--|-----------|--|---------------------|--|-----------------|--|-------------------------|--|--------------------|--|----------------------|--|---------|--|--------------|--|--------------|--|--------------|--|
| NOAA RV MILLER FREEMAN |  |            |  | MF02-11       |  |           |  | PBA-9               |  |                 |  |                         |  |                    |  |                      |  |         |  |              |  |              |  |              |  |
| CONSC CAST #           |  | LATITUDE   |  | LONGITUDE     |  | DATE JD=  |  | TIME (GMT)          |  | WET BULB        |  | WIND DIRN.              |  | WIND SPD.          |  | CLOUD (amt)          |  | WEATHER |  | BOTTOM DEPTH |  | STA. NAME/ID |  |              |  |
| DEG MIN                |  | DEG MIN    |  | DEG MIN       |  | DAY MO YR |  | HR MIN              |  | (°C)            |  | (deg)                   |  | (m/s)              |  | *                    |  | *       |  | (m)          |  |              |  |              |  |
| 0535807.01N            |  | 15023.46W  |  | 15023.46W     |  | 05 OCT 02 |  | 2220                |  | 9.6             |  | 200                     |  | 10872              |  | 194                  |  | PBA-9   |  |              |  |              |  |              |  |
| CTD                    |  |            |  | TIMES         |  |           |  | JD/TIME             |  |                 |  | DATA LOCATION           |  |                    |  | REMARKS              |  |         |  |              |  |              |  |              |  |
| TYPE & SN              |  |            |  | DATA ON       |  |           |  | 22:22:00 GMT        |  |                 |  | Tape/Diskette ID        |  |                    |  | File Name/Header     |  |         |  |              |  |              |  |              |  |
| PRESS SN               |  |            |  | 80020         |  |           |  | 22:22:00 GMT        |  |                 |  |                         |  |                    |  |                      |  |         |  |              |  |              |  |              |  |
| TEMP SN                |  |            |  | 710/884       |  |           |  | 22:29:00 GMT        |  |                 |  |                         |  |                    |  |                      |  |         |  |              |  |              |  |              |  |
| COND SN                |  |            |  | 915/530       |  |           |  | 22:40:00 GMT        |  |                 |  |                         |  |                    |  |                      |  |         |  |              |  |              |  |              |  |
| MAX. DEPTH = 188 m     |  |            |  |               |  |           |  |                     |  |                 |  |                         |  |                    |  |                      |  |         |  |              |  |              |  |              |  |
| POS.                   |  | TRIP DEPTH |  | PAR 4242      |  | FLUOR 153 |  | CHIAM 109           |  | TRANSMISSOMETER |  | Cleaned air bleed valve |  | SAMPLE BOTTLE DATA |  | SAMPLE BOTTLE NUMBER |  | SAL.    |  | NUTR.        |  | CHL.         |  | WHIT'S NUTR. |  |
| 1                      |  | 188        |  |               |  |           |  |                     |  |                 |  |                         |  |                    |  |                      |  |         |  |              |  |              |  |              |  |
| 2                      |  | 124        |  |               |  |           |  |                     |  |                 |  |                         |  |                    |  |                      |  |         |  |              |  |              |  |              |  |
| 3                      |  | 151        |  |               |  |           |  |                     |  |                 |  |                         |  |                    |  |                      |  |         |  |              |  |              |  |              |  |
| 4                      |  | 127        |  |               |  |           |  |                     |  |                 |  |                         |  |                    |  |                      |  |         |  |              |  |              |  |              |  |
| 5                      |  | 101        |  |               |  |           |  |                     |  |                 |  |                         |  |                    |  |                      |  |         |  |              |  |              |  |              |  |
| 6                      |  | 75         |  |               |  |           |  |                     |  |                 |  |                         |  |                    |  |                      |  |         |  |              |  |              |  |              |  |
| 7                      |  | 49         |  |               |  |           |  |                     |  |                 |  |                         |  |                    |  |                      |  |         |  |              |  |              |  |              |  |
| 8                      |  | 30         |  |               |  |           |  |                     |  |                 |  |                         |  |                    |  |                      |  |         |  |              |  |              |  |              |  |
| 9                      |  | 20         |  |               |  |           |  |                     |  |                 |  |                         |  |                    |  |                      |  |         |  |              |  |              |  |              |  |
| 10                     |  | 10         |  |               |  |           |  |                     |  |                 |  |                         |  |                    |  |                      |  |         |  |              |  |              |  |              |  |
| 11                     |  |            |  |               |  |           |  |                     |  |                 |  |                         |  |                    |  |                      |  |         |  |              |  |              |  |              |  |
| 12                     |  |            |  |               |  |           |  |                     |  |                 |  |                         |  |                    |  |                      |  |         |  |              |  |              |  |              |  |

MAX FLO = 0.5 volts



| VESSEL                  |          | PROJECT & LEG |           |              |          | STATION DESIGNATION |               |                     |                     |                  |           |                         |                        |                              |                |         |                        |                 |    |
|-------------------------|----------|---------------|-----------|--------------|----------|---------------------|---------------|---------------------|---------------------|------------------|-----------|-------------------------|------------------------|------------------------------|----------------|---------|------------------------|-----------------|----|
| NOAA R/V MILLER FREEMAN |          | MF02-11       |           |              |          | PBA08               |               |                     |                     |                  |           |                         |                        |                              |                |         |                        |                 |    |
| CONSC<br>CAST #         | LATITUDE |               | LONGITUDE |              | DATE JD= |                     | TIME<br>(GMT) | DRY<br>BULB<br>(°C) | WET<br>BULB<br>(°C) | PRESSURE<br>(mb) | SEA STATE | VISIBILITY              | WIND<br>DIRN.<br>(deg) | WIND<br>SPD.<br>(m/s)        | CLOUD<br>(amt) | WEATHER | BOTTOM<br>DEPTH<br>(m) | STA.<br>NAME/ID |    |
|                         | DEG      | MIN           | DEG       | MIN          | DAY      | MO                  |               |                     |                     |                  |           |                         |                        |                              |                |         |                        |                 | YR |
| 05458                   | 09.22    | N             | 15021.8   | W            | 05       | 05                  | 012           | 23                  | 03                  | 9.7              | 05        | 43                      | 21                     | 50                           | 98             | 72      | 158                    | PBA08           |    |
| CTD                     |          | TIMES         |           | JD/TIME      |          | DATA LOCATION       |               |                     |                     |                  |           |                         |                        |                              |                |         |                        |                 |    |
| TYPE & SN               |          | 9+ SN 91220   |           | DATA ON      |          | File Name/Header    |               |                     |                     |                  |           |                         |                        |                              |                |         |                        |                 |    |
| PRESS SN                |          | 80020         |           | START DOWN   |          |                     |               |                     |                     |                  |           |                         |                        |                              |                |         |                        |                 |    |
| TEMP SN                 |          | 710/884       |           | AT DEPTH     |          |                     |               |                     |                     |                  |           |                         |                        |                              |                |         |                        |                 |    |
| COND SN                 |          | 915/530       |           | AT SURFACE   |          |                     |               |                     |                     |                  |           |                         |                        |                              |                |         |                        |                 |    |
|                         |          |               |           | 23:17:00 GMT |          | MAX. DEPTH = 150 m  |               |                     |                     |                  |           |                         |                        |                              |                |         |                        |                 |    |
| POS.                    |          | TRIP<br>DEPTH |           | PAR 4242     |          | FLUOR 153           |               | CHIAM 109           |                     | TRANSMISSOMETER  |           | Cleared air bleed valve |                        | SAMPLE BOTTLE DATA           |                |         |                        |                 |    |
|                         |          |               |           |              |          |                     |               |                     |                     |                  |           |                         |                        | SAMPLE BOTTLE NUMBER         |                |         |                        |                 |    |
|                         |          |               |           |              |          |                     |               |                     |                     |                  |           |                         |                        | SAL. NUTR. CHL. WHIT'S NUTR. |                |         |                        |                 |    |
| 1                       | 150      |               |           |              |          |                     |               |                     |                     |                  |           |                         |                        | 913 ✓                        |                |         |                        |                 |    |
| 2                       | 125      |               |           |              |          |                     |               |                     |                     |                  |           |                         |                        | 914 ✓                        |                |         |                        |                 |    |
| 3                       | 100      |               |           |              |          |                     |               |                     |                     |                  |           |                         |                        | 915 ✓                        |                |         |                        |                 |    |
| 4                       | 75       |               |           |              |          |                     |               |                     |                     |                  |           |                         |                        | 916 ✓                        |                |         |                        |                 |    |
| 5                       | 60       |               |           |              |          |                     |               |                     |                     |                  |           |                         |                        | 917 ✓                        |                |         |                        |                 |    |
| 6                       | 51       |               |           |              |          |                     |               |                     |                     |                  |           |                         |                        | 918 ✓                        |                |         |                        |                 |    |
| 7                       | 39       |               |           |              |          |                     |               |                     |                     |                  |           |                         |                        | 919 ✓                        |                |         |                        |                 |    |
| 8                       | 30       |               |           |              |          |                     |               |                     |                     |                  |           |                         |                        | 920 ✓                        |                |         |                        |                 |    |
| 9                       | 19       |               |           |              |          |                     |               |                     |                     |                  |           |                         |                        | 921 ✓                        |                |         |                        |                 |    |
| 10                      | 9        |               |           |              |          |                     |               |                     |                     |                  |           |                         |                        | 922 ✓                        |                |         |                        |                 |    |
| 11                      | 1.5      |               |           |              |          |                     |               |                     |                     |                  |           |                         |                        | 923 ✓                        |                |         |                        |                 |    |
| 12                      |          |               |           |              |          |                     |               |                     |                     |                  |           |                         |                        |                              |                |         |                        |                 |    |

MAX FLO = 0.5 volts

125  
100  
75  
60  
50  
40  
30  
20  
10  
0

| VESSEL                 |  | PROJECT & LEG |  |                              |  | STATION DESIGNATION |  |                  |  |                  |  |                 |  |                         |  |                    |  |                      |  |         |  |              |  |              |  |              |  |
|------------------------|--|---------------|--|------------------------------|--|---------------------|--|------------------|--|------------------|--|-----------------|--|-------------------------|--|--------------------|--|----------------------|--|---------|--|--------------|--|--------------|--|--------------|--|
| NOAA RV MILLER FREEMAN |  | MF02-11       |  |                              |  |                     |  |                  |  |                  |  |                 |  |                         |  |                    |  |                      |  |         |  |              |  |              |  |              |  |
| CONSC. CAST #          |  | LATITUDE      |  | LONGITUDE                    |  | DATE JD=            |  | TIME (GMT)       |  | WET BULB         |  | SEA STATE       |  | WIND DIRN.              |  | WIND SPD.          |  | CLOUD (amt)          |  | WEATHER |  | BOTTOM DEPTH |  | STA. NAME/ID |  |              |  |
|                        |  | DEG MIN       |  | DEG MIN                      |  | DAY MO YR           |  | HR MIN           |  | °C               |  | (mb)            |  | * * *                   |  | (m/s)              |  | * * *                |  | * * *   |  | (m)          |  |              |  |              |  |
| 0555812.98N            |  | 15020         |  | .12W                         |  | 05 OCT 02           |  | 2349             |  | 9.7              |  | 0443            |  | 193                     |  | 11                 |  | 872                  |  | 85      |  | PBA07        |  |              |  |              |  |
| CTD                    |  | TIMES         |  | JD/TIME                      |  | DATA LOCATION       |  | Tape/Diskette ID |  | File Name/Header |  | REMARKS         |  |                         |  |                    |  |                      |  |         |  |              |  |              |  |              |  |
| TYPE & SN              |  | 9+ S/N 91220  |  | DATA ON                      |  | 23:51:00 GMT        |  |                  |  |                  |  |                 |  |                         |  |                    |  |                      |  |         |  |              |  |              |  |              |  |
| PRESS SN               |  | 80020         |  | START DOWN                   |  | 23:51:00 GMT        |  |                  |  |                  |  |                 |  |                         |  |                    |  |                      |  |         |  |              |  |              |  |              |  |
| TEMP SN                |  | 710/884       |  | AT DEPTH                     |  | 23:54:10 GMT        |  |                  |  |                  |  |                 |  |                         |  |                    |  |                      |  |         |  |              |  |              |  |              |  |
| COND SN                |  | 915/530       |  | AT SURFACE                   |  | 23:59:00 GMT        |  |                  |  |                  |  |                 |  |                         |  |                    |  |                      |  |         |  |              |  |              |  |              |  |
| MAX. DEPTH =           |  | 82            |  |                              |  |                     |  |                  |  |                  |  |                 |  |                         |  |                    |  |                      |  |         |  |              |  |              |  |              |  |
| POS.                   |  | TRIP DEPTH    |  | CTD CONVERTED MONITOR VALUES |  | PAR 4242            |  | FLUOR 153        |  | CHIAM 109        |  | TRANSMISSOMETER |  | Cleaned air bleed valve |  | SAMPLE BOTTLE DATA |  | SAMPLE BOTTLE NUMBER |  | SAL.    |  | NUTR.        |  | CHL.         |  | WHIT's NUTR. |  |
| 1                      |  | 82            |  |                              |  |                     |  |                  |  |                  |  |                 |  |                         |  |                    |  |                      |  | ✓       |  | 924          |  |              |  |              |  |
| 2                      |  | 74            |  |                              |  |                     |  |                  |  |                  |  |                 |  |                         |  |                    |  |                      |  |         |  | 925          |  |              |  |              |  |
| 3                      |  | 61            |  |                              |  |                     |  |                  |  |                  |  |                 |  |                         |  |                    |  |                      |  |         |  | 926          |  | ✓            |  |              |  |
| 4                      |  | 52            |  |                              |  |                     |  |                  |  |                  |  |                 |  |                         |  |                    |  |                      |  |         |  | 927          |  | ✓            |  |              |  |
| 5                      |  | 40            |  |                              |  |                     |  |                  |  |                  |  |                 |  |                         |  |                    |  |                      |  |         |  | 928          |  | ✓            |  |              |  |
| 6                      |  | 29            |  |                              |  |                     |  |                  |  |                  |  |                 |  |                         |  |                    |  |                      |  |         |  | 929          |  | ✓            |  |              |  |
| 7                      |  | 20            |  |                              |  |                     |  |                  |  |                  |  |                 |  |                         |  |                    |  |                      |  |         |  | 930          |  | ✓            |  |              |  |
| 8                      |  | 10            |  |                              |  |                     |  |                  |  |                  |  |                 |  |                         |  |                    |  |                      |  |         |  | 931          |  | ✓            |  |              |  |
| 9                      |  | 3             |  |                              |  |                     |  |                  |  |                  |  |                 |  |                         |  |                    |  |                      |  |         |  | 932          |  | ✓            |  |              |  |
| 10                     |  |               |  |                              |  |                     |  |                  |  |                  |  |                 |  |                         |  |                    |  |                      |  |         |  |              |  |              |  |              |  |
| 11                     |  |               |  |                              |  |                     |  |                  |  |                  |  |                 |  |                         |  |                    |  |                      |  |         |  |              |  |              |  |              |  |
| 12                     |  |               |  |                              |  |                     |  |                  |  |                  |  |                 |  |                         |  |                    |  |                      |  |         |  |              |  |              |  |              |  |

MAX FLO = 0.5 volts

| VESSEL                 |               | PROJECT & LEG |           |            |          | STATION DESIGNATION |               |                 |             |                       |          |                      |            |               |              |             |         |                 |                 |                 |  |
|------------------------|---------------|---------------|-----------|------------|----------|---------------------|---------------|-----------------|-------------|-----------------------|----------|----------------------|------------|---------------|--------------|-------------|---------|-----------------|-----------------|-----------------|--|
| NOAA RV MILLER FREEMAN |               | MF02-11       |           |            |          |                     |               |                 |             |                       |          |                      |            |               |              |             |         |                 |                 |                 |  |
| CONSC<br>CAST #        | LATITUDE      |               | LONGITUDE |            | DATE JD= |                     | TIME<br>(GMT) |                 | DRY<br>BULB | WET<br>BULB           | PRESSURE | SEA STATE            | VISIBILITY | WIND<br>DIRN. | WIND<br>SPD. | CLOUD (amt) | WEATHER | BOTTOM<br>DEPTH | STA.<br>NAME/ID |                 |  |
|                        | DEG           | MIN           | DEG       | MIN        | DAY      | MO                  | YR            | HR              | MIN         | (°C)                  | (°C)     | (mb)                 | *          | *             | (deg)        | (m/s)       | *       | (m)             |                 |                 |  |
| 0565817.43N            | 150           | 17.94W        | 06        | 10         | 01       | 20                  | 12            | 00              | 45          | 10.0                  | 11.0     | 0455                 | 189        | 08            | 72           | 55          | 90      | 06              |                 |                 |  |
| CTD                    |               | TIMES         |           | JD/TIME    |          | DATA LOCATION       |               |                 |             |                       |          |                      |            |               |              |             |         |                 |                 |                 |  |
|                        |               |               |           |            |          | File Name/Header    |               |                 |             |                       |          |                      |            |               |              |             |         |                 |                 |                 |  |
| TYPE & SN              |               | 9+ S/N 91220  |           | DATA ON    |          | Tape/Diskette ID    |               |                 |             |                       |          |                      |            |               |              |             |         |                 |                 |                 |  |
| PRESS SN               |               | 80020         |           | START DOWN |          |                     |               |                 |             |                       |          |                      |            |               |              |             |         |                 |                 |                 |  |
| TEMP SN                |               | 710/884       |           | AT DEPTH   |          |                     |               |                 |             |                       |          |                      |            |               |              |             |         |                 |                 |                 |  |
| COND SN                |               | 915/530       |           | AT SURFACE |          | MAX. DEPTH = 52 m   |               |                 |             |                       |          |                      |            |               |              |             |         |                 |                 |                 |  |
| POS.                   | TRIP<br>DEPTH | PAR 4242      |           | FLUOR 153  |          | CHAM 109            |               | TRANSMISSOMETER |             | SAMPLE BOTTLE<br>DATA |          | SAMPLE BOTTLE NUMBER |            | SAL.          |              | NUTR.       |         | CHL.            |                 | WHIT'S<br>NUTR. |  |
| 1                      | 52            |               |           |            |          |                     |               |                 |             |                       |          |                      |            | 935           |              |             |         |                 |                 |                 |  |
| 2                      | 40            |               |           |            |          |                     |               |                 |             |                       |          |                      |            |               |              | 936         |         |                 |                 |                 |  |
| 3                      | 20            |               |           |            |          |                     |               |                 |             |                       |          |                      |            |               |              | 937         |         |                 |                 |                 |  |
| 4                      | 20            |               |           |            |          |                     |               |                 |             |                       |          |                      |            |               |              | 938         |         |                 |                 |                 |  |
| 5                      | 10            |               |           |            |          |                     |               |                 |             |                       |          |                      |            |               |              | 939         |         |                 |                 |                 |  |
| 6                      | 0             |               |           |            |          |                     |               |                 |             |                       |          |                      |            |               |              | 940         |         |                 |                 |                 |  |
| 7                      |               |               |           |            |          |                     |               |                 |             |                       |          |                      |            |               |              |             |         |                 |                 |                 |  |
| 8                      |               |               |           |            |          |                     |               |                 |             |                       |          |                      |            |               |              |             |         |                 |                 |                 |  |
| 9                      |               |               |           |            |          |                     |               |                 |             |                       |          |                      |            |               |              |             |         |                 |                 |                 |  |
| 10                     |               |               |           |            |          |                     |               |                 |             |                       |          |                      |            |               |              |             |         |                 |                 |                 |  |
| 11                     |               |               |           |            |          |                     |               |                 |             |                       |          |                      |            |               |              |             |         |                 |                 |                 |  |
| 12                     |               |               |           |            |          |                     |               |                 |             |                       |          |                      |            |               |              |             |         |                 |                 |                 |  |

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| VESSEL                 |               | PROJECT & LEG                |            |              |               | STATION DESIGNATION |               |                 |                     |                         |                 |                        |                       |                |         |                        |                 |
|------------------------|---------------|------------------------------|------------|--------------|---------------|---------------------|---------------|-----------------|---------------------|-------------------------|-----------------|------------------------|-----------------------|----------------|---------|------------------------|-----------------|
| NOAA RV MILLER FREEMAN |               | MF02-11                      |            |              |               |                     |               |                 |                     |                         |                 |                        |                       |                |         |                        |                 |
| CONSC<br>CAST #        | LATITUDE      |                              | LONGITUDE  |              | DATE JD=      |                     | TIME<br>(GMT) |                 | WET<br>BULB<br>(°C) | SEA STATE               | VISIBILITY      | WIND<br>DIRN.<br>(deg) | WIND<br>SPD.<br>(m/s) | CLOUD<br>(amt) | WEATHER | BOTTOM<br>DEPTH<br>(m) | STA.<br>NAME/ID |
|                        | DEG           | MIN                          | DEG        | MIN          | DAY           | MO                  | YR            | HR              |                     |                         |                 |                        |                       |                |         |                        |                 |
| 058                    | 23.7          | 15                           | 14.0       | 07           | 10            | 06                  | 01            | 02              | 18                  | 10.4                    | 0355            | 165                    | 098                   | 72             | *       | 65                     | 0161A04         |
| CTD                    |               | TIMES                        |            | JD/TIME      |               | DATA LOCATION       |               |                 |                     |                         |                 |                        |                       |                |         |                        |                 |
| TYPE & SN              |               | DATA ON                      |            | 02:21:00 GMT |               | File Name/Header    |               |                 |                     |                         |                 |                        |                       |                |         |                        |                 |
| PRESS SN               |               | START DOWN                   |            | 02:22:00 GMT |               |                     |               |                 |                     |                         |                 |                        |                       |                |         |                        |                 |
| TEMP SN                |               | AT DEPTH                     |            | 02:24:00 GMT |               |                     |               |                 |                     |                         |                 |                        |                       |                |         |                        |                 |
| COND SN                |               | AT SURFACE                   |            | 02:29:00 GMT |               |                     |               |                 |                     |                         |                 |                        |                       |                |         |                        |                 |
|                        |               | PAR 4242                     |            | FLUOR 153    |               | CHAM 109            |               | TRANSMISSOMETER |                     | Cleaned air bleed valve |                 |                        |                       |                |         |                        |                 |
| POS.                   | TRIP<br>DEPTH | CTD CONVERTED MONITOR VALUES |            |              |               |                     |               |                 |                     |                         |                 |                        |                       |                |         |                        |                 |
|                        |               | PRESSURE                     | PRI. TEMP. | SEC. TEMP.   | PRI. SALINITY | SEC. SALINITY       | SALINITY      | SAL.            | NUTR.               | CHL.                    | WHIT'S<br>NUTR. | SAMPLE BOTTLE<br>DATA  |                       |                |         |                        |                 |
| 1                      | 61            |                              |            |              |               |                     |               | ✓               | 947                 |                         |                 |                        |                       |                |         |                        |                 |
| 2                      | 50            |                              |            |              |               |                     |               |                 | 948                 |                         |                 |                        |                       |                |         |                        |                 |
| 3                      | 41            |                              |            |              |               |                     |               |                 | 949                 |                         |                 |                        |                       |                |         |                        |                 |
| 4                      | 30            |                              |            |              |               |                     |               |                 | 950                 |                         |                 |                        |                       |                |         |                        |                 |
| 5                      | 20            |                              |            |              |               |                     |               |                 | 951                 |                         |                 |                        |                       |                |         |                        |                 |
| 6                      | 10            |                              |            |              |               |                     |               |                 | 952                 |                         |                 |                        |                       |                |         |                        |                 |
| 7                      | 3             |                              |            |              |               |                     |               |                 | 953                 |                         |                 |                        |                       |                |         |                        |                 |
| 8                      |               |                              |            |              |               |                     |               |                 |                     |                         |                 |                        |                       |                |         |                        |                 |
| 9                      |               |                              |            |              |               |                     |               |                 |                     |                         |                 |                        |                       |                |         |                        |                 |
| 10                     |               |                              |            |              |               |                     |               |                 |                     |                         |                 |                        |                       |                |         |                        |                 |
| 11                     |               |                              |            |              |               |                     |               |                 |                     |                         |                 |                        |                       |                |         |                        |                 |
| 12                     |               |                              |            |              |               |                     |               |                 |                     |                         |                 |                        |                       |                |         |                        |                 |

60  
50  
40  
30  
20  
10  
0

0.4 = max fl

| VESSEL<br>NOAA R/V MILLER FREEMAN |               | PROJECT & LEG<br>MF02-11     |            | STATION DESIGNATION<br>P9A03 |               |               |               |                  |                     |                     |                  |                         |            |                        |                       |             |      |         |                        |                 |
|-----------------------------------|---------------|------------------------------|------------|------------------------------|---------------|---------------|---------------|------------------|---------------------|---------------------|------------------|-------------------------|------------|------------------------|-----------------------|-------------|------|---------|------------------------|-----------------|
| CONSC<br>CAST #                   | LATITUDE      |                              | LONGITUDE  |                              | DATE JD=      |               | TIME<br>(GMT) |                  | WET<br>BULB<br>(°C) | DRY<br>BULB<br>(°C) | PRESSURE<br>(mb) | SEA STATE               | VISIBILITY | WIND<br>DIRN.<br>(deg) | WIND<br>SPD.<br>(m/s) | CLOUD (amt) | TYPE | WEATHER | BOTTOM<br>DEPTH<br>(m) | STA.<br>NAME/ID |
|                                   | DEG           | MIN                          | DEG        | MIN                          | DAY           | MO            | YR            | HR               |                     |                     |                  |                         |            |                        |                       |             |      |         |                        |                 |
| 059                               | 58            | 28.58                        | N          | 150                          | 31.81         | W             | 06            | 0                | 2                   | 03                  | 17               | 10                      | 5          | 16                     | 8                     | 7           | 2    | 8       | 4                      | P19A03          |
| CTD                               |               |                              |            |                              |               |               |               |                  |                     |                     |                  |                         |            |                        |                       |             |      |         |                        |                 |
| TYPE & SN                         |               | 9+ SN 91220                  |            | DATA ON                      |               | 03:19:00 GMT  |               | Tape/Diskette ID |                     | File Name/Header    |                  |                         |            |                        |                       |             |      |         |                        |                 |
| PRESS SN                          |               | 80020                        |            | START DOWN                   |               | 03:19:00 GMT  |               |                  |                     |                     |                  |                         |            |                        |                       |             |      |         |                        |                 |
| TEMP SN                           |               | 710/884                      |            | AT DEPTH                     |               | 03:22:00 GMT  |               |                  |                     |                     |                  |                         |            |                        |                       |             |      |         |                        |                 |
| COND SN                           |               | 915/530                      |            | AT SURFACE                   |               | 03:27:00 GMT  |               |                  |                     |                     |                  |                         |            |                        |                       |             |      |         |                        |                 |
|                                   |               |                              |            | PAR 4242                     |               | FLUOR 153     |               | CHIAM 109        |                     | TRANSMISSOMETER     |                  | Cleaned air bleed valve |            |                        |                       |             |      |         |                        |                 |
| POS.                              | TRIP<br>DEPTH | CTD CONVERTED MONITOR VALUES |            |                              |               |               |               |                  |                     |                     |                  |                         |            |                        |                       |             |      |         |                        |                 |
|                                   |               | PRESSURE                     | PRI. TEMP. | SEC. TEMP.                   | PRI. SALINITY | SEC. SALINITY | SALINITY      | SAL.             | NUTR.               | CHL.                | WHIT'S<br>NUTR.  |                         |            |                        |                       |             |      |         |                        |                 |
| 1                                 | 80            |                              |            |                              |               |               |               | ✓                | 954                 |                     |                  |                         |            |                        |                       |             |      |         |                        |                 |
| 2                                 | 59            |                              |            |                              |               |               |               |                  | 955                 | ✓                   |                  |                         |            |                        |                       |             |      |         |                        |                 |
| 3                                 | 38            |                              |            |                              |               |               |               |                  | 956                 | ✓                   |                  |                         |            |                        |                       |             |      |         |                        |                 |
| 4                                 | 30            |                              |            |                              |               |               |               |                  | 957                 | ✓                   |                  |                         |            |                        |                       |             |      |         |                        |                 |
| 5                                 | 20            |                              |            |                              |               |               |               |                  | 958                 | ✓                   |                  |                         |            |                        |                       |             |      |         |                        |                 |
| 6                                 | 10            |                              |            |                              |               |               |               |                  | 959                 | ✓                   |                  |                         |            |                        |                       |             |      |         |                        |                 |
| 7                                 | 3             |                              |            |                              |               |               |               |                  | 960                 | ✓                   |                  |                         |            |                        |                       |             |      |         |                        |                 |
| 8                                 |               |                              |            |                              |               |               |               |                  |                     |                     |                  |                         |            |                        |                       |             |      |         |                        |                 |
| 9                                 |               |                              |            |                              |               |               |               |                  |                     |                     |                  |                         |            |                        |                       |             |      |         |                        |                 |
| 10                                |               |                              |            |                              |               |               |               |                  |                     |                     |                  |                         |            |                        |                       |             |      |         |                        |                 |
| 11                                |               |                              |            |                              |               |               |               |                  |                     |                     |                  |                         |            |                        |                       |             |      |         |                        |                 |
| 12                                |               |                              |            |                              |               |               |               |                  |                     |                     |                  |                         |            |                        |                       |             |      |         |                        |                 |

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| VESSEL                 |               |                                   |           |                                    |          | PROJECT & LEG                      |               |  |             |  |          |                       |            | STATION DESIGNATION  |              |             |         |                 |                 |                    |  |  |  |
|------------------------|---------------|-----------------------------------|-----------|------------------------------------|----------|------------------------------------|---------------|--|-------------|--|----------|-----------------------|------------|----------------------|--------------|-------------|---------|-----------------|-----------------|--------------------|--|--|--|
| NOAA RV MILLER FREEMAN |               |                                   |           |                                    |          | MF02-11                            |               |  |             |  |          |                       |            |                      |              |             |         |                 |                 |                    |  |  |  |
| CONSC<br>CAST #        | LATITUDE      |                                   | LONGITUDE |                                    | DATE JD= |                                    | TIME<br>(GMT) |  | DRY<br>BULB | WET<br>BULB                                      | PRESSURE | SEA STATE             | VISIBILITY | WIND<br>DIRN.        | WIND<br>SPD. | CLOUD (amt) | WEATHER | BOTTOM<br>DEPTH | STA.<br>NAME/ID |                    |  |  |  |
|                        | DEG           | MIN                               | DEG       | MIN                                | DAY      | MO                                 | YR            | HR                                       | MIN         | (°C)   | (°C)     | (mb)                  | *          | *                    | (m/s)        | *           | *       | (m)             |                 |                    |  |  |  |
| 060                    | 58            | 36.03                             | N         | 150                                | 10.5     | 8                                  | W             | 06                                       | 02          | 04   | 23       | 11.0                  | .0         | 02                   | 55           | 177         | 17      | 872             | 01139           | BA02               |  |  |  |
| CTD                    |               | TIMES                             |           | JD/TIME                            |          | DATA LOCATION                      |               |  |             |  |          |                       |            |                      |              |             |         |                 |                 | REMARKS            |  |  |  |
| TYPE & SN              |               | DATA ON                           |           | 04:26:00 GMT                       |          | File Name/Header                   |               |  |             |  |          |                       |            |                      |              |             |         |                 |                 |                    |  |  |  |
| PRESS SN               |               | START DOWN                        |           | 04:26:00 GMT                       |          |                                    |               |  |             |  |          |                       |            |                      |              |             |         |                 |                 |                    |  |  |  |
| TEMP SN                |               | AT DEPTH                          |           | 04:31:00 GMT                       |          |                                    |               |  |             |  |          |                       |            |                      |              |             |         |                 |                 |                    |  |  |  |
| COND SN                |               | AT SURFACE                        |           | 04:36:00 GMT                       |          |                                    |               |  |             |  |          |                       |            |                      |              |             |         |                 |                 | MAX. DEPTH = 111 m |  |  |  |
|                        |               | <input type="checkbox"/> PAR 4242 |           | <input type="checkbox"/> FLUOR 153 |          | <input type="checkbox"/> CHIAM 109 |               | <input type="checkbox"/> TRANSMISSOMETER |             | <input type="checkbox"/> Cleaned air bleed valve |          |                       |            |                      |              |             |         |                 |                 |                    |  |  |  |
| POS.                   | TRIP<br>DEPTH | PRESSURE                          |           | PRI. TEMP.                         |          | SEC. TEMP.                         |               | PRI. SALINITY                            |             | SEC. SALINITY                                    |          | SAMPLE BOTTLE<br>DATA |            | SAMPLE BOTTLE NUMBER |              | SAL.        | NUTR.   | CHL.            | WHIT'S<br>NUTR. |                    |  |  |  |
| 1                      | 111           |                                   |           |                                    |          |                                    |               |  |             |  |          |                       |            |                      |              | ✓           | 781     |                 |                 |                    |  |  |  |
| 2                      | 76            |                                   |           |                                    |          |                                    |               |  |             |  |          |                       |            |                      |              |             | 782     |                 |                 |                    |  |  |  |
| 3                      | 59            |                                   |           |                                    |          |                                    |               |  |             |  |          |                       |            |                      |              |             | 783     |                 |                 |                    |  |  |  |
| 4                      | 50            |                                   |           |                                    |          |                                    |               |  |             |  |          |                       |            |                      |              |             | 784     | ✓               |                 |                    |  |  |  |
| 5                      | 40            |                                   |           |                                    |          |                                    |               |  |             |  |          |                       |            |                      |              |             | 785     | ✓               |                 |                    |  |  |  |
| 6                      | 30            |                                   |           |                                    |          |                                    |               |  |             |  |          |                       |            |                      |              |             | 786     | ✓               |                 |                    |  |  |  |
| 7                      | 20            |                                   |           |                                    |          |                                    |               |  |             |  |          |                       |            |                      |              |             | 787     | ✓               |                 |                    |  |  |  |
| 8                      | 10            |                                   |           |                                    |          |                                    |               |  |             |  |          |                       |            |                      |              |             | 788     | ✓               |                 |                    |  |  |  |
| 9                      | 2             |                                   |           |                                    |          |                                    |               |  |             |  |          |                       |            |                      |              |             | 789     | ✓               |                 |                    |  |  |  |
| 10                     |               |                                   |           |                                    |          |                                    |               |  |             |  |          |                       |            |                      |              |             |         |                 |                 |                    |  |  |  |
| 11                     |               |                                   |           |                                    |          |                                    |               |  |             |  |          |                       |            |                      |              |             |         |                 |                 |                    |  |  |  |
| 12                     |               |                                   |           |                                    |          |                                    |               |  |             |  |          |                       |            |                      |              |             |         |                 |                 |                    |  |  |  |

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| VESSEL                 |               | PROJECT & LEG                |            | STATION DESIGNATION |               |                  |                     |                       |                      |                         |            |                        |                       |             |         |                        |                 |
|------------------------|---------------|------------------------------|------------|---------------------|---------------|------------------|---------------------|-----------------------|----------------------|-------------------------|------------|------------------------|-----------------------|-------------|---------|------------------------|-----------------|
| NOAA RV MILLER FREEMAN |               | MF02-11                      |            | PBA01               |               |                  |                     |                       |                      |                         |            |                        |                       |             |         |                        |                 |
| CONSC<br>CAST #        | LATITUDE      |                              | LONGITUDE  |                     | DATE JD=      | TIME<br>(GMT)    | DRY<br>BULB<br>(°C) | WET<br>BULB<br>(°C)   | PRESSURE<br>(mb)     | SEA STATE               | VISIBILITY | WIND<br>DIRN.<br>(deg) | WIND<br>SPD.<br>(m/s) | CLOUD (amt) | WEATHER | BOTTOM<br>DEPTH<br>(m) | STA.<br>NAME/ID |
|                        | DEG           | MIN                          | DEG        | MIN                 |               |                  |                     |                       |                      |                         |            |                        |                       |             |         |                        |                 |
| 0615839.91N            | 15009.34W     | 06                           | 10         | 02                  | 05            | 16               | 11.0                | .                     | 0245                 | 190                     | 19         | 86                     | 4                     | 125         | PBA01   |                        |                 |
| CTD                    |               | TIMES                        |            | JD/TIME             |               | DATA LOCATION    |                     |                       |                      |                         |            |                        |                       |             |         |                        |                 |
| TYPE & SN              |               | DATA ON                      |            | 05:12:00 GMT        |               | File Name/Header |                     |                       |                      |                         |            |                        |                       |             |         |                        |                 |
| PRESS SN               |               | START DOWN                   |            | 05:12:00 GMT        |               |                  |                     |                       |                      |                         |            |                        |                       |             |         |                        |                 |
| TEMP SN                |               | AT DEPTH                     |            | 05:16:00 GMT        |               |                  |                     |                       |                      |                         |            |                        |                       |             |         |                        |                 |
| COND SN                |               | AT SURFACE                   |            | 05:24:00 GMT        |               |                  |                     |                       |                      |                         |            |                        |                       |             |         |                        |                 |
|                        |               | PAR 4242                     |            | FLUOR 153           |               | CHIAM 109        |                     | TRANSMISSOMETER       |                      | Cleaned air bleed valve |            |                        |                       |             |         |                        |                 |
| POS.                   | TRIP<br>DEPTH | CTD CONVERTED MONITOR VALUES |            |                     |               |                  |                     |                       |                      |                         |            |                        |                       |             |         |                        |                 |
|                        |               | PRESSURE                     | PRI. TEMP. | SEC. TEMP.          | PRI. SALINITY | SEC. SALINITY    | SALINITY            | SAMPLE BOTTLE<br>DATA | SAMPLE BOTTLE NUMBER |                         |            |                        |                       |             |         |                        |                 |
| 1                      | 123           |                              |            |                     |               |                  |                     |                       | SAL.                 | NUTR.                   | CHL.       | WHIT'S<br>NUTR.        |                       |             |         |                        |                 |
| 2                      | 100           |                              |            |                     |               |                  |                     |                       | 790                  |                         |            |                        |                       |             |         |                        |                 |
| 3                      | 76            |                              |            |                     |               |                  |                     |                       | 791                  |                         |            |                        |                       |             |         |                        |                 |
| 4                      | 60            |                              |            |                     |               |                  |                     |                       | 792                  |                         |            |                        |                       |             |         |                        |                 |
| 5                      | 49            |                              |            |                     |               |                  |                     |                       | 793                  |                         |            |                        |                       |             |         |                        |                 |
| 6                      | 40            |                              |            |                     |               |                  |                     |                       | 794                  |                         |            |                        |                       |             |         |                        |                 |
| 7                      | 30            |                              |            |                     |               |                  |                     |                       | 795                  |                         |            |                        |                       |             |         |                        |                 |
| 8                      | 20            |                              |            |                     |               |                  |                     |                       | 796                  |                         |            |                        |                       |             |         |                        |                 |
| 9                      | 11            |                              |            |                     |               |                  |                     |                       | 797                  |                         |            |                        |                       |             |         |                        |                 |
| 10                     | 3             |                              |            |                     |               |                  |                     |                       | 798                  |                         |            |                        |                       |             |         |                        |                 |
| 11                     |               |                              |            |                     |               |                  |                     |                       | 799                  |                         |            |                        |                       |             |         |                        |                 |
| 12                     |               |                              |            |                     |               |                  |                     |                       |                      |                         |            |                        |                       |             |         |                        |                 |

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| VESSEL                  |          | PROJECT & LEG |           |                              |          | STATION DESIGNATION |               |            |                     |                 |                        |                         |             |          |                        |                 |     |                     |                  |      |   |                 |    |     |    |
|-------------------------|----------|---------------|-----------|------------------------------|----------|---------------------|---------------|------------|---------------------|-----------------|------------------------|-------------------------|-------------|----------|------------------------|-----------------|-----|---------------------|------------------|------|---|-----------------|----|-----|----|
| NOAA R/V MILLER FREEMAN |          | MF02-11       |           |                              |          |                     |               |            |                     |                 |                        |                         |             |          |                        |                 |     |                     |                  |      |   |                 |    |     |    |
| CONSC<br>CAST #         | LATITUDE |               | LONGITUDE |                              | DATE JD= |                     | TIME<br>(GMT) |            | WET<br>BULB<br>(°C) | SEA STATE       | WIND<br>DIRN.<br>(deg) | WIND<br>SPD.<br>(m/s)   | CLOUD (amt) | WEATHER  | BOTTOM<br>DEPTH<br>(m) | STA.<br>NAME/ID |     |                     |                  |      |   |                 |    |     |    |
|                         | DEG      | MIN           | DEG       | MIN                          | DAY      | MO                  | YR            | HR         |                     |                 |                        |                         |             |          |                        |                 | MIN | DRY<br>BULB<br>(°C) | PRESSURE<br>(mb) | TYPE |   |                 |    |     |    |
| 06258                   | 39       | 01            | 15        | 03                           | 3        | 87                  | W             | 6          | 0                   | 2               | 06                     | 39                      | 11          | 0        | 01                     | 45              | 18  | 5                   | 20               | 86   | 4 | 21              | 18 | APR | 12 |
| CTD                     |          | TIMES         |           | JD/TIME                      |          | DATA LOCATION       |               |            |                     |                 |                        |                         |             |          |                        |                 |     | REMARKS             |                  |      |   |                 |    |     |    |
| TYPE & SN               |          | 9+ S/N 91220  |           | DATA ON                      |          | 06:40:00 GMT        |               |            |                     |                 |                        |                         |             |          |                        |                 |     | pbt/rv              |                  |      |   |                 |    |     |    |
| PRESS SN                |          | 80020         |           | START DOWN                   |          | 06:40:00 GMT        |               |            |                     |                 |                        |                         |             |          |                        |                 |     | pbb/rv              |                  |      |   |                 |    |     |    |
| TEMP SN                 |          | 710/884       |           | AT DEPTH                     |          | 06:50:00 GMT        |               |            |                     |                 |                        |                         |             |          |                        |                 |     |                     |                  |      |   |                 |    |     |    |
| COND SN                 |          | 915/530       |           | AT SURFACE                   |          | 06:58:00 GMT        |               |            |                     |                 |                        |                         |             |          |                        |                 |     |                     |                  |      |   |                 |    |     |    |
|                         |          |               |           | PAR 4242                     |          | FLUOR 153           |               | CHIAM 109  |                     | TRANSMISSOMETER |                        | Cleaned air bleed valve |             |          |                        |                 |     |                     |                  |      |   |                 |    |     |    |
| POS.                    |          | TRIP<br>DEPTH |           | CTD CONVERTED MONITOR VALUES |          |                     |               |            |                     |                 |                        |                         |             |          |                        |                 |     |                     |                  |      |   |                 |    |     |    |
|                         |          |               |           | PRESSURE                     |          | PRI. TEMP.          |               | SEC. TEMP. |                     | PRI. SALINITY   |                        | SEC. SALINITY           |             | SALINITY |                        | SAL.            |     | NUTR.               |                  | CHL. |   | WHIT'S<br>NUTR. |    |     |    |
| 1                       |          | 215           |           |                              |          |                     |               |            |                     |                 |                        |                         |             |          |                        | ✓               |     | 800                 |                  |      |   |                 |    |     |    |
| 2                       |          | 200           |           |                              |          |                     |               |            |                     |                 |                        |                         |             |          |                        |                 |     | 801                 |                  |      |   |                 |    |     |    |
| 3                       |          | 176           |           |                              |          |                     |               |            |                     |                 |                        |                         |             |          |                        |                 |     | 802                 |                  |      |   |                 |    |     |    |
| 4                       |          | 150           |           |                              |          |                     |               |            |                     |                 |                        |                         |             |          |                        |                 |     | 803                 |                  |      |   |                 |    |     |    |
| 5                       |          | 100           |           |                              |          |                     |               |            |                     |                 |                        |                         |             |          |                        |                 |     | 804                 |                  |      |   |                 |    |     |    |
| 6                       |          | 75            |           |                              |          |                     |               |            |                     |                 |                        |                         |             |          |                        |                 |     | 805                 |                  |      |   |                 |    |     |    |
| 7                       |          | 49            |           |                              |          |                     |               |            |                     |                 |                        |                         |             |          |                        |                 |     | 806                 |                  | ✓    |   |                 |    |     |    |
| 8                       |          | 40            |           |                              |          |                     |               |            |                     |                 |                        |                         |             |          |                        |                 |     | 807                 |                  | ✓    |   |                 |    |     |    |
| 9                       |          | 30            |           |                              |          |                     |               |            |                     |                 |                        |                         |             |          |                        |                 |     | 808                 |                  | ✓    |   |                 |    |     |    |
| 10                      |          | 19            |           |                              |          |                     |               |            |                     |                 |                        |                         |             |          |                        |                 |     | 809                 |                  | ✓    |   |                 |    |     |    |
| 11                      |          | 3             |           |                              |          |                     |               |            |                     |                 |                        |                         |             |          |                        |                 |     | 810                 |                  | ✓    |   |                 |    |     |    |
| 12                      |          |               |           |                              |          |                     |               |            |                     |                 |                        |                         |             |          |                        |                 |     |                     |                  |      |   |                 |    |     |    |

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175  
150  
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75  
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| VESSEL                 |               | PROJECT & LEG                |            |              |               | STATION DESIGNATION |          |               |       |                     |                  |                    |            |                        |                       |             |                 |                        |                 |       |
|------------------------|---------------|------------------------------|------------|--------------|---------------|---------------------|----------|---------------|-------|---------------------|------------------|--------------------|------------|------------------------|-----------------------|-------------|-----------------|------------------------|-----------------|-------|
| NOAA RV MILLER FREEMAN |               | MF02-11                      |            |              |               |                     |          |               |       |                     |                  |                    |            |                        |                       |             |                 |                        |                 |       |
| CONSC<br>CAST #        | LATITUDE      |                              | LONGITUDE  |              | DATE JD=      |                     |          | TIME<br>(GMT) |       | WET<br>BULB<br>(°C) | PRESSURE<br>(mb) | SEA STATE          | VISIBILITY | WIND<br>DIRN.<br>(deg) | WIND<br>SPD.<br>(m/s) | CLOUD (amt) | WEATHER         | BOTTOM<br>DEPTH<br>(m) | STA.<br>NAME/ID |       |
|                        | DEG           | MIN                          | DEG        | MIN          | DAY           | MO                  | YR       | HR            | MIN   |                     |                  |                    |            |                        |                       |             |                 |                        |                 |       |
| 063                    | 58            | 33.87                        | N          | 150          | 28.4          | QW                  | 06       | OCT           | 02    | 07                  | 48               | 11.0               | 0          | 45                     | 19                    | 02          | 18              | 64                     | 173             | PBA11 |
| CTD                    |               | TIMES                        |            | JD/TIME      |               | DATA LOCATION       |          |               |       |                     |                  |                    |            |                        |                       |             |                 |                        |                 |       |
| TYPE & SN              |               | DATA ON                      |            | 67:51:00 GMT |               | File Name/Header    |          |               |       |                     |                  |                    |            |                        |                       |             |                 |                        |                 |       |
| PRESS SN               |               | 80020                        |            | 67:51:00 GMT |               |                     |          |               |       |                     |                  |                    |            |                        |                       |             |                 |                        |                 |       |
| TEMP SN                |               | 710/884                      |            |              |               |                     |          |               |       |                     |                  |                    |            |                        |                       |             |                 |                        |                 |       |
| COND SN                |               | 915/530                      |            | Wester       |               |                     |          |               |       |                     |                  |                    |            |                        |                       |             |                 |                        |                 |       |
| MAX. DEPTH =           |               | 168                          |            | m            |               |                     |          |               |       |                     |                  |                    |            |                        |                       |             |                 |                        |                 |       |
| POS.                   | TRIP<br>DEPTH | CTD CONVERTED MONITOR VALUES |            |              |               |                     |          |               |       |                     |                  | SAMPLE BOTTLE DATA |            | SAMPLE BOTTLE NUMBER   |                       |             | WHIT'S<br>NUTR. |                        |                 |       |
|                        |               | PRESSURE                     | PRI. TEMP. | SEC. TEMP.   | PRI. SALINITY | SEC. SALINITY       | SALINITY | SAL.          | NUTR. | CHL.                | NUTR.            | WHIT'S             | NUTR.      |                        |                       |             |                 |                        |                 |       |
| 1                      | 128           |                              |            |              |               |                     |          |               |       |                     |                  |                    |            |                        |                       |             |                 |                        |                 |       |
| 2                      | 150           |                              |            |              |               |                     |          |               |       |                     |                  |                    |            |                        |                       |             |                 |                        |                 |       |
| 3                      | 125           |                              |            |              |               |                     |          |               |       |                     |                  |                    |            |                        |                       |             |                 |                        |                 |       |
| 4                      | 100           |                              |            |              |               |                     |          |               |       |                     |                  |                    |            |                        |                       |             |                 |                        |                 |       |
| 5                      | 75            |                              |            |              |               |                     |          |               |       |                     |                  |                    |            |                        |                       |             |                 |                        |                 |       |
| 6                      | 50            |                              |            |              |               |                     |          |               |       |                     |                  |                    |            |                        |                       |             |                 |                        |                 |       |
| 7                      | 40            |                              |            |              |               |                     |          |               |       |                     |                  |                    |            |                        |                       |             |                 |                        |                 |       |
| 8                      | 30            |                              |            |              |               |                     |          |               |       |                     |                  |                    |            |                        |                       |             |                 |                        |                 |       |
| 9                      | 20            |                              |            |              |               |                     |          |               |       |                     |                  |                    |            |                        |                       |             |                 |                        |                 |       |
| 10                     | 10            |                              |            |              |               |                     |          |               |       |                     |                  |                    |            |                        |                       |             |                 |                        |                 |       |
| 11                     | 0             |                              |            |              |               |                     |          |               |       |                     |                  |                    |            |                        |                       |             |                 |                        |                 |       |
| 12                     |               |                              |            |              |               |                     |          |               |       |                     |                  |                    |            |                        |                       |             |                 |                        |                 |       |

60+  
150  
125  
100  
75

0.45 max fl

| VESSEL                       |               | PROJECT & LEG |           |                  |          | STATION DESIGNATION |               |                 |                     |                         |                  |           |            |                        |                       |                      |         |                        |                 |       |  |      |  |                 |  |
|------------------------------|---------------|---------------|-----------|------------------|----------|---------------------|---------------|-----------------|---------------------|-------------------------|------------------|-----------|------------|------------------------|-----------------------|----------------------|---------|------------------------|-----------------|-------|--|------|--|-----------------|--|
| NOAA RV MILLER FREEMAN       |               | MF02-11       |           |                  |          |                     |               |                 |                     |                         |                  |           |            |                        |                       |                      |         |                        |                 |       |  |      |  |                 |  |
| CONSC<br>CAST #              | LATITUDE      |               | LONGITUDE |                  | DATE JD= |                     | TIME<br>(GMT) |                 | WET<br>BULB<br>(°C) | DRY<br>BULB<br>(°C)     | PRESSURE<br>(mb) | SEA STATE | VISIBILITY | WIND<br>DIRN.<br>(deg) | WIND<br>SPD.<br>(m/s) | CLOUD (amt)<br>TYPE  | WEATHER | BOTTOM<br>DEPTH<br>(m) | STA.<br>NAME/ID |       |  |      |  |                 |  |
|                              | DEG           | MIN           | DEG       | MIN              | DAY      | MO                  | YR            | HR              |                     |                         |                  |           |            |                        |                       |                      |         |                        |                 | MIN   |  |      |  |                 |  |
| 0645831                      | 1.89N         | 15025.78W     | 6         | 0                | 20       | 08                  | 49            | 16              | 1                   | 0137                    | 188              | 25        | 872        | 101                    | P8018                 |                      |         |                        |                 |       |  |      |  |                 |  |
| CTD                          |               | TIMES         |           | JD/TIME          |          | REMARKS             |               |                 |                     |                         |                  |           |            |                        |                       |                      |         |                        |                 |       |  |      |  |                 |  |
| TYPE & SN                    |               | DATA ON       |           | Tape/Diskette ID |          | File Name/Header    |               |                 |                     |                         |                  |           |            |                        |                       |                      |         |                        |                 |       |  |      |  |                 |  |
| PRESS SN                     |               | 80020         |           | START DOWN       |          |                     |               |                 |                     |                         |                  |           |            |                        |                       |                      |         |                        |                 |       |  |      |  |                 |  |
| TEMP SN                      |               | 710/884       |           | AT DEPTH         |          |                     |               |                 |                     |                         |                  |           |            |                        |                       |                      |         |                        |                 |       |  |      |  |                 |  |
| COND SN                      |               | 915/530       |           | AT SURFACE       |          | MAX. DEPTH = 96 m   |               |                 |                     |                         |                  |           |            |                        |                       |                      |         |                        |                 |       |  |      |  |                 |  |
| CTD CONVERTED MONITOR VALUES |               | PAR 4242      |           | FLUOR 153        |          | CHIAM 109           |               | TRANSMISSOMETER |                     | Cleaned air bleed valve |                  |           |            |                        |                       |                      |         |                        |                 |       |  |      |  |                 |  |
| POS.                         | TRIP<br>DEPTH | PRESSURE      |           | PRI. TEMP.       |          | SEC. TEMP.          |               | PRI. SALINITY   |                     | SEC. SALINITY           |                  | SALINITY  |            | SAMPLE BOTTLE<br>DATA  |                       | SAMPLE BOTTLE NUMBER |         | SAL.                   |                 | NUTR. |  | CHL. |  | WHIT'S<br>NUTR. |  |
| 1                            | 95            |               |           |                  |          |                     |               |                 |                     |                         |                  |           |            |                        |                       |                      |         |                        |                 |       |  |      |  |                 |  |
| 2                            | 75            |               |           |                  |          |                     |               |                 |                     |                         |                  |           |            |                        |                       |                      |         |                        |                 |       |  |      |  |                 |  |
| 3                            | 60            |               |           |                  |          |                     |               |                 |                     |                         |                  |           |            |                        |                       |                      |         |                        |                 |       |  |      |  |                 |  |
| 4                            | 50            |               |           |                  |          |                     |               |                 |                     |                         |                  |           |            |                        |                       |                      |         |                        |                 |       |  |      |  |                 |  |
| 5                            | 40            |               |           |                  |          |                     |               |                 |                     |                         |                  |           |            |                        |                       |                      |         |                        |                 |       |  |      |  |                 |  |
| 6                            | 30            |               |           |                  |          |                     |               |                 |                     |                         |                  |           |            |                        |                       |                      |         |                        |                 |       |  |      |  |                 |  |
| 7                            | 20            |               |           |                  |          |                     |               |                 |                     |                         |                  |           |            |                        |                       |                      |         |                        |                 |       |  |      |  |                 |  |
| 8                            | 10            |               |           |                  |          |                     |               |                 |                     |                         |                  |           |            |                        |                       |                      |         |                        |                 |       |  |      |  |                 |  |
| 9                            | 6             |               |           |                  |          |                     |               |                 |                     |                         |                  |           |            |                        |                       |                      |         |                        |                 |       |  |      |  |                 |  |
| 10                           |               |               |           |                  |          |                     |               |                 |                     |                         |                  |           |            |                        |                       |                      |         |                        |                 |       |  |      |  |                 |  |
| 11                           |               |               |           |                  |          |                     |               |                 |                     |                         |                  |           |            |                        |                       |                      |         |                        |                 |       |  |      |  |                 |  |
| 12                           |               |               |           |                  |          |                     |               |                 |                     |                         |                  |           |            |                        |                       |                      |         |                        |                 |       |  |      |  |                 |  |

Fluor max ≈ 0.4

| VESSEL                 |          | PROJECT & LEG |           | STATION DESIGNATION   |          |                   |               |            |             |               |               |               |              |          |             |      |         |       |                 |      |                 |                 |      |
|------------------------|----------|---------------|-----------|---|----------|-------------------|---------------|------------|-------------|---------------|---------------|---------------|--------------|----------|-------------|------|---------|-------|-----------------|------|-----------------|-----------------|------|
| NOAA RV MILLER FREEMAN |          | MF02-11       |           |   |          |                   |               |            |             |               |               |               |              |          |             |      |         |       |                 |      |                 |                 |      |
| CONSC<br>CAST #        | LATITUDE |               | LONGITUDE |   | DATE JD= |                   | TIME<br>(GMT) |            | WET<br>BULB |               | WIND<br>DIRN. |               | WIND<br>SPD. |          | CLOUD (amt) |      | WEATHER |       | BOTTOM<br>DEPTH |      | STA.<br>NAME/ID |                 |      |
|                        | DEG      | MIN           | DEG       | MIN   | DAY      | MO                | YR            | HR         | MIN         | (°C)          | (°C)          | (deg)         | (m/s)        | *        | *           | *    | *       | (m)   |                 |      |                 |                 |      |
| 46                     | 5        | 29.33         | N         | 156   | 23       | 51                | W             | 06         | 00          | 20            | 24            | 93            | 08           | 10       | 11          | 01   | 37      | 18    | 42              | 28   | 62              | 94              | 8809 |
| CTD                    |          | TIMES         |           | JD/TIME   |          | DATA LOCATION     |               |            |             |               |               |               |              |          |             |      |         |       |                 |      |                 |                 |      |
| TYPE & SN              |          | 9+ SN 91220   |           | DATA ON   |          | File Name/Header  |               |            |             |               |               |               |              |          |             |      |         |       |                 |      |                 |                 |      |
| PRESS SN               |          | 80020         |           | START DOWN  |          |                   |               |            |             |               |               |               |              |          |             |      |         |       |                 |      |                 |                 |      |
| TEMP SN                |          | 710/884       |           | AT DEPTH  |          |                   |               |            |             |               |               |               |              |          |             |      |         |       |                 |      |                 |                 |      |
| COND SN                |          | 915/530       |           | AT SURFACE  |          |                   |               |            |             |               |               |               |              |          |             |      |         |       |                 |      |                 |                 |      |
|                        |          |               |           |   |          | MAX. DEPTH = 85 m |               |            |             |               |               |               |              |          |             |      |         |       |                 |      |                 |                 |      |
| POS.                   |          | TRIP<br>DEPTH |           | CTD CONVERTED MONITOR VALUES  |          |                   |               |            |             |               |               |               |              |          |             |      |         |       |                 |      |                 |                 |      |
|                        |          |               |           | <input type="checkbox"/> PAR 4242 <input type="checkbox"/> FLUOR 153 <input type="checkbox"/> CHIAM 109 <input type="checkbox"/> TRANSMISSOMETER <input type="checkbox"/> Cleaned air bleed valve |          |                   |               |            |             |               |               |               |              |          |             |      |         |       |                 |      |                 |                 |      |
|                        |          |               |           | SAMPLE BOTTLE DATA  |          |                   |               |            |             |               |               |               |              |          |             |      |         |       |                 |      |                 |                 |      |
|                        |          |               |           | PRESSURE  |          | PRI. TEMP.        |               | SEC. TEMP. |             | PRI. SALINITY |               | SEC. SALINITY |              | SALINITY |             | SAL. |         | NUTR. |                 | CHL. |                 | WHIT'S<br>NUTR. |      |
| 1                      | 85       |               |           |   |          |                   |               |            |             |               |               |               |              |          |             |      |         |       |                 |      |                 |                 |      |
| 2                      | 75       |               |           |   |          |                   |               |            |             |               |               |               |              |          |             |      |         |       |                 |      |                 |                 |      |
| 3                      | 60       |               |           |   |          |                   |               |            |             |               |               |               |              |          |             |      |         |       |                 |      |                 |                 |      |
| 4                      | 50       |               |           |   |          |                   |               |            |             |               |               |               |              |          |             |      |         |       |                 |      |                 |                 |      |
| 5                      | 40       |               |           |   |          |                   |               |            |             |               |               |               |              |          |             |      |         |       |                 |      |                 |                 |      |
| 6                      | 30       |               |           |   |          |                   |               |            |             |               |               |               |              |          |             |      |         |       |                 |      |                 |                 |      |
| 7                      | 20       |               |           |   |          |                   |               |            |             |               |               |               |              |          |             |      |         |       |                 |      |                 |                 |      |
| 8                      | 10       |               |           |   |          |                   |               |            |             |               |               |               |              |          |             |      |         |       |                 |      |                 |                 |      |
| 9                      | 0        |               |           |   |          |                   |               |            |             |               |               |               |              |          |             |      |         |       |                 |      |                 |                 |      |
| 10                     |          |               |           |   |          |                   |               |            |             |               |               |               |              |          |             |      |         |       |                 |      |                 |                 |      |
| 11                     |          |               |           |   |          |                   |               |            |             |               |               |               |              |          |             |      |         |       |                 |      |                 |                 |      |
| 12                     |          |               |           |   |          |                   |               |            |             |               |               |               |              |          |             |      |         |       |                 |      |                 |                 |      |

FLKt max = 0.5

| VESSEL                 |          | PROJECT & LEG |           |                              |          | STATION DESIGNATION |               |                  |             |           |          |                 |           |                       |               |                      |              |      |             |                   |         |      |                 |                 |                 |  |
|------------------------|----------|---------------|-----------|------------------------------|----------|---------------------|---------------|------------------|-------------|-----------|----------|-----------------|-----------|-----------------------|---------------|----------------------|--------------|------|-------------|-------------------|---------|------|-----------------|-----------------|-----------------|--|
| NOAA RV MILLER FREEMAN |          | MF02-11       |           |                              |          |                     |               |                  |             |           |          |                 |           |                       |               |                      |              |      |             |                   |         |      |                 |                 |                 |  |
| CONSC<br>CAST #        | LATITUDE |               | LONGITUDE |                              | DATE JD= |                     | TIME<br>(GMT) |                  | WET<br>BULB |           | PRESSURE |                 | SEA STATE |                       | WIND<br>DIRN. |                      | WIND<br>SPD. |      | CLOUD (amt) |                   | WEATHER |      | BOTTOM<br>DEPTH |                 | STA.<br>NAME/ID |  |
|                        | DEG      | MIN           | DEG       | MIN                          | DAY      | MO                  | YR            | HR               | MIN         | (°C)      | (mb)     | *               | *         | (deg)                 | (m/s)         | *                    | *            | (m)  |             |                   |         |      |                 |                 |                 |  |
| 465826.78              | N        | 15421.26      | W         | 06                           | 0        | 02                  | 10            | 25               | 16.1        | .         | 04       | 37              | 20        | 42                    | 8             | 72                   |              |      |             |                   |         |      | 79              |                 | 1668            |  |
| CTD                    |          | TIMES         |           | JD/TIME                      |          | DATA LOCATION       |               |                  |             |           |          |                 |           |                       |               | REMARKS              |              |      |             |                   |         |      |                 |                 |                 |  |
| TYPE & SN              |          | 9+ SN 91220   |           | DATA ON                      |          | Tape/Diskette ID    |               | File Name/Header |             |           |          |                 |           |                       |               |                      |              |      |             |                   |         |      |                 |                 |                 |  |
| PRESS SN               |          | 80020         |           | START DOWN                   |          |                     |               |                  |             |           |          |                 |           |                       |               |                      |              |      |             |                   |         |      |                 |                 |                 |  |
| TEMP SN                |          | 710/884       |           | AT DEPTH                     |          |                     |               |                  |             |           |          |                 |           |                       |               |                      |              |      |             |                   |         |      |                 |                 |                 |  |
| COND SN                |          | 915/530       |           | AT SURFACE                   |          |                     |               |                  |             |           |          |                 |           |                       |               |                      |              |      |             | MAX. DEPTH = 74 m |         |      |                 |                 |                 |  |
| POS.                   |          | TRIP<br>DEPTH |           | CTD CONVERTED MONITOR VALUES |          | PAR 4242            |               | FLUOR 153        |             | CHIAM 109 |          | TRANSMISSOMETER |           | SAMPLE BOTTLE<br>DATA |               | SAMPLE BOTTLE NUMBER |              | SAL. |             | NUTR.             |         | CHL. |                 | WHIT'S<br>NUTR. |                 |  |
| 1                      | 74       |               |           |                              |          |                     |               |                  |             |           |          |                 |           |                       |               |                      |              |      |             |                   |         |      |                 |                 |                 |  |
| 2                      | 60       |               |           |                              |          |                     |               |                  |             |           |          |                 |           |                       |               |                      |              |      |             |                   |         |      |                 |                 |                 |  |
| 3                      | 50       |               |           |                              |          |                     |               |                  |             |           |          |                 |           |                       |               |                      |              |      |             |                   |         |      |                 |                 |                 |  |
| 4                      | 40       |               |           |                              |          |                     |               |                  |             |           |          |                 |           |                       |               |                      |              |      |             |                   |         |      |                 |                 |                 |  |
| 5                      | 30       |               |           |                              |          |                     |               |                  |             |           |          |                 |           |                       |               |                      |              |      |             |                   |         |      |                 |                 |                 |  |
| 6                      | 20       |               |           |                              |          |                     |               |                  |             |           |          |                 |           |                       |               |                      |              |      |             |                   |         |      |                 |                 |                 |  |
| 7                      | 10       |               |           |                              |          |                     |               |                  |             |           |          |                 |           |                       |               |                      |              |      |             |                   |         |      |                 |                 |                 |  |
| 8                      | 0        |               |           |                              |          |                     |               |                  |             |           |          |                 |           |                       |               |                      |              |      |             |                   |         |      |                 |                 |                 |  |
| 9                      |          |               |           |                              |          |                     |               |                  |             |           |          |                 |           |                       |               |                      |              |      |             |                   |         |      |                 |                 |                 |  |
| 10                     |          |               |           |                              |          |                     |               |                  |             |           |          |                 |           |                       |               |                      |              |      |             |                   |         |      |                 |                 |                 |  |
| 11                     |          |               |           |                              |          |                     |               |                  |             |           |          |                 |           |                       |               |                      |              |      |             |                   |         |      |                 |                 |                 |  |
| 12                     |          |               |           |                              |          |                     |               |                  |             |           |          |                 |           |                       |               |                      |              |      |             |                   |         |      |                 |                 |                 |  |

flvlt max  $\approx$  0.47

[illegible]
$$E_{\text{Voll max}} \approx \phi.3 (u_{\text{term}})_{\text{gr}} \approx 0.3, 0-65 \text{ m}$$

$$\epsilon_{1 \text{ Volt max}} = 0.3 / \text{well mixed}$$
$$\epsilon_{1 \text{ Volt max}} = 0.3 / \text{well mixed}$$

| VESSEL                 |          | PROJECT & LEG |           |                              |          | STATION DESIGNATION |               |           |                     |                        |                       |                 |         |                         |                 |                    |                     |                      |                  |            |      |
|------------------------|----------|---------------|-----------|------------------------------|----------|---------------------|---------------|-----------|---------------------|------------------------|-----------------------|-----------------|---------|-------------------------|-----------------|--------------------|---------------------|----------------------|------------------|------------|------|
| NOAA RV MILLER FREEMAN |          | MF02-11       |           |                              |          |                     |               |           |                     |                        |                       |                 |         |                         |                 |                    |                     |                      |                  |            |      |
| CONSC<br>CAST #        | LATITUDE |               | LONGITUDE |                              | DATE JD= |                     | TIME<br>(GMT) |           | WET<br>BULB<br>(°C) | WIND<br>DIRN.<br>(deg) | WIND<br>SPD.<br>(m/s) | CLOUD<br>(amt)  | WEATHER | BOTTOM<br>DEPTH<br>(m)  | STA.<br>NAME/ID |                    |                     |                      |                  |            |      |
|                        | DEG      | MIN           | DEG       | MIN                          | DAY      | MO                  | YR            | HR        |                     |                        |                       |                 |         |                         |                 | MIN                | DRY<br>BULB<br>(°C) | SEA STATE            | PRESSURE<br>(mb) | VISIBILITY |      |
| 46958                  | 19       | 14            | 15        | 41                           | 4        | 6                   | 0             | 2         | 12                  | 49                     | 1                     | 4               | 7       | 22                      | 8               | 26                 | 6                   | 2                    | 5                | 3          | 9005 |
| CTD                    |          | JD/TIME       |           | TIMES                        |          | DATA LOCATION       |               |           |                     |                        |                       |                 |         |                         |                 | REMARKS            |                     |                      |                  |            |      |
| TYPE & SN              |          | 9+ S/N 91220  |           | DATA ON                      |          | Tape/Diskette ID    |               |           |                     |                        |                       |                 |         |                         |                 | File Name/Header   |                     |                      |                  |            |      |
| PRESS SN               |          | 80020         |           | START DOWN                   |          |                     |               |           |                     |                        |                       |                 |         |                         |                 |                    |                     |                      |                  |            |      |
| TEMP SN                |          | 710/884       |           | AT DEPTH                     |          |                     |               |           |                     |                        |                       |                 |         |                         |                 |                    |                     |                      |                  |            |      |
| COND SN                |          | 915/530       |           | AT SURFACE                   |          |                     |               |           |                     |                        |                       |                 |         |                         |                 | 4/0 - 48           |                     |                      |                  |            |      |
|                        |          |               |           |                              |          |                     |               |           |                     |                        |                       |                 |         |                         |                 | MAX. DEPTH = m     |                     |                      |                  |            |      |
| POS.                   |          | TRIP DEPTH    |           | CTD CONVERTED MONITOR VALUES |          | PAR 4242            |               | FLUOR 153 |                     | CHIAM 109              |                       | TRANSMISSOMETER |         | Cleaned air bleed valve |                 | SAMPLE BOTTLE DATA |                     | SAMPLE BOTTLE NUMBER |                  |            |      |
|                        |          |               |           |                              |          |                     |               |           |                     |                        |                       |                 |         |                         |                 |                    |                     |                      |                  |            |      |
| 1                      |          | 48            |           |                              |          |                     |               |           |                     |                        |                       |                 |         |                         |                 |                    |                     |                      |                  |            |      |
| 2                      |          | 40            |           |                              |          |                     |               |           |                     |                        |                       |                 |         |                         |                 |                    |                     |                      |                  |            |      |
| 3                      |          | 30            |           |                              |          |                     |               |           |                     |                        |                       |                 |         |                         |                 |                    |                     |                      |                  |            |      |
| 4                      |          | 20            |           |                              |          |                     |               |           |                     |                        |                       |                 |         |                         |                 |                    |                     |                      |                  |            |      |
| 5                      |          | 10            |           |                              |          |                     |               |           |                     |                        |                       |                 |         |                         |                 |                    |                     |                      |                  |            |      |
| 6                      |          | 0             |           |                              |          |                     |               |           |                     |                        |                       |                 |         |                         |                 |                    |                     |                      |                  |            |      |
| 7                      |          |               |           |                              |          |                     |               |           |                     |                        |                       |                 |         |                         |                 |                    |                     |                      |                  |            |      |
| 8                      |          |               |           |                              |          |                     |               |           |                     |                        |                       |                 |         |                         |                 |                    |                     |                      |                  |            |      |
| 9                      |          |               |           |                              |          |                     |               |           |                     |                        |                       |                 |         |                         |                 |                    |                     |                      |                  |            |      |
| 10                     |          |               |           |                              |          |                     |               |           |                     |                        |                       |                 |         |                         |                 |                    |                     |                      |                  |            |      |
| 11                     |          |               |           |                              |          |                     |               |           |                     |                        |                       |                 |         |                         |                 |                    |                     |                      |                  |            |      |
| 12                     |          |               |           |                              |          |                     |               |           |                     |                        |                       |                 |         |                         |                 |                    |                     |                      |                  |            |      |

61 Votts = 0.3 / well mixed

1 bottle didn't fire / Assuming it was surface bottle



| VESSEL                 |               |                              |            | PROJECT & LEG |               |               |          | STATION DESIGNATION |     |                     |           |                         |                       |             |         |                        |                 |                      |       |                 |  |
|------------------------|---------------|------------------------------|------------|---------------|---------------|---------------|----------|---------------------|-----|---------------------|-----------|-------------------------|-----------------------|-------------|---------|------------------------|-----------------|----------------------|-------|-----------------|--|
| NOAA RV MILLER FREEMAN |               |                              |            | MF02-11       |               |               |          |                     |     |                     |           |                         |                       |             |         |                        |                 |                      |       |                 |  |
| CONSC<br>CAST #        | LATITUDE      |                              | LONGITUDE  |               | DATE JD=      |               |          | TIME<br>(GMT)       |     | WET<br>BULB<br>(°C) | SEA STATE | WIND<br>DIRN.<br>(deg)  | WIND<br>SPD.<br>(m/s) | CLOUD (amt) | WEATHER | BOTTOM<br>DEPTH<br>(m) | STA.<br>NAME/ID |                      |       |                 |  |
|                        | DEG           | MIN                          | DEG        | MIN           | DAY           | MO            | YR       | HR                  | MIN |                     |           |                         |                       |             |         |                        |                 |                      |       |                 |  |
| 0705816.54N            | 150           | 12.34W                       | 06         | 0             | 2             | 13            | 30       | 14                  | 7   | 02                  | 4         | 2                       | 4                     | 2           | 6       | 7                      | 2               | 56                   | P6664 |                 |  |
| CTD                    |               |                              |            | TIMES         |               | JD/TIME       |          | DATA LOCATION       |     |                     |           |                         |                       |             |         |                        |                 | REMARKS              |       |                 |  |
| TYPE & SN              |               |                              |            | DATA ON       |               |               |          | Tape/Diskette ID    |     |                     |           |                         |                       |             |         |                        |                 | File Name/Header     |       |                 |  |
| PRESS SN               |               |                              |            | 80020         |               |               |          |                     |     |                     |           |                         |                       |             |         |                        |                 |                      |       |                 |  |
| TEMP SN                |               |                              |            | 710/884       |               |               |          |                     |     |                     |           |                         |                       |             |         |                        |                 |                      |       |                 |  |
| COND SN                |               |                              |            | 915/530       |               |               |          |                     |     |                     |           |                         |                       |             |         |                        |                 |                      |       |                 |  |
|                        |               |                              |            | PAR 4242      |               | FLUOR 153     |          | CHIAM 109           |     | TRANSMISSOMETER     |           | Cleaned air bleed valve |                       |             |         |                        |                 |                      |       |                 |  |
| POS.                   | TRIP<br>DEPTH | CTD CONVERTED MONITOR VALUES |            |               |               |               |          |                     |     |                     |           |                         |                       |             |         |                        |                 |                      |       |                 |  |
|                        |               | PRESSURE                     | PRI. TEMP. | SEC. TEMP.    | PRI. SALINITY | SEC. SALINITY | SALINITY | SAMPLE BOTTLE DATA  |     |                     |           |                         |                       |             |         |                        |                 | SAMPLE BOTTLE NUMBER |       | WHIT'S<br>NUTR. |  |
| 1                      | 50            |                              |            |               |               |               |          |                     |     |                     |           |                         |                       |             |         |                        |                 |                      |       |                 |  |
| 2                      | 40            |                              |            |               |               |               |          |                     |     |                     |           |                         |                       |             |         |                        |                 |                      |       |                 |  |
| 3                      | 30            |                              |            |               |               |               |          |                     |     |                     |           |                         |                       |             |         |                        |                 |                      |       |                 |  |
| 4                      | 20            |                              |            |               |               |               |          |                     |     |                     |           |                         |                       |             |         |                        |                 |                      |       |                 |  |
| 5                      | 10            |                              |            |               |               |               |          |                     |     |                     |           |                         |                       |             |         |                        |                 |                      |       |                 |  |
| 6                      | 0             |                              |            |               |               |               |          |                     |     |                     |           |                         |                       |             |         |                        |                 |                      |       |                 |  |
| 7                      |               |                              |            |               |               |               |          |                     |     |                     |           |                         |                       |             |         |                        |                 |                      |       |                 |  |
| 8                      |               |                              |            |               |               |               |          |                     |     |                     |           |                         |                       |             |         |                        |                 |                      |       |                 |  |
| 9                      |               |                              |            |               |               |               |          |                     |     |                     |           |                         |                       |             |         |                        |                 |                      |       |                 |  |
| 10                     |               |                              |            |               |               |               |          |                     |     |                     |           |                         |                       |             |         |                        |                 |                      |       |                 |  |
| 11                     |               |                              |            |               |               |               |          |                     |     |                     |           |                         |                       |             |         |                        |                 |                      |       |                 |  |
| 12                     |               |                              |            |               |               |               |          |                     |     |                     |           |                         |                       |             |         |                        |                 |                      |       |                 |  |

$$f(v) = \phi.3$$

| VESSEL                 |          | PROJECT & LEG |           |                              |          | STATION DESIGNATION |     |               |     |                     |           |                 |                        |                         |             |                       |         |                        |                 |                      |      |       |       |            |   |               |   |               |   |          |   |      |   |       |  |      |  |                 |  |
|------------------------|----------|---------------|-----------|------------------------------|----------|---------------------|-----|---------------|-----|---------------------|-----------|-----------------|------------------------|-------------------------|-------------|-----------------------|---------|------------------------|-----------------|----------------------|------|-------|-------|------------|---|---------------|---|---------------|---|----------|---|------|---|-------|--|------|--|-----------------|--|
| NOAA RV MILLER FREEMAN |          | MF02-11       |           |                              |          |                     |     |               |     |                     |           |                 |                        |                         |             |                       |         |                        |                 |                      |      |       |       |            |   |               |   |               |   |          |   |      |   |       |  |      |  |                 |  |
| CONSC<br>CAST #        | LATITUDE |               | LONGITUDE |                              | DATE JD= |                     |     | TIME<br>(GMT) |     | WET<br>BULB<br>(°C) | SEA STATE | VISIBILITY      | WIND<br>DIRN.<br>(deg) | WIND<br>SPD.<br>(m/s)   | CLOUD (amt) | TYPE                  | WEATHER | BOTTOM<br>DEPTH<br>(m) | STA.<br>NAME/ID |                      |      |       |       |            |   |               |   |               |   |          |   |      |   |       |  |      |  |                 |  |
|                        | DEG      | MIN           | DEG       | MIN                          | DAY      | MO                  | YR  | HR            | MIN |                     |           |                 |                        |                         |             |                       |         |                        |                 | (mb)                 | (°C) | (deg) | (m/s) | (m)        |   |               |   |               |   |          |   |      |   |       |  |      |  |                 |  |
| 47                     | 15       | 813.9         | 1         | N                            | 15       | 01                  | 0.2 | W             | 4   | 6                   | 0         | C               | T                      | 0                       | 2           | 1                     | 4       | 1                      | 0               | 7                    | 4    | 2     | 4     | 7          | 2 | 3             | 4 | 2             | 6 | 7        | 2 | 8    | 2 | P803  |  |      |  |                 |  |
| CTD                    |          | TIMES         |           | JD/TIME                      |          | DATA LOCATION       |     |               |     |                     |           |                 |                        |                         |             |                       |         |                        |                 | REMARKS              |      |       |       |            |   |               |   |               |   |          |   |      |   |       |  |      |  |                 |  |
| TYPE & SN              |          | 9+ S/N 91220  |           | DATA ON                      |          | Tape/Diskette ID    |     |               |     |                     |           |                 |                        |                         |             |                       |         |                        |                 | File Name/Header     |      |       |       |            |   |               |   |               |   |          |   |      |   |       |  |      |  |                 |  |
| PRESS SN               |          | 80020         |           | START DOWN                   |          |                     |     |               |     |                     |           |                 |                        |                         |             |                       |         |                        |                 |                      |      |       |       |            |   |               |   |               |   |          |   |      |   |       |  |      |  |                 |  |
| TEMP SN                |          | 710/884       |           | AT DEPTH                     |          |                     |     |               |     |                     |           |                 |                        |                         |             |                       |         |                        |                 |                      |      |       |       |            |   |               |   |               |   |          |   |      |   |       |  |      |  |                 |  |
| COND SN                |          | 915/530       |           | AT SURFACE                   |          |                     |     |               |     |                     |           |                 |                        |                         |             |                       |         |                        |                 | MAX. DEPTH = m       |      |       |       |            |   |               |   |               |   |          |   |      |   |       |  |      |  |                 |  |
| POS.                   |          | TRIP<br>DEPTH |           | CTD CONVERTED MONITOR VALUES |          | PAR 4242            |     | FLUOR 153     |     | CHIAM 109           |           | TRANSMISSOMETER |                        | Cleaned air bleed valve |             | SAMPLE BOTTLE<br>DATA |         |                        |                 | SAMPLE BOTTLE NUMBER |      |       |       |            |   |               |   |               |   |          |   |      |   |       |  |      |  |                 |  |
|                        |          |               |           |                              |          |                     |     |               |     |                     |           |                 |                        |                         |             | PRESSURE              |         |                        |                 | PRI. TEMP.           |      |       |       | SEC. TEMP. |   | PRI. SALINITY |   | SEC. SALINITY |   | SALINITY |   | SAL. |   | NUTR. |  | CHL. |  | WHIT'S<br>NUTR. |  |
| 1                      |          | 75            |           |                              |          |                     |     |               |     |                     |           |                 |                        |                         |             |                       |         |                        |                 |                      |      |       |       |            |   |               |   |               |   |          |   |      |   |       |  |      |  |                 |  |
| 2                      |          | 60            |           |                              |          |                     |     |               |     |                     |           |                 |                        |                         |             |                       |         |                        |                 |                      |      |       |       |            |   |               |   |               |   |          |   |      |   |       |  |      |  |                 |  |
| 3                      |          | 50            |           |                              |          |                     |     |               |     |                     |           |                 |                        |                         |             |                       |         |                        |                 |                      |      |       |       |            |   |               |   |               |   |          |   |      |   |       |  |      |  |                 |  |
| 4                      |          | 40            |           |                              |          |                     |     |               |     |                     |           |                 |                        |                         |             |                       |         |                        |                 |                      |      |       |       |            |   |               |   |               |   |          |   |      |   |       |  |      |  |                 |  |
| 5                      |          | 30            |           |                              |          |                     |     |               |     |                     |           |                 |                        |                         |             |                       |         |                        |                 |                      |      |       |       |            |   |               |   |               |   |          |   |      |   |       |  |      |  |                 |  |
| 6                      |          | 20            |           |                              |          |                     |     |               |     |                     |           |                 |                        |                         |             |                       |         |                        |                 |                      |      |       |       |            |   |               |   |               |   |          |   |      |   |       |  |      |  |                 |  |
| 7                      |          | 10            |           |                              |          |                     |     |               |     |                     |           |                 |                        |                         |             |                       |         |                        |                 |                      |      |       |       |            |   |               |   |               |   |          |   |      |   |       |  |      |  |                 |  |
| 8                      |          | 0             |           |                              |          |                     |     |               |     |                     |           |                 |                        |                         |             |                       |         |                        |                 |                      |      |       |       |            |   |               |   |               |   |          |   |      |   |       |  |      |  |                 |  |
| 9                      |          |               |           |                              |          |                     |     |               |     |                     |           |                 |                        |                         |             |                       |         |                        |                 |                      |      |       |       |            |   |               |   |               |   |          |   |      |   |       |  |      |  |                 |  |
| 10                     |          |               |           |                              |          |                     |     |               |     |                     |           |                 |                        |                         |             |                       |         |                        |                 |                      |      |       |       |            |   |               |   |               |   |          |   |      |   |       |  |      |  |                 |  |
| 11                     |          |               |           |                              |          |                     |     |               |     |                     |           |                 |                        |                         |             |                       |         |                        |                 |                      |      |       |       |            |   |               |   |               |   |          |   |      |   |       |  |      |  |                 |  |
| 12                     |          |               |           |                              |          |                     |     |               |     |                     |           |                 |                        |                         |             |                       |         |                        |                 |                      |      |       |       |            |   |               |   |               |   |          |   |      |   |       |  |      |  |                 |  |

Fl Volt max = 4.3

[illegible]

| VESSEL                 |          | PROJECT & LEG |           |            |          | STATION DESIGNATION          |               |                  |             |                 |          |                         |            |                       |              |                      |         |                 |                 |    |
|------------------------|----------|---------------|-----------|------------|----------|------------------------------|---------------|------------------|-------------|-----------------|----------|-------------------------|------------|-----------------------|--------------|----------------------|---------|-----------------|-----------------|----|
| NOAA RV MILLER FREEMAN |          | MF02-11       |           |            |          |                              |               |                  |             |                 |          |                         |            |                       |              |                      |         |                 |                 |    |
| CONSC<br>CAST #        | LATITUDE |               | LONGITUDE |            | DATE JD= |                              | TIME<br>(GMT) |                  | DRY<br>BULB | WET<br>BULB     | PRESSURE | SEA STATE               | VISIBILITY | WIND<br>DIRN.         | WIND<br>SPD. | CLOUD (amt)          | WEATHER | BOTTOM<br>DEPTH | STA.<br>NAME/ID |    |
|                        | DEG      | MIN           | DEG       | MIN        | DAY      | MO                           | YR            | HR               | MIN         | (°C)            | (°C)     | (mb)                    | *          | *                     | (deg)        | (m/s)                | *       | (m)             |                 |    |
| 0773                   | 58       | 46.57         | N         | 15         | 04       | 4.22                         | W             | 06               | 00          | 02              | 16       | 15                      | 14         | .3                    | .            | 05                   | 47      | 23              | 91              | 77 |
| CTD                    |          |               |           |            |          |                              |               |                  |             |                 |          |                         |            |                       |              |                      |         |                 |                 |    |
| TYPE & SN              |          | 9+ SN 91220   |           | DATA ON    |          | JD/TIME                      |               | Tape/Diskette ID |             | DATA LOCATION   |          | File Name/Header        |            | REMARKS               |              |                      |         |                 |                 |    |
| PRESS SN               |          | 80020         |           | START DOWN |          |                              |               |                  |             |                 |          |                         |            |                       |              |                      |         |                 |                 |    |
| TEMP SN                |          | 710/884       |           | AT DEPTH   |          |                              |               |                  |             |                 |          |                         |            |                       |              |                      |         |                 |                 |    |
| COND SN                |          | 915/530       |           | AT SURFACE |          |                              |               |                  |             |                 |          |                         |            |                       |              |                      |         |                 |                 |    |
| MAX. DEPTH = m         |          |               |           |            |          |                              |               |                  |             |                 |          |                         |            |                       |              |                      |         |                 |                 |    |
| POS.                   |          | TRIP<br>DEPTH |           | PAR 4242   |          | FLUOR 153                    |               | CHAM 109         |             | TRANSMISSOMETER |          | Cleaned air bleed valve |            | SAMPLE BOTTLE<br>DATA |              | SAMPLE BOTTLE NUMBER |         |                 |                 |    |
|                        |          |               |           |            |          | CTD CONVERTED MONITOR VALUES |               |                  |             |                 |          |                         |            |                       |              |                      |         |                 |                 |    |
|                        |          |               |           | PRESSURE   |          | PRI. TEMP.                   |               | SEC. TEMP.       |             | PRI. SALINITY   |          | SEC. SALINITY           |            | SALINITY              |              | SAL.                 |         | NUTR.           |                 |    |
|                        |          |               |           |            |          |                              |               |                  |             |                 |          |                         |            |                       |              |                      |         |                 |                 |    |
| 1                      |          | 276           |           |            |          |                              |               |                  |             |                 |          |                         |            |                       |              |                      |         | 802             |                 |    |
| 2                      |          | 250           |           |            |          |                              |               |                  |             |                 |          |                         |            |                       |              |                      |         | 893             |                 |    |
| 3                      |          | 225           |           |            |          |                              |               |                  |             |                 |          |                         |            |                       |              |                      |         | 894             |                 |    |
| 4                      |          | 200           |           |            |          |                              |               |                  |             |                 |          |                         |            |                       |              |                      |         | 895             |                 |    |
| 5                      |          | 150           |           |            |          |                              |               |                  |             |                 |          |                         |            |                       |              |                      |         | 896             |                 |    |
| 6                      |          | 100           |           |            |          |                              |               |                  |             |                 |          |                         |            |                       |              |                      |         | 897             |                 |    |
| 7                      |          | 50            |           |            |          |                              |               |                  |             |                 |          |                         |            |                       |              |                      |         | 898             |                 |    |
| 8                      |          | 30            |           |            |          |                              |               |                  |             |                 |          |                         |            |                       |              |                      |         | 899             |                 |    |
| 9                      |          | 20            |           |            |          |                              |               |                  |             |                 |          |                         |            |                       |              |                      |         | 900             |                 |    |
| 10                     |          | 10            |           |            |          |                              |               |                  |             |                 |          |                         |            |                       |              |                      |         | 961             |                 |    |
| 11                     |          | 0             |           |            |          |                              |               |                  |             |                 |          |                         |            |                       |              |                      |         | 962             |                 |    |
| 12                     |          |               |           |            |          |                              |               |                  |             |                 |          |                         |            |                       |              |                      |         |                 |                 |    |

Fluor max = 4.33

| VESSEL                 |          | PROJECT & LEG |           |            |          | STATION DESIGNATION |               |           |             |                 |          |                         |           |                       |               |                    |              |   |             |   |         |   |                 |   |                 |   |   |      |
|------------------------|----------|---------------|-----------|------------|----------|---------------------|---------------|-----------|-------------|-----------------|----------|-------------------------|-----------|-----------------------|---------------|--------------------|--------------|---|-------------|---|---------|---|-----------------|---|-----------------|---|---|------|
| NOAA RV MILLER FREEMAN |          | MF02-11       |           |            |          |                     |               |           |             |                 |          |                         |           |                       |               |                    |              |   |             |   |         |   |                 |   |                 |   |   |      |
| CONSC<br>CAST #        | LATITUDE |               | LONGITUDE |            | DATE JD= |                     | TIME<br>(GMT) |           | WET<br>BULB |                 | PRESSURE |                         | SEA STATE |                       | WIND<br>DIRN. |                    | WIND<br>SPD. |   | CLOUD (amt) |   | WEATHER |   | BOTTOM<br>DEPTH |   | STA.<br>NAME/ID |   |   |      |
|                        | DEG      | MIN           | DEG       | MIN        | DAY      | MO                  | YR            | HR        | MIN         | (°C)            | (mb)     | *                       | *         | *                     | (deg)         | (m/s)              | *            | * | *           | * | (m)     |   |                 |   |                 |   |   |      |
| 47                     | 45       | 06            | 1         | 8          | 0        | N                   | 77            | W         | 06          | 0               | 2        | 17                      | 25        | 10                    | 7             | 0                  | 4            | 7 | 2           | 3 | 9       | 2 | 1               | 7 | 2               | 2 | 8 | PBC8 |
| CTD                    |          | TIMES         |           | JD/TIME    |          | DATA LOCATION       |               |           |             |                 |          |                         |           |                       |               | REMARKS            |              |   |             |   |         |   |                 |   |                 |   |   |      |
| TYPE & SN              |          | 9+ SN 91220   |           | DATA ON    |          | Tape/Diskette ID    |               |           |             |                 |          |                         |           |                       |               | File Name/Header   |              |   |             |   |         |   |                 |   |                 |   |   |      |
| PRESS SN               |          | 80020         |           | START DOWN |          |                     |               |           |             |                 |          |                         |           |                       |               |                    |              |   |             |   |         |   |                 |   |                 |   |   |      |
| TEMP SN                |          | 710/884       |           | AT DEPTH   |          |                     |               |           |             |                 |          |                         |           |                       |               |                    |              |   |             |   |         |   |                 |   |                 |   |   |      |
| COND SN                |          | 915/530       |           | AT SURFACE |          |                     |               |           |             |                 |          |                         |           |                       |               | MAX. DEPTH = 285 m |              |   |             |   |         |   |                 |   |                 |   |   |      |
| POS.                   |          | TRIP<br>DEPTH |           | PAR 4242   |          | FLUOR 153           |               | CHIAM 109 |             | TRANSMISSOMETER |          | Cleaned air bleed valve |           | SAMPLE BOTTLE<br>DATA |               |                    |              |   |             |   |         |   |                 |   |                 |   |   |      |
|                        |          |               |           |            |          |                     |               |           |             |                 |          |                         |           | SAMPLE BOTTLE NUMBER  |               |                    |              |   |             |   |         |   |                 |   |                 |   |   |      |
|                        |          |               |           |            |          |                     |               |           |             |                 |          |                         |           | SAL.                  |               |                    |              |   |             |   |         |   |                 |   |                 |   |   |      |
|                        |          |               |           |            |          |                     |               |           |             |                 |          |                         |           | NUTR.                 |               |                    |              |   |             |   |         |   |                 |   |                 |   |   |      |
|                        |          |               |           |            |          |                     |               |           |             |                 |          |                         |           | CHL.                  |               |                    |              |   |             |   |         |   |                 |   |                 |   |   |      |
|                        |          |               |           |            |          |                     |               |           |             |                 |          |                         |           | WHIT'S<br>NUTR.       |               |                    |              |   |             |   |         |   |                 |   |                 |   |   |      |
| 1                      | 285      |               |           |            |          |                     |               |           |             |                 |          |                         |           |                       |               |                    |              |   |             |   |         |   |                 |   |                 |   |   |      |
| 2                      | 275      |               |           |            |          |                     |               |           |             |                 |          |                         |           |                       |               |                    |              |   |             |   |         |   |                 |   |                 |   |   |      |
| 3                      | 250      |               |           |            |          |                     |               |           |             |                 |          |                         |           |                       |               |                    |              |   |             |   |         |   |                 |   |                 |   |   |      |
| 4                      | 200      |               |           |            |          |                     |               |           |             |                 |          |                         |           |                       |               |                    |              |   |             |   |         |   |                 |   |                 |   |   |      |
| 5                      | 150      |               |           |            |          |                     |               |           |             |                 |          |                         |           |                       |               |                    |              |   |             |   |         |   |                 |   |                 |   |   |      |
| 6                      | 100      |               |           |            |          |                     |               |           |             |                 |          |                         |           |                       |               |                    |              |   |             |   |         |   |                 |   |                 |   |   |      |
| 7                      | 70       |               |           |            |          |                     |               |           |             |                 |          |                         |           |                       |               |                    |              |   |             |   |         |   |                 |   |                 |   |   |      |
| 8                      | 50       |               |           |            |          |                     |               |           |             |                 |          |                         |           |                       |               |                    |              |   |             |   |         |   |                 |   |                 |   |   |      |
| 9                      | 20       |               |           |            |          |                     |               |           |             |                 |          |                         |           |                       |               |                    |              |   |             |   |         |   |                 |   |                 |   |   |      |
| 10                     | 10       |               |           |            |          |                     |               |           |             |                 |          |                         |           |                       |               |                    |              |   |             |   |         |   |                 |   |                 |   |   |      |
| 11                     | 0        |               |           |            |          |                     |               |           |             |                 |          |                         |           |                       |               |                    |              |   |             |   |         |   |                 |   |                 |   |   |      |
| 12                     |          |               |           |            |          |                     |               |           |             |                 |          |                         |           |                       |               |                    |              |   |             |   |         |   |                 |   |                 |   |   |      |

51 Volt max = 0.3

| VESSEL                 |          | PROJECT & LEG |           |            |          | STATION DESIGNATION |               |                 |             |                         |          |                       |           |       |               |                  |              |      |             |                 |         |                      |                 |   |                 |  |  |
|------------------------|----------|---------------|-----------|------------|----------|---------------------|---------------|-----------------|-------------|-------------------------|----------|-----------------------|-----------|-------|---------------|------------------|--------------|------|-------------|-----------------|---------|----------------------|-----------------|---|-----------------|--|--|
| NOAA RV MILLER FREEMAN |          | MF02-11       |           |            |          |                     |               |                 |             |                         |          |                       |           |       |               |                  |              |      |             |                 |         |                      |                 |   |                 |  |  |
| CONSC<br>CAST #        | LATITUDE |               | LONGITUDE |            | DATE JD= |                     | TIME<br>(GMT) |                 | WET<br>BULB |                         | PRESSURE |                       | SEA STATE |       | WIND<br>DIRN. |                  | WIND<br>SPD. |      | CLOUD (amt) |                 | WEATHER |                      | BOTTOM<br>DEPTH |   | STA.<br>NAME/ID |  |  |
|                        | DEG      | MIN           | DEG       | MIN        | DAY      | MO                  | YR            | HR              | MIN         | (°C)                    | (mb)     | *                     | *         | (deg) | (m/s)         | *                | *            | (m)  |             |                 |         |                      |                 |   |                 |  |  |
| 075                    | 58       | 08            | 19        | N          | 14       | 05                  | 8             | 19              | W           | 06                      | 00       | 02                    | 18        | 33    | 11            | 0                | 48           | 47   | 24          | 4               | 6       | 72                   | 28              | 3 | PBC7            |  |  |
| CTD                    |          | TIMES         |           | JD/TIME    |          | DATA LOCATION       |               |                 |             |                         |          |                       |           |       |               | REMARKS          |              |      |             |                 |         |                      |                 |   |                 |  |  |
| TYPE & SN              |          | 9+ SN 91220   |           | DATA ON    |          | Tape/Diskette ID    |               |                 |             |                         |          |                       |           |       |               | File Name/Header |              |      |             |                 |         |                      |                 |   |                 |  |  |
| PRESS SN               |          | 80020         |           | START DOWN |          |                     |               |                 |             |                         |          |                       |           |       |               |                  |              |      |             |                 |         |                      |                 |   |                 |  |  |
| TEMP SN                |          | 710/884       |           | AT DEPTH   |          |                     |               |                 |             |                         |          |                       |           |       |               |                  |              |      |             |                 |         |                      |                 |   |                 |  |  |
| COND SN                |          | 915/530       |           | AT SURFACE |          |                     |               |                 |             |                         |          |                       |           |       |               | MAX. DEPTH = m   |              |      |             |                 |         |                      |                 |   |                 |  |  |
| TRIP<br>DEPTH          |          | PAR 4242      |           | FLUOR 153  |          | CHAM 109            |               | TRANSMISSOMETER |             | Cleaned air bleed valve |          | SAMPLE BOTTLE<br>DATA |           |       |               |                  |              |      |             |                 |         | SAMPLE BOTTLE NUMBER |                 |   |                 |  |  |
| POS.                   |          | PRESSURE      |           | PRI. TEMP. |          | SEC. TEMP.          |               | PRI. SALINITY   |             | SEC. SALINITY           |          | SALINITY              |           | SAL.  |               | NUTR.            |              | CHL. |             | WHIT'S<br>NUTR. |         |                      |                 |   |                 |  |  |
| 1                      | 275      |               |           |            |          |                     |               |                 |             |                         |          |                       |           |       |               | 974              |              |      |             |                 |         |                      |                 |   |                 |  |  |
| 2                      | 250      |               |           |            |          |                     |               |                 |             |                         |          |                       |           |       |               | 975              |              |      |             |                 |         |                      |                 |   |                 |  |  |
| 3                      | 225      |               |           |            |          |                     |               |                 |             |                         |          |                       |           |       |               | 976              |              |      |             |                 |         |                      |                 |   |                 |  |  |
| 4                      | 200      |               |           |            |          |                     |               |                 |             |                         |          |                       |           |       |               | 977              |              |      |             |                 |         |                      |                 |   |                 |  |  |
| 5                      | 150      |               |           |            |          |                     |               |                 |             |                         |          |                       |           |       |               | 978              |              |      |             |                 |         |                      |                 |   |                 |  |  |
| 6                      | 100      |               |           |            |          |                     |               |                 |             |                         |          |                       |           |       |               | 979              |              |      |             |                 |         |                      |                 |   |                 |  |  |
| 7                      | 50       |               |           |            |          |                     |               |                 |             |                         |          |                       |           |       |               | 980              |              |      |             |                 |         |                      |                 |   |                 |  |  |
| 8                      | 30       |               |           |            |          |                     |               |                 |             |                         |          |                       |           |       |               | 981              |              |      |             |                 |         |                      |                 |   |                 |  |  |
| 9                      | 20       |               |           |            |          |                     |               |                 |             |                         |          |                       |           |       |               | 982              |              |      |             |                 |         |                      |                 |   |                 |  |  |
| 10                     | 10       |               |           |            |          |                     |               |                 |             |                         |          |                       |           |       |               | 983              |              |      |             |                 |         |                      |                 |   |                 |  |  |
| 11                     | 0        |               |           |            |          |                     |               |                 |             |                         |          |                       |           |       |               | 984              |              |      |             |                 |         |                      |                 |   |                 |  |  |
| 12                     |          |               |           |            |          |                     |               |                 |             |                         |          |                       |           |       |               |                  |              |      |             |                 |         |                      |                 |   |                 |  |  |

FLUOR max  $\approx$  0.35



| VESSEL                 |          | PROJECT & LEG |           |                              |          | STATION DESIGNATION |               |                  |                     |                     |                  |                         |            |                        |                       |             |         |                        |                 |      |  |                 |  |
|------------------------|----------|---------------|-----------|------------------------------|----------|---------------------|---------------|------------------|---------------------|---------------------|------------------|-------------------------|------------|------------------------|-----------------------|-------------|---------|------------------------|-----------------|------|--|-----------------|--|
| NOAA RV MILLER FREEMAN |          | MF02-11       |           |                              |          |                     |               |                  |                     |                     |                  |                         |            |                        |                       |             |         |                        |                 |      |  |                 |  |
| CONSC<br>CAST #        | LATITUDE |               | LONGITUDE |                              | DATE JD= |                     | TIME<br>(GMT) |                  | DRY<br>BULB<br>(°C) | WET<br>BULB<br>(°C) | PRESSURE<br>(mb) | SEA STATE               | VISIBILITY | WIND<br>DIRN.<br>(deg) | WIND<br>SPD.<br>(m/s) | CLOUD (amt) | WEATHER | BOTTOM<br>DEPTH<br>(m) | STA.<br>NAME/ID |      |  |                 |  |
| DEG                    | MIN      | DEG           | MIN       | DAY                          | MO       | YR                  | HR            | MIN              |                     |                     |                  |                         |            |                        |                       |             |         |                        |                 |      |  |                 |  |
| 47758                  | 13       | 48            | N         | 149                          | 54       | 46                  | W             | 4                | 20                  | 24                  | 10               | 4                       | 1          | 04                     | 72                    | 59          | 15      | 67                     | 2               | PB   |  |                 |  |
| CTD                    |          | TIMES         |           | JD/TIME                      |          | DATA LOCATION       |               |                  |                     |                     |                  |                         |            |                        |                       |             |         |                        |                 |      |  |                 |  |
| TYPE & SN              |          | 9+ SN 91220   |           | DATA ON                      |          | 20:25:00 GMT        |               | Tape/Diskette ID |                     | File Name/Header    |                  |                         |            |                        |                       |             |         |                        |                 |      |  |                 |  |
| PRESS SN               |          | 80020         |           | START DOWN                   |          | 20:25:00 GMT        |               |                  |                     |                     |                  |                         |            |                        |                       |             |         |                        |                 |      |  |                 |  |
| TEMP SN                |          | 710/884       |           | AT DEPTH                     |          | 20:28:00 GMT        |               |                  |                     |                     |                  |                         |            |                        |                       |             |         |                        |                 |      |  |                 |  |
| COND SN                |          | 915/530       |           | AT SURFACE                   |          | 20:32:00 GMT        |               |                  |                     |                     |                  |                         |            |                        |                       |             |         |                        |                 |      |  |                 |  |
|                        |          |               |           | PAR 4242                     |          | FLUOR 153           |               | CHAM 109         |                     | TRANSMISSOMETER     |                  | Cleaned air bleed valve |            |                        |                       |             |         |                        |                 |      |  |                 |  |
| POS.                   |          | TRIP<br>DEPTH |           | CTD CONVERTED MONITOR VALUES |          |                     |               |                  |                     |                     |                  |                         |            |                        |                       |             |         |                        |                 |      |  |                 |  |
|                        |          |               |           | PRESSURE                     |          | PRI. TEMP.          |               | SEC. TEMP.       |                     | PRI. SALINITY       |                  | SEC. SALINITY           |            | SALINITY               |                       | SAL.        |         | NUTR.                  |                 | CHL. |  | WHIT'S<br>NUTR. |  |
| 1                      | 83       |               |           |                              |          |                     |               |                  |                     |                     |                  |                         |            |                        |                       | ✓           |         | 995                    |                 |      |  |                 |  |
| 2                      | 75       |               |           |                              |          |                     |               |                  |                     |                     |                  |                         |            |                        |                       |             |         | 996                    |                 |      |  |                 |  |
| 3                      | 60       |               |           |                              |          |                     |               |                  |                     |                     |                  |                         |            |                        |                       |             |         | 997                    |                 | ✓    |  |                 |  |
| 4                      | 50       |               |           |                              |          |                     |               |                  |                     |                     |                  |                         |            |                        |                       |             |         | 998                    |                 | ✓    |  |                 |  |
| 5                      | 39       |               |           |                              |          |                     |               |                  |                     |                     |                  |                         |            |                        |                       |             |         | 999                    |                 | ✓    |  |                 |  |
| 6                      | 29       |               |           |                              |          |                     |               |                  |                     |                     |                  |                         |            |                        |                       |             |         | 1000                   |                 | ✓    |  |                 |  |
| 7                      | 19       |               |           |                              |          |                     |               |                  |                     |                     |                  |                         |            |                        |                       |             |         | 1001                   |                 | ✓    |  |                 |  |
| 8                      | 10       |               |           |                              |          |                     |               |                  |                     |                     |                  |                         |            |                        |                       |             |         | 1002                   |                 | ✓    |  |                 |  |
| 9                      | 3        |               |           |                              |          |                     |               |                  |                     |                     |                  |                         |            |                        |                       |             |         | 1003                   |                 | ✓    |  |                 |  |
| 10                     |          |               |           |                              |          |                     |               |                  |                     |                     |                  |                         |            |                        |                       |             |         |                        |                 |      |  |                 |  |
| 11                     |          |               |           |                              |          |                     |               |                  |                     |                     |                  |                         |            |                        |                       |             |         |                        |                 |      |  |                 |  |
| 12                     |          |               |           |                              |          |                     |               |                  |                     |                     |                  |                         |            |                        |                       |             |         |                        |                 |      |  |                 |  |

MAX. DEPTH = 83 m

bot 75 60 50 40 30 20 10 0

0.4 max fl



| VESSEL  |               | PROJECT & LEG |           |            |          | STATION DESIGNATION |               |               |             |   |          |           |            |               |              |             |         |                 |                 |                 |          |
|---|---------------|---------------|-----------|------------|----------|---------------------|---------------|---------------|-------------|---|----------|-----------|------------|---------------|--------------|-------------|---------|-----------------|-----------------|-----------------|----------|
| NOAA RV MILLER FREEMAN  |               | MF02-11       |           |            |          |                     |               |               |             |   |          |           |            |               |              |             |         |                 |                 |                 |          |
| CONSC<br>CAST #   | LATITUDE      |               | LONGITUDE |            | DATE JD= |                     | TIME<br>(GMT) |               | DRY<br>BULB | WET<br>BULB   | PRESSURE | SEA STATE | VISIBILITY | WIND<br>DIRN. | WIND<br>SPD. | CLOUD (amt) | WEATHER | BOTTOM<br>DEPTH | STA.<br>NAME/ID |                 |          |
| DEG   | MIN           | DEG           | MIN       | DAY        | MO       | YR                  | HR            | MIN           | (°C)        | (°C)  | (mb)     | *         | *          | (deg)         | (m/s)        | *           | *       | (m)             |                 |                 |          |
| 078   | 58            | 17            | 23        | N          | 14       | 9                   | 52            | 21            | W           | 06  | 0        | C         | 10         | 2             | 21           | 09          | 10      | 2               | 6               | 6               | P B C 14 |
| <div>CTD</div> <div> <div>DATA ON</div> <div>21:09:00 GMT</div> </div> <div> <div>START DOWN</div> <div>21:09:00 GMT</div> </div> <div> <div>AT DEPTH</div> <div>21:12:00 GMT</div> </div> <div> <div>AT SURFACE</div> <div>21:15:00 GMT</div> </div> |               |               |           |            |          |                     |               |               |             |   |          |           |            |               |              |             |         |                 |                 |                 |          |
| <div>TYPE &amp; SN</div> <div>9+ S/N 91220</div>  |               |               |           |            |          |                     |               |               |             |   |          |           |            |               |              |             |         |                 |                 |                 |          |
| <div>PRESS SN</div> <div>80020</div>  |               |               |           |            |          |                     |               |               |             |   |          |           |            |               |              |             |         |                 |                 |                 |          |
| <div>TEMP SN</div> <div>710/884</div>   |               |               |           |            |          |                     |               |               |             |   |          |           |            |               |              |             |         |                 |                 |                 |          |
| <div>COND SN</div> <div>915/530</div>   |               |               |           |            |          |                     |               |               |             |   |          |           |            |               |              |             |         |                 |                 |                 |          |
| <div>DATA LOCATION</div> <div>File Name/Header</div>  |               |               |           |            |          |                     |               |               |             | <div>REMARKS</div>  |          |           |            |               |              |             |         |                 |                 |                 |          |
| <div>MAX. DEPTH =</div> <div>63 m</div>   |               |               |           |            |          |                     |               |               |             |   |          |           |            |               |              |             |         |                 |                 |                 |          |
| <div>TRANSMISSOMETER</div> <div> <input type="checkbox"/> PAR 4242           <input type="checkbox"/> FLUOR 153           <input type="checkbox"/> CHIAM 109         </div>   |               |               |           |            |          |                     |               |               |             | <div>Cleaned air bleed valve</div> <div> <input type="checkbox"/> SAMPLE BOTTLE DATA           <input type="checkbox"/> SAMPLE BOTTLE NUMBER         </div> |          |           |            |               |              |             |         |                 |                 |                 |          |
| POS.  | TRIP<br>DEPTH | PRESSURE      |           | PRI. TEMP. |          | SEC. TEMP.          |               | PRI. SALINITY |             | SEC. SALINITY   |          | SALINITY  |            | SAL.          |              | NUTR.       |         | CHL.            |                 | WHIT'S<br>NUTR. |          |
| 1   | 63            |               |           |            |          |                     |               |               |             |   |          |           |            | ✓             |              | 1004        |         |                 |                 |                 |          |
| 2   | 49            |               |           |            |          |                     |               |               |             |   |          |           |            |               |              | 1005        |         | ✓               |                 |                 |          |
| 3   | 39            |               |           |            |          |                     |               |               |             |   |          |           |            |               |              | 1006        |         | ✓               |                 |                 |          |
| 4   | 29            |               |           |            |          |                     |               |               |             |   |          |           |            |               |              | 1007        |         | ✓               |                 |                 |          |
| 5   | 21            |               |           |            |          |                     |               |               |             |   |          |           |            |               |              | 1008        |         | ✓               |                 |                 |          |
| 6   | 10            |               |           |            |          |                     |               |               |             |   |          |           |            |               |              | 1009        |         | ✓               |                 |                 |          |
| 7   | 2             |               |           |            |          |                     |               |               |             |   |          |           |            |               |              | 1010        |         | ✓               |                 |                 |          |
| 8   |               |               |           |            |          |                     |               |               |             |   |          |           |            |               |              |             |         |                 |                 |                 |          |
| 9   |               |               |           |            |          |                     |               |               |             |   |          |           |            |               |              |             |         |                 |                 |                 |          |
| 10  |               |               |           |            |          |                     |               |               |             |   |          |           |            |               |              |             |         |                 |                 |                 |          |
| 11  |               |               |           |            |          |                     |               |               |             |   |          |           |            |               |              |             |         |                 |                 |                 |          |
| 12  |               |               |           |            |          |                     |               |               |             |   |          |           |            |               |              |             |         |                 |                 |                 |          |

0.5 max fl

| VESSEL                 |                              | PROJECT & LEG |                       |            |                       | STATION DESIGNATION |                       |                  |                       |                         |                       |   |                       |       |                       |   |                       |     |                       |  |                       |  |                       |  |                       |  |                       |  |
|------------------------|------------------------------|---------------|-----------------------|------------|-----------------------|---------------------|-----------------------|------------------|-----------------------|-------------------------|-----------------------|---|-----------------------|-------|-----------------------|---|-----------------------|-----|-----------------------|--|-----------------------|--|-----------------------|--|-----------------------|--|-----------------------|--|
| NOAA RV MILLER FREEMAN |                              | MF02-11       |                       |            |                       |                     |                       |                  |                       |                         |                       |   |                       |       |                       |   |                       |     |                       |  |                       |  |                       |  |                       |  |                       |  |
| CONSC<br>CAST #        | LATITUDE                     |               | LONGITUDE             |            | DATE JD=              |                     | TIME<br>(GMT)         |                  | WET<br>BULB           |                         | PRESSURE              |   | SEA STATE             |       | VISIBILITY            |   | WIND<br>DIRN.         |     | WIND<br>SPD.          |  | CLOUD (amt)           |  | WEATHER               |  | BOTTOM<br>DEPTH       |  | STA.<br>NAME/ID       |  |
|                        | DEG                          | MIN           | DEG                   | MIN        | DAY                   | MO                  | YR                    | HR               | MIN                   | (°C)                    | (mb)                  | * | *                     | (deg) | (m/s)                 | * | *                     | (m) |                       |  |                       |  |                       |  |                       |  |                       |  |
| 0795819.77N            | 14950.71W                    | 06            | OCT                   | 02         | 21                    | 40                  | 10.1                  |                  |                       |                         |                       |   |                       |       |                       |   |                       |     |                       |  |                       |  |                       |  |                       |  |                       |  |
| CTD                    |                              | TIMES         |                       | JD/TIME    |                       | DATA LOCATION       |                       | REMARKS          |                       |                         |                       |   |                       |       |                       |   |                       |     |                       |  |                       |  |                       |  |                       |  |                       |  |
| TYPE & SN              |                              | 9+ SN 91220   |                       | DATA ON    |                       | 21:41:00 GMT        |                       | Tape/Diskette ID |                       | File Name/Header        |                       |   |                       |       |                       |   |                       |     |                       |  |                       |  |                       |  |                       |  |                       |  |
| PRESS SN               |                              | 80020         |                       | START DOWN |                       | 21:41:00 GMT        |                       |                  |                       |                         |                       |   |                       |       |                       |   |                       |     |                       |  |                       |  |                       |  |                       |  |                       |  |
| TEMP SN                |                              | 710/884       |                       | AT DEPTH   |                       | 21:44:00 GMT        |                       |                  |                       |                         |                       |   |                       |       |                       |   |                       |     |                       |  |                       |  |                       |  |                       |  |                       |  |
| COND SN                |                              | 915/530       |                       | AT SURFACE |                       | 21:50:00 GMT        |                       |                  |                       | MAX. DEPTH = 76 m       |                       |   |                       |       |                       |   |                       |     |                       |  |                       |  |                       |  |                       |  |                       |  |
| TRIP<br>DEPTH          |                              | PAR 4242      |                       | FLUOR 153  |                       | CHAM 109            |                       | TRANSMISSOMETER  |                       | Cleaned air bleed valve |                       |   |                       |       |                       |   |                       |     |                       |  |                       |  |                       |  |                       |  |                       |  |
| POS.                   | CTD CONVERTED MONITOR VALUES |               | SAMPLE BOTTLE<br>DATA |            | SAMPLE BOTTLE<br>DATA |                     | SAMPLE BOTTLE<br>DATA |                  | SAMPLE BOTTLE<br>DATA |                         | SAMPLE BOTTLE<br>DATA |   | SAMPLE BOTTLE<br>DATA |       | SAMPLE BOTTLE<br>DATA |   | SAMPLE BOTTLE<br>DATA |     | SAMPLE BOTTLE<br>DATA |  | SAMPLE BOTTLE<br>DATA |  | SAMPLE BOTTLE<br>DATA |  | SAMPLE BOTTLE<br>DATA |  | SAMPLE BOTTLE<br>DATA |  |
| 1                      | 76                           | PRESSURE      | PRI. TEMP.            | SEC. TEMP. | PRI. SALINITY         | SEC. SALINITY       | SALINITY              | SAL.             | NUTR.                 | CHL.                    | WHIT'S<br>NUTR.       |   |                       |       |                       |   |                       |     |                       |  |                       |  |                       |  |                       |  |                       |  |
| 2                      | 61                           |               |                       |            |                       |                     |                       |                  |                       |                         |                       |   |                       |       |                       |   |                       |     |                       |  |                       |  |                       |  |                       |  |                       |  |
| 3                      | 50                           |               |                       |            |                       |                     |                       |                  |                       |                         |                       |   |                       |       |                       |   |                       |     |                       |  |                       |  |                       |  |                       |  |                       |  |
| 4                      | 40                           |               |                       |            |                       |                     |                       |                  |                       |                         |                       |   |                       |       |                       |   |                       |     |                       |  |                       |  |                       |  |                       |  |                       |  |
| 5                      | 29                           |               |                       |            |                       |                     |                       |                  |                       |                         |                       |   |                       |       |                       |   |                       |     |                       |  |                       |  |                       |  |                       |  |                       |  |
| 6                      | 20                           |               |                       |            |                       |                     |                       |                  |                       |                         |                       |   |                       |       |                       |   |                       |     |                       |  |                       |  |                       |  |                       |  |                       |  |
| 7                      | 11                           |               |                       |            |                       |                     |                       |                  |                       |                         |                       |   |                       |       |                       |   |                       |     |                       |  |                       |  |                       |  |                       |  |                       |  |
| 8                      | 2                            |               |                       |            |                       |                     |                       |                  |                       |                         |                       |   |                       |       |                       |   |                       |     |                       |  |                       |  |                       |  |                       |  |                       |  |
| 9                      |                              |               |                       |            |                       |                     |                       |                  |                       |                         |                       |   |                       |       |                       |   |                       |     |                       |  |                       |  |                       |  |                       |  |                       |  |
| 10                     |                              |               |                       |            |                       |                     |                       |                  |                       |                         |                       |   |                       |       |                       |   |                       |     |                       |  |                       |  |                       |  |                       |  |                       |  |
| 11                     |                              |               |                       |            |                       |                     |                       |                  |                       |                         |                       |   |                       |       |                       |   |                       |     |                       |  |                       |  |                       |  |                       |  |                       |  |
| 12                     |                              |               |                       |            |                       |                     |                       |                  |                       |                         |                       |   |                       |       |                       |   |                       |     |                       |  |                       |  |                       |  |                       |  |                       |  |

bot  
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O.S max fl

| VESSEL                 |           | PROJECT & LEG                |           |                  |          | STATION DESIGNATION |               |                 |                     |                         |                  |           |            |                        |                       |                      |         |                        |                 |       |  |      |  |                 |  |
|------------------------|-----------|------------------------------|-----------|------------------|----------|---------------------|---------------|-----------------|---------------------|-------------------------|------------------|-----------|------------|------------------------|-----------------------|----------------------|---------|------------------------|-----------------|-------|--|------|--|-----------------|--|
| NOAA RV MILLER FREEMAN |           | MF02-11                      |           |                  |          |                     |               |                 |                     |                         |                  |           |            |                        |                       |                      |         |                        |                 |       |  |      |  |                 |  |
| CONSC<br>CAST #        | LATITUDE  |                              | LONGITUDE |                  | DATE JD= |                     | TIME<br>(GMT) |                 | DRY<br>BULB<br>(°C) | WET<br>BULB<br>(°C)     | PRESSURE<br>(mb) | SEA STATE | VISIBILITY | WIND<br>DIRN.<br>(deg) | WIND<br>SPD.<br>(m/s) | CLOUD<br>(amt)       | WEATHER | BOTTOM<br>DEPTH<br>(m) | STA.<br>NAME/ID |       |  |      |  |                 |  |
| 0805822.41N            | 14949.98W | 06 OCT 02                    | 2214      | 10.2             |          |                     |               |                 |                     |                         |                  |           |            |                        |                       |                      |         |                        |                 |       |  |      |  |                 |  |
| CTD                    |           | JD/TIME                      |           | DATA LOCATION    |          |                     |               |                 |                     |                         |                  |           |            |                        |                       |                      |         |                        |                 |       |  |      |  |                 |  |
| TYPE & SN 9+ SN 91220  |           | DATA ON 22:16:00 GMT         |           | File Name/Header |          |                     |               |                 |                     |                         |                  |           |            |                        |                       |                      |         |                        |                 |       |  |      |  |                 |  |
| PRESS SN 80020         |           | START DOWN 22:16:00 GMT      |           |                  |          |                     |               |                 |                     |                         |                  |           |            |                        |                       |                      |         |                        |                 |       |  |      |  |                 |  |
| TEMP SN 710884         |           | AT DEPTH 22:19:00 GMT        |           |                  |          |                     |               |                 |                     |                         |                  |           |            |                        |                       |                      |         |                        |                 |       |  |      |  |                 |  |
| COND SN 915530         |           | AT SURFACE 22:24:00 GMT      |           |                  |          |                     |               |                 |                     |                         |                  |           |            |                        |                       |                      |         |                        |                 |       |  |      |  |                 |  |
|                        |           | PAR 4242                     |           | FLUOR 153        |          | CHAM 109            |               | TRANSMISSOMETER |                     | Cleaned air bleed valve |                  |           |            |                        |                       |                      |         |                        |                 |       |  |      |  |                 |  |
| POS. TRIP<br>DEPTH     |           | CTD CONVERTED MONITOR VALUES |           |                  |          |                     |               |                 |                     |                         |                  |           |            |                        |                       |                      |         |                        |                 |       |  |      |  |                 |  |
|                        |           | PRESSURE                     |           | PRI. TEMP.       |          | SEC. TEMP.          |               | PRI. SALINITY   |                     | SEC. SALINITY           |                  | SALINITY  |            | SAMPLE BOTTLE<br>DATA  |                       | SAMPLE BOTTLE NUMBER |         | SAL.                   |                 | NUTR. |  | CHL. |  | WHIT'S<br>NUTR. |  |
| 1                      | 106       |                              |           |                  |          |                     |               |                 |                     |                         |                  |           |            |                        |                       |                      |         | ✓                      |                 | 1019  |  |      |  |                 |  |
| 2                      | 75        |                              |           |                  |          |                     |               |                 |                     |                         |                  |           |            |                        |                       |                      |         |                        |                 | 1020  |  |      |  |                 |  |
| 3                      | 61        |                              |           |                  |          |                     |               |                 |                     |                         |                  |           |            |                        |                       |                      |         |                        |                 | 1021  |  |      |  |                 |  |
| 4                      | 50        |                              |           |                  |          |                     |               |                 |                     |                         |                  |           |            |                        |                       |                      |         |                        |                 | 1022  |  | ✓    |  |                 |  |
| 5                      | 39        |                              |           |                  |          |                     |               |                 |                     |                         |                  |           |            |                        |                       |                      |         |                        |                 | 1023  |  | ✓    |  |                 |  |
| 6                      | 29        |                              |           |                  |          |                     |               |                 |                     |                         |                  |           |            |                        |                       |                      |         |                        |                 | 1024  |  | ✓    |  |                 |  |
| 7                      | 20        |                              |           |                  |          |                     |               |                 |                     |                         |                  |           |            |                        |                       |                      |         |                        |                 | 1025  |  | ✓    |  |                 |  |
| 8                      | 10        |                              |           |                  |          |                     |               |                 |                     |                         |                  |           |            |                        |                       |                      |         |                        |                 | 1026  |  | ✓    |  |                 |  |
| 9                      | 3         |                              |           |                  |          |                     |               |                 |                     |                         |                  |           |            |                        |                       |                      |         |                        |                 | 1027  |  | ✓    |  |                 |  |
| 10                     |           |                              |           |                  |          |                     |               |                 |                     |                         |                  |           |            |                        |                       |                      |         |                        |                 |       |  |      |  |                 |  |
| 11                     |           |                              |           |                  |          |                     |               |                 |                     |                         |                  |           |            |                        |                       |                      |         |                        |                 |       |  |      |  |                 |  |
| 12                     |           |                              |           |                  |          |                     |               |                 |                     |                         |                  |           |            |                        |                       |                      |         |                        |                 |       |  |      |  |                 |  |

604  
75  
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0.45 max fl

| VESSEL                 |            | PROJECT & LEG |           |            |            | STATION DESIGNATION |               |                  |                    |                      |               |           |            |                  |                 |              |         |                  |              |   |     |      |
|------------------------|------------|---------------|-----------|------------|------------|---------------------|---------------|------------------|--------------------|----------------------|---------------|-----------|------------|------------------|-----------------|--------------|---------|------------------|--------------|---|-----|------|
| NOAA RV MILLER FREEMAN |            | MF02-11       |           |            |            |                     |               |                  |                    |                      |               |           |            |                  |                 |              |         |                  |              |   |     |      |
| CONSC. CAST #          | LATITUDE   |               | LONGITUDE |            | DATE JD=   |                     | TIME (GMT)    |                  | DRY BULB (°C)      | WET BULB (°C)        | PRESSURE (mb) | SEA STATE | VISIBILITY | WIND DIRN. (deg) | WIND SPD. (m/s) | CLOUD (amt)  | WEATHER | BOTTOM DEPTH (m) | STA. NAME/ID |   |     |      |
| 08158                  | 25         | 20            | N         | 149        | 48         | 8                   | W             | 06               | 01                 | 02                   | 22            | 52        | 10         | 5                | 11              | 47           | 25      | 1                | 46           | 72  | 141 | PBC1 |
| CTD                    |            | TIMES         |           | JD/TIME    |            | DATA LOCATION       |               |                  |                    |                      |               |           |            |                  |                 |              |         |                  |              |   |     |      |
| TYPE & SN              |            | 9+ SN 91220   |           | DATA ON    |            | 22:53:00 GMT        |               | Tape/Diskette ID |                    | File Name/Header     |               |           |            |                  |                 |              |         |                  |              |   |     |      |
| PRESS SN               |            | 80020         |           | START DOWN |            | 22:53:00 GMT        |               |                  |                    |                      |               |           |            |                  |                 |              |         |                  |              |   |     |      |
| TEMP SN                |            | 710/884       |           | AT DEPTH   |            | 22:58:00 GMT        |               |                  |                    |                      |               |           |            |                  |                 |              |         |                  |              |   |     |      |
| COND SN                |            | 915/530       |           | AT SURFACE |            | 23:06:00 GMT        |               |                  |                    |                      |               |           |            |                  |                 |              |         |                  |              |   |     |      |
|                        |            |               |           |            |            |                     |               |                  |                    |                      |               |           |            |                  |                 |              |         |                  |              | REMARKS   |     |      |
|                        |            |               |           |            |            |                     |               |                  |                    |                      |               |           |            |                  |                 |              |         |                  |              | This cast showed large diff. in up & down cast. 82 is repeat. |     |      |
|                        |            |               |           |            |            |                     |               |                  |                    |                      |               |           |            |                  |                 |              |         |                  |              | MAX. DEPTH = 135 m  |     |      |
| POS.                   | TRIP DEPTH | PRESSURE      |           | PRI. TEMP. | SEC. TEMP. | PRI. SALINITY       | SEC. SALINITY | SALINITY         | SAMPLE BOTTLE DATA | SAMPLE BOTTLE NUMBER |               | SAL.      |            | NUTR.            | CHL             | WHIT'S NUTR. |         |                  |              |   |     |      |
| 1                      | 12.5       |               |           |            |            |                     |               |                  |                    |                      |               |           |            |                  |                 |              |         |                  |              |   |     |      |
| 2                      | 12.5       |               |           |            |            |                     |               |                  |                    |                      |               |           |            |                  |                 |              |         |                  |              |   |     |      |
| 3                      | 100        |               |           |            |            |                     |               |                  |                    |                      |               |           |            |                  |                 |              |         |                  |              |   |     |      |
| 4                      | 7.5        |               |           |            |            |                     |               |                  |                    |                      |               |           |            |                  |                 |              |         |                  |              |   |     |      |
| 5                      | 50         |               |           |            |            |                     |               |                  |                    |                      |               |           |            |                  |                 |              |         |                  |              |   |     |      |
| 6                      | 40         |               |           |            |            |                     |               |                  |                    |                      |               |           |            |                  |                 |              |         |                  |              |   |     |      |
| 7                      | 30         |               |           |            |            |                     |               |                  |                    |                      |               |           |            |                  |                 |              |         |                  |              |   |     |      |
| 8                      | 20         |               |           |            |            |                     |               |                  |                    |                      |               |           |            |                  |                 |              |         |                  |              |   |     |      |
| 9                      | 10         |               |           |            |            |                     |               |                  |                    |                      |               |           |            |                  |                 |              |         |                  |              |   |     |      |
| 10                     | 3          |               |           |            |            |                     |               |                  |                    |                      |               |           |            |                  |                 |              |         |                  |              |   |     |      |
| 11                     |            |               |           |            |            |                     |               |                  |                    |                      |               |           |            |                  |                 |              |         |                  |              |   |     |      |
| 12                     |            |               |           |            |            |                     |               |                  |                    |                      |               |           |            |                  |                 |              |         |                  |              |   |     |      |

bot  
125  
100  
75  
50  
40  
30  
20  
10  
0

Water dumped / no samples taken

0.55 max fl

| VESSEL                 |               | PROJECT & LEG |           | STATION DESIGNATION |          |                              |               |               |             |               |          |           |            |                       |              |                      |         |                 |                 |       |  |      |  |                 |  |
|------------------------|---------------|---------------|-----------|---------------------|----------|------------------------------|---------------|---------------|-------------|---------------|----------|-----------|------------|-----------------------|--------------|----------------------|---------|-----------------|-----------------|-------|--|------|--|-----------------|--|
| NOAA RV MILLER FREEMAN |               | MF02-11       |           |                     |          |                              |               |               |             |               |          |           |            |                       |              |                      |         |                 |                 |       |  |      |  |                 |  |
| CONSC<br>CAST #        | LATITUDE      |               | LONGITUDE |                     | DATE JD= |                              | TIME<br>(GMT) |               | DRY<br>BULB | WET<br>BULB   | PRESSURE | SEA STATE | VISIBILITY | WIND<br>DIRN.         | WIND<br>SPD. | CLOUD (amt)          | WEATHER | BOTTOM<br>DEPTH | STA.<br>NAME/ID |       |  |      |  |                 |  |
| DEG                    | MIN           | DEG           | MIN       | DAY                 | MO       | YR                           | HR            | MIN           | (°C)        | (°C)          | (mb)     | *         | *          | (deg)                 | (m/s)        | *                    | *       | (m)             |                 |       |  |      |  |                 |  |
| 082                    | 58            | 25            | 07        | N                   | 14       | 9                            | 49            | 26            | W           | 06            | 0        | C         | 0          | 2                     | 23           | 16                   | 10      | 5               | 114723913672    | PBC11 |  |      |  |                 |  |
| CTD                    |               | TIMES         |           | JD/TIME             |          | DATA LOCATION                |               |               |             |               |          |           |            |                       |              |                      |         |                 |                 |       |  |      |  |                 |  |
| TYPE & SN              |               | DATA ON       |           | 23:17:00 GMT        |          | File Name/Header             |               |               |             |               |          |           |            |                       |              |                      |         |                 |                 |       |  |      |  |                 |  |
| PRESS SN               |               | 80020         |           | 23:17:00 GMT        |          |                              |               |               |             |               |          |           |            |                       |              |                      |         |                 |                 |       |  |      |  |                 |  |
| TEMP SN                |               | 710/884       |           | 23:23:00 GMT        |          |                              |               |               |             |               |          |           |            |                       |              |                      |         |                 |                 |       |  |      |  |                 |  |
| COND SN                |               | 915/530       |           | 23:30:00 GMT        |          |                              |               |               |             |               |          |           |            |                       |              |                      |         |                 |                 |       |  |      |  |                 |  |
|                        |               |               |           |                     |          | MAX. DEPTH = 135 m           |               |               |             |               |          |           |            |                       |              |                      |         |                 |                 |       |  |      |  |                 |  |
|                        |               |               |           |                     |          | Cleared air bleed valve      |               |               |             |               |          |           |            |                       |              |                      |         |                 |                 |       |  |      |  |                 |  |
|                        |               |               |           |                     |          | TRANSMISSOMETER              |               |               |             |               |          |           |            |                       |              |                      |         |                 |                 |       |  |      |  |                 |  |
|                        |               |               |           |                     |          | Cham 109                     |               |               |             |               |          |           |            |                       |              |                      |         |                 |                 |       |  |      |  |                 |  |
|                        |               |               |           |                     |          | FLUOR 153                    |               |               |             |               |          |           |            |                       |              |                      |         |                 |                 |       |  |      |  |                 |  |
|                        |               |               |           |                     |          | PAR 4242                     |               |               |             |               |          |           |            |                       |              |                      |         |                 |                 |       |  |      |  |                 |  |
|                        |               |               |           |                     |          | CTD CONVERTED MONITOR VALUES |               |               |             |               |          |           |            |                       |              |                      |         |                 |                 |       |  |      |  |                 |  |
| POS.                   | TRIP<br>DEPTH | PRESSURE      |           | PRI. TEMP.          |          | SEC. TEMP.                   |               | PRI. SALINITY |             | SEC. SALINITY |          | SALINITY  |            | SAMPLE BOTTLE<br>DATA |              | SAMPLE BOTTLE NUMBER |         | SAL.            |                 | NUTR. |  | CHL. |  | WHIT'S<br>NUTR. |  |
| 1                      | 135           |               |           |                     |          |                              |               |               |             |               |          |           |            |                       |              |                      |         |                 |                 |       |  |      |  |                 |  |
| 2                      | 125           |               |           |                     |          |                              |               |               |             |               |          |           |            |                       |              |                      |         |                 |                 |       |  |      |  |                 |  |
| 3                      | 100           |               |           |                     |          |                              |               |               |             |               |          |           |            |                       |              |                      |         |                 |                 |       |  |      |  |                 |  |
| 4                      | 75            |               |           |                     |          |                              |               |               |             |               |          |           |            |                       |              |                      |         |                 |                 |       |  |      |  |                 |  |
| 5                      | 49            |               |           |                     |          |                              |               |               |             |               |          |           |            |                       |              |                      |         |                 |                 |       |  |      |  |                 |  |
| 6                      | 40            |               |           |                     |          |                              |               |               |             |               |          |           |            |                       |              |                      |         |                 |                 |       |  |      |  |                 |  |
| 7                      | 29            |               |           |                     |          |                              |               |               |             |               |          |           |            |                       |              |                      |         |                 |                 |       |  |      |  |                 |  |
| 8                      | 19            |               |           |                     |          |                              |               |               |             |               |          |           |            |                       |              |                      |         |                 |                 |       |  |      |  |                 |  |
| 9                      | 10            |               |           |                     |          |                              |               |               |             |               |          |           |            |                       |              |                      |         |                 |                 |       |  |      |  |                 |  |
| 10                     | 2             |               |           |                     |          |                              |               |               |             |               |          |           |            |                       |              |                      |         |                 |                 |       |  |      |  |                 |  |
| 11                     |               |               |           |                     |          |                              |               |               |             |               |          |           |            |                       |              |                      |         |                 |                 |       |  |      |  |                 |  |
| 12                     |               |               |           |                     |          |                              |               |               |             |               |          |           |            |                       |              |                      |         |                 |                 |       |  |      |  |                 |  |

0.5 max fl

| VESSEL                 |          | PROJECT & LEG |            |                              |               | STATION DESIGNATION |               |           |                     |           |                        |                       |             |                         |                        |                    |     |                      |  |
|------------------------|----------|---------------|------------|------------------------------|---------------|---------------------|---------------|-----------|---------------------|-----------|------------------------|-----------------------|-------------|-------------------------|------------------------|--------------------|-----|----------------------|--|
| NOAA RV MILLER FREEMAN |          | MF02-11       |            |                              |               |                     |               |           |                     |           |                        |                       |             |                         |                        |                    |     |                      |  |
| CONSC<br>CAST #        | LATITUDE |               | LONGITUDE  |                              | DATE JD=      |                     | TIME<br>(GMT) |           | WET<br>BULB<br>(°C) | SEA STATE | WIND<br>DIRN.<br>(deg) | WIND<br>SPD.<br>(m/s) | CLOUD (amt) | WEATHER                 | BOTTOM<br>DEPTH<br>(m) | STA.<br>NAME/ID    |     |                      |  |
|                        | DEG      | MIN           | DEG        | MIN                          | DAY           | MO                  | YR            | HR        |                     |           |                        |                       |             |                         |                        |                    | MIN |                      |  |
| 0835810                | 39       | N             | 149        | 25.06                        | W             | 07                  | O             | C         | T                   | 02        | 00                     | 10                    | 41          | 13                      | 47                     | 23                 | 104 | PX111                |  |
| CTD                    |          | TIMES         |            | JD/TIME                      |               | DATA LOCATION       |               |           |                     |           |                        |                       |             |                         |                        |                    |     |                      |  |
| TYPE & SN 9+ S/N 91220 |          | DATA ON       |            | 01:31:00 GMT                 |               | File Name/Header    |               |           |                     |           |                        |                       |             |                         |                        |                    |     |                      |  |
| PRESS SN 80020         |          | START DOWN    |            | 01:32:00 GMT                 |               |                     |               |           |                     |           |                        |                       |             |                         |                        |                    |     |                      |  |
| TEMP SN 710/884        |          | AT DEPTH      |            | 01:35:00 GMT                 |               |                     |               |           |                     |           |                        |                       |             |                         |                        |                    |     |                      |  |
| COND SN 915/530        |          | AT SURFACE    |            | 01:42:00 GMT                 |               | MAX. DEPTH = 100 m  |               |           |                     |           |                        |                       |             |                         |                        |                    |     |                      |  |
| POS.                   |          | TRIP DEPTH    |            | CTD CONVERTED MONITOR VALUES |               | PAR 4242            |               | FLUOR 153 |                     | CHAM 109  |                        | TRANSMISSOMETER       |             | Cleaned air bleed valve |                        | SAMPLE BOTTLE DATA |     | SAMPLE BOTTLE NUMBER |  |
| 1                      | 100      | PRESSURE      | PRI. TEMP. | SEC. TEMP.                   | PRI. SALINITY | SEC. SALINITY       | SALINITY      | SAL.      | NUTR.               | CHL.      | WHIT'S<br>NUTR.        |                       |             |                         |                        |                    |     |                      |  |
| 2                      | 75       |               |            |                              |               |                     |               | ✓         | 1038                |           |                        |                       |             |                         |                        |                    |     |                      |  |
| 3                      | 58       |               |            |                              |               |                     |               |           | 1039                |           |                        |                       |             |                         |                        |                    |     |                      |  |
| 4                      | 49       |               |            |                              |               |                     |               |           | 1040                |           |                        |                       |             |                         |                        |                    |     |                      |  |
| 5                      | 40       |               |            |                              |               |                     |               |           | 1041                |           |                        |                       |             |                         |                        |                    |     |                      |  |
| 6                      | 30       |               |            |                              |               |                     |               |           | 1042                |           |                        |                       |             |                         |                        |                    |     |                      |  |
| 7                      | 20       |               |            |                              |               |                     |               |           | 1043                |           |                        |                       |             |                         |                        |                    |     |                      |  |
| 8                      | 10       |               |            |                              |               |                     |               |           | 1044                |           |                        |                       |             |                         |                        |                    |     |                      |  |
| 9                      | 3        |               |            |                              |               |                     |               |           | 1045                |           |                        |                       |             |                         |                        |                    |     |                      |  |
| 10                     |          |               |            |                              |               |                     |               |           | 1046                |           |                        |                       |             |                         |                        |                    |     |                      |  |
| 11                     |          |               |            |                              |               |                     |               |           |                     |           |                        |                       |             |                         |                        |                    |     |                      |  |
| 12                     |          |               |            |                              |               |                     |               |           |                     |           |                        |                       |             |                         |                        |                    |     |                      |  |

60f  
75  
60  
56  
40  
20  
20  
10  
0

0.45 max fl

| VESSEL                  |          | PROJECT & LEG |           |                    |          | STATION DESIGNATION |               |                 |             |                         |           |               |              |             |         |                 |                 |       |      |                 |
|-------------------------|----------|---------------|-----------|--------------------|----------|---------------------|---------------|-----------------|-------------|-------------------------|-----------|---------------|--------------|-------------|---------|-----------------|-----------------|-------|------|-----------------|
| NOAA R/V MILLER FREEMAN |          | MF02-11       |           |                    |          |                     |               |                 |             |                         |           |               |              |             |         |                 |                 |       |      |                 |
| CONSC<br>CAST #         | LATITUDE |               | LONGITUDE |                    | DATE JD= |                     | TIME<br>(GMT) |                 | DRY<br>BULB | WET<br>BULB             | SEA STATE | WIND<br>DIRN. | WIND<br>SPD. | CLOUD (amt) | WEATHER | BOTTOM<br>DEPTH | STA.<br>NAME/ID |       |      |                 |
|                         | DEG      | MIN           | DEG       | MIN                | DAY      | MO                  | YR            | HR              | MIN         | (°C)                    | (°C)      | *             | (deg)        | (m/s)       | *       | (m)             |                 |       |      |                 |
| 0845                    | 81       | 3.5           | 14        | 38.4               | 20       | 10                  | 02            | 02              | 44          | 10.5                    | 1         | 3             | 47           | 2           | 12      | 17              | 672             | PX10  |      |                 |
| CTD                     |          | TIMES         |           | JD/TIME            |          | DATA LOCATION       |               |                 |             |                         |           |               |              |             |         |                 |                 |       |      |                 |
| TYPE & SN               |          | DATA ON       |           | 02:45:00           |          | File Name/Header    |               |                 |             |                         |           |               |              |             |         |                 |                 |       |      |                 |
| PRESS SN                |          | START DOWN    |           | 02:46:00           |          |                     |               |                 |             |                         |           |               |              |             |         |                 |                 |       |      |                 |
| TEMP SN                 |          | AT DEPTH      |           | 02:48:00           |          |                     |               |                 |             |                         |           |               |              |             |         |                 |                 |       |      |                 |
| COND SN                 |          | AT SURFACE    |           | 02:51:00           |          |                     |               |                 |             |                         |           |               |              |             |         |                 |                 |       |      |                 |
|                         |          | PAR 4242      |           | FLUOR 153          |          | CHAM 109            |               | TRANSMISSOMETER |             | Cleared air bleed valve |           |               |              |             |         |                 |                 |       |      |                 |
| POS.                    |          | TRIP<br>DEPTH |           | SAMPLE BOTTLE DATA |          |                     |               |                 |             |                         |           |               |              |             |         |                 |                 |       |      |                 |
|                         |          |               |           | PRESSURE           |          | PRI. TEMP.          |               | SEC. TEMP.      |             | PRI. SALINITY           |           | SEC. SALINITY |              | SALINITY    |         | SAL.            |                 | NUTR. | CHL. | WHIT'S<br>NUTR. |
| 1                       |          | 55            |           |                    |          |                     |               |                 |             |                         |           |               |              |             |         | ✓               |                 | 1047  | ✓    |                 |
| 2                       |          | 40            |           |                    |          |                     |               |                 |             |                         |           |               |              |             |         |                 |                 | 1048  | ✓    |                 |
| 3                       |          | 30            |           |                    |          |                     |               |                 |             |                         |           |               |              |             |         |                 |                 | 1049  | ✓    |                 |
| 4                       |          | 21            |           |                    |          |                     |               |                 |             |                         |           |               |              |             |         |                 |                 | 1050  | ✓    |                 |
| 5                       |          | 10            |           |                    |          |                     |               |                 |             |                         |           |               |              |             |         |                 |                 | 1051  | ✓    |                 |
| 6                       |          | 3             |           |                    |          |                     |               |                 |             |                         |           |               |              |             |         |                 |                 | 1052  | ✓    |                 |
| 7                       |          |               |           |                    |          |                     |               |                 |             |                         |           |               |              |             |         |                 |                 |       |      |                 |
| 8                       |          |               |           |                    |          |                     |               |                 |             |                         |           |               |              |             |         |                 |                 |       |      |                 |
| 9                       |          |               |           |                    |          |                     |               |                 |             |                         |           |               |              |             |         |                 |                 |       |      |                 |
| 10                      |          |               |           |                    |          |                     |               |                 |             |                         |           |               |              |             |         |                 |                 |       |      |                 |
| 11                      |          |               |           |                    |          |                     |               |                 |             |                         |           |               |              |             |         |                 |                 |       |      |                 |
| 12                      |          |               |           |                    |          |                     |               |                 |             |                         |           |               |              |             |         |                 |                 |       |      |                 |

bot  
46  
30  
20  
10  
0

0.5 max fl

| VESSEL                 |          | PROJECT & LEG |           |            |          | STATION DESIGNATION |               |                   |                     |                 |                        |                         |             |                      |                        |                 |       |                 |
|------------------------|----------|---------------|-----------|------------|----------|---------------------|---------------|-------------------|---------------------|-----------------|------------------------|-------------------------|-------------|----------------------|------------------------|-----------------|-------|-----------------|
| NOAA RV MILLER FREEMAN |          | MF02-11       |           |            |          |                     |               |                   |                     |                 |                        |                         |             |                      |                        |                 |       |                 |
| CONSC<br>CAST #        | LATITUDE |               | LONGITUDE |            | DATE JD= |                     | TIME<br>(GMT) |                   | WET<br>BULB<br>(°C) | SEA STATE       | WIND<br>DIRN.<br>(deg) | WIND<br>SPD.<br>(m/s)   | CLOUD (amt) | WEATHER              | BOTTOM<br>DEPTH<br>(m) | STA.<br>NAME/ID |       |                 |
|                        | DEG      | MIN           | DEG       | MIN        | DAY      | MO                  | YR            | HR                |                     |                 |                        |                         |             |                      |                        |                 | MIN   |                 |
| 085                    | 16.7     | 79N           | 149       | 51.7       | 79       | W                   | 07            | 01                | 20                  | 35              | 6                      | 10                      | 1           | 13                   | 47                     | 21              | 18672 | PX9             |
| CTD                    |          | TIMES         |           | JD/TIME    |          | DATA LOCATION       |               |                   |                     |                 |                        |                         |             |                      |                        |                 |       |                 |
| TYPE & SN              |          | 9+ SN 91220   |           | DATA ON    |          | 03:58:00 GMT        |               | File Name/Header  |                     |                 |                        |                         |             |                      |                        |                 |       |                 |
| PRESS SN               |          | 80020         |           | START DOWN |          | 03:58:00 GMT        |               |                   |                     |                 |                        |                         |             |                      |                        |                 |       |                 |
| TEMP SN                |          | 710884        |           | AT DEPTH   |          | 04:00:00 GMT        |               |                   |                     |                 |                        |                         |             |                      |                        |                 |       |                 |
| COND SN                |          | 915530        |           | AT SURFACE |          | 04:04:00 GMT        |               | MAX. DEPTH = 53 m |                     |                 |                        |                         |             |                      |                        |                 |       |                 |
| POS.                   |          | TRIP DEPTH    |           | PAR 4242   |          | FLUOR 153           |               | CHAM 109          |                     | TRANSMISSOMETER |                        | Cleaned air bleed valve |             | SAMPLE BOTTLE DATA   |                        |                 |       |                 |
|                        |          |               |           |            |          |                     |               |                   |                     |                 |                        |                         |             | SAMPLE BOTTLE NUMBER |                        |                 |       |                 |
| 1                      | 53       |               |           |            |          |                     |               |                   |                     |                 |                        |                         |             | SAL.                 |                        | NUTR.           | CHL.  | WHIT'S<br>NUTR. |
| 2                      | 40       |               |           |            |          |                     |               |                   |                     |                 |                        |                         |             | ✓                    |                        | 1053            | ✓     |                 |
| 3                      | 30       |               |           |            |          |                     |               |                   |                     |                 |                        |                         |             |                      |                        | 1054            | ✓     |                 |
| 4                      | 19       |               |           |            |          |                     |               |                   |                     |                 |                        |                         |             |                      |                        | 1055            | ✓     |                 |
| 5                      | 10       |               |           |            |          |                     |               |                   |                     |                 |                        |                         |             |                      |                        | 1056            | ✓     |                 |
| 6                      | 3        |               |           |            |          |                     |               |                   |                     |                 |                        |                         |             |                      |                        | 1057            | ✓     |                 |
| 7                      |          |               |           |            |          |                     |               |                   |                     |                 |                        |                         |             |                      |                        | 1058            | ✓     |                 |
| 8                      |          |               |           |            |          |                     |               |                   |                     |                 |                        |                         |             |                      |                        |                 |       |                 |
| 9                      |          |               |           |            |          |                     |               |                   |                     |                 |                        |                         |             |                      |                        |                 |       |                 |
| 10                     |          |               |           |            |          |                     |               |                   |                     |                 |                        |                         |             |                      |                        |                 |       |                 |
| 11                     |          |               |           |            |          |                     |               |                   |                     |                 |                        |                         |             |                      |                        |                 |       |                 |
| 12                     |          |               |           |            |          |                     |               |                   |                     |                 |                        |                         |             |                      |                        |                 |       |                 |

0.55 max f1



| VESSEL                 |               | PROJECT & LEG |           |              |          | STATION DESIGNATION          |               |               |             |               |           |            |               |                       |             |                      |                 |                 |  |
|------------------------|---------------|---------------|-----------|--------------|----------|------------------------------|---------------|---------------|-------------|---------------|-----------|------------|---------------|-----------------------|-------------|----------------------|-----------------|-----------------|--|
| NOAA RV MILLER FREEMAN |               | MF02-11       |           |              |          |                              |               |               |             |               |           |            |               |                       |             |                      |                 |                 |  |
| CONSC<br>CAST #        | LATITUDE      |               | LONGITUDE |              | DATE JD= |                              | TIME<br>(GMT) |               | DRY<br>BULB | WET<br>BULB   | SEA STATE | VISIBILITY | WIND<br>DIRN. | WIND<br>SPD.          | CLOUD (amt) | WEATHER              | BOTTOM<br>DEPTH | STA.<br>NAME/ID |  |
| DEG                    | MIN           | DEG           | MIN       | DAY          | MO       | YR                           | HR            | MIN           | (°C)        | (°C)          | (mb)      | *          | (deg)         | (m/s)                 | *           | *                    | (m)             |                 |  |
| 08658                  | 19            | 19            | 04        | 34           | 07       | 01                           | 05            | 05            | 10.6        | .             | 1347      | 206        | 21            | 672                   |             |                      | 53              | PX8             |  |
| CTD                    |               | TIMES         |           | JD/TIME      |          | DATA LOCATION                |               |               |             |               |           |            |               |                       |             |                      |                 |                 |  |
| TYPE & SN              |               | DATA ON       |           | 05:06:00 GMT |          | File Name/Header             |               |               |             |               |           |            |               |                       |             |                      |                 |                 |  |
| PRESS SN               |               | 80020         |           | 05:06:00 GMT |          |                              |               |               |             |               |           |            |               |                       |             |                      |                 |                 |  |
| TEMP SN                |               | 710/884       |           | 05:08:00 GMT |          |                              |               |               |             |               |           |            |               |                       |             |                      |                 |                 |  |
| COND SN                |               | 915/530       |           | 05:12:00 GMT |          |                              |               |               |             |               |           |            |               |                       |             |                      |                 |                 |  |
|                        |               |               |           |              |          | MAX. DEPTH = 48 m            |               |               |             |               |           |            |               |                       |             |                      |                 |                 |  |
|                        |               |               |           |              |          | Cleared air bleed valve      |               |               |             |               |           |            |               |                       |             |                      |                 |                 |  |
|                        |               |               |           |              |          | TRANSMISSOMETER              |               |               |             |               |           |            |               |                       |             |                      |                 |                 |  |
|                        |               |               |           |              |          | CHAM 109                     |               |               |             |               |           |            |               |                       |             |                      |                 |                 |  |
|                        |               |               |           |              |          | FLUOR 153                    |               |               |             |               |           |            |               |                       |             |                      |                 |                 |  |
|                        |               |               |           |              |          | PAR 4242                     |               |               |             |               |           |            |               |                       |             |                      |                 |                 |  |
|                        |               |               |           |              |          | CTD CONVERTED MONITOR VALUES |               |               |             |               |           |            |               |                       |             |                      |                 |                 |  |
| POS.                   | TRIP<br>DEPTH | PRESSURE      |           | PRI. TEMP.   |          | SEC. TEMP.                   |               | PRI. SALINITY |             | SEC. SALINITY |           | SALINITY   |               | SAMPLE BOTTLE<br>DATA |             | SAMPLE BOTTLE NUMBER |                 | WHIT'S<br>NUTR. |  |
| 1                      | 48            |               |           |              |          |                              |               |               |             |               |           |            |               |                       |             | 1059                 |                 | -               |  |
| 2                      | 40            |               |           |              |          |                              |               |               |             |               |           |            |               |                       |             | 1060                 |                 | ✓               |  |
| 3                      | 30            |               |           |              |          |                              |               |               |             |               |           |            |               |                       |             | 1061                 |                 | ✓               |  |
| 4                      | 20            |               |           |              |          |                              |               |               |             |               |           |            |               |                       |             | 1062                 |                 | ✓               |  |
| 5                      | 10            |               |           |              |          |                              |               |               |             |               |           |            |               |                       |             | 1063                 |                 | ✓               |  |
| 6                      | 3             |               |           |              |          |                              |               |               |             |               |           |            |               |                       |             | 1064                 |                 | ✓               |  |
| 7                      |               |               |           |              |          |                              |               |               |             |               |           |            |               |                       |             |                      |                 |                 |  |
| 8                      |               |               |           |              |          |                              |               |               |             |               |           |            |               |                       |             |                      |                 |                 |  |
| 9                      |               |               |           |              |          |                              |               |               |             |               |           |            |               |                       |             |                      |                 |                 |  |
| 10                     |               |               |           |              |          |                              |               |               |             |               |           |            |               |                       |             |                      |                 |                 |  |
| 11                     |               |               |           |              |          |                              |               |               |             |               |           |            |               |                       |             |                      |                 |                 |  |
| 12                     |               |               |           |              |          |                              |               |               |             |               |           |            |               |                       |             |                      |                 |                 |  |

60+  
40  
30  
20  
10  
0

0.55 max f!

$$\approx 0.6 \max f_l$$

| VESSEL                 |               | PROJECT & LEG                |            |              |               | STATION DESIGNATION |               |                 |             |                         |                 |                      |               |              |             |         |                 |                 |      |
|------------------------|---------------|------------------------------|------------|--------------|---------------|---------------------|---------------|-----------------|-------------|-------------------------|-----------------|----------------------|---------------|--------------|-------------|---------|-----------------|-----------------|------|
| NOAA RV MILLER FREEMAN |               | MF02-11                      |            |              |               |                     |               |                 |             |                         |                 |                      |               |              |             |         |                 |                 |      |
| CONSC<br>CAST #        | LATITUDE      |                              | LONGITUDE  |              | DATE JD=      |                     | TIME<br>(GMT) |                 | DRY<br>BULB | WET<br>BULB             | PRESSURE        | SEA STATE            | WIND<br>DIRN. | WIND<br>SPD. | CLOUD (amt) | WEATHER | BOTTOM<br>DEPTH | STA.<br>NAME/ID |      |
| DEG                    | MIN           | DEG                          | MIN        | DAY          | MO            | YR                  | HR            | MIN             | (°C)        | (°C)                    | (mb)            | *                    | (deg)         | (m/s)        | *           | *       | (m)             |                 |      |
| 088                    | 58            | 23                           | N          | 15           | 02            | 5                   | 06            | 42              | 10.5        |                         | 12.4            | 7                    | 20            | 1            | 22          | 6       | 72              | 68              | PK16 |
| CTD                    |               | TIMES                        |            | JD/TIME      |               | DATA LOCATION       |               |                 |             |                         |                 |                      |               |              |             |         |                 |                 |      |
| TYPE & SN              |               | DATA ON                      |            | 06:43:00 GMT |               | File Name/Header    |               |                 |             |                         |                 |                      |               |              |             |         |                 |                 |      |
| PRESS SN               |               | START DOWN                   |            | 06:44:00 GMT |               |                     |               |                 |             |                         |                 |                      |               |              |             |         |                 |                 |      |
| TEMP SN                |               | AT DEPTH                     |            | 06:45:00 GMT |               |                     |               |                 |             |                         |                 |                      |               |              |             |         |                 |                 |      |
| COND SN                |               | AT SURFACE                   |            | 06:51:00 GMT |               |                     |               |                 |             |                         |                 |                      |               |              |             |         |                 |                 |      |
|                        |               | PAR 4242                     |            | FLUOR 153    |               | CHIAM 109           |               | TRANSMISSOMETER |             | Cleaned air bleed valve |                 |                      |               |              |             |         |                 |                 |      |
| POS.                   | TRIP<br>DEPTH | CTD CONVERTED MONITOR VALUES |            |              |               |                     |               |                 |             |                         |                 |                      |               |              |             |         |                 |                 |      |
|                        |               | PRESSURE                     | PRI. TEMP. | SEC. TEMP.   | PRI. SALINITY | SEC. SALINITY       | SALINITY      | SAL.            | NUTR.       | CHL.                    | WHIT'S<br>NUTR. | SAMPLE BOTTLE NUMBER |               |              |             |         |                 |                 |      |
| 1                      | 64            |                              |            |              |               |                     |               | ✓               | 1070        |                         |                 |                      |               |              |             |         |                 |                 |      |
| 2                      | 50            |                              |            |              |               |                     |               |                 | 1071        | ✓                       |                 |                      |               |              |             |         |                 |                 |      |
| 3                      | 40            |                              |            |              |               |                     |               |                 | 1072        | ✓                       |                 |                      |               |              |             |         |                 |                 |      |
| 4                      | 31            |                              |            |              |               |                     |               |                 | 1073        | ✓                       |                 |                      |               |              |             |         |                 |                 |      |
| 5                      | 26            |                              |            |              |               |                     |               |                 | 1074        | ✓                       |                 |                      |               |              |             |         |                 |                 |      |
| 6                      | 10            |                              |            |              |               |                     |               |                 | 1075        | ✓                       |                 |                      |               |              |             |         |                 |                 |      |
| 7                      | 3             |                              |            |              |               |                     |               |                 | 1076        | ✓                       |                 |                      |               |              |             |         |                 |                 |      |
| 8                      |               |                              |            |              |               |                     |               |                 |             |                         |                 |                      |               |              |             |         |                 |                 |      |
| 9                      |               |                              |            |              |               |                     |               |                 |             |                         |                 |                      |               |              |             |         |                 |                 |      |
| 10                     |               |                              |            |              |               |                     |               |                 |             |                         |                 |                      |               |              |             |         |                 |                 |      |
| 11                     |               |                              |            |              |               |                     |               |                 |             |                         |                 |                      |               |              |             |         |                 |                 |      |
| 12                     |               |                              |            |              |               |                     |               |                 |             |                         |                 |                      |               |              |             |         |                 |                 |      |

0.55 max f1

| VESSEL                 |               | PROJECT & LEG                |            |              |               | STATION DESIGNATION |               |                       |                      |                         |          |                 |            |               |              |             |         |                 |                 |      |
|------------------------|---------------|------------------------------|------------|--------------|---------------|---------------------|---------------|-----------------------|----------------------|-------------------------|----------|-----------------|------------|---------------|--------------|-------------|---------|-----------------|-----------------|------|
| NOAA RV MILLER FREEMAN |               | MF02-11                      |            |              |               |                     |               |                       |                      |                         |          |                 |            |               |              |             |         |                 |                 |      |
| CONSC<br>CAST #        | LATITUDE      |                              | LONGITUDE  |              | DATE JD=      |                     | TIME<br>(GMT) |                       | DRY<br>BULB          | WET<br>BULB             | PRESSURE | SEA STATE       | VISIBILITY | WIND<br>DIRN. | WIND<br>SPD. | CLOUD (amt) | WEATHER | BOTTOM<br>DEPTH | STA.<br>NAME/ID |      |
|                        | DEG           | MIN                          | DEG        | MIN          | DAY           | MO                  | YR            | HR                    | MIN                  | (°C)                    | (°C)     | (mb)            | *          | *             | (deg)        | (m/s)       | *       | (m)             |                 |      |
| 089                    | 58            | 41                           | 150        | 35           | 18            | W                   | 07            | 0                     | 72                   | 4                       | 10       | 2               | 1          | 4             | 72           | 0           | 19      | 6               | 73              | PX18 |
| CTD                    |               | TIMES                        |            | JD/TIME      |               | DATA LOCATION       |               |                       |                      |                         |          |                 |            |               |              |             |         |                 |                 |      |
| TYPE & SN              |               | DATA ON                      |            | 07:27:00 GMT |               | File Name/Header    |               |                       |                      |                         |          |                 |            |               |              |             |         |                 |                 |      |
| PRESS SN               |               | START DOWN                   |            | 07:27:00 GMT |               |                     |               |                       |                      |                         |          |                 |            |               |              |             |         |                 |                 |      |
| TEMP SN                |               | AT DEPTH                     |            | 07:29:00 GMT |               |                     |               |                       |                      |                         |          |                 |            |               |              |             |         |                 |                 |      |
| COND SN                |               | AT SURFACE                   |            | 07:33:00 GMT |               |                     |               |                       |                      |                         |          |                 |            |               |              |             |         |                 |                 |      |
|                        |               | PAR 4242                     |            | FLUOR 153    |               | CHAM 109            |               | TRANSMISSOMETER       |                      | Cleared air bleed valve |          |                 |            |               |              |             |         |                 |                 |      |
| POS.                   | TRIP<br>DEPTH | CTD CONVERTED MONITOR VALUES |            |              |               |                     |               |                       |                      |                         |          |                 |            |               |              |             |         |                 |                 |      |
|                        |               | PRESSURE                     | PRI. TEMP. | SEC. TEMP.   | PRI. SALINITY | SEC. SALINITY       | SALINITY      | SAMPLE BOTTLE<br>DATA | SAMPLE BOTTLE NUMBER |                         |          |                 |            |               |              |             |         |                 |                 |      |
|                        |               |                              |            |              |               |                     |               |                       | SAL.                 | NUTR.                   | CHL.     | WHIT'S<br>NUTR. |            |               |              |             |         |                 |                 |      |
| 1                      | 68            |                              |            |              |               |                     |               |                       |                      | 1077                    |          |                 |            |               |              |             |         |                 |                 |      |
| 2                      | 50            |                              |            |              |               |                     |               |                       |                      |                         |          |                 |            |               |              |             |         |                 |                 |      |
| 3                      | 40            |                              |            |              |               |                     |               |                       |                      |                         |          |                 |            |               |              |             |         |                 |                 |      |
| 4                      | 31            |                              |            |              |               |                     |               |                       |                      |                         |          |                 |            |               |              |             |         |                 |                 |      |
| 5                      | 20            |                              |            |              |               |                     |               |                       |                      |                         |          |                 |            |               |              |             |         |                 |                 |      |
| 6                      | 10            |                              |            |              |               |                     |               |                       |                      |                         |          |                 |            |               |              |             |         |                 |                 |      |
| 7                      | 3             |                              |            |              |               |                     |               |                       |                      |                         |          |                 |            |               |              |             |         |                 |                 |      |
| 8                      |               |                              |            |              |               |                     |               |                       |                      |                         |          |                 |            |               |              |             |         |                 |                 |      |
| 9                      |               |                              |            |              |               |                     |               |                       |                      |                         |          |                 |            |               |              |             |         |                 |                 |      |
| 10                     |               |                              |            |              |               |                     |               |                       |                      |                         |          |                 |            |               |              |             |         |                 |                 |      |
| 11                     |               |                              |            |              |               |                     |               |                       |                      |                         |          |                 |            |               |              |             |         |                 |                 |      |
| 12                     |               |                              |            |              |               |                     |               |                       |                      |                         |          |                 |            |               |              |             |         |                 |                 |      |

0.55 max f1

| VESSEL                 |               | PROJECT & LEG |           |            |            | STATION DESIGNATION               |               |          |             |                       |          |                      |            |               |              |             |         |                 |                 |
|------------------------|---------------|---------------|-----------|------------|------------|-----------------------------------|---------------|----------|-------------|-----------------------|----------|----------------------|------------|---------------|--------------|-------------|---------|-----------------|-----------------|
| NOAA RV MILLER FREEMAN |               | MF02-11       |           |            |            |                                   |               |          |             |                       |          |                      |            |               |              |             |         |                 |                 |
| CONSC<br>CAST #        | LATITUDE      |               | LONGITUDE |            | DATE JD=   |                                   | TIME<br>(GMT) |          | DRY<br>BULB | WET<br>BULB           | PRESSURE | SEA STATE            | VISIBILITY | WIND<br>DIRN. | WIND<br>SPD. | CLOUD (amt) | WEATHER | BOTTOM<br>DEPTH | STA.<br>NAME/ID |
|                        | DEG           | MIN           | DEG       | MIN        | DAY        | MO                                | YR            | HR       | MIN         | (°C)                  | (°C)     | (mb)                 | *          | (deg)         | (m/s)        | *           | *       | (m)             |                 |
| 0905825.8              | N             | 15044.4       | W         | 070        | O          | C                                 | T             | 02       | 48          | 16.1                  |          | 1136                 | 1722       | 4             | 876          |             | 77      | PX4             |                 |
| CTD                    |               | TIMES         |           | JD/TIME    |            | DATA LOCATION                     |               |          |             |                       |          |                      |            |               |              |             |         |                 |                 |
| TYPE & SN              |               | DATA ON       |           |            |            | Tape/Diskette ID File Name/Header |               |          |             |                       |          |                      |            |               |              |             |         |                 |                 |
| PRESS SN               |               | 80020         |           |            |            |                                   |               |          |             |                       |          |                      |            |               |              |             |         |                 |                 |
| TEMP SN                |               | 710/884       |           |            |            |                                   |               |          |             |                       |          |                      |            |               |              |             |         |                 |                 |
| COND SN                |               | 915/530       |           |            |            |                                   |               |          |             |                       |          |                      |            |               |              |             |         |                 |                 |
|                        |               |               |           |            |            | MAX. DEPTH = m                    |               |          |             |                       |          |                      |            |               |              |             |         |                 |                 |
| POS.                   | TRIP<br>DEPTH | PRESSURE      |           | PRI. TEMP. | SEC. TEMP. | PRI. SALINITY                     | SEC. SALINITY | SALINITY |             | SAMPLE BOTTLE<br>DATA |          | SAMPLE BOTTLE NUMBER |            | SAL.          |              | NUTR.       | CHL.    | WHIT'S<br>NUTR. |                 |
| 1                      | 704           |               |           |            |            |                                   |               |          |             |                       |          |                      |            |               |              |             |         |                 |                 |
| 2                      | 604           |               |           |            |            |                                   |               |          |             |                       |          |                      |            |               |              |             |         |                 |                 |
| 3                      | 504           |               |           |            |            |                                   |               |          |             |                       |          |                      |            |               |              |             |         |                 |                 |
| 4                      | 404           |               |           |            |            |                                   |               |          |             |                       |          |                      |            |               |              |             |         |                 |                 |
| 5                      | 304           |               |           |            |            |                                   |               |          |             |                       |          |                      |            |               |              |             |         |                 |                 |
| 6                      | 204           |               |           |            |            |                                   |               |          |             |                       |          |                      |            |               |              |             |         |                 |                 |
| 7                      | 104           |               |           |            |            |                                   |               |          |             |                       |          |                      |            |               |              |             |         |                 |                 |
| 8                      | 0             |               |           |            |            |                                   |               |          |             |                       |          |                      |            |               |              |             |         |                 |                 |
| 9                      |               |               |           |            |            |                                   |               |          |             |                       |          |                      |            |               |              |             |         |                 |                 |
| 10                     |               |               |           |            |            |                                   |               |          |             |                       |          |                      |            |               |              |             |         |                 |                 |
| 11                     |               |               |           |            |            |                                   |               |          |             |                       |          |                      |            |               |              |             |         |                 |                 |
| 12                     |               |               |           |            |            |                                   |               |          |             |                       |          |                      |            |               |              |             |         |                 |                 |

Fluor max = 0.33