

SOUTH HEART COAL LLC
SOUTH HEART POWER PROJECT
SOUTH HEART, NORTH DAKOTA

DRAFT



HYDROGRAPH OF DAILY AVERAGE STREAMFLOW AT SHHR-01 (Heart River)

SURFACE WATER

| | | | | |
|-------------|--------------------------------------|--------|-----|------------|
| PROJECT NO. | 063-2174Y09 | DESIGN | BER | 05/24/2010 |
| FILE | Attachment A and Tables 1 and 2.xlsx | CHECK | ANH | 05/24/2010 |
| REV. | 1 | REVIEW | EJP | 05/24/2010 |

DAILY AVERAGE STREAMFLOW AT SHHR-01 (Heart River)

| Day | 2006 | | | | | | | | | | | |
|--------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------------|
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
| 1 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
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| 10 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 11 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 12 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
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| 15 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 16 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 17 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 18 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 19 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 20 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.38 |
| 21 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice |
| 22 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice |
| 23 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice |
| 24 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice |
| 25 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice |
| 26 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice |
| 27 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice |
| 28 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.16 |
| 29 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice |
| 30 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice |
| 31 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice |
| Total (cfs) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.54 |
| Mean (cfs) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.27 |
| Max (cfs) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.38 |
| Min (cfs) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.16 |

Notes:

- "--" = No data
- Ice = If more than 6 hours with 50% or more of the 5-minute data points indicated temperature recordings at or below freezing, the day was designated as ice-influenced; no daily average flow was calculated for this day.
- FE = Stage exceeded flume height for at least one measurement on this day. For time steps where stage exceeded flume height, flow was estimated using maximum flume height.
- If calculated average daily flow fell below the minimum measureable flume flow, the daily average flow was set to 0 cfs.
- cfs = cubic feet per second

DAILY AVERAGE STREAMFLOW AT SHHR-01 (Heart River)

| Day | 2007 | | | | | | | | | | | |
|--------------------|-------------|-----------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-----------|-----------|
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
| 1 | 0.45 | Ice | Ice | 0.07 | 0.02 | 0.13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.54 | -- |
| 2 | Ice | Ice | Ice | 0.08 | 0.02 | 0.17 | 0.00 | 0.00 | 0.00 | 0.01 | 0.54 | -- |
| 3 | Ice | Ice | Ice | 0.07 | 0.02 | 0.15 | 0.01 | 0.00 | 0.00 | 0.00 | 0.56 | -- |
| 4 | Ice | Ice | Ice | 0.05 | 0.02 | 0.15 | 0.00 | 0.00 | 0.00 | 0.01 | 0.55 | -- |
| 5 | Ice | Ice | Ice | 0.05 | 0.02 | 0.15 | 0.00 | 0.00 | 0.00 | 0.01 | 0.55 | -- |
| 6 | Ice | Ice | Ice | 0.04 | 0.05 | 0.13 | 0.00 | 0.00 | 0.01 | 0.01 | 0.56 | -- |
| 7 | Ice | Ice | Ice | 0.03 | 0.06 | 0.13 | 0.00 | 0.00 | 0.00 | 0.01 | 0.56 | -- |
| 8 | Ice | Ice | Ice | 0.03 | 0.04 | 0.14 | 0.01 | 0.00 | 0.01 | 0.06 | 0.56 | -- |
| 9 | Ice | Ice | Ice | 0.02 | 0.02 | 0.08 | 0.01 | 0.00 | 0.01 | 0.13 | -- | -- |
| 10 | Ice | Ice | Ice | 0.03 | 0.02 | 0.04 | 0.01 | 0.00 | 0.01 | 0.13 | -- | -- |
| 11 | Ice | Ice | Ice | 0.03 | 0.02 | 0.02 | 0.00 | 0.00 | 0.01 | 0.15 | -- | -- |
| 12 | Ice | Ice | Ice | 0.04 | 0.01 | 0.02 | 0.00 | 0.00 | 0.01 | 0.16 | -- | -- |
| 13 | Ice | Ice | Ice | 0.06 | 0.01 | 0.02 | 0.00 | 0.00 | 0.01 | 0.16 | -- | -- |
| 14 | Ice | Ice | Ice | 0.13 | 2.26 | 0.01 | 0.00 | 0.00 | 0.01 | 0.25 | -- | -- |
| 15 | Ice | Ice | Ice | 0.22 | 2.60 | 0.01 | 0.00 | 0.00 | 0.01 | 0.31 | -- | -- |
| 16 | Ice | Ice | Ice | 0.43 | 1.15 | 0.01 | 0.00 | 0.00 | 0.01 | 0.31 | -- | -- |
| 17 | Ice | Ice | Ice | 0.32 | 0.64 | 0.01 | 0.00 | 0.01 | 0.00 | 0.34 | -- | -- |
| 18 | Ice | Ice | Ice | 0.17 | 0.34 | 0.01 | 0.01 | 0.01 | 0.00 | 0.38 | -- | -- |
| 19 | Ice | Ice | 0.04 | 0.09 | 0.19 | 0.01 | 0.00 | 0.01 | 0.00 | 0.41 | -- | -- |
| 20 | Ice | Ice | 0.03 | 0.09 | 0.19 | 0.01 | 0.00 | 0.00 | 0.00 | 0.45 | -- | -- |
| 21 | Ice | Ice | 0.03 | 0.09 | 0.10 | 0.01 | 0.00 | 0.00 | 0.00 | 0.47 | -- | -- |
| 22 | Ice | Ice | 0.02 | 0.05 | 0.07 | 0.01 | 0.00 | 0.00 | 0.00 | 0.48 | -- | -- |
| 23 | Ice | Ice | 0.02 | 0.03 | 0.06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.50 | -- | -- |
| 24 | Ice | Ice | 0.02 | 0.02 | 0.03 | 0.00 | 0.00 | 0.01 | 0.00 | 0.51 | -- | -- |
| 25 | Ice | Ice | 0.02 | 0.02 | 0.03 | 0.00 | 0.00 | 0.01 | 0.00 | 0.51 | -- | -- |
| 26 | Ice | Ice | 0.02 | 0.02 | 0.04 | 0.01 | 0.00 | 0.01 | 0.00 | 0.52 | -- | -- |
| 27 | Ice | Ice | 0.01 | 0.01 | 0.06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.55 | -- | -- |
| 28 | Ice | Ice | 0.02 | 0.01 | 0.03 | 0.00 | 0.00 | 0.01 | 0.00 | 0.49 | -- | -- |
| 29 | Ice | -- | 0.04 | 0.01 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.53 | -- | -- |
| 30 | Ice | -- | 0.06 | 0.01 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.52 | -- | -- |
| 31 | Ice | -- | 0.06 | -- | 0.05 | -- | 0.00 | 0.00 | -- | 0.54 | -- | -- |
| Total (cfs) | 0.45 | -- | 0.38 | 2.31 | 8.18 | 1.42 | 0.12 | 0.13 | 0.11 | 8.86 | -- | -- |
| Mean (cfs) | 0.45 | -- | 0.03 | 0.08 | 0.26 | 0.05 | 0.00 | 0.00 | 0.00 | 0.29 | -- | -- |
| Max (cfs) | 0.45 | -- | 0.06 | 0.43 | 2.60 | 0.17 | 0.01 | 0.01 | 0.01 | 0.55 | -- | -- |
| Min (cfs) | 0.45 | -- | 0.01 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |

Notes:

- "--" = No data
- Ice = If more than 6 hours with 50% or more of the 5-minute data points indicated temperature recordings at or below freezing, the day was designated as ice-influenced; no daily average flow was calculated for this day.
- FE = Stage exceeded flume height for at least one measurement on this day. For time steps where stage exceeded flume height, flow was estimated using maximum flume height.
- If calculated average daily flow fell below the minimum measureable flume flow, the daily average flow was set to 0 cfs.
- cfs = cubic feet per second

DAILY AVERAGE STREAMFLOW AT SHHR-01 (Heart River)

| Day | 2008 | | | | | | | | | | | |
|--------------------|------|-----|-------------|--------------|--------------|-------------|-------------|--------------|--------------|--------------|--------------|--------------|
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
| 1 | -- | -- | -- | 0.37 | 0.36 | 0.32 | 0.22 | 0.05 | 0.68 | 0.91 | 0.91 | 0.91 |
| 2 | -- | -- | -- | 0.37 | 0.37 | 0.31 | 0.22 | 0.13 | 0.69 | 0.90 | 0.91 | 0.91 |
| 3 | -- | -- | -- | 0.36 | 0.36 | 0.30 | 0.22 | 0.15 | 0.67 | 0.90 | 0.91 | 0.90 |
| 4 | -- | -- | -- | 0.37 | 0.36 | 0.30 | 0.21 | 0.18 | 0.69 | 0.90 | 0.90 | 0.89 |
| 5 | -- | -- | -- | 0.34 | 0.36 | 0.30 | 0.21 | 0.14 | 0.70 | 0.91 | 0.92 | 0.88 |
| 6 | -- | -- | -- | 0.33 | 0.35 | 0.31 | 0.20 | 0.16 | 0.71 | 0.90 | 0.95 | 0.90 |
| 7 | -- | -- | -- | 0.36 | 0.35 | 0.30 | 0.21 | 0.22 | 0.71 | 0.90 | 0.92 | 0.90 |
| 8 | -- | -- | -- | 0.37 | 0.35 | 0.29 | 0.20 | 0.22 | 0.71 | 0.90 | 0.92 | 0.91 |
| 9 | -- | -- | -- | 0.37 | 0.35 | 0.29 | 0.17 | 0.27 | 0.73 | 0.90 | 0.92 | 0.90 |
| 10 | -- | -- | -- | 0.38 | 0.38 | 0.29 | 0.19 | 0.30 | 0.76 | 0.91 | 0.92 | 0.90 |
| 11 | -- | -- | -- | 0.37 | 0.36 | 0.29 | 0.20 | 0.33 | 0.78 | 0.91 | 0.92 | 0.91 |
| 12 | -- | -- | -- | 0.38 | 0.36 | 0.29 | 0.19 | 0.33 | 0.81 | 0.93 | 0.93 | 0.90 |
| 13 | -- | -- | -- | 0.38 | 0.36 | 0.29 | 0.19 | 0.37 | 0.83 | 0.91 | 0.94 | 0.91 |
| 14 | -- | -- | -- | 0.38 | 0.36 | 0.28 | 0.19 | 0.42 | 0.85 | 0.91 | 0.93 | 0.90 |
| 15 | -- | -- | -- | 0.40 | 0.36 | 0.26 | 0.19 | 0.47 | 0.86 | 0.90 | 0.92 | 0.89 |
| 16 | -- | -- | -- | 0.37 | 0.36 | 0.26 | 0.19 | 0.51 | 0.86 | 0.90 | 0.92 | 0.89 |
| 17 | -- | -- | -- | 0.36 | 0.36 | 0.26 | 0.18 | 0.53 | 0.88 | 0.90 | 0.92 | 0.89 |
| 18 | -- | -- | -- | 0.36 | 0.37 | 0.26 | 0.12 | 0.54 | 0.89 | 0.90 | 0.92 | 0.89 |
| 19 | -- | -- | -- | 0.36 | 0.37 | 0.26 | 0.18 | 0.55 | 0.90 | 0.90 | 0.92 | 0.89 |
| 20 | -- | -- | -- | 0.37 | 0.37 | 0.26 | 0.19 | 0.56 | 0.92 | 0.90 | 0.92 | 0.92 |
| 21 | -- | -- | 0.35 | 0.36 | 0.36 | 0.26 | 0.18 | 0.57 | 0.93 | 0.90 | 0.92 | 0.91 |
| 22 | -- | -- | 0.35 | 0.37 | 0.36 | 0.25 | 0.17 | 0.60 | 0.94 | 0.90 | 0.92 | 0.94 |
| 23 | -- | -- | 0.35 | 0.37 | 0.36 | 0.25 | 0.16 | 0.60 | 0.94 | 0.90 | 0.92 | 1.01 |
| 24 | -- | -- | 0.37 | 0.39 | 0.38 | 0.25 | 0.16 | 0.60 | 0.92 | 0.90 | 0.92 | 1.01 |
| 25 | -- | -- | 0.36 | 0.38 | 0.37 | 0.25 | 0.16 | 0.61 | 0.93 | 0.90 | 0.92 | 1.01 |
| 26 | -- | -- | 0.36 | 0.37 | 0.35 | 0.24 | 0.16 | 0.61 | 0.92 | 0.91 | 0.91 | 1.01 |
| 27 | -- | -- | 0.36 | 0.36 | 0.34 | 0.24 | 0.17 | 0.62 | 0.92 | 0.91 | 0.91 | 1.01 |
| 28 | -- | -- | 0.36 | 0.36 | 0.33 | 0.23 | 0.13 | 0.63 | 0.91 | 0.91 | 0.91 | 1.00 |
| 29 | -- | -- | 0.37 | 0.36 | 0.33 | 0.23 | 0.13 | 0.63 | 0.91 | 0.91 | 0.91 | 0.99 |
| 30 | -- | -- | 0.36 | 0.36 | 0.33 | 0.22 | 0.14 | 0.65 | 0.91 | 0.91 | 0.91 | 0.99 |
| 31 | -- | -- | 0.35 | -- | 0.32 | -- | 0.13 | 0.65 | -- | 0.91 | -- | 0.99 |
| Total (cfs) | -- | -- | 3.95 | 11.06 | 11.05 | 8.12 | 5.53 | 13.20 | 24.83 | 28.04 | 27.54 | 28.86 |
| Mean (cfs) | -- | -- | 0.36 | 0.37 | 0.36 | 0.27 | 0.18 | 0.43 | 0.83 | 0.90 | 0.92 | 0.93 |
| Max (cfs) | -- | -- | 0.37 | 0.40 | 0.38 | 0.32 | 0.22 | 0.65 | 0.94 | 0.93 | 0.95 | 1.01 |
| Min (cfs) | -- | -- | 0.35 | 0.33 | 0.32 | 0.22 | 0.12 | 0.05 | 0.67 | 0.90 | 0.90 | 0.88 |

Notes:

- "--" = No data
- Ice = If more than 6 hours with 50% or more of the 5-minute data points indicated temperature recordings at or below freezing, the day was designated as ice-influenced; no daily average flow was calculated for this day.
- FE = Stage exceeded flume height for at least one measurement on this day. For time steps where stage exceeded flume height, flow was estimated using maximum flume height.
- If calculated average daily flow fell below the minimum measureable flume flow, the daily average flow was set to 0 cfs.
- cfs = cubic feet per second

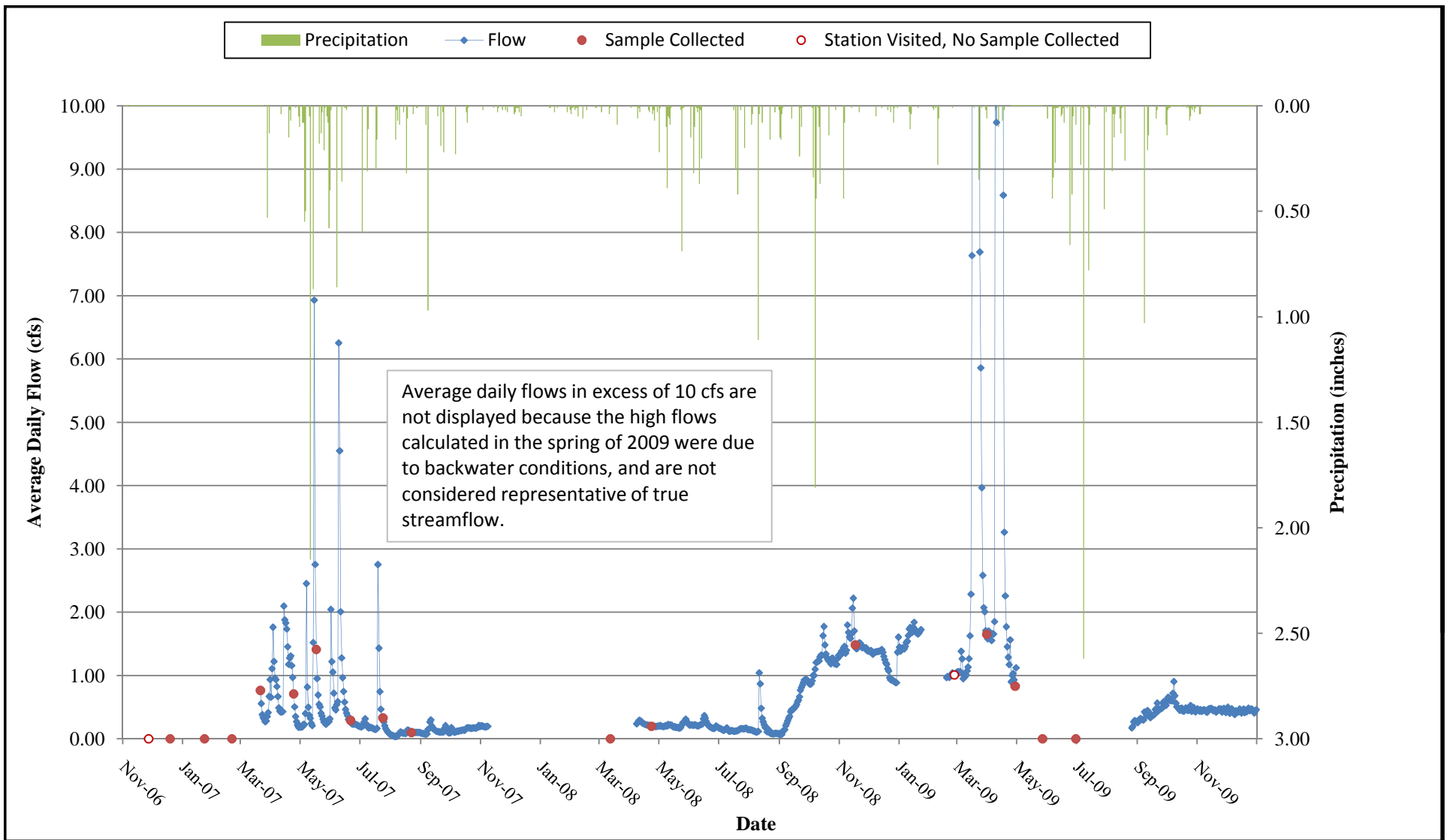
DAILY AVERAGE STREAMFLOW AT SHHR-01 (Heart River)

| Day | 2009 | | | | | | | | | | | |
|--------------------|--------------|--------------|--------------------|--------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
| 1 | 0.99 | 1.00 | 0.99 | 1.38 | 1.13 | 0.99 | 0.88 | 0.84 | 0.79 | 1.14 | 1.18 | 1.21 |
| 2 | 1.01 | 1.00 | 0.99 | 1.43 | 1.07 | 0.98 | 0.87 | 0.84 | 0.79 | 1.13 | 1.20 | 1.21 |
| 3 | 1.06 | 1.00 | 0.99 | 1.37 | 1.05 | 0.96 | 0.86 | 0.83 | 0.78 | 1.13 | 1.20 | 1.21 |
| 4 | 1.04 | 1.00 | 1.00 | 1.40 | 1.03 | 0.95 | 0.87 | 0.79 | 0.78 | 1.14 | 1.20 | 1.20 |
| 5 | 1.04 | 1.00 | 1.03 | 1.51 | 1.02 | 0.92 | 0.86 | 0.79 | 0.77 | 1.17 | 1.19 | 1.20 |
| 6 | 1.03 | 1.00 | 1.02 | 1.49 | 1.01 | 0.98 | 0.85 | 0.83 | 0.77 | 1.17 | 1.19 | 1.21 |
| 7 | 1.04 | 1.00 | 1.01 | 1.50 | 0.99 | 1.02 | 0.93 | 0.84 | 0.78 | 1.15 | 1.19 | 1.20 |
| 8 | 1.03 | 1.00 | 1.02 | 2.46 | 1.00 | 1.04 | 1.18 | 0.84 | 0.88 | 1.15 | 1.20 | 1.20 |
| 9 | 1.04 | 1.01 | 1.01 | 5.59 | 0.99 | 1.05 | 5.88 | 0.81 | 0.81 | 1.15 | 1.21 | 1.20 |
| 10 | 1.03 | 1.05 | 1.00 | 3.33 | 0.99 | 1.06 | 2.87 | 0.80 | 0.79 | 1.15 | 1.22 | 1.20 |
| 11 | 1.03 | 1.04 | 1.01 | 6.33 ¹ | 0.99 | 1.04 | 1.67 | 0.80 | 0.81 | 1.15 | 1.22 | 1.20 |
| 12 | 1.03 | 1.01 | 1.00 | 10.19 ¹ | 1.00 | 1.03 | 1.35 | 0.79 | 0.83 | 1.16 | 1.21 | 1.20 |
| 13 | 1.03 | 1.01 | 1.01 | 7.09 ¹ | 1.02 | 1.01 | 1.22 | 0.78 | 0.82 | 1.16 | 1.22 | 1.20 |
| 14 | 1.03 | 1.01 | 1.04 | 2.54 ¹ | 0.98 | 0.98 | 1.18 | 0.79 | 0.81 | 1.16 | 1.21 | 1.20 |
| 15 | 1.03 | 1.00 | 1.13 | 1.85 ¹ | 0.97 | 0.95 | 1.11 | 0.78 | 0.78 | 1.16 | 1.21 | 1.19 |
| 16 | 1.02 | 1.00 | 13.19 ¹ | 1.62 ¹ | 0.96 | 0.96 | 1.10 | 0.78 | 0.88 | 1.16 | 1.22 | 1.19 |
| 17 | 1.02 | 1.00 | 32.80 ¹ | 1.46 | 0.95 | 1.02 | 1.00 | 0.79 | 0.93 | 1.15 | 1.22 | 1.20 |
| 18 | 1.02 | 1.00 | 27.19 ¹ | 1.37 | 0.94 | 1.11 | 0.98 | 0.77 | 0.96 | 1.17 | 1.22 | 1.20 |
| 19 | 1.02 | 1.00 | 13.63 ¹ | 1.30 | 0.93 | 1.00 | 0.95 | 0.75 | 1.00 | 1.18 | 1.22 | 1.19 |
| 20 | 1.02 | 1.00 | 9.44 ¹ | 1.25 | 0.92 | 0.94 | 0.92 | 0.79 | 1.06 | 1.19 | 1.22 | 1.20 |
| 21 | 1.02 | 1.00 | 6.35 ¹ | 1.19 | 0.92 | 0.92 | 0.89 | 0.80 | 1.08 | 1.17 | 1.21 | 1.20 |
| 22 | 1.02 | 1.00 | 4.77 ¹ | 1.17 | 0.92 | 0.90 | 0.87 | 0.78 | 1.09 | 1.18 | 1.22 | 1.20 |
| 23 | 1.02 | 1.00 | 3.33 ¹ | 1.14 | 0.92 | 0.88 | 0.85 | 0.79 | 1.08 | 1.18 | 1.22 | 1.21 |
| 24 | 1.02 | 1.00 | 2.20 | 1.11 | 0.95 | 0.94 | 0.85 | 0.80 | 1.07 | 1.18 | 1.21 | 1.21 |
| 25 | 1.02 | 1.00 | 1.68 | 1.14 | 1.14 | 1.30 | 0.86 | 0.78 | 1.09 | 1.17 | 1.21 | 1.24 |
| 26 | 1.01 | 1.00 | 1.27 | 1.19 | 1.20 | 1.01 | 0.86 | 0.77 | 1.09 | 1.17 | 1.21 | 1.26 |
| 27 | 1.01 | 1.00 | 1.29 | 1.18 | 1.11 | 0.99 | 0.85 | 0.77 | 1.11 | 1.16 | 1.21 | 1.24 |
| 28 | 1.00 | 0.99 | 1.33 | 1.16 | 1.07 | 0.94 | 0.84 | 0.77 | 1.11 | 1.18 | 1.21 | 1.23 |
| 29 | 1.00 | -- | 1.35 | 1.18 | 1.04 | 0.89 | 0.87 | 0.79 | 1.13 | 1.18 | 1.20 | 1.23 |
| 30 | 1.00 | -- | 1.27 | 1.17 | 1.02 | 0.87 | 0.86 | 0.77 | 1.13 | 1.18 | 1.20 | 1.23 |
| 31 | 1.00 | -- | 1.33 | -- | 1.02 | -- | 0.84 | 0.78 | -- | 1.18 | -- | 1.23 |
| Total (cfs) | 31.68 | 28.08 | 137.63 | 68.05 | 31.22 | 29.61 | 36.95 | 24.63 | 27.79 | 36.02 | 36.22 | 37.47 |
| Mean (cfs) | 1.02 | 1.00 | 1.17 | 1.60 | 1.01 | 0.99 | 1.19 | 0.79 | 0.93 | 1.16 | 1.21 | 1.21 |
| Max (cfs) | 1.06 | 1.05 | 2.20 | 5.59 | 1.20 | 1.30 | 5.88 | 0.84 | 1.13 | 1.19 | 1.22 | 1.26 |
| Min (cfs) | 0.99 | 0.99 | 0.99 | 1.11 | 0.92 | 0.87 | 0.84 | 0.75 | 0.77 | 1.13 | 1.18 | 1.19 |

Notes:

- "--" = No data
- Ice = If more than 6 hours with 50% or more of the 5-minute data points indicated temperature recordings at or below freezing, the day was designated as ice-influenced; no daily average flow was calculated for this day.
- FE = Stage exceeded flume height for at least one measurement on this day. For time steps where stage exceeded flume height, flow was estimated using maximum flume height.
- If calculated average daily flow fell below the minimum measureable flume flow, the daily average flow was set to 0 cfs.
- cfs = cubic feet per second

¹ Calculated streamflows considered invalid due to backwater conditions; calculated flow was not included in mean and maximum monthly flows.



SOUTH HEART COAL LLC
 SOUTH HEART POWER PROJECT
 SOUTH HEART, NORTH DAKOTA

DRAFT



**HYDROGRAPH OF DAILY AVERAGE STREAMFLOW AT SHHR-02
 (Heart River)**

| SURFACE WATER | | | | | |
|---------------|--------------------------------------|--------|-----|------------|--|
| PROJECT NO. | 063-2174Y09 | DESIGN | BER | 05/24/2010 | |
| FILE | Attachment A and Tables 1 and 2.xlsx | CHECK | ANH | 05/24/2010 | |
| REV. | 1 | REVIEW | EJP | 05/24/2010 | |

DAILY AVERAGE STREAMFLOW AT SHHR-02 (Heart River)

| Day | 2006 | | | | | | | | | | | |
|--------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
| 1 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 2 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 4 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 5 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 6 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 7 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 8 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 9 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 10 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 11 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 12 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 13 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 14 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 15 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 16 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice |
| 17 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice |
| 18 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice |
| 19 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice |
| 20 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice |
| 21 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice |
| 22 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice |
| 23 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice |
| 24 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice |
| 25 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice |
| 26 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice |
| 27 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice |
| 28 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice |
| 29 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice |
| 30 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice |
| 31 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice |
| Total (cfs) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Mean (cfs) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Max (cfs) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Min (cfs) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |

Notes:

- "--" = No data
- Ice = If more than 6 hours with 50% or more of the 5-minute data points indicated temperature recordings at or below freezing, the day was designated as ice-influenced; no daily average flow was calculated for this day.
- FE = Stage exceeded flume height for at least one measurement on this day. For time steps where stage exceeded flume height, flow was estimated using maximum flume height.
- If calculated average daily flow fell below the minimum measureable flume flow, the daily average flow was set to 0 cfs.
- cfs = cubic feet per second

DAILY AVERAGE STREAMFLOW AT SHHR-02 (Heart River)

| Day | 2007 | | | | | | | | | | | |
|--------------------|------|-----|-------------|--------------|--------------|--------------|--------------|-------------|-------------|-------------|-------------|-----|
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
| 1 | Ice | Ice | Ice | 0.65 | 0.18 | 2.04 | 0.19 | 0.07 | 0.09 | 0.10 | 0.20 | -- |
| 2 | Ice | Ice | Ice | 1.11 | 0.19 | 1.22 | 0.19 | 0.06 | 0.09 | 0.18 | 0.21 | -- |
| 3 | Ice | Ice | Ice | 1.76 | 0.19 | 1.05 | 0.21 | 0.05 | 0.08 | 0.14 | 0.19 | -- |
| 4 | Ice | Ice | Ice | 1.22 | 0.23 | 0.72 | 0.20 | 0.05 | 0.08 | 0.11 | 0.19 | -- |
| 5 | Ice | Ice | Ice | 0.96 | 0.22 | 0.49 | 0.26 | 0.04 | 0.07 | 0.10 | 0.19 | -- |
| 6 | Ice | Ice | Ice | 0.93 | 0.40 | 0.46 | 0.32 | 0.04 | 0.07 | 0.10 | 0.19 | -- |
| 7 | Ice | Ice | Ice | 0.82 | 2.45 | 0.54 | 0.23 | 0.04 | 0.08 | 0.11 | 0.19 | -- |
| 8 | Ice | Ice | Ice | 0.67 | 0.82 | 0.59 | 0.20 | 0.05 | 0.15 | 0.12 | 0.20 | -- |
| 9 | Ice | Ice | Ice | 0.49 | 0.50 | 6.25 | 0.18 | 0.07 | 0.16 | 0.12 | -- | -- |
| 10 | Ice | Ice | Ice | 0.44 | 0.37 | 4.55 | 0.17 | 0.09 | 0.26 | 0.12 | -- | -- |
| 11 | Ice | Ice | Ice | 0.42 | 0.32 | 2.01 | 0.18 | 0.11 | 0.30 | 0.13 | -- | -- |
| 12 | Ice | Ice | Ice | 0.42 | 0.24 | 1.28 | 0.18 | 0.10 | 0.20 | 0.13 | -- | -- |
| 13 | Ice | Ice | Ice | 0.43 | 0.21 | 0.96 | 0.17 | 0.09 | 0.17 | 0.14 | -- | -- |
| 14 | Ice | Ice | Ice | 2.10 | 1.52 | 0.75 | 0.16 | 0.09 | 0.15 | 0.14 | -- | -- |
| 15 | Ice | Ice | Ice | 1.88 | 6.93 | 0.58 | 0.15 | 0.09 | 0.14 | 0.13 | -- | -- |
| 16 | Ice | Ice | Ice | 1.83 | 2.75 | 0.46 | 0.15 | 0.08 | 0.13 | 0.14 | -- | -- |
| 17 | Ice | Ice | Ice | 1.73 | 1.41 | 0.41 | 0.15 | 0.09 | 0.12 | 0.16 | -- | -- |
| 18 | Ice | Ice | Ice | 1.45 | 0.95 | 0.37 | 0.16 | 0.14 | 0.11 | 0.17 | -- | -- |
| 19 | Ice | Ice | Ice | 1.18 | 0.69 | 0.31 | 2.75 | 0.14 | 0.11 | 0.17 | -- | -- |
| 20 | Ice | Ice | Ice | 1.27 | 0.54 | 0.29 | 1.43 | 0.12 | 0.11 | 0.17 | -- | -- |
| 21 | Ice | Ice | 0.77 | 1.31 | 0.50 | 0.29 | 0.74 | 0.11 | 0.11 | 0.17 | -- | -- |
| 22 | Ice | Ice | 0.56 | 1.16 | 0.40 | 0.24 | 0.47 | 0.10 | 0.11 | 0.16 | -- | -- |
| 23 | Ice | Ice | 0.38 | 0.97 | 0.36 | 0.23 | 0.35 | 0.09 | 0.10 | 0.17 | -- | -- |
| 24 | Ice | Ice | 0.34 | 0.71 | 0.31 | 0.23 | 0.33 | 0.09 | 0.11 | 0.17 | -- | -- |
| 25 | Ice | Ice | 0.31 | 0.50 | 0.26 | 0.24 | 0.27 | 0.10 | 0.17 | 0.17 | -- | -- |
| 26 | Ice | Ice | 0.27 | 0.35 | 0.25 | 0.23 | 0.21 | 0.10 | 0.21 | 0.17 | -- | -- |
| 27 | Ice | Ice | 0.28 | 0.27 | 0.23 | 0.22 | 0.16 | 0.10 | 0.14 | 0.17 | -- | -- |
| 28 | Ice | Ice | 0.35 | 0.21 | 0.27 | 0.21 | 0.13 | 0.10 | 0.11 | 0.18 | -- | -- |
| 29 | Ice | -- | 0.41 | 0.18 | 0.29 | 0.21 | 0.11 | 0.10 | 0.09 | 0.18 | -- | -- |
| 30 | Ice | -- | 0.67 | 0.21 | 0.27 | 0.19 | 0.09 | 0.10 | 0.09 | 0.21 | -- | -- |
| 31 | Ice | -- | 0.94 | -- | 0.32 | -- | 0.08 | 0.10 | -- | 0.19 | -- | -- |
| Total (cfs) | -- | -- | 5.26 | 27.62 | 24.58 | 27.59 | 10.55 | 2.65 | 3.87 | 4.61 | 1.56 | -- |
| Mean (cfs) | -- | -- | 0.48 | 0.92 | 0.79 | 0.92 | 0.34 | 0.09 | 0.13 | 0.15 | 0.20 | -- |
| Max (cfs) | -- | -- | 0.94 | 2.10 | 6.93 | 6.25 | 2.75 | 0.14 | 0.30 | 0.21 | 0.21 | -- |
| Min (cfs) | -- | -- | 0.27 | 0.18 | 0.18 | 0.19 | 0.08 | 0.04 | 0.07 | 0.10 | 0.19 | -- |

Notes:

- "--" = No data
- Ice = If more than 6 hours with 50% or more of the 5-minute data points indicated temperature recordings at or below freezing, the day was designated as ice-influenced; no daily average flow was calculated for this day.
- FE = Stage exceeded flume height for at least one measurement on this day. For time steps where stage exceeded flume height, flow was estimated using maximum flume height.
- If calculated average daily flow fell below the minimum measureable flume flow, the daily average flow was set to 0 cfs.
- cfs = cubic feet per second

DAILY AVERAGE STREAMFLOW AT SHHR-02 (Heart River)

| Day | 2008 | | | | | | | | | | | |
|--------------------|------|-----|-----|-------------|-------------|-------------|-------------|-------------|--------------|--------------|--------------|--------------|
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
| 1 | -- | -- | -- | Ice | 0.20 | 0.21 | 0.17 | 0.14 | 0.06 | 0.87 | 1.32 | 1.39 |
| 2 | -- | -- | -- | Ice | 0.21 | 0.22 | 0.16 | 0.14 | 0.07 | 0.86 | 1.32 | 1.37 |
| 3 | -- | -- | -- | Ice | 0.20 | 0.22 | 0.16 | 0.14 | 0.07 | 0.87 | 1.38 | 1.40 |
| 4 | -- | -- | -- | Ice | 0.19 | 0.21 | 0.15 | 0.13 | 0.12 | 0.92 | 1.37 | 1.35 |
| 5 | -- | -- | -- | Ice | 0.19 | 0.21 | 0.14 | 0.13 | 0.13 | 1.00 | 1.43 | 1.34 |
| 6 | -- | -- | -- | Ice | 0.19 | 0.22 | 0.13 | 0.12 | 0.14 | 1.00 | 1.46 | 1.36 |
| 7 | -- | -- | -- | Ice | 0.20 | 0.22 | 0.14 | 0.11 | 0.21 | 1.10 | 1.35 | 1.37 |
| 8 | -- | -- | -- | 0.24 | 0.21 | 0.21 | 0.16 | 0.11 | 0.24 | 1.20 | 1.40 | 1.37 |
| 9 | -- | -- | -- | 0.26 | 0.20 | 0.21 | 0.17 | 0.11 | 0.28 | 1.21 | 1.80 | 1.37 |
| 10 | -- | -- | -- | 0.28 | 0.22 | 0.20 | 0.14 | 0.12 | 0.32 | 1.23 | 1.68 | 1.38 |
| 11 | -- | -- | -- | 0.29 | 0.22 | 0.21 | 0.12 | 1.04 | 0.35 | 1.23 | 1.61 | 1.38 |
| 12 | -- | -- | -- | 0.28 | 0.22 | 0.22 | 0.12 | 0.87 | 0.43 | 1.29 | 1.58 | 1.39 |
| 13 | -- | -- | -- | 0.27 | 0.22 | 0.23 | 0.13 | 0.48 | 0.46 | 1.32 | 1.66 | 1.39 |
| 14 | -- | -- | -- | 0.24 | 0.21 | 0.23 | 0.13 | 0.32 | 0.47 | 1.32 | 2.06 | 1.41 |
| 15 | -- | -- | -- | 0.24 | 0.19 | 0.31 | 0.12 | 0.27 | 0.47 | 1.63 | 2.22 | 1.36 |
| 16 | -- | -- | -- | 0.23 | 0.18 | 0.36 | 0.12 | 0.22 | 0.49 | 1.77 | 1.70 | 1.30 |
| 17 | -- | -- | -- | 0.22 | 0.19 | 0.33 | 0.12 | 0.18 | 0.51 | 1.48 | 1.48 | 1.25 |
| 18 | -- | -- | -- | 0.22 | 0.18 | 0.27 | 0.12 | 0.18 | 0.54 | 1.34 | 1.42 | 1.20 |
| 19 | -- | -- | -- | 0.21 | 0.18 | 0.24 | 0.12 | 0.11 | 0.58 | 1.28 | 1.43 | 1.18 |
| 20 | -- | -- | -- | 0.21 | 0.18 | 0.21 | 0.13 | 0.15 | 0.61 | 1.25 | 1.47 | 1.11 |
| 21 | -- | -- | Ice | 0.21 | 0.17 | 0.20 | 0.14 | 0.10 | 0.66 | 1.23 | 1.52 | 1.07 |
| 22 | -- | -- | Ice | 0.20 | 0.17 | 0.19 | 0.15 | 0.12 | 0.77 | 1.22 | 1.51 | 0.97 |
| 23 | -- | -- | Ice | 0.20 | 0.18 | 0.18 | 0.16 | 0.08 | 0.81 | 1.18 | 1.48 | 0.93 |
| 24 | -- | -- | Ice | 0.19 | 0.22 | 0.17 | 0.16 | 0.08 | 0.84 | 1.27 | 1.44 | 0.93 |
| 25 | -- | -- | Ice | 0.20 | 0.25 | 0.16 | 0.16 | 0.08 | 0.89 | 1.27 | 1.45 | 0.93 |
| 26 | -- | -- | Ice | 0.20 | 0.25 | 0.16 | 0.16 | 0.08 | 0.93 | 1.24 | 1.44 | 0.91 |
| 27 | -- | -- | Ice | 0.19 | 0.28 | 0.18 | 0.16 | 0.08 | 0.93 | 1.18 | 1.43 | 0.90 |
| 28 | -- | -- | Ice | 0.19 | 0.31 | 0.20 | 0.17 | 0.09 | 0.94 | 1.19 | 1.44 | 0.89 |
| 29 | -- | -- | Ice | 0.20 | 0.27 | 0.19 | 0.16 | 0.08 | 0.92 | 1.17 | 1.39 | 0.89 |
| 30 | -- | -- | Ice | 0.20 | 0.25 | 0.18 | 0.15 | 0.08 | 0.89 | 1.27 | 1.39 | 1.37 |
| 31 | -- | -- | Ice | -- | 0.23 | -- | 0.14 | 0.08 | -- | 1.32 | -- | 1.61 |
| Total (cfs) | -- | -- | -- | 5.16 | 6.56 | 6.55 | 4.43 | 6.00 | 15.15 | 37.70 | 45.61 | 38.03 |
| Mean (cfs) | -- | -- | -- | 0.22 | 0.21 | 0.22 | 0.14 | 0.19 | 0.50 | 1.22 | 1.52 | 1.23 |
| Max (cfs) | -- | -- | -- | 0.29 | 0.31 | 0.36 | 0.17 | 1.04 | 0.94 | 1.77 | 2.22 | 1.61 |
| Min (cfs) | -- | -- | -- | 0.19 | 0.17 | 0.16 | 0.12 | 0.08 | 0.06 | 0.86 | 1.32 | 0.89 |

Notes:

- "--" = No data
- Ice = If more than 6 hours with 50% or more of the 5-minute data points indicated temperature recordings at or below freezing, the day was designated as ice-influenced; no daily average flow was calculated for this day.
- FE = Stage exceeded flume height for at least one measurement on this day. For time steps where stage exceeded flume height, flow was estimated using maximum flume height.
- If calculated average daily flow fell below the minimum measureable flume flow, the daily average flow was set to 0 cfs.
- cfs = cubic feet per second

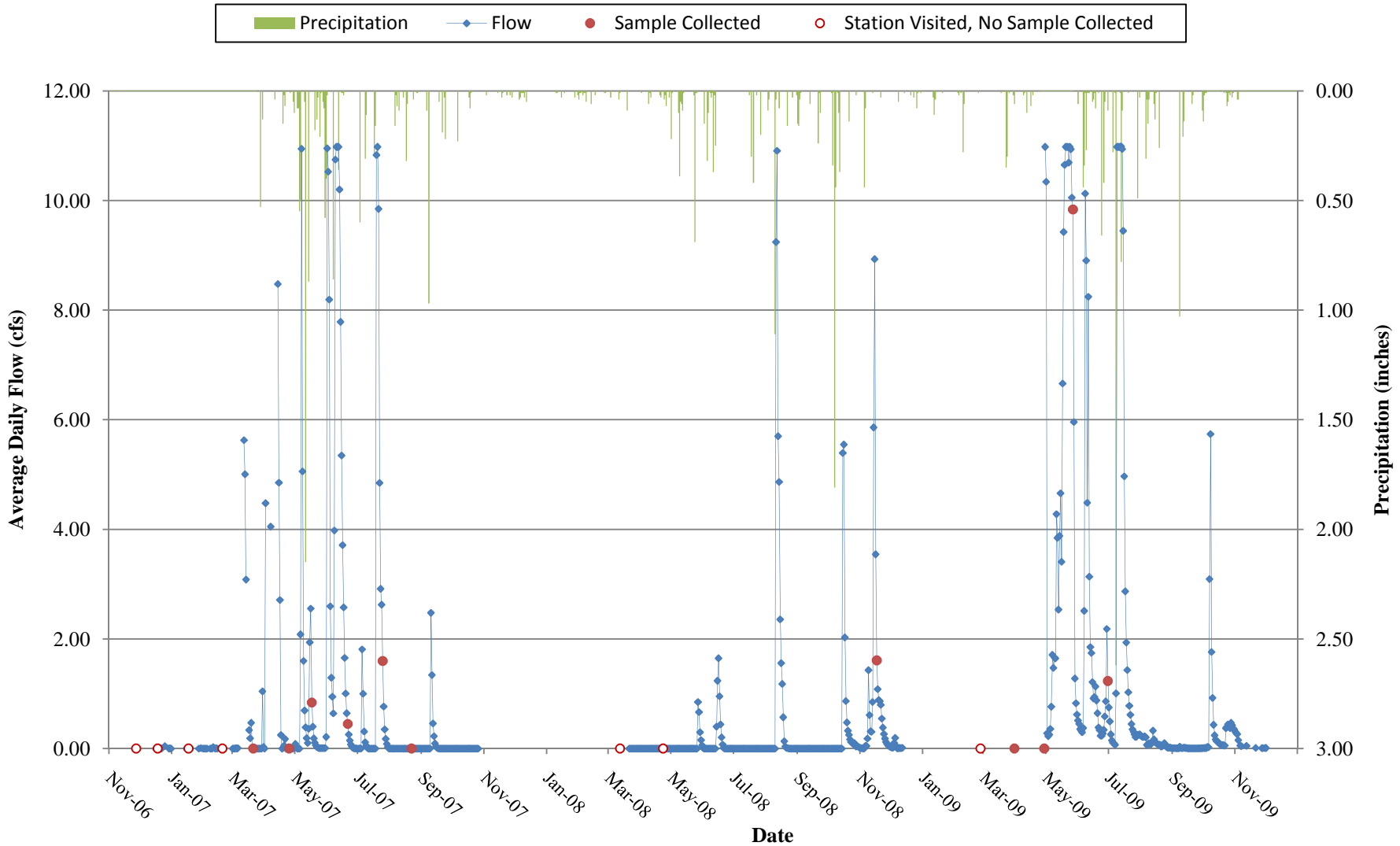
DAILY AVERAGE STREAMFLOW AT SHHR-02 (Heart River)

| Day | 2009 | | | | | | | | | | | |
|--------------------|--------------|--------------|---------------------|---------------------|-----------|-----------|-----------|-------------|--------------|--------------|--------------|--------------|
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
| 1 | 1.45 | Ice | 1.06 | 1.58 | -- | -- | -- | -- | 0.25 | 0.59 | 0.47 | 0.47 |
| 2 | 1.39 | Ice | 1.06 | 1.70 | -- | -- | -- | -- | 0.30 | 0.65 | 0.45 | 0.50 |
| 3 | 1.40 | Ice | 1.05 | 1.66 | -- | -- | -- | -- | 0.31 | 0.65 | 0.44 | 0.47 |
| 4 | 1.44 | Ice | 1.06 | 1.65 | -- | -- | -- | -- | 0.32 | 0.60 | 0.46 | 0.40 |
| 5 | 1.43 | Ice | 1.38 | 1.55 | -- | -- | -- | -- | 0.30 | 0.61 | 0.43 | 0.46 |
| 6 | 1.42 | Ice | 1.26 | 1.66 | -- | -- | -- | -- | 0.30 | 0.60 | 0.44 | 0.47 |
| 7 | 1.46 | Ice | 0.95 | 1.65 | -- | -- | -- | -- | 0.30 | 0.72 | 0.46 | 0.45 |
| 8 | 1.52 | Ice | 1.00 | 1.85 | -- | -- | -- | -- | 0.42 | 0.90 | 0.46 | 0.41 |
| 9 | 1.54 | Ice | 0.98 | 14.05 | -- | -- | -- | -- | 0.41 | 0.68 | 0.45 | 0.38 |
| 10 | 1.63 | Ice | 1.01 | 9.74 | -- | -- | -- | -- | 0.37 | 0.56 | 0.42 | 0.44 |
| 11 | 1.73 | Ice | 1.07 | 23.20 ¹ | -- | -- | -- | -- | 0.45 | 0.50 | 0.42 | 0.41 |
| 12 | 1.76 | Ice | 1.13 | 110.45 ¹ | -- | -- | -- | -- | 0.43 | 0.49 | 0.47 | 0.43 |
| 13 | 1.74 | Ice | 1.27 | 63.79 ¹ | -- | -- | -- | -- | 0.35 | 0.48 | 0.48 | 0.42 |
| 14 | 1.68 | Ice | 1.63 | 63.93 ¹ | -- | -- | -- | -- | 0.33 | 0.45 | 0.47 | 0.47 |
| 15 | 1.76 | Ice | 2.28 | 74.59 ¹ | -- | -- | -- | -- | 0.37 | 0.48 | 0.48 | 0.43 |
| 16 | 1.84 | Ice | 7.63 ¹ | 27.34 ¹ | -- | -- | -- | -- | 0.36 | 0.48 | 0.47 | 0.41 |
| 17 | 1.73 | Ice | 203.61 ¹ | 8.59 | -- | -- | -- | -- | 0.37 | 0.44 | 0.44 | 0.43 |
| 18 | 1.68 | 0.97 | 288.52 ¹ | 3.26 | -- | -- | -- | -- | 0.38 | 0.44 | 0.44 | 0.47 |
| 19 | 1.66 | 0.98 | 181.94 ¹ | 2.26 | -- | -- | -- | -- | 0.46 | 0.45 | 0.46 | 0.41 |
| 20 | 1.65 | 0.98 | 132.28 ¹ | 1.77 | -- | -- | -- | -- | 0.48 | 0.49 | 0.42 | 0.45 |
| 21 | 1.68 | 0.97 | 114.70 ¹ | 1.45 | -- | -- | -- | -- | 0.56 | 0.47 | 0.43 | 0.42 |
| 22 | 1.70 | 0.99 | 89.33 ¹ | 1.29 | -- | -- | -- | -- | 0.44 | 0.45 | 0.45 | 0.45 |
| 23 | 1.72 | 1.01 | 56.04 ¹ | 1.17 | -- | -- | -- | -- | 0.46 | 0.45 | 0.47 | 0.48 |
| 24 | Ice | 1.04 | 7.69 | 1.56 | -- | -- | -- | -- | 0.47 | 0.48 | 0.46 | 0.44 |
| 25 | Ice | 1.02 | 5.86 | 0.90 | -- | -- | -- | -- | 0.48 | 0.53 | 0.47 | 0.45 |
| 26 | Ice | 1.01 | 3.97 | 1.00 | -- | -- | -- | 0.17 | 0.48 | 0.43 | 0.42 | 0.47 |
| 27 | Ice | 1.01 | 2.58 | 1.03 | -- | -- | -- | 0.19 | 0.56 | 0.44 | 0.45 | 0.46 |
| 28 | Ice | 1.02 | 2.07 | 0.93 | -- | -- | -- | 0.27 | 0.59 | 0.49 | 0.48 | 0.43 |
| 29 | Ice | -- | 2.01 | 0.83 | -- | -- | -- | 0.29 | 0.54 | 0.45 | 0.45 | 0.41 |
| 30 | Ice | -- | 1.71 | 1.12 | -- | -- | -- | 0.27 | 0.53 | 0.42 | 0.41 | 0.44 |
| 31 | Ice | -- | 1.65 | -- | -- | -- | -- | 0.27 | -- | 0.45 | -- | 0.46 |
| Total (cfs) | 37.01 | 10.99 | 1119.77 | 427.54 | -- | -- | -- | 1.45 | 12.36 | 16.32 | 13.54 | 13.69 |
| Mean (cfs) | 1.61 | 1.00 | 1.99 | 2.68 | -- | -- | -- | 0.24 | 0.41 | 0.53 | 0.45 | 0.44 |
| Max (cfs) | 1.84 | 1.04 | 7.69 | 14.05 | -- | -- | -- | 0.29 | 0.59 | 0.90 | 0.48 | 0.50 |
| Min (cfs) | 1.39 | 0.97 | 0.95 | 0.83 | -- | -- | -- | 0.17 | 0.25 | 0.42 | 0.41 | 0.38 |

Notes:

- "--" = No data
- Ice = If more than 6 hours with 50% or more of the 5-minute data points indicated temperature recordings at or below freezing, the day was designated as ice-influenced; no daily average flow was calculated for this day.
- FE = Stage exceeded flume height for at least one measurement on this day. For time steps where stage exceeded flume height, flow was estimated using maximum flume height.
- If calculated average daily flow fell below the minimum measureable flume flow, the daily average flow was set to 0 cfs.
- cfs = cubic feet per second

¹ Calculated streamflows considered invalid due to backwater conditions; calculated flow was not included in mean and maximum monthly flows.



SOUTH HEART COAL LLC
SOUTH HEART POWER PROJECT
SOUTH HEART, NORTH DAKOTA

DRAFT



HYDROGRAPH OF DAILY AVERAGE STREAMFLOW AT SHSB-01 (South Branch Heart River)

SURFACE WATER

| | | | | |
|-------------|--------------------------------------|--------|-----|------------|
| PROJECT NO. | 063-2174Y09 | DESIGN | BER | 05/24/2010 |
| FILE | Attachment A and Tables 1 and 2.xlsx | CHECK | ANH | 05/24/2010 |
| REV. | 1 | REVIEW | EJP | 05/24/2010 |

DAILY AVERAGE STREAMFLOW AT SHSB-01 (South Branch Heart River)

| Day | 2006 | | | | | | | | | | | |
|--------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------------|
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
| 1 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 2 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 4 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 5 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 6 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 7 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 8 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 9 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 10 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 11 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 12 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 13 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 14 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 15 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 16 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.00 |
| 17 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.00 |
| 18 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.00 |
| 19 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.00 |
| 20 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.00 |
| 21 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.00 |
| 22 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.01 |
| 23 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice |
| 24 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice |
| 25 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.05 |
| 26 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice |
| 27 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice |
| 28 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice |
| 29 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.00 |
| 30 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.00 |
| 31 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.00 |
| Total (cfs) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.06 |
| Mean (cfs) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.01 |
| Max (cfs) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.05 |
| Min (cfs) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.00 |

Notes:

- "--" = No data
- Ice = If more than 6 hours with 50% or more of the 5-minute data points indicated temperature recordings at or below freezing, the day was designated as ice-influenced; no daily average flow was calculated for this day.
- FE = Stage exceeded flume height for at least one measurement on this day. For time steps where stage exceeded flume height, flow was estimated using maximum flume height.
- If calculated average daily flow fell below the minimum measureable flume flow, the daily average flow was set to 0 cfs.
- cfs = cubic feet per second

DAILY AVERAGE STREAMFLOW AT SHSB-01 (South Branch Heart River)

| Day | 2007 | | | | | | | | | | | |
|--------------------|-------------|-------------|--------------|--------------|--------------|---------------|--------------|-------------|-------------|-------------|-----------|-----------|
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
| 1 | Ice | 0.00 | 0.00 | 0.00 | 0.09 | 10.95 FE | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 2 | Ice | 0.00 | 0.00 | 4.48 FE | 0.02 | 10.53 FE | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 3 | Ice | 0.00 | 0.00 | Ice | 0.00 | 8.19 FE | 0.01 | 0.00 | 0.00 | 0.00 | -- | -- |
| 4 | Ice | 0.00 | 0.01 | Ice | 0.00 | 2.60 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 5 | Ice | Ice | 0.00 | Ice | 0.00 | 1.29 | 1.81 | 0.00 | 0.00 | 0.00 | -- | -- |
| 6 | Ice | Ice | 0.01 | Ice | 2.08 FE | 0.95 | 1.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 7 | Ice | 0.00 | Ice | 4.05 FE | 10.94 FE | 0.64 | 0.31 | 0.00 | 0.00 | 0.00 | -- | -- |
| 8 | Ice | 0.00 | Ice | Ice | 5.06 | 3.98 FE | 0.12 | 0.00 | 0.00 | 0.00 | -- | -- |
| 9 | Ice | 0.00 | Ice | Ice | 1.60 | 10.75 FE | 0.06 | 0.00 | 0.00 | 0.00 | -- | -- |
| 10 | Ice | 0.03 | Ice | Ice | 0.70 | 10.98 FE | 0.02 | 0.00 | 2.48 | 0.00 | -- | -- |
| 11 | Ice | Ice | Ice | Ice | 0.39 | 10.98 FE | 0.00 | 0.00 | 1.34 | 0.00 | -- | -- |
| 12 | Ice | 0.00 | 5.63 | Ice | 0.19 | 10.98 FE | 0.00 | 0.00 | 0.46 | 0.00 | -- | -- |
| 13 | Ice | 0.01 | 5.01 | Ice | 0.10 | 10.20 FE | 0.00 | 0.00 | 0.23 | 0.00 | -- | -- |
| 14 | Ice | 0.00 | 3.08 | 8.48 FE | 0.36 | 7.79 | 0.00 | 0.00 | 0.10 | 0.00 | -- | -- |
| 15 | 0.00 | Ice | Ice | 4.85 | 1.94 | 5.35 | 0.00 | 0.00 | 0.04 | 0.00 | -- | -- |
| 16 | Ice | Ice | Ice | 2.71 | 2.56 | 3.71 | 0.00 | 0.00 | 0.02 | 0.00 | -- | -- |
| 17 | Ice | Ice | 0.34 | 0.25 | 0.84 | 2.58 | 0.00 | 0.00 | 0.01 | 0.00 | -- | -- |
| 18 | 0.01 | Ice | 0.19 | 0.00 | 0.40 | 1.66 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 19 | Ice | Ice | 0.47 | 0.01 | 0.19 | 1.01 | 10.83 FE | 0.00 | 0.00 | 0.00 | -- | -- |
| 20 | Ice | Ice | 0.02 | 0.06 | 0.11 | 0.65 | 10.98 FE | 0.00 | 0.00 | 0.00 | -- | -- |
| 21 | Ice | Ice | 0.00 | 0.18 | 0.06 | 0.45 | 9.85 FE | 0.00 | 0.00 | 0.00 | -- | -- |
| 22 | Ice | Ice | 0.00 | 0.00 | 0.03 | 0.26 | 4.85 | 0.00 | 0.00 | 0.00 | -- | -- |
| 23 | Ice | Ice | 0.00 | 0.00 | 0.02 | 0.15 | 2.92 | 0.00 | 0.00 | 0.00 | -- | -- |
| 24 | Ice | Ice | 0.00 | 0.00 | 0.01 | 0.08 | 2.63 | 0.00 | 0.00 | 0.00 | -- | -- |
| 25 | Ice | Ice | 0.00 | 0.00 | 0.01 | 0.04 | 1.60 | 0.00 | 0.00 | 0.00 | -- | -- |
| 26 | Ice | Ice | 0.00 | 0.00 | 0.01 | 0.02 | 0.77 | 0.00 | 0.00 | 0.00 | -- | -- |
| 27 | 0.00 | Ice | 0.00 | 0.00 | 0.01 | 0.01 | 0.35 | 0.00 | 0.00 | -- | -- | -- |
| 28 | Ice | Ice | 0.00 | 0.00 | 0.01 | 0.00 | 0.18 | 0.00 | 0.00 | -- | -- | -- |
| 29 | 0.01 | -- | 0.00 | 0.00 | 0.01 | 0.00 | 0.09 | 0.00 | 0.00 | -- | -- | -- |
| 30 | Ice | -- | 1.05 | 0.02 | 0.01 | 0.00 | 0.03 | 0.00 | 0.00 | -- | -- | -- |
| 31 | 0.00 | -- | 0.03 | -- | 0.21 | -- | 0.00 | 0.00 | -- | -- | -- | -- |
| Total (cfs) | 0.02 | 0.04 | 15.83 | 25.08 | 27.95 | 116.75 | 48.39 | 0.01 | 4.66 | 0.00 | -- | -- |
| Mean (cfs) | 0.00 | 0.00 | 0.66 | 1.25 | 0.90 | 3.89 | 1.56 | 0.00 | 0.16 | 0.00 | -- | -- |
| Max (cfs) | 0.01 | 0.03 | 5.63 | 8.48 | 10.94 | 10.98 | 10.98 | 0.00 | 2.48 | 0.00 | -- | -- |
| Min (cfs) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |

Notes:

- "--" = No data
- Ice = If more than 6 hours with 50% or more of the 5-minute data points indicated temperature recordings at or below freezing, the day was designated as ice-influenced; no daily average flow was calculated for this day.
- FE = Stage exceeded flume height for at least one measurement on this day. For time steps where stage exceeded flume height, flow was estimated using maximum flume height.
- If calculated average daily flow fell below the minimum measureable flume flow, the daily average flow was set to 0 cfs.
- cfs = cubic feet per second

DAILY AVERAGE STREAMFLOW AT SHSB-01 (South Branch Heart River)

| Day | 2008 | | | | | | | | | | | |
|--------------------|------|-----|-------------|-------------|-------------|-------------|-------------|-----------------|-------------|--------------|----------------|-------------|
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
| 1 | -- | -- | -- | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.02 |
| 2 | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.02 |
| 3 | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 |
| 4 | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.11 |
| 5 | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.20 |
| 6 | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.05 | 0.04 |
| 7 | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.05 | 0.00 |
| 8 | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.18 | 0.01 |
| 9 | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.43 | 0.01 |
| 10 | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.61 | 0.01 |
| 11 | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 9.24 <i>FE</i> | 0.00 | 0.00 | 0.32 | 0.01 |
| 12 | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 10.91 <i>FE</i> | 0.00 | 0.00 | 0.31 | 0.02 |
| 13 | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 5.70 | 0.00 | 0.00 | 0.85 | Ice |
| 14 | -- | -- | -- | 0.00 | 0.00 | 0.40 | 0.00 | 4.87 | 0.00 | 0.00 | 5.86 <i>FE</i> | Ice |
| 15 | -- | -- | -- | 0.00 | 0.00 | 1.24 | 0.00 | 2.36 | 0.00 | 5.39 | 8.93 <i>FE</i> | -- |
| 16 | -- | -- | -- | 0.00 | 0.00 | 1.65 | 0.00 | 1.56 | 0.00 | 5.55 | 3.55 | -- |
| 17 | -- | -- | -- | 0.00 | 0.00 | 0.95 | 0.00 | 1.18 | 0.00 | 2.03 | 1.61 | -- |
| 18 | -- | -- | -- | 0.00 | 0.00 | 0.44 | 0.00 | 0.57 | 0.00 | 0.87 | 1.09 | -- |
| 19 | -- | -- | -- | 0.00 | 0.00 | 0.21 | 0.00 | 0.13 | 0.00 | 0.48 | 0.89 | -- |
| 20 | -- | -- | -- | 0.00 | 0.00 | 0.07 | 0.00 | 0.04 | 0.00 | 0.33 | 0.87 | -- |
| 21 | -- | -- | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.25 | 0.80 | -- |
| 22 | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.17 | 0.55 | -- |
| 23 | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.12 | 0.38 | -- |
| 24 | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.10 | 0.27 | -- |
| 25 | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.10 | 0.18 | -- |
| 26 | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.11 | 0.12 | -- |
| 27 | -- | -- | 0.00 | 0.00 | 0.85 | 0.00 | 0.00 | 0.00 | 0.00 | 0.06 | 0.09 | -- |
| 28 | -- | -- | 0.00 | 0.00 | 0.67 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 | 0.06 | -- |
| 29 | -- | -- | 0.00 | 0.00 | 0.30 | 0.00 | 0.00 | 0.00 | 0.00 | 0.05 | 0.05 | -- |
| 30 | -- | -- | 0.00 | 0.00 | 0.16 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 | 0.04 | -- |
| 31 | -- | -- | 0.00 | -- | 0.06 | -- | 0.00 | 0.00 | -- | 0.02 | -- | -- |
| Total (cfs) | -- | -- | 0.00 | 0.00 | 2.03 | 4.99 | 0.00 | 36.58 | 0.00 | 15.70 | 29.15 | 0.46 |
| Mean (cfs) | -- | -- | 0.00 | 0.00 | 0.07 | 0.17 | 0.00 | 1.18 | 0.00 | 0.51 | 0.97 | 0.04 |
| Max (cfs) | -- | -- | 0.00 | 0.00 | 0.85 | 1.65 | 0.00 | 10.91 | 0.00 | 5.55 | 8.93 | 0.20 |
| Min (cfs) | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Notes:

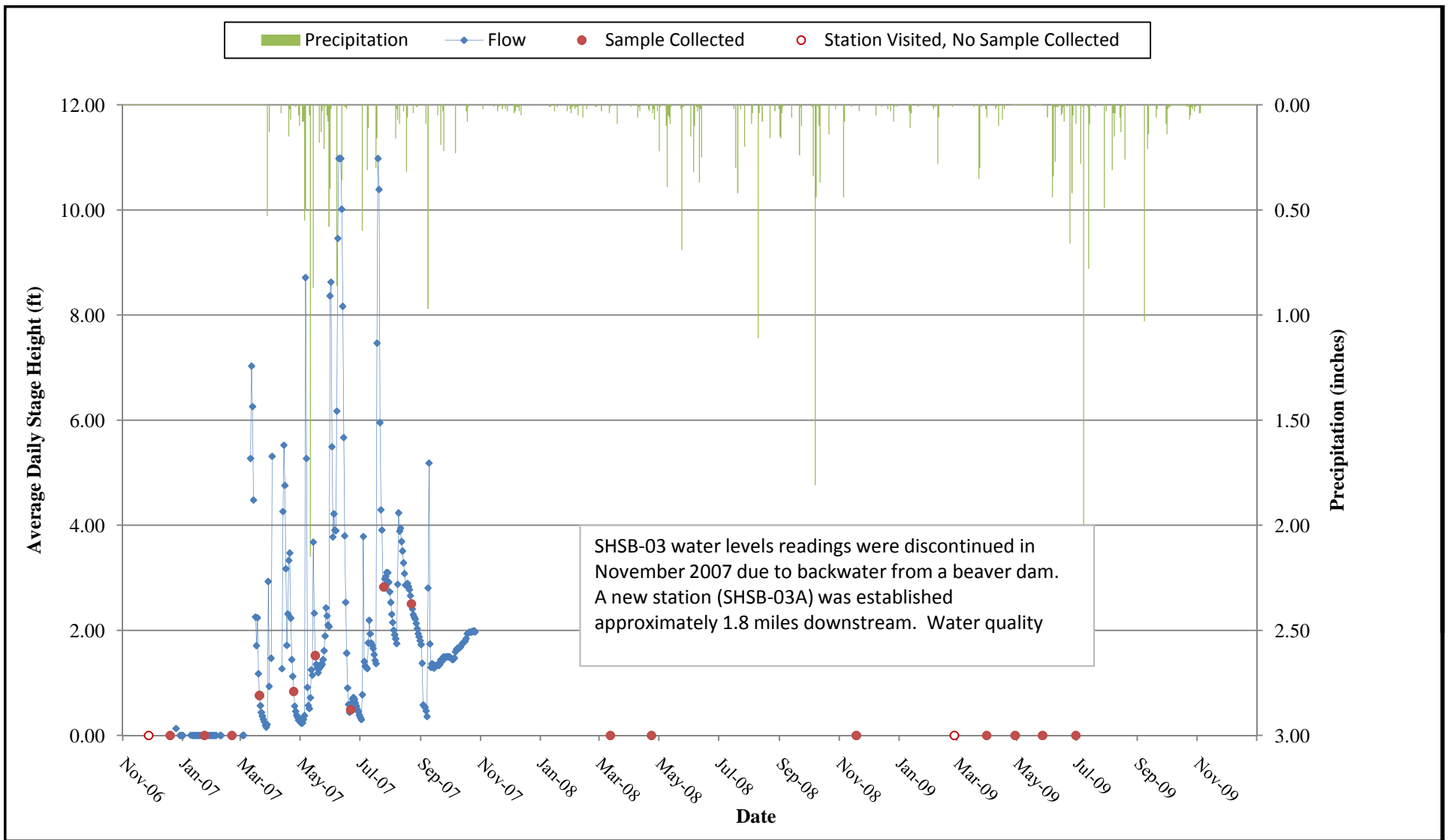
- "--" = No data
- Ice = If more than 6 hours with 50% or more of the 5-minute data points indicated temperature recordings at or below freezing, the day was designated as ice-influenced; no daily average flow was calculated for this day.
- *FE* = Stage exceeded flume height for at least one measurement on this day. For time steps where stage exceeded flume height, flow was estimated using maximum flume height.
- If calculated average daily flow fell below the minimum measureable flume flow, the daily average flow was set to 0 cfs.
- cfs = cubic feet per second

DAILY AVERAGE STREAMFLOW AT SHSB-01 (South Branch Heart River)

| Day | 2009 | | | | | | | | | | | |
|--------------------|------|-----|-----|-----------------|-----------------|-----------------|-----------------|-------------|-------------|--------------|-------------|-------------|
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
| 1 | -- | -- | -- | -- | 10.34 <i>FE</i> | 0.51 | 0.75 | 0.24 | 0.01 | 0.01 | 0.31 | 0.01 |
| 2 | -- | -- | -- | -- | 0.28 | 0.45 | 0.50 | 0.23 | 0.01 | 0.01 | 0.29 | Ice |
| 3 | -- | -- | -- | -- | 0.23 | 0.36 | 0.26 | 0.21 | 0.01 | 0.01 | 0.26 | Ice |
| 4 | -- | -- | -- | -- | 0.26 | 0.33 | 0.15 | 0.22 | 0.01 | 0.01 | 0.16 | Ice |
| 5 | -- | -- | -- | -- | 0.36 | 0.30 | 0.11 | 0.23 | 0.01 | 0.03 | Ice | Ice |
| 6 | -- | -- | -- | -- | 0.77 | 0.38 | 0.10 | 0.20 | 0.00 | 0.03 | 0.06 | Ice |
| 7 | -- | -- | -- | -- | 1.71 | 2.51 <i>FE</i> | 0.07 | 0.07 | 0.00 | 3.09 | 0.04 | Ice |
| 8 | -- | -- | -- | -- | 1.47 | 10.13 <i>FE</i> | 1.01 <i>FE</i> | 0.08 | 0.04 | 5.74 | Ice | Ice |
| 9 | -- | -- | -- | -- | 1.66 | 8.91 <i>FE</i> | 10.98 <i>FE</i> | 0.10 | 0.01 | 1.76 | Ice | Ice |
| 10 | -- | -- | -- | -- | 1.65 | 4.49 <i>FE</i> | 10.98 <i>FE</i> | 0.09 | 0.01 | 0.93 | Ice | Ice |
| 11 | -- | -- | -- | -- | 4.28 <i>FE</i> | 8.25 <i>FE</i> | 10.98 <i>FE</i> | 0.08 | 0.01 | 0.43 | Ice | Ice |
| 12 | -- | -- | -- | -- | 3.85 <i>FE</i> | 3.14 | 10.98 <i>FE</i> | 0.12 | 0.02 | 0.24 | 0.04 | Ice |
| 13 | -- | -- | -- | -- | 2.54 | 1.85 | 10.99 <i>FE</i> | 0.33 | 0.02 | 0.17 | Ice | Ice |
| 14 | -- | -- | -- | -- | 3.88 | 1.75 | 10.94 <i>FE</i> | 0.17 | 0.01 | 0.14 | Ice | Ice |
| 15 | -- | -- | -- | -- | 4.66 | 1.21 | 9.45 <i>FE</i> | 0.11 | 0.01 | 0.12 | Ice | Ice |
| 16 | -- | -- | -- | -- | 3.41 | 0.92 | 4.97 | 0.11 | 0.01 | 0.11 | Ice | Ice |
| 17 | -- | -- | -- | -- | 6.66 <i>FE</i> | 0.94 | 2.87 | 0.09 | 0.01 | 0.09 | Ice | Ice |
| 18 | -- | -- | -- | -- | 9.43 <i>FE</i> | 1.13 | 1.94 | 0.08 | 0.00 | 0.07 | Ice | Ice |
| 19 | -- | -- | -- | -- | 10.65 <i>FE</i> | 0.88 | 1.43 | 0.07 | 0.00 | 0.06 | Ice | Ice |
| 20 | -- | -- | -- | -- | 10.98 <i>FE</i> | 0.65 | 1.03 | 0.07 | 0.00 | 0.07 | Ice | Ice |
| 21 | -- | -- | -- | -- | 10.98 <i>FE</i> | 0.39 | 0.78 | 0.04 | 0.00 | 0.06 | 0.01 | Ice |
| 22 | -- | -- | -- | -- | 10.98 <i>FE</i> | 0.34 | 0.62 | 0.05 | 0.01 | 0.06 | Ice | Ice |
| 23 | -- | -- | -- | -- | 10.69 <i>FE</i> | 0.24 | 0.45 | 0.06 | 0.01 | 0.37 | Ice | Ice |
| 24 | -- | -- | -- | -- | 10.98 <i>FE</i> | 0.23 | 0.35 | 0.10 | 0.00 | 0.40 | Ice | Ice |
| 25 | -- | -- | -- | -- | 10.94 <i>FE</i> | 0.28 | 0.31 | 0.08 | 0.00 | 0.44 | Ice | Ice |
| 26 | -- | -- | -- | -- | 10.06 <i>FE</i> | 0.34 | 0.26 | 0.04 | 0.01 | 0.40 | Ice | Ice |
| 27 | -- | -- | -- | -- | 9.84 <i>FE</i> | 0.59 | 0.21 | 0.02 | 0.01 | 0.37 | 0.01 | Ice |
| 28 | -- | -- | -- | -- | 5.96 <i>FE</i> | 0.86 | 0.22 | 0.02 | 0.01 | 0.47 | 0.01 | Ice |
| 29 | -- | -- | -- | -- | 1.28 | 2.18 | 0.25 | 0.02 | 0.01 | 0.43 | Ice | Ice |
| 30 | -- | -- | -- | 10.98 <i>FE</i> | 0.83 | 1.23 | 0.25 | 0.02 | 0.01 | 0.37 | 0.01 | Ice |
| 31 | -- | -- | -- | -- | 0.62 | -- | 0.26 | 0.01 | -- | 0.35 | -- | Ice |
| Total (cfs) | -- | -- | -- | 10.98 | 162.20 | 55.74 | 94.44 | 3.32 | 0.24 | 16.83 | 1.19 | 0.01 |
| Mean (cfs) | -- | -- | -- | 10.98 | 5.23 | 1.86 | 3.05 | 0.11 | 0.01 | 0.54 | 0.11 | 0.01 |
| Max (cfs) | -- | -- | -- | 10.98 | 10.98 | 10.13 | 10.99 | 0.33 | 0.04 | 5.74 | 0.31 | 0.01 |
| Min (cfs) | -- | -- | -- | 10.98 | 0.23 | 0.23 | 0.07 | 0.01 | 0.00 | 0.01 | 0.01 | 0.01 |

Notes:

- "--" = No data
- Ice = If more than 6 hours with 50% or more of the 5-minute data points indicated temperature recordings at or below freezing, the day was designated as ice-influenced; no daily average flow was calculated for this day.
- *FE* = Stage exceeded flume height for at least one measurement on this day. For time steps where stage exceeded flume height, flow was estimated using maximum flume height.
- If calculated average daily flow fell below the minimum measureable flume flow, the daily average flow was set to 0 cfs.
- cfs = cubic feet per second



SOUTH HEART COAL LLC
SOUTH HEART POWER PROJECT
SOUTH HEART, NORTH DAKOTA

DRAFT



HYDROGRAPH OF DAILY AVERAGE STREAMFLOW AT SHSB-03 (South Branch Heart River)

SURFACE WATER

| | | | | |
|-------------|--------------------------------------|--------|-----|------------|
| PROJECT NO. | 063-2174Y09 | DESIGN | BER | 05/24/2010 |
| FILE | Attachment A and Tables 1 and 2.xlsx | CHECK | ANH | 05/24/2010 |
| REV. | 1 | REVIEW | EJP | 05/24/2010 |

DAILY AVERAGE STREAMFLOW AT SHSB-03 (South Branch Heart River)

| Day | 2006 | | | | | | | | | | | |
|--------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----------------|
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
| 1 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 2 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 4 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 5 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 6 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 7 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 8 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 9 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 10 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 11 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 12 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 13 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 14 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 15 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 16 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 17 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 18 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 19 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.00 |
| 20 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice |
| 21 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice |
| 22 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice |
| 23 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice |
| 24 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice |
| 25 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.13 <i>FE</i> |
| 26 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice |
| 27 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice |
| 28 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice |
| 29 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.00 |
| 30 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.00 |
| 31 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.00 |
| Total (cfs) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.13 |
| Mean (cfs) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.03 |
| Max (cfs) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.13 |
| Min (cfs) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.00 |

Notes:

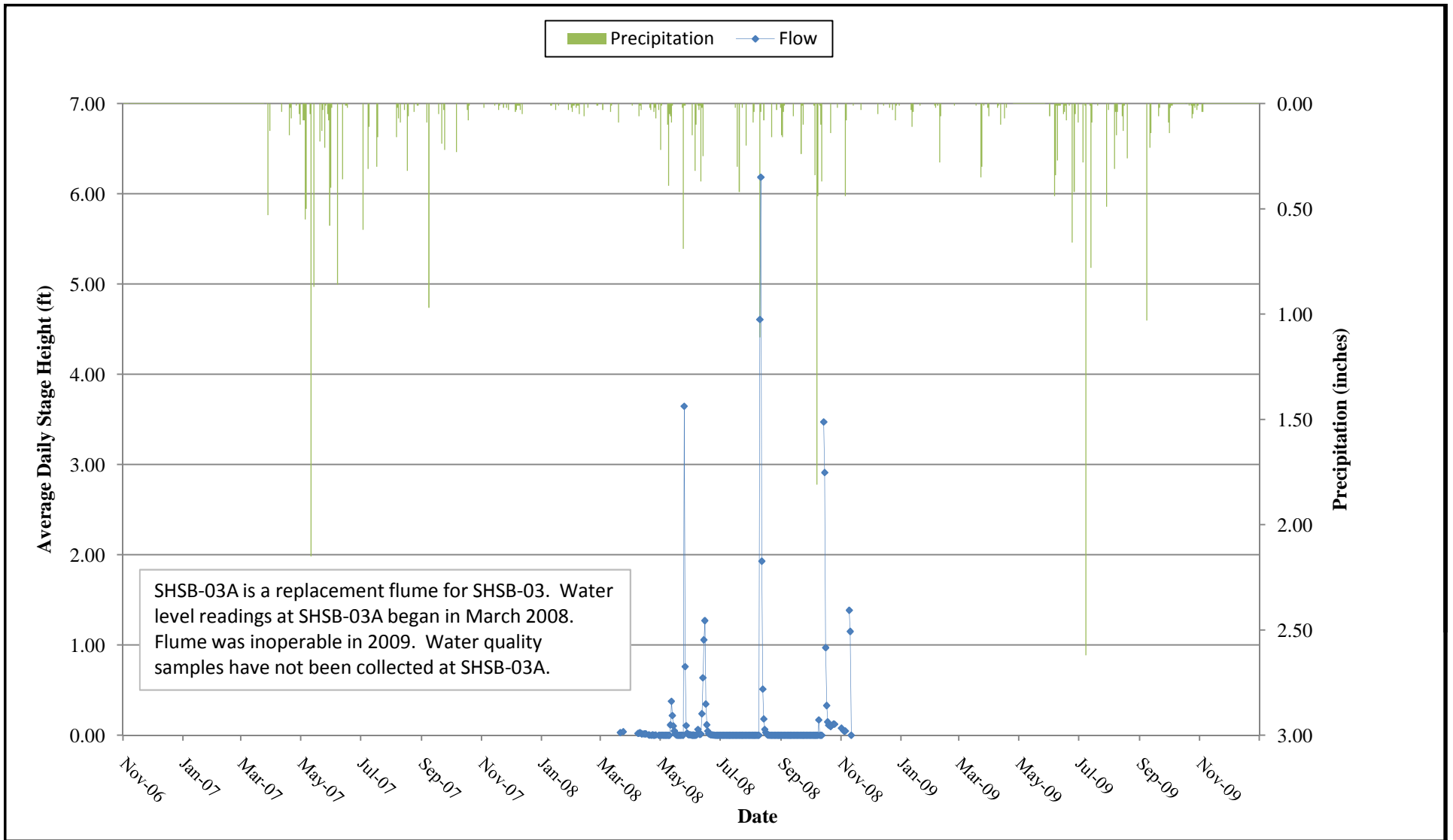
- "--" = No data
- Ice = If more than 6 hours with 50% or more of the 5-minute data points indicated temperature recordings at or below freezing, the day was designated as ice-influenced; no daily average flow was calculated for this day.
- *FE* = Stage exceeded flume height for at least one measurement on this day. For time steps where stage exceeded flume height, flow was estimated using maximum flume height.
- If calculated average daily flow fell below the minimum measureable flume flow, the daily average flow was set to 0 cfs.
- cfs = cubic feet per second

DAILY AVERAGE STREAMFLOW AT SHSB-03 (South Branch Heart River)

| Day | 2007 | | | | | | | | | | | |
|--------------------|-------------|-------------|--------------|--------------|----------------|-----------------|-----------------|--------------|--------------|--------------|-----|-----|
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
| 1 | 0.00 | 0.00 | Ice | 1.47 | 0.25 | 8.63 <i>FE</i> | 0.34 | 2.53 | 1.73 | 1.48 | -- | -- |
| 2 | Ice | 0.00 | Ice | 5.31 | 0.23 | 5.49 | 0.30 | 2.31 | 1.37 | 1.46 | -- | -- |
| 3 | Ice | 0.00 | 0.00 | Ice | 0.24 | 3.78 | 0.77 | 2.15 | 0.58 | 1.44 | -- | -- |
| 4 | Ice | 0.00 | 0.00 | Ice | 0.31 | 4.22 | 3.79 | 2.00 | 0.57 | 1.45 | -- | -- |
| 5 | Ice | Ice | Ice | Ice | 0.38 | 3.91 | 1.41 | 1.92 | 0.54 | 1.48 | -- | -- |
| 6 | Ice | Ice | Ice | Ice | 8.72 <i>FE</i> | 3.90 | 1.32 | 1.84 | 0.47 | 1.59 | -- | -- |
| 7 | Ice | Ice | Ice | Ice | 5.27 <i>FE</i> | 6.17 <i>FE</i> | 1.30 | 1.75 | 0.36 | 1.63 | -- | -- |
| 8 | Ice | 0.00 | Ice | Ice | 0.92 | 9.46 <i>FE</i> | 1.27 | 2.88 | 2.81 | 1.66 | -- | -- |
| 9 | 0.01 | 0.00 | Ice | Ice | 0.57 | 10.98 <i>FE</i> | 1.76 | 4.24 | 5.18 | 1.67 | -- | -- |
| 10 | Ice | Ice | Ice | Ice | 0.51 | 10.98 <i>FE</i> | 2.19 | 3.89 | 1.74 | 1.67 | -- | -- |
| 11 | 0.00 | Ice | 5.27 | Ice | 0.72 | 10.98 <i>FE</i> | 1.94 | 3.95 | 1.30 | 1.68 | -- | -- |
| 12 | 0.00 | Ice | 7.03 | 1.27 | 1.25 | 10.02 | 1.76 | 3.69 | 1.36 | 1.72 | -- | -- |
| 13 | 0.00 | Ice | 6.26 | 4.26 | 1.15 | 8.17 | 1.72 | 3.51 | 1.36 | 1.75 | -- | -- |
| 14 | 0.00 | Ice | 4.48 | 5.52 | 3.68 | 5.67 | 1.66 | 3.29 | 1.28 | 1.77 | -- | -- |
| 15 | 0.00 | Ice | Ice | 4.76 | 2.33 | 3.80 | 1.54 | 3.08 | 1.30 | 1.78 | -- | -- |
| 16 | 0.00 | Ice | 2.26 | 3.17 | 1.52 | 2.53 | 1.43 | 2.86 | 1.32 | 1.80 | -- | -- |
| 17 | 0.00 | Ice | 1.71 | 1.71 | 1.35 | 1.57 | 1.37 | 2.86 | 1.34 | 1.85 | -- | -- |
| 18 | 0.00 | Ice | 2.24 | 2.31 | 1.29 | 0.90 | 7.47 <i>FE</i> | 2.90 | 1.35 | 1.94 | -- | -- |
| 19 | 0.00 | Ice | 1.18 | 3.33 | 1.20 | 0.59 | 10.98 <i>FE</i> | 2.83 | 1.33 | 1.95 | -- | -- |
| 20 | 0.00 | Ice | 0.76 | 3.47 | 1.27 | 0.44 | 10.39 <i>FE</i> | 2.77 | 1.35 | 1.97 | -- | -- |
| 21 | 0.00 | Ice | 0.57 | 2.23 | 1.34 | 0.49 | 5.95 | 2.66 | 1.44 | 1.97 | -- | -- |
| 22 | Ice | Ice | 0.44 | 1.44 | 1.32 | 0.61 | 4.29 | 2.50 | 1.42 | 1.96 | -- | -- |
| 23 | Ice | Ice | 0.37 | 1.12 | 1.36 | 0.70 | 3.91 | 2.41 | 1.43 | 1.98 | -- | -- |
| 24 | Ice | Ice | 0.31 | 0.84 | 1.44 | 0.72 | 2.82 | 2.30 | 1.50 | 1.97 | -- | -- |
| 25 | Ice | Ice | 0.26 | 0.56 | 1.61 | 0.69 | 2.82 | 2.25 | 1.48 | 1.99 | -- | -- |
| 26 | Ice | Ice | 0.19 | 0.46 | 1.89 | 0.62 | 2.98 | 2.21 | 1.49 | 1.97 | -- | -- |
| 27 | 0.00 | Ice | 0.16 | 0.39 | 2.43 | 0.56 | 3.03 | 2.13 | 1.50 | -- | -- | -- |
| 28 | 0.00 | Ice | 0.21 | 0.35 | 2.28 | 0.49 | 3.10 | 2.03 | 1.50 | -- | -- | -- |
| 29 | 0.00 | -- | 2.93 | 0.29 | 2.10 | 0.45 | 3.10 | 1.94 | 1.50 | -- | -- | -- |
| 30 | 0.00 | -- | 0.93 | 0.32 | 2.07 | 0.39 | 2.92 | 1.88 | 1.50 | -- | -- | -- |
| 31 | 0.00 | -- | Ice | -- | 8.37 <i>FE</i> | -- | 2.73 | 1.80 | -- | -- | -- | -- |
| Total (cfs) | 0.01 | 0.00 | 37.55 | 44.59 | 59.34 | 117.88 | 92.35 | 81.34 | 43.38 | 45.56 | -- | -- |
| Mean (cfs) | 0.00 | 0.00 | 1.79 | 2.12 | 1.91 | 3.93 | 2.98 | 2.62 | 1.45 | 1.75 | -- | -- |
| Max (cfs) | 0.01 | 0.00 | 7.03 | 5.52 | 8.72 | 10.98 | 10.98 | 4.24 | 5.18 | 1.99 | -- | -- |
| Min (cfs) | 0.00 | 0.00 | 0.00 | 0.29 | 0.23 | 0.39 | 0.30 | 1.75 | 0.36 | 1.44 | -- | -- |

Notes:

- "--" = No data
- Ice = If more than 6 hours with 50% or more of the 5-minute data points indicated temperature recordings at or below freezing, the day was designated as ice-influenced; no daily average flow was calculated for this day.
- *FE* = Stage exceeded flume height for at least one measurement on this day. For time steps where stage exceeded flume height, flow was estimated using maximum flume height.
- If calculated average daily flow fell below the minimum measureable flume flow, the daily average flow was set to 0 cfs.
- cfs = cubic feet per second



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HYDROGRAPH OF DAILY AVERAGE STREAMFLOW AT SHSB-03A (South Branch Heart River)

| SURFACE WATER | | | | | |
|---------------|--------------------------------------|--------|-----|------------|--|
| PROJECT NO. | 063-2174Y09 | DESIGN | BER | 05/24/2010 | |
| FILE | Attachment A and Tables 1 and 2.xlsx | CHECK | ANH | 05/24/2010 | |
| REV. | 1 | REVIEW | EJP | 05/24/2010 | |

DAILY AVERAGE STREAMFLOW AT SHSB-03A (South Branch Heart River)

| Day | 2008 | | | | | | | | | | | |
|--------------------|------|-----|-------------|-------------|-------------|-------------|-------------|----------------|-------------|-------------|-------------|-----|
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
| 1 | -- | -- | -- | Ice | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.08 | -- |
| 2 | -- | -- | -- | Ice | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | Ice | -- |
| 3 | -- | -- | -- | Ice | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.06 | -- |
| 4 | -- | -- | -- | Ice | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 | -- |
| 5 | -- | -- | -- | Ice | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.05 | -- |
| 6 | -- | -- | -- | Ice | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | Ice | -- |
| 7 | -- | -- | -- | Ice | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | Ice | -- |
| 8 | -- | -- | -- | 0.02 | 0.00 | 0.07 | 0.00 | 0.00 | 0.00 | 0.00 | Ice | -- |
| 9 | -- | -- | -- | 0.02 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.17 | 1.39 | -- |
| 10 | -- | -- | -- | 0.03 | 0.00 | 0.01 | 0.00 | 4.61 <i>FE</i> | 0.00 | 0.00 | 1.15 | -- |
| 11 | -- | -- | -- | 0.02 | 0.12 | 0.01 | 0.00 | 6.18 | 0.00 | 0.00 | 0.00 | -- |
| 12 | -- | -- | -- | 0.02 | 0.38 | 0.24 | 0.00 | 1.93 | 0.00 | 0.00 | -- | -- |
| 13 | -- | -- | -- | Ice | 0.22 | 0.64 | 0.00 | 0.51 | 0.00 | Ice | -- | -- |
| 14 | -- | -- | -- | 0.02 | 0.10 | 1.06 | 0.00 | 0.18 | 0.00 | 3.47 | -- | -- |
| 15 | -- | -- | -- | 0.02 | 0.05 | 1.27 | 0.00 | 0.07 | 0.00 | 2.91 | -- | -- |
| 16 | -- | -- | -- | 0.02 | 0.02 | 0.35 | 0.00 | 0.03 | 0.00 | 0.97 | -- | -- |
| 17 | -- | -- | -- | Ice | 0.00 | 0.12 | 0.00 | 0.01 | 0.00 | 0.33 | -- | -- |
| 18 | -- | -- | -- | Ice | 0.00 | 0.05 | 0.00 | 0.00 | 0.00 | 0.15 | -- | -- |
| 19 | -- | -- | -- | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.11 | -- | -- |
| 20 | -- | -- | -- | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | Ice | -- | -- |
| 21 | -- | -- | 0.03 | Ice | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.10 | -- | -- |
| 22 | -- | -- | Ice | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.11 | -- | -- |
| 23 | -- | -- | Ice | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | Ice | -- | -- |
| 24 | -- | -- | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.12 | -- | -- |
| 25 | -- | -- | Ice | 0.00 | 3.65 | 0.00 | 0.00 | 0.00 | 0.00 | 0.12 | -- | -- |
| 26 | -- | -- | Ice | 0.00 | 0.76 | 0.00 | 0.00 | 0.00 | 0.00 | Ice | -- | -- |
| 27 | -- | -- | Ice | Ice | 0.11 | 0.00 | 0.00 | 0.00 | 0.00 | Ice | -- | -- |
| 28 | -- | -- | Ice | Ice | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | Ice | -- | -- |
| 29 | -- | -- | Ice | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | Ice | -- | -- |
| 30 | -- | -- | Ice | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | Ice | -- | -- |
| 31 | -- | -- | Ice | -- | 0.01 | -- | 0.00 | 0.00 | -- | Ice | -- | -- |
| Total (cfs) | -- | -- | 0.07 | 0.17 | 5.44 | 3.88 | 0.00 | 13.53 | 0.00 | 8.56 | 2.76 | -- |
| Mean (cfs) | -- | -- | 0.03 | 0.01 | 0.18 | 0.13 | 0.00 | 0.44 | 0.00 | 0.39 | 0.39 | -- |
| Max (cfs) | -- | -- | 0.04 | 0.03 | 3.65 | 1.27 | 0.00 | 6.18 | 0.00 | 3.47 | 1.39 | -- |
| Min (cfs) | -- | -- | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- |

Notes:

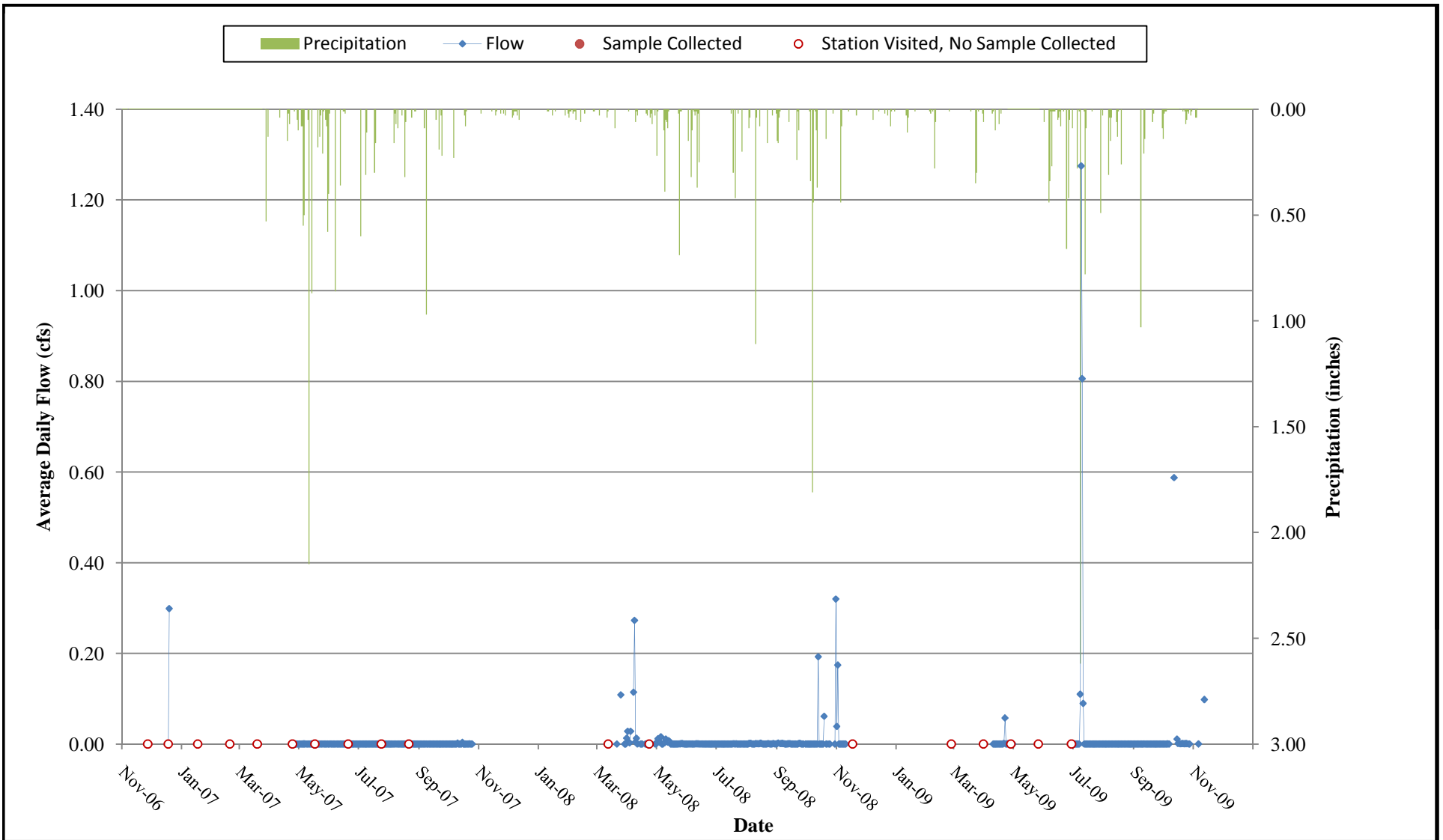
- "--" = No data
- Ice = If more than 6 hours with 50% or more of the 5-minute data points indicated temperature recordings at or below freezing, the day was designated as ice-influenced; no daily average flow was calculated for this day.
- *FE* = Stage exceed
- If calculated average daily flow fell below the minimum measureable flume flow, the daily average flow was set to 0 cfs.
- cfs = cubic feet per second

DAILY AVERAGE STREAMFLOW AT SHSB-03A (South Branch Heart River)

| Day | 2009 | | | | | | | | | | | |
|--------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
| 1 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 2 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 4 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 5 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 6 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 7 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 8 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 9 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 10 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 11 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 12 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 13 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 14 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 15 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 16 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 17 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 18 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 19 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 20 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 21 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 22 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 23 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 24 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 25 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 26 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 27 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 28 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 29 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 30 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 31 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Total (cfs) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Mean (cfs) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Max (cfs) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Min (cfs) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |

Notes:

- "--" = No data
- Ice = If more than 6 hours with 50% or more of the 5-minute data points indicated temperature recordings at or below freezing, the day was designated as ice-influenced; no daily average flow was calculated for this day.
- FE = Stage exceeded flume height for at least one measurement on this day. For time steps where stage exceeded flume height, flow was estimated using maximum flume height.
- If calculated average daily flow fell below the minimum measureable flume flow, the daily average flow was set to 0 cfs.
- cfs = cubic feet per second



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DRAFT



HYDROGRAPH OF DAILY AVERAGE STREAMFLOW AT SHUN-01 (West Tributary)

SURFACE WATER

| | | | | |
|-------------|--------------------------------------|--------|-----|------------|
| PROJECT NO. | 063-2174Y09 | DESIGN | BER | 05/24/2010 |
| FILE | Attachment A and Tables 1 and 2.xlsx | CHECK | ANH | 05/24/2010 |
| REV. | 1 | REVIEW | EJP | 05/24/2010 |

DAILY AVERAGE STREAMFLOW AT SHUN-01 (West Tributary)

| Day | 2006 | | | | | | | | | | | |
|--------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----------------|
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
| 1 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 2 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 4 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 5 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 6 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 7 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 8 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 9 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 10 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 11 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 12 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 13 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 14 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice |
| 15 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice |
| 16 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice |
| 17 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice |
| 18 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.00 |
| 19 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.30 <i>FE</i> |
| 20 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice |
| 21 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice |
| 22 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 23 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice |
| 24 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice |
| 25 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice |
| 26 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice |
| 27 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice |
| 28 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice |
| 29 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice |
| 30 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice |
| 31 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice |
| Total (cfs) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.30 |
| Mean (cfs) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.15 |
| Max (cfs) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.30 |
| Min (cfs) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.00 |

Notes:

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- *FE* = Stage exceeded flume height for at least one measurement on this day. For time steps where stage exceeded flume height, flow was estimated using maximum flume height.
- If calculated average daily flow fell below the minimum measureable flume flow, the daily average flow was set to 0 cfs.
- cfs = cubic feet per second

DAILY AVERAGE STREAMFLOW AT SHUN-01 (West Tributary)

| Day | 2007 | | | | | | | | | | | |
|--------------------|------|-----|-----|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-----|-----|
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
| 1 | Ice | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 2 | Ice | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 3 | Ice | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 4 | Ice | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 5 | Ice | -- | -- | Ice | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 6 | Ice | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 7 | Ice | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 8 | Ice | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 9 | Ice | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 10 | Ice | -- | -- | Ice | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 11 | -- | -- | -- | Ice | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 12 | -- | -- | -- | Ice | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 13 | -- | -- | -- | Ice | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 14 | -- | -- | -- | Ice | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 15 | -- | -- | Ice | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 16 | -- | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 17 | -- | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 18 | -- | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 19 | -- | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 20 | -- | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 21 | -- | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 22 | -- | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 23 | -- | -- | -- | Ice | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 24 | -- | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 25 | -- | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 26 | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- | -- |
| 27 | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- | -- |
| 28 | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- | -- |
| 29 | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- | -- |
| 30 | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- | -- |
| 31 | Ice | -- | -- | -- | 0.00 | -- | 0.00 | 0.00 | -- | -- | -- | -- |
| Total (cfs) | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | -- | -- |
| Mean (cfs) | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| Max (cfs) | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| Min (cfs) | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |

Notes:

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- Ice = If more than 6 hours with 50% or more of the 5-minute data points indicated temperature recordings at or below freezing, the day was designated as ice-influenced; no daily average flow was calculated for this day.
- FE = Stage exceeded flume height for at least one measurement on this day. For time steps where stage exceeded flume height, flow was estimated using maximum flume height.
- If calculated average daily flow fell below the minimum measureable flume flow, the daily average flow was set to 0 cfs.
- cfs = cubic feet per second

DAILY AVERAGE STREAMFLOW AT SHUN-01 (West Tributary)

| Day | 2008 | | | | | | | | | | | |
|--------------------|------|-----|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-----|
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
| 1 | -- | -- | -- | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 FE | -- |
| 2 | -- | -- | -- | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.17 FE | -- |
| 3 | -- | -- | -- | 0.00 | Ice | 0.00 | 0.00 | 0.00 | Ice | 0.00 | 0.00 | -- |
| 4 | -- | -- | -- | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- |
| 5 | -- | -- | -- | Ice | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- |
| 6 | -- | -- | -- | Ice | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- |
| 7 | -- | -- | -- | 0.11 FE | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- |
| 8 | -- | -- | -- | 0.27 FE | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- |
| 9 | -- | -- | -- | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- |
| 10 | -- | -- | -- | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- |
| 11 | -- | -- | -- | 0.00 | Ice | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 12 | -- | -- | -- | Ice | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 13 | -- | -- | -- | Ice | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.19 FE | -- | -- |
| 14 | -- | -- | -- | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 15 | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 16 | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 17 | -- | -- | -- | Ice | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 18 | -- | -- | -- | Ice | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 19 | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.06 FE | -- | -- |
| 20 | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | Ice | -- | -- |
| 21 | -- | -- | 0.00 | Ice | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 22 | -- | -- | Ice | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 23 | -- | -- | Ice | Ice | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | Ice | -- | -- |
| 24 | -- | -- | Ice | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 25 | -- | -- | 0.11 | Ice | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 26 | -- | -- | Ice | Ice | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | Ice | -- | -- |
| 27 | -- | -- | Ice | Ice | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | Ice | -- | -- |
| 28 | -- | -- | Ice | Ice | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | Ice | -- | -- |
| 29 | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | Ice | Ice | -- | -- |
| 30 | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 31 | -- | -- | 0.01 | -- | 0.00 | -- | 0.00 | 0.00 | -- | 0.32 FE | -- | -- |
| Total (cfs) | -- | -- | 0.12 | 0.47 | 0.07 | 0.00 | 0.00 | 0.01 | 0.01 | 0.57 | 0.21 | -- |
| Mean (cfs) | -- | -- | 0.02 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.02 | -- |
| Max (cfs) | -- | -- | 0.11 | 0.27 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.32 | 0.17 | -- |
| Min (cfs) | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- |

Notes:

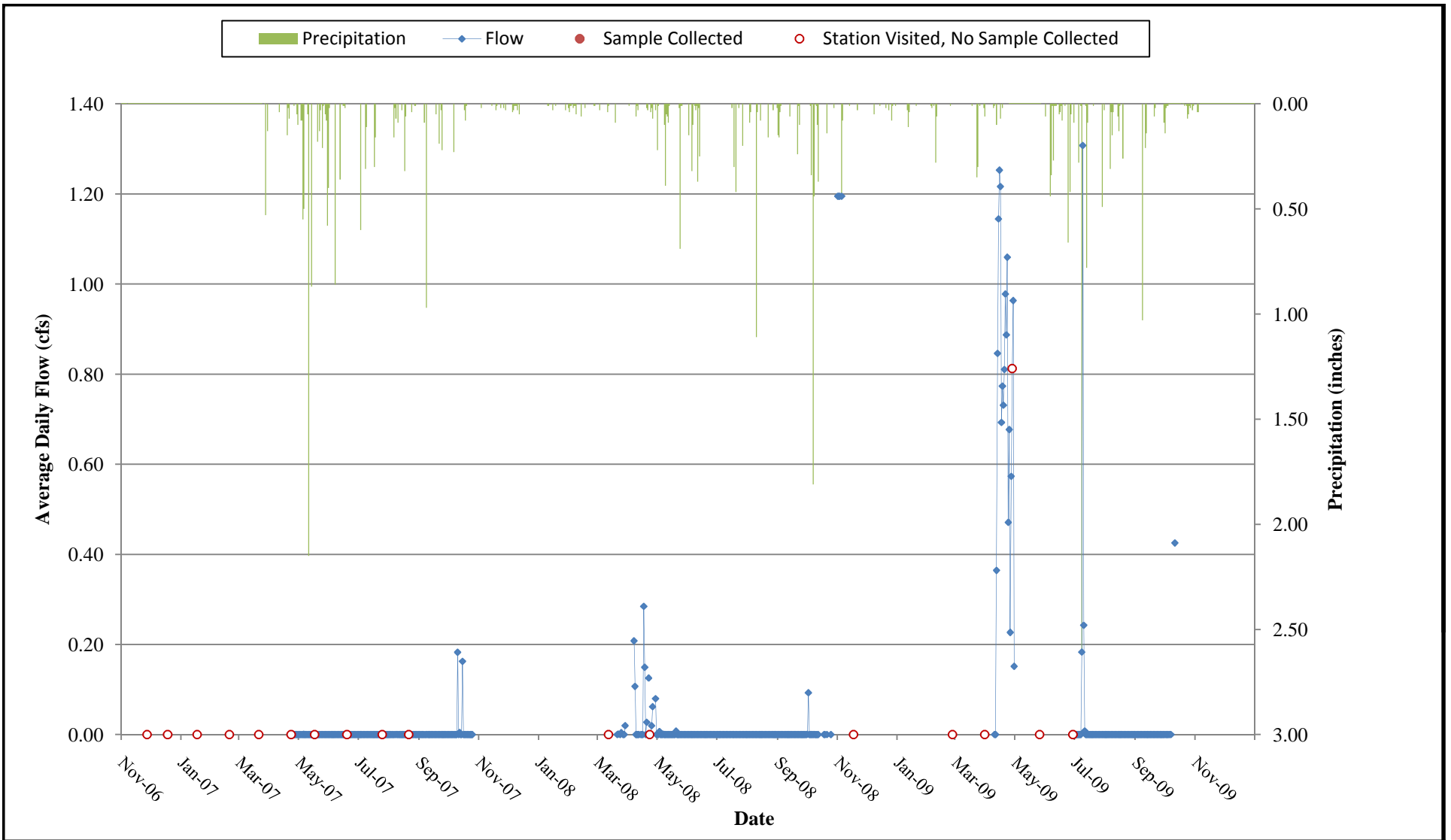
- "--" = No data
- Ice = If more than 6 hours with 50% or more of the 5-minute data points indicated temperature recordings at or below freezing, the day was designated as ice-influenced; no daily average flow was calculated for this day.
- FE = Stage exceeded flume height for at least one measurement on this day. For time steps where stage exceeded flume height, flow was estimated using maximum flume height.
- If calculated average daily flow fell below the minimum measureable flume flow, the daily average flow was set to 0 cfs.
- cfs = cubic feet per second

DAILY AVERAGE STREAMFLOW AT SHUN-01 (West Tributary)

| Day | 2009 | | | | | | | | | | | |
|--------------------|------|-----|-----|-------------|-----|-----|----------------|-------------|-------------|----------------|-------------|-----|
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
| 1 | -- | -- | -- | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | Ice | -- |
| 2 | -- | -- | -- | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | Ice | -- |
| 3 | -- | -- | -- | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | Ice | -- |
| 4 | -- | -- | -- | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | Ice | -- |
| 5 | -- | -- | -- | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | Ice | -- |
| 6 | -- | -- | -- | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- |
| 7 | -- | -- | -- | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | Ice | -- |
| 8 | -- | -- | -- | -- | -- | -- | 0.11 | 0.00 | 0.00 | Ice | Ice | -- |
| 9 | -- | -- | -- | -- | -- | -- | 1.28 <i>FE</i> | 0.00 | 0.00 | Ice | Ice | -- |
| 10 | -- | -- | -- | 0.00 | -- | -- | 0.81 | 0.00 | 0.00 | Ice | Ice | -- |
| 11 | -- | -- | -- | 0.00 | -- | -- | 0.09 | 0.00 | 0.00 | Ice | Ice | -- |
| 12 | -- | -- | -- | 0.00 | -- | -- | 0.00 | 0.00 | 0.00 | 0.59 <i>FE</i> | 0.10 | -- |
| 13 | -- | -- | -- | 0.00 | -- | -- | 0.00 | 0.00 | 0.00 | Ice | -- | -- |
| 14 | -- | -- | -- | 0.00 | -- | -- | 0.00 | 0.00 | 0.00 | Ice | -- | -- |
| 15 | -- | -- | -- | 0.00 | -- | -- | 0.00 | 0.00 | 0.00 | 0.01 | -- | -- |
| 16 | -- | -- | -- | 0.00 | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 17 | -- | -- | -- | 0.00 | -- | -- | 0.00 | 0.00 | 0.00 | Ice | -- | -- |
| 18 | -- | -- | -- | 0.00 | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 19 | -- | -- | -- | 0.00 | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 20 | -- | -- | -- | 0.00 | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 21 | -- | -- | -- | 0.00 | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 22 | -- | -- | -- | 0.06 | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 23 | -- | -- | -- | 0.00 | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 24 | -- | -- | -- | 0.00 | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 25 | -- | -- | -- | 0.00 | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 26 | -- | -- | -- | 0.00 | -- | -- | 0.00 | 0.00 | 0.00 | Ice | -- | -- |
| 27 | -- | -- | -- | Ice | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 28 | -- | -- | -- | 0.00 | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 29 | -- | -- | -- | 0.00 | -- | -- | 0.00 | 0.00 | 0.00 | Ice | -- | -- |
| 30 | -- | -- | -- | 0.00 | -- | -- | 0.00 | 0.00 | 0.00 | Ice | -- | -- |
| 31 | -- | -- | -- | -- | -- | -- | 0.00 | 0.00 | -- | Ice | -- | -- |
| Total (cfs) | -- | -- | -- | 0.06 | -- | -- | 2.28 | 0.00 | 0.00 | 0.61 | 0.10 | -- |
| Mean (cfs) | -- | -- | -- | 0.00 | -- | -- | 0.07 | 0.00 | 0.00 | 0.03 | 0.05 | -- |
| Max (cfs) | -- | -- | -- | 0.06 | -- | -- | 1.28 | 0.00 | 0.00 | 0.59 | 0.10 | -- |
| Min (cfs) | -- | -- | -- | 0.00 | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- |

Notes:

- "--" = No data
- Ice = If more than 6 hours with 50% or more of the 5-minute data points indicated temperature recordings at or below freezing, the day was designated as ice-influenced; no daily average flow was calculated for this day.
- *FE* = Stage exceeded flume height for at least one measurement on this day. For time steps where stage exceeded flume height, flow was estimated using maximum flume height.
- If calculated average daily flow fell below the minimum measureable flume flow, the daily average flow was set to 0 cfs.
- cfs = cubic feet per second



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HYDROGRAPH OF DAILY AVERAGE STREAMFLOW AT SHUN-02 (West Tributary)

SURFACE WATER

| | | | | |
|-------------|--------------------------------------|--------|-----|------------|
| PROJECT NO. | 063-2174Y09 | DESIGN | BER | 05/24/2010 |
| FILE | Attachment A and Tables 1 and 2.xlsx | CHECK | ANH | 05/24/2010 |
| REV. | 1 | REVIEW | EJP | 05/24/2010 |

DAILY AVERAGE STREAMFLOW AT SHUN-02 (West Tributary)

| Day | 2007 | | | | | | | | | | | |
|--------------------|------|-----|-----|-------------|-------------|-------------|-------------|-------------|-------------|----------------|-----|-----|
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
| 1 | -- | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 2 | -- | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 3 | -- | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 4 | -- | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 5 | -- | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 6 | -- | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 7 | -- | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 8 | -- | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 9 | -- | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 10 | -- | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.18 <i>FE</i> | -- | -- |
| 11 | -- | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 12 | -- | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | -- | -- |
| 13 | -- | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 14 | -- | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 15 | -- | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.16 <i>FE</i> | -- | -- |
| 16 | -- | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 17 | -- | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 18 | -- | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 19 | -- | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 20 | -- | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 21 | -- | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 22 | -- | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 23 | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 24 | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 25 | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 26 | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- | -- |
| 27 | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- | -- |
| 28 | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- | -- |
| 29 | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- | -- |
| 30 | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- | -- |
| 31 | -- | -- | -- | -- | 0.00 | -- | 0.00 | 0.00 | -- | -- | -- | -- |
| Total (cfs) | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.35 | -- | -- |
| Mean (cfs) | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | -- | -- |
| Max (cfs) | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.18 | -- | -- |
| Min (cfs) | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |

Notes:

- "--" = No data
- Ice = If more than 6 hours with 50% or more of the 5-minute data points indicated temperature recordings at or below freezing, the day was designated as ice-influenced; no daily average flow was calculated for this day.
- *FE* = Stage exceeded flume height for at least one measurement on this day. For time steps where stage exceeded flume height, flow was estimated using maximum flume height.
- If calculated average daily flow fell below the minimum measureable flume flow, the daily average flow was set to 0 cfs.
- cfs = cubic feet per second

DAILY AVERAGE STREAMFLOW AT SHUN-02 (West Tributary)

| Day | 2008 | | | | | | | | | | | |
|--------------------|------|-----|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-----|
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
| 1 | -- | -- | -- | Ice | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.20 FE | -- |
| 2 | -- | -- | -- | Ice | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.09 FE | 1.20 FE | -- |
| 3 | -- | -- | -- | Ice | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.20 FE | -- |
| 4 | -- | -- | -- | Ice | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | Ice | -- |
| 5 | -- | -- | -- | Ice | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.20 FE | -- |
| 6 | -- | -- | -- | Ice | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | Ice | -- |
| 7 | -- | -- | -- | 0.21 FE | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | Ice | -- |
| 8 | -- | -- | -- | 0.11 FE | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | Ice | -- |
| 9 | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | Ice | -- |
| 10 | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | Ice | -- |
| 11 | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 12 | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 13 | -- | -- | -- | Ice | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | Ice | -- | -- |
| 14 | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | Ice | -- | -- |
| 15 | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | Ice | -- | -- |
| 16 | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | Ice | -- | -- |
| 17 | -- | -- | -- | 0.29 FE | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | Ice | -- | -- |
| 18 | -- | -- | -- | 0.15 FE | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 19 | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 20 | -- | -- | -- | 0.03 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | Ice | -- | -- |
| 21 | -- | -- | 0.00 | Ice | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 22 | -- | -- | 0.00 | 0.13 FE | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | Ice | -- | -- |
| 23 | -- | -- | Ice | Ice | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | Ice | -- | -- |
| 24 | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | Ice | -- | -- |
| 25 | -- | -- | 0.00 FE | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 26 | -- | -- | Ice | 0.06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | Ice | -- | -- |
| 27 | -- | -- | 0.00 | Ice | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | Ice | -- | -- |
| 28 | -- | -- | 0.00 | Ice | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | Ice | -- | -- |
| 29 | -- | -- | 0.02 | 0.08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | Ice | -- | -- |
| 30 | -- | -- | Ice | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | Ice | -- | -- |
| 31 | -- | -- | Ice | -- | 0.00 | -- | 0.00 | 0.00 | -- | Ice | -- | -- |
| Total (cfs) | -- | -- | 0.03 | 1.06 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.09 | 4.78 | -- |
| Mean (cfs) | -- | -- | 0.00 | 0.06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 1.20 | -- |
| Max (cfs) | -- | -- | 0.02 | 0.29 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.09 | 1.20 | -- |
| Min (cfs) | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.20 | -- |

Notes:

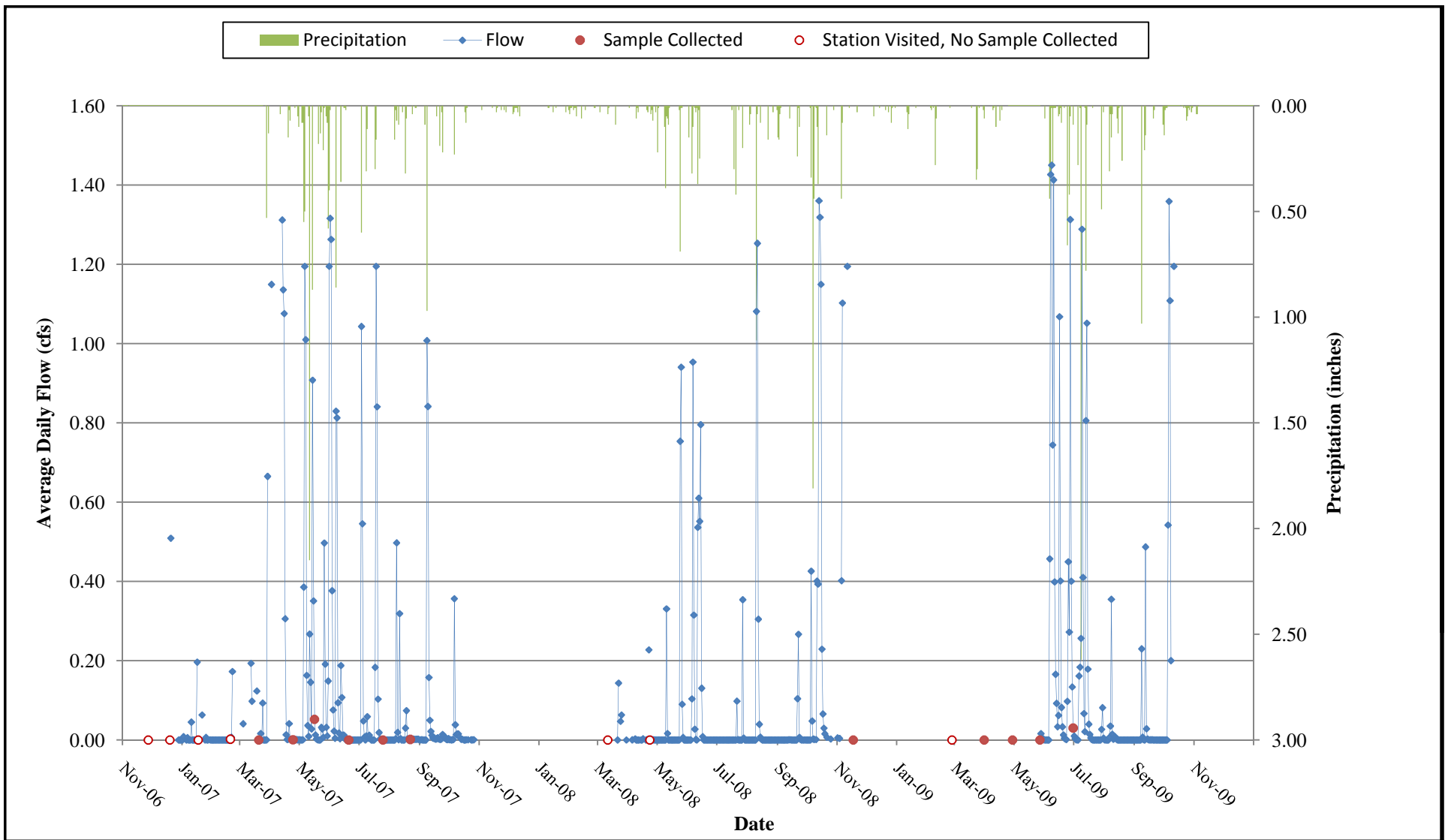
- "--" = No data
- Ice = If more than 6 hours with 50% or more of the 5-minute data points indicated temperature recordings at or below freezing, the day was designated as ice-influenced; no daily average flow was calculated for this day.
- FE = Stage exceed
- If calculated average daily flow fell below the minimum measureable flume flow, the daily average flow was set to 0 cfs.
- cfs = cubic feet per second

DAILY AVERAGE STREAMFLOW AT SHUN-02 (West Tributary)

| Day | 2009 | | | | | | | | | | | |
|--------------------|------|-----|-----|----------------|-----|-----|----------------|-------------|-------------|----------------|-----|-----|
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
| 1 | -- | -- | -- | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 2 | -- | -- | -- | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 3 | -- | -- | -- | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 4 | -- | -- | -- | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 5 | -- | -- | -- | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 6 | -- | -- | -- | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 7 | -- | -- | -- | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 8 | -- | -- | -- | -- | -- | -- | 0.18 <i>FE</i> | 0.00 | 0.00 | Ice | -- | -- |
| 9 | -- | -- | -- | -- | -- | -- | 1.31 <i>FE</i> | 0.00 | 0.00 | Ice | -- | -- |
| 10 | -- | -- | -- | 0.00 | -- | -- | 0.24 | 0.00 | 0.00 | Ice | -- | -- |
| 11 | -- | -- | -- | 0.00 | -- | -- | 0.01 | 0.00 | 0.00 | 0.43 <i>FE</i> | -- | -- |
| 12 | -- | -- | -- | 0.36 | -- | -- | 0.00 | 0.00 | 0.00 | -- | -- | -- |
| 13 | -- | -- | -- | 0.85 <i>FE</i> | -- | -- | 0.00 | 0.00 | 0.00 | -- | -- | -- |
| 14 | -- | -- | -- | 1.15 <i>FE</i> | -- | -- | 0.00 | 0.00 | 0.00 | -- | -- | -- |
| 15 | -- | -- | -- | 1.25 <i>FE</i> | -- | -- | 0.00 | 0.00 | 0.00 | -- | -- | -- |
| 16 | -- | -- | -- | 1.22 <i>FE</i> | -- | -- | 0.00 | 0.00 | 0.00 | -- | -- | -- |
| 17 | -- | -- | -- | 0.69 <i>FE</i> | -- | -- | 0.00 | 0.00 | 0.00 | -- | -- | -- |
| 18 | -- | -- | -- | 0.77 <i>FE</i> | -- | -- | 0.00 | 0.00 | 0.00 | -- | -- | -- |
| 19 | -- | -- | -- | 0.73 <i>FE</i> | -- | -- | 0.00 | 0.00 | 0.00 | -- | -- | -- |
| 20 | -- | -- | -- | 0.81 <i>FE</i> | -- | -- | 0.00 | 0.00 | 0.00 | -- | -- | -- |
| 21 | -- | -- | -- | 0.98 <i>FE</i> | -- | -- | 0.00 | 0.00 | 0.00 | -- | -- | -- |
| 22 | -- | -- | -- | 0.89 <i>FE</i> | -- | -- | 0.00 | 0.00 | 0.00 | -- | -- | -- |
| 23 | -- | -- | -- | 1.06 <i>FE</i> | -- | -- | 0.00 | 0.00 | 0.00 | -- | -- | -- |
| 24 | -- | -- | -- | 0.47 <i>FE</i> | -- | -- | 0.00 | 0.00 | 0.00 | -- | -- | -- |
| 25 | -- | -- | -- | 0.68 <i>FE</i> | -- | -- | 0.00 | 0.00 | 0.00 | -- | -- | -- |
| 26 | -- | -- | -- | 0.23 | -- | -- | 0.00 | 0.00 | 0.00 | -- | -- | -- |
| 27 | -- | -- | -- | 0.57 <i>FE</i> | -- | -- | 0.00 | 0.00 | 0.00 | -- | -- | -- |
| 28 | -- | -- | -- | 0.81 <i>FE</i> | -- | -- | 0.00 | 0.00 | 0.00 | -- | -- | -- |
| 29 | -- | -- | -- | 0.96 <i>FE</i> | -- | -- | 0.00 | 0.00 | 0.00 | -- | -- | -- |
| 30 | -- | -- | -- | 0.15 <i>FE</i> | -- | -- | 0.00 | 0.00 | 0.00 | -- | -- | -- |
| 31 | -- | -- | -- | -- | -- | -- | 0.00 | 0.00 | -- | -- | -- | -- |
| Total (cfs) | -- | -- | -- | 14.63 | -- | -- | 1.74 | 0.00 | 0.00 | 0.43 | -- | -- |
| Mean (cfs) | -- | -- | -- | 0.70 | -- | -- | 0.06 | 0.00 | 0.00 | 0.05 | -- | -- |
| Max (cfs) | -- | -- | -- | 1.25 | -- | -- | 1.31 | 0.00 | 0.00 | 0.43 | -- | -- |
| Min (cfs) | -- | -- | -- | 0.00 | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |

Notes:

- "--" = No data
- Ice = If more than 6 hours with 50% or more of the 5-minute data points indicated temperature recordings at or below freezing, the day was designated as ice-influenced; no daily average flow was calculated for this day.
- *FE* = Stage exceeded flume height for at least one measurement on this day. For time steps where stage exceeded flume height, flow was estimated using maximum flume height.
- If calculated average daily flow fell below the minimum measureable flume flow, the daily average flow was set to 0 cfs.
- cfs = cubic feet per second



SOUTH HEART COAL LLC
SOUTH HEART POWER PROJECT
SOUTH HEART, NORTH DAKOTA

DRAFT



HYDROGRAPH OF DAILY AVERAGE STREAMFLOW AT SHUN-03 (South Tributary)

SURFACE WATER

| | | | | |
|-------------|--------------------------------------|--------|-----|------------|
| PROJECT NO. | 063-2174Y09 | DESIGN | BER | 05/24/2010 |
| FILE | Attachment A and Tables 1 and 2.xlsx | CHECK | ANH | 05/24/2010 |
| REV. | 1 | REVIEW | EJP | 05/24/2010 |

DAILY AVERAGE STREAMFLOW AT SHUN-03 (South Tributary)

| Day | 2006 | | | | | | | | | | | |
|--------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------------|
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
| 1 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 2 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 4 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 5 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 6 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 7 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 8 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 9 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 10 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 11 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 12 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 13 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 14 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 15 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 16 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 17 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 18 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 19 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 20 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.51 FE |
| 21 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice |
| 22 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice |
| 23 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice |
| 24 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice |
| 25 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice |
| 26 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice |
| 27 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice |
| 28 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.00 |
| 29 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.00 |
| 30 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.00 |
| 31 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.00 |
| Total (cfs) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.51 |
| Mean (cfs) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.10 |
| Max (cfs) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.51 |
| Min (cfs) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.00 |

Notes:

- "--" = No data
- Ice = If more than 6 hours with 50% or more of the 5-minute data points indicated temperature recordings at or below freezing, the day was designated as ice-influenced; no daily average flow was calculated for this day.
- FE = Stage exceeded flume height for at least one measurement on this day. For time steps where stage exceeded flume height, flow was estimated using maximum flume height.
- If calculated average daily flow fell below the minimum measureable flume flow, the daily average flow was set to 0 cfs.
- cfs = cubic feet per second

DAILY AVERAGE STREAMFLOW AT SHUN-03 (South Tributary)

| Day | 2007 | | | | | | | | | | | |
|--------------------|-------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----|-----|
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
| 1 | 0.00 | 0.00 | Ice | Ice | 0.00 | 1.32 <i>FE</i> | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 2 | 0.01 | 0.00 | Ice | 1.15 <i>FE</i> | 0.00 | 1.26 <i>FE</i> | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 3 | Ice | 0.00 | Ice | Ice | 0.00 | 0.38 | 1.04 <i>FE</i> | 0.00 | 0.00 | 0.00 | -- | -- |
| 4 | Ice | 0.00 | 0.04 | Ice | 0.00 | 0.08 | 0.55 | 0.00 | 0.00 | 0.00 | -- | -- |
| 5 | 0.00 | 0.00 | Ice | Ice | 0.39 <i>FE</i> | 0.02 | 0.05 | 0.00 | 0.00 | 0.00 | -- | -- |
| 6 | 0.01 | 0.00 | Ice | Ice | 1.20 <i>FE</i> | 0.01 | 0.01 | 0.00 | 0.00 | 0.36 <i>FE</i> | -- | -- |
| 7 | 0.00 | 0.00 | Ice | Ice | 1.01 <i>FE</i> | 0.83 <i>FE</i> | 0.00 | 0.00 | 0.00 | 0.04 | -- | -- |
| 8 | 0.00 | 0.00 | Ice | Ice | 0.16 | 0.81 <i>FE</i> | 0.01 | 0.50 <i>FE</i> | 1.01 <i>FE</i> | 0.01 | -- | -- |
| 9 | 0.00 | 0.00 | Ice | Ice | 0.04 | 0.09 | 0.06 | 0.02 | 0.84 <i>FE</i> | 0.02 | -- | -- |
| 10 | 0.05 | 0.00 | Ice | Ice | 0.01 | 0.02 | 0.00 | 0.00 | 0.16 | 0.02 | -- | -- |
| 11 | 0.00 | 0.00 | Ice | Ice | 0.27 | 0.00 | 0.01 | 0.32 <i>FE</i> | 0.05 | 0.01 | -- | -- |
| 12 | 0.00 | 0.00 | 0.19 | Ice | 0.15 | 0.19 | 0.00 | 0.00 | 0.02 | Ice | -- | -- |
| 13 | 0.00 | 0.00 | 0.10 | 1.31 <i>FE</i> | 0.03 | 0.11 | 0.00 | 0.00 | 0.01 | 0.00 | -- | -- |
| 14 | 0.00 | 0.00 | Ice | 1.14 <i>FE</i> | 0.91 <i>FE</i> | 0.01 | 0.00 | 0.00 | 0.01 | 0.00 | -- | -- |
| 15 | 0.00 | 0.00 | Ice | 1.08 <i>FE</i> | 0.35 | 0.01 | 0.00 | 0.00 | 0.00 | Ice | -- | -- |
| 16 | 0.20 | 0.00 | Ice | 0.31 | 0.05 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 17 | Ice | 0.00 | Ice | 0.01 | 0.01 | 0.00 | 0.18 <i>FE</i> | 0.03 | 0.00 | 0.00 | -- | -- |
| 18 | Ice | Ice | 0.12 | 0.00 | 0.00 | 0.00 | 1.20 <i>FE</i> | 0.07 | 0.00 | 0.00 | -- | -- |
| 19 | Ice | 0.00 | Ice | 0.00 | 0.00 | 0.00 | 0.84 <i>FE</i> | 0.00 | 0.01 | Ice | -- | -- |
| 20 | Ice | 0.01 | Ice | 0.04 | 0.00 | 0.00 | 0.10 | 0.00 | 0.00 | 0.00 | -- | -- |
| 21 | 0.06 | 0.17 <i>FE</i> | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | Ice | -- | -- |
| 22 | Ice | Ice | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | Ice | -- | -- |
| 23 | Ice | Ice | 0.00 | 0.00 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 24 | 0.00 | Ice | 0.09 | 0.00 | 0.03 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | -- | -- |
| 25 | 0.01 | Ice | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | -- | -- |
| 26 | 0.00 | Ice | 0.00 | 0.00 | 0.50 <i>FE</i> | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | -- | -- |
| 27 | 0.00 | Ice | 0.00 | 0.00 | 0.19 | 0.00 | 0.00 | 0.00 | 0.01 | -- | -- | -- |
| 28 | Ice | Ice | 0.00 | 0.00 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- | -- |
| 29 | 0.00 | -- | 0.67 <i>FE</i> | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- | -- |
| 30 | 0.00 | -- | Ice | 0.00 | 0.15 <i>FE</i> | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- | -- |
| 31 | 0.00 | -- | Ice | -- | 1.20 <i>FE</i> | -- | 0.00 | 0.00 | -- | -- | -- | -- |
| Total (cfs) | 0.33 | 0.18 | 1.23 | 5.04 | 6.71 | 5.14 | 4.08 | 0.97 | 2.17 | 0.46 | -- | -- |
| Mean (cfs) | 0.01 | 0.01 | 0.09 | 0.27 | 0.22 | 0.17 | 0.13 | 0.03 | 0.07 | 0.02 | -- | -- |
| Max (cfs) | 0.20 | 0.17 | 0.67 | 1.31 | 1.20 | 1.32 | 1.20 | 0.50 | 1.01 | 0.36 | -- | -- |
| Min (cfs) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |

Notes:

- "--" = No data
- Ice = If more than 6 hours with 50% or more of the 5-minute data points indicated temperature recordings at or below freezing, the day was designated as ice-influenced; no daily average flow was calculated for this day.
- *FE* = Stage exceeded flume height for at least one measurement on this day. For time steps where stage exceeded flume height, flow was estimated using maximum flume height.
- If calculated average daily flow fell below the minimum measureable flume flow, the daily average flow was set to 0 cfs.
- cfs = cubic feet per second

DAILY AVERAGE STREAMFLOW AT SHUN-03 (South Tributary)

| Day | 2008 | | | | | | | | | | | |
|--------------------|------|-----|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----|
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
| 1 | -- | -- | -- | Ice | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | -- |
| 2 | -- | -- | -- | Ice | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | Ice | -- |
| 3 | -- | -- | -- | Ice | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- |
| 4 | -- | -- | -- | Ice | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | Ice | -- |
| 5 | -- | -- | -- | 0.00 | 0.00 | 0.10 | 0.00 | 0.00 | 0.00 | 0.43 <i>FE</i> | 0.40 <i>FE</i> | -- |
| 6 | -- | -- | -- | Ice | 0.00 | 0.95 | 0.00 | 0.00 | 0.00 | 0.05 | 1.10 <i>FE</i> | -- |
| 7 | -- | -- | -- | Ice | 0.00 | 0.32 | 0.00 | 0.00 | 0.00 | 0.00 | Ice | -- |
| 8 | -- | -- | -- | 0.00 | 0.00 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | Ice | -- |
| 9 | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | Ice | Ice | -- |
| 10 | -- | -- | -- | 0.00 | 0.33 | 0.00 | 0.00 | 1.08 <i>FE</i> | 0.00 | 0.00 | Ice | -- |
| 11 | -- | -- | -- | 0.00 | 0.02 | 0.54 <i>FE</i> | 0.00 | 1.25 <i>FE</i> | 0.00 | 0.40 | 1.20 <i>FE</i> | -- |
| 12 | -- | -- | -- | 0.00 | 0.00 | 0.61 | 0.00 | 0.31 | 0.00 | 0.39 <i>FE</i> | -- | -- |
| 13 | -- | -- | -- | Ice | 0.00 | 0.55 | 0.00 | 0.04 | 0.00 | 1.36 <i>FE</i> | -- | -- |
| 14 | -- | -- | -- | 0.00 | 0.00 | 0.80 | 0.00 | 0.01 | 0.00 | 1.32 <i>FE</i> | -- | -- |
| 15 | -- | -- | -- | 0.00 | 0.00 | 0.13 | 0.00 | 0.00 | 0.00 | 1.15 <i>FE</i> | -- | -- |
| 16 | -- | -- | -- | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.23 | -- | -- |
| 17 | -- | -- | -- | Ice | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.07 | -- | -- |
| 18 | -- | -- | -- | Ice | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 | -- | -- |
| 19 | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | -- | -- |
| 20 | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | Ice | -- | -- |
| 21 | -- | -- | 0.00 | Ice | 0.00 | 0.00 | 0.10 | 0.00 | 0.10 <i>FE</i> | 0.01 | -- | -- |
| 22 | -- | -- | 0.14 <i>FE</i> | 0.23 <i>FE</i> | 0.00 | 0.00 | 0.00 | 0.00 | 0.27 <i>FE</i> | Ice | -- | -- |
| 23 | -- | -- | Ice | Ice | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | Ice | -- | -- |
| 24 | -- | -- | 0.05 | 0.00 | 0.75 <i>FE</i> | 0.00 | 0.00 | 0.00 | 0.00 | Ice | -- | -- |
| 25 | -- | -- | 0.06 | Ice | 0.94 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 26 | -- | -- | Ice | 0.00 | 0.09 | 0.00 | 0.00 | 0.00 | 0.00 | Ice | -- | -- |
| 27 | -- | -- | Ice | 0.00 | 0.01 | 0.00 | 0.35 <i>FE</i> | 0.00 | 0.00 | Ice | -- | -- |
| 28 | -- | -- | Ice | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | Ice | -- | -- |
| 29 | -- | -- | Ice | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | Ice | -- | -- |
| 30 | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | Ice | -- | -- |
| 31 | -- | -- | Ice | -- | 0.00 | -- | 0.00 | 0.00 | -- | Ice | -- | -- |
| Total (cfs) | -- | -- | 0.25 | 0.24 | 2.14 | 4.04 | 0.46 | 2.69 | 0.38 | 5.46 | 2.71 | -- |
| Mean (cfs) | -- | -- | 0.05 | 0.01 | 0.07 | 0.13 | 0.01 | 0.09 | 0.01 | 0.27 | 0.54 | -- |
| Max (cfs) | -- | -- | 0.14 | 0.23 | 0.94 | 0.95 | 0.35 | 1.25 | 0.27 | 1.36 | 1.20 | -- |
| Min (cfs) | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- |

Notes:

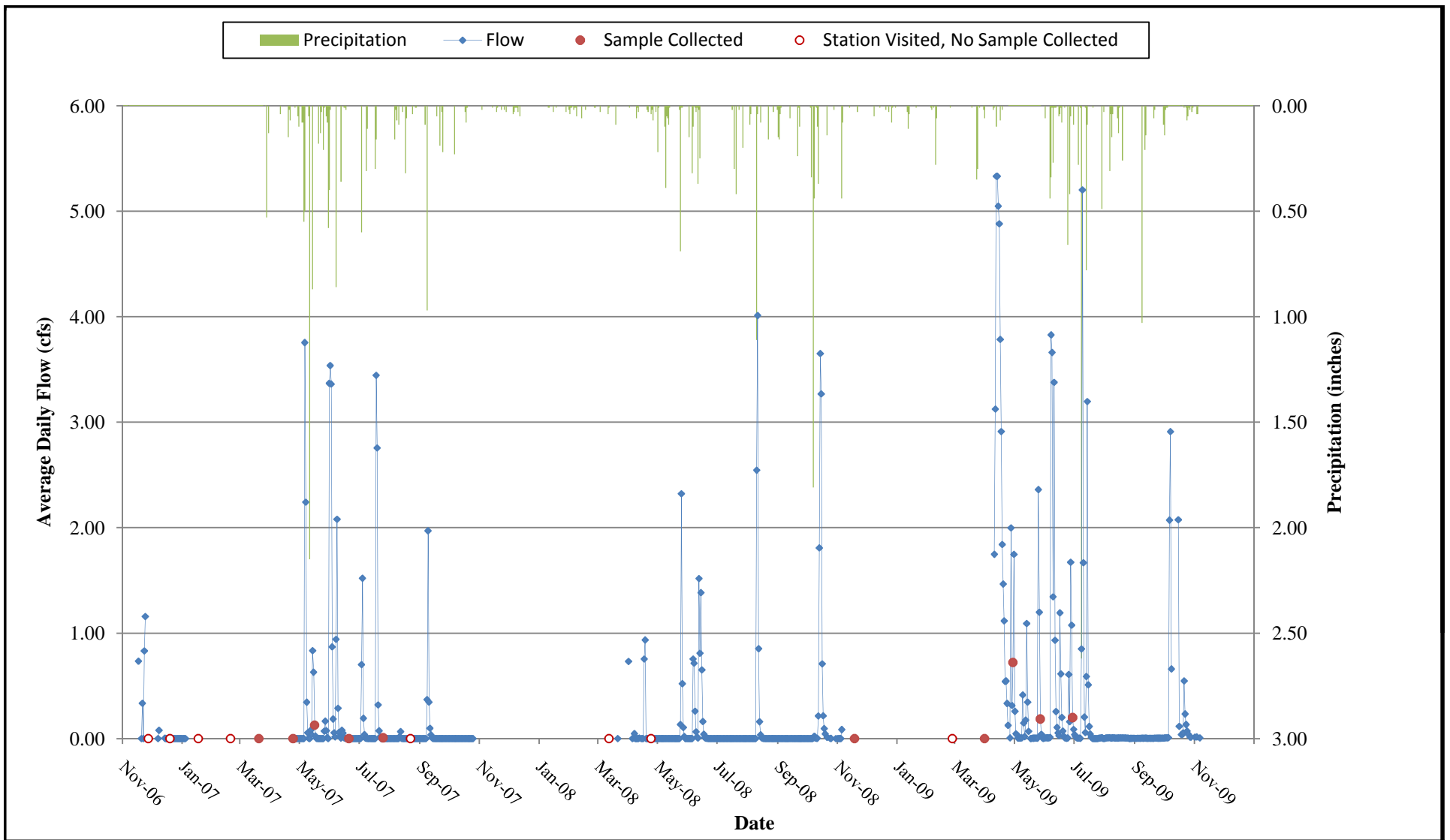
- "--" = No data
- Ice = If more than 6 hours with 50% or more of the 5-minute data points indicated temperature recordings at or below freezing, the day was designated as ice-influenced; no daily average flow was calculated for this day.
- *FE* = Stage exceeded flume height for at least one measurement on this day. For time steps where stage exceeded flume height, flow was estimated using maximum flume height.
- If calculated average daily flow fell below the minimum measureable flume flow, the daily average flow was set to 0 cfs.
- cfs = cubic feet per second

DAILY AVERAGE STREAMFLOW AT SHUN-03 (South Tributary)

| Day | 2009 | | | | | | | | | | | |
|--------------------|------|-----|-----|-----|-------------|----------------|----------------|-------------|----------------|----------------|-----|-----|
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
| 1 | -- | -- | -- | -- | -- | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | -- | -- |
| 2 | -- | -- | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 3 | -- | -- | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 4 | -- | -- | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 5 | -- | -- | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.54 <i>FE</i> | -- | -- |
| 6 | -- | -- | -- | -- | -- | 0.46 <i>FE</i> | 0.16 | 0.01 | 0.00 | 1.36 <i>FE</i> | -- | -- |
| 7 | -- | -- | -- | -- | -- | 1.43 <i>FE</i> | 0.18 | 0.04 | 0.00 | 1.11 | -- | -- |
| 8 | -- | -- | -- | -- | -- | 1.45 <i>FE</i> | 0.26 <i>FE</i> | 0.36 | 0.23 | 0.20 | -- | -- |
| 9 | -- | -- | -- | -- | -- | 0.74 <i>FE</i> | 1.29 <i>FE</i> | 0.02 | 0.01 | Ice | -- | -- |
| 10 | -- | -- | -- | -- | -- | 1.41 <i>FE</i> | 0.41 | 0.00 | 0.00 | Ice | -- | -- |
| 11 | -- | -- | -- | -- | -- | 0.40 | 0.07 | 0.00 | 0.00 | 1.20 <i>FE</i> | -- | -- |
| 12 | -- | -- | -- | -- | -- | 0.17 | 0.02 | 0.01 | 0.49 <i>FE</i> | -- | -- | -- |
| 13 | -- | -- | -- | -- | -- | 0.09 | 0.81 <i>FE</i> | 0.00 | 0.03 | -- | -- | -- |
| 14 | -- | -- | -- | -- | -- | 0.03 | 1.05 <i>FE</i> | 0.00 | 0.00 | -- | -- | -- |
| 15 | -- | -- | -- | -- | -- | 0.06 <i>FE</i> | 0.18 | 0.00 | 0.00 | -- | -- | -- |
| 16 | -- | -- | -- | -- | -- | 1.07 <i>FE</i> | 0.04 | 0.00 | 0.00 | -- | -- | -- |
| 17 | -- | -- | -- | -- | -- | 0.40 | 0.01 | 0.00 | 0.00 | -- | -- | -- |
| 18 | -- | -- | -- | -- | -- | 0.08 | 0.01 | 0.00 | 0.00 | -- | -- | -- |
| 19 | -- | -- | -- | -- | -- | 0.03 | 0.00 | 0.00 | 0.00 | -- | -- | -- |
| 20 | -- | -- | -- | -- | -- | 0.01 | 0.00 | 0.00 | 0.00 | -- | -- | -- |
| 21 | -- | -- | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- | -- |
| 22 | -- | -- | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- | -- |
| 23 | -- | -- | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- | -- |
| 24 | -- | -- | -- | -- | -- | 0.10 <i>FE</i> | 0.00 | 0.00 | 0.00 | -- | -- | -- |
| 25 | -- | -- | -- | -- | -- | 0.45 <i>FE</i> | 0.00 | 0.00 | 0.00 | -- | -- | -- |
| 26 | -- | -- | -- | -- | -- | 0.27 <i>FE</i> | 0.00 | 0.00 | 0.00 | -- | -- | -- |
| 27 | -- | -- | -- | -- | -- | 1.31 <i>FE</i> | 0.00 | 0.00 | 0.00 | -- | -- | -- |
| 28 | -- | -- | -- | -- | 0.02 | 0.40 | 0.00 | 0.00 | 0.00 | -- | -- | -- |
| 29 | -- | -- | -- | -- | 0.01 | 0.13 | 0.03 | 0.00 | 0.00 | -- | -- | -- |
| 30 | -- | -- | -- | -- | 0.00 | 0.03 | 0.08 | 0.00 | 0.00 | -- | -- | -- |
| 31 | -- | -- | -- | -- | 0.00 | -- | 0.01 | 0.00 | -- | -- | -- | -- |
| Total (cfs) | -- | -- | -- | -- | 0.02 | 10.55 | 4.61 | 0.43 | 0.76 | 4.41 | -- | -- |
| Mean (cfs) | -- | -- | -- | -- | 0.01 | 0.35 | 0.15 | 0.01 | 0.03 | 0.49 | -- | -- |
| Max (cfs) | -- | -- | -- | -- | 0.02 | 1.45 | 1.29 | 0.36 | 0.49 | 1.36 | -- | -- |
| Min (cfs) | -- | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |

Notes:

- "--" = No data
- Ice = If more than 6 hours with 50% or more of the 5-minute data points indicated temperature recordings at or below freezing, the day was designated as ice-influenced; no daily average flow was calculated for this day.
- *FE* = Stage exceeded flume height for at least one measurement on this day. For time steps where stage exceeded flume height, flow was estimated using maximum flume height.
- If calculated average daily flow fell below the minimum measureable flume flow, the daily average flow was set to 0 cfs.
- cfs = cubic feet per second



SOUTH HEART COAL LLC
 SOUTH HEART POWER PROJECT
 SOUTH HEART, NORTH DAKOTA

DRAFT



HYDROGRAPH OF DAILY AVERAGE STREAMFLOW AT SHUN-04 (South Tributary)

| SURFACE WATER | | | | | |
|---------------|--------------------------------------|--------|-----|------------|--|
| PROJECT NO. | 063-2174Y09 | DESIGN | BER | 05/24/2010 | |
| FILE | Attachment A and Tables 1 and 2.xlsx | CHECK | ANH | 05/24/2010 | |
| REV. | 1 | REVIEW | EJP | 05/24/2010 | |

DAILY AVERAGE STREAMFLOW AT SHUN-04 (South Tributary)

| Day | 2006 | | | | | | | | | | | |
|--------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------------|-------------|
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
| 1 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice |
| 2 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice |
| 3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice |
| 4 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice |
| 5 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice |
| 6 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice |
| 7 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.00 |
| 8 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.08 |
| 9 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice |
| 10 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice |
| 11 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice |
| 12 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice |
| 13 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice |
| 14 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.00 |
| 15 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.00 |
| 16 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.00 |
| 17 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.73 FE | 0.00 |
| 18 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice | 0.00 |
| 19 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice | 0.00 |
| 20 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.00 | 0.00 |
| 21 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.34 FE | 0.00 |
| 22 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.00 | 0.00 |
| 23 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.83 FE | 0.00 |
| 24 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1.16 FE | 0.00 |
| 25 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice | 0.00 |
| 26 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice | 0.00 |
| 27 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice | 0.00 |
| 28 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice | 0.00 |
| 29 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice | 0.00 |
| 30 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Ice | 0.00 |
| 31 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.00 |
| Total (cfs) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 3.06 | 0.08 |
| Mean (cfs) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.51 | 0.00 |
| Max (cfs) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1.16 | 0.08 |
| Min (cfs) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.00 | 0.00 |

Notes:

- "--" = No data
- Ice = If more than 6 hours with 50% or more of the 5-minute data points indicated temperature recordings at or below freezing, the day was designated as ice-influenced; no daily average flow was calculated for this day.
- FE = Stage exceeded flume height for at least one measurement on this day. For time steps where stage exceeded flume height, flow was estimated using maximum flume height.
- If calculated average daily flow fell below the minimum measureable flume flow, the daily average flow was set to 0 cfs.
- cfs = cubic feet per second

DAILY AVERAGE STREAMFLOW AT SHUN-04 (South Tributary)

| Day | 2007 | | | | | | | | | | | |
|--------------------|-------------|-----------|-----------|-------------|----------------|--------------|----------------|-------------|-------------|-------------|-----------|-----------|
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
| 1 | 0.00 | Ice | Ice | Ice | 0.00 | 3.54 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 2 | 0.00 | -- | Ice | -- | 0.00 | 3.36 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 3 | 0.00 | Ice | Ice | Ice | 0.00 | 0.87 | 0.70 | 0.00 | 0.00 | 0.00 | -- | -- |
| 4 | 0.00 | Ice | Ice | Ice | 0.00 | 0.19 | 1.52 | 0.00 | 0.00 | 0.00 | -- | -- |
| 5 | Ice | Ice | Ice | Ice | 0.00 | 0.06 | 0.19 | 0.00 | 0.00 | 0.00 | -- | -- |
| 6 | Ice | Ice | Ice | Ice | 3.75 <i>FE</i> | 0.02 | 0.04 | 0.00 | 0.00 | 0.00 | -- | -- |
| 7 | Ice | Ice | -- | Ice | 2.24 | 0.94 | 0.01 | 0.00 | 0.00 | 0.00 | -- | -- |
| 8 | Ice | Ice | -- | Ice | 0.35 | 2.08 | 0.00 | 0.00 | 0.37 | 0.00 | -- | -- |
| 9 | Ice | Ice | -- | Ice | 0.06 | 0.29 | 0.00 | 0.00 | 1.97 | 0.00 | -- | -- |
| 10 | Ice | Ice | -- | Ice | 0.00 | 0.06 | 0.00 | 0.00 | 0.35 | 0.00 | -- | -- |
| 11 | Ice | Ice | -- | Ice | 0.00 | 0.02 | 0.00 | 0.02 | 0.10 | 0.00 | -- | -- |
| 12 | Ice | Ice | -- | Ice | 0.08 | 0.01 | 0.00 | 0.07 | 0.04 | 0.00 | -- | -- |
| 13 | Ice | Ice | -- | -- | 0.04 | 0.08 | 0.00 | 0.00 | 0.01 | 0.00 | -- | -- |
| 14 | Ice | Ice | Ice | -- | 0.83 | 0.05 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 15 | Ice | Ice | Ice | -- | 0.63 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 16 | Ice | Ice | Ice | -- | 0.13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 17 | Ice | Ice | Ice | -- | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 18 | Ice | Ice | -- | -- | 0.00 | 0.00 | 3.44 <i>FE</i> | 0.00 | 0.00 | 0.00 | -- | -- |
| 19 | Ice | -- | -- | -- | 0.00 | 0.00 | 2.76 | 0.00 | 0.00 | 0.00 | -- | -- |
| 20 | Ice | -- | Ice | -- | 0.00 | 0.00 | 0.32 | 0.00 | 0.00 | 0.00 | -- | -- |
| 21 | Ice | -- | -- | -- | 0.00 | 0.00 | 0.07 | 0.00 | 0.00 | 0.00 | -- | -- |
| 22 | Ice | Ice | Ice | -- | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | -- | -- |
| 23 | Ice | Ice | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 24 | Ice | Ice | Ice | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 25 | Ice | Ice | -- | -- | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | -- | -- |
| 26 | Ice | Ice | -- | 0.00 | 0.07 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- | -- |
| 27 | Ice | Ice | -- | 0.00 | 0.17 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- | -- |
| 28 | Ice | Ice | -- | 0.00 | 0.08 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- | -- |
| 29 | -- | -- | -- | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- | -- |
| 30 | Ice | -- | Ice | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- | -- |
| 31 | Ice | -- | Ice | -- | 3.37 | -- | 0.00 | 0.00 | -- | -- | -- | -- |
| Total (cfs) | 0.00 | -- | -- | 0.00 | 11.82 | 11.56 | 9.08 | 0.09 | 2.83 | 0.00 | -- | -- |
| Mean (cfs) | 0.00 | -- | -- | 0.00 | 0.38 | 0.39 | 0.29 | 0.00 | 0.09 | 0.00 | -- | -- |
| Max (cfs) | 0.00 | -- | -- | 0.00 | 3.75 | 3.54 | 3.44 | 0.07 | 1.97 | 0.00 | -- | -- |
| Min (cfs) | 0.00 | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |

Notes:

- "--" = No data
- Ice = If more than 6 hours with 50% or more of the 5-minute data points indicated temperature recordings at or below freezing, the day was designated as ice-influenced; no daily average flow was calculated for this day.
- *FE* = Stage exceeded flume height for at least one measurement on this day. For time steps where stage exceeded flume height, flow was estimated using maximum flume height.
- If calculated average daily flow fell below the minimum measureable flume flow, the daily average flow was set to 0 cfs.
- cfs = cubic feet per second

DAILY AVERAGE STREAMFLOW AT SHUN-04 (South Tributary)

| Day | 2008 | | | | | | | | | | | |
|--------------------|------|-----|-------------|----------------|-------------|-------------|-------------|----------------|-------------|--------------|-------------|-----|
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
| 1 | -- | -- | -- | 0.73 <i>FE</i> | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- |
| 2 | -- | -- | -- | Ice | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- |
| 3 | -- | -- | -- | Ice | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- |
| 4 | -- | -- | -- | Ice | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- |
| 5 | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.09 | -- |
| 6 | -- | -- | -- | 0.00 | 0.00 | 0.75 | 0.00 | 0.00 | 0.00 | 0.00 | Ice | -- |
| 7 | -- | -- | -- | 0.05 | 0.00 | 0.72 | 0.00 | 0.00 | 0.00 | 0.01 | Ice | -- |
| 8 | -- | -- | -- | 0.00 | 0.00 | 0.26 | 0.00 | 0.00 | 0.00 | 0.02 | Ice | -- |
| 9 | -- | -- | -- | 0.00 | 0.00 | 0.06 | 0.00 | 0.00 | 0.00 | 0.00 | Ice | -- |
| 10 | -- | -- | -- | 0.00 | 0.00 | 0.02 | 0.00 | 2.54 <i>FE</i> | 0.00 | 0.00 | Ice | -- |
| 11 | -- | -- | -- | 0.00 | 0.00 | 0.01 | 0.00 | 4.01 <i>FE</i> | 0.00 | 0.00 | -- | -- |
| 12 | -- | -- | -- | 0.01 | 0.00 | 1.52 | 0.00 | 0.85 | 0.00 | 0.22 | -- | -- |
| 13 | -- | -- | -- | Ice | 0.00 | 0.81 | 0.00 | 0.16 | 0.00 | 1.81 | -- | -- |
| 14 | -- | -- | -- | 0.00 | 0.00 | 1.38 | 0.00 | 0.04 | 0.00 | 3.65 | -- | -- |
| 15 | -- | -- | -- | 0.00 | 0.00 | 0.65 | 0.00 | 0.01 | 0.00 | 3.27 | -- | -- |
| 16 | -- | -- | -- | 0.00 | 0.00 | 0.16 | 0.00 | 0.00 | 0.00 | 0.71 | -- | -- |
| 17 | -- | -- | -- | 0.75 <i>FE</i> | 0.00 | 0.04 | 0.00 | 0.00 | 0.00 | 0.22 | -- | -- |
| 18 | -- | -- | -- | 0.94 <i>FE</i> | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.10 | -- | -- |
| 19 | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.05 | -- | -- |
| 20 | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | Ice | -- | -- |
| 21 | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | -- | -- |
| 22 | -- | -- | Ice | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | Ice | -- | -- |
| 23 | -- | -- | Ice | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | Ice | -- | -- |
| 24 | -- | -- | Ice | 0.00 | 0.13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 25 | -- | -- | Ice | 0.00 | 2.32 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 26 | -- | -- | Ice | 0.00 | 0.52 | 0.00 | 0.00 | 0.00 | 0.00 | Ice | -- | -- |
| 27 | -- | -- | Ice | 0.00 | 0.11 | 0.00 | 0.00 | 0.00 | 0.00 | Ice | -- | -- |
| 28 | -- | -- | Ice | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | Ice | -- | -- |
| 29 | -- | -- | Ice | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | Ice | -- | -- |
| 30 | -- | -- | Ice | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- |
| 31 | -- | -- | Ice | -- | 0.00 | -- | 0.00 | 0.00 | -- | Ice | -- | -- |
| Total (cfs) | -- | -- | 0.00 | 2.48 | 3.10 | 6.39 | 0.00 | 7.61 | 0.00 | 10.06 | 0.09 | -- |
| Mean (cfs) | -- | -- | 0.00 | 0.10 | 0.10 | 0.21 | 0.00 | 0.25 | 0.00 | 0.44 | 0.02 | -- |
| Max (cfs) | -- | -- | 0.00 | 0.94 | 2.32 | 1.52 | 0.00 | 4.01 | 0.00 | 3.65 | 0.09 | -- |
| Min (cfs) | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- |

Notes:

- "--" = No data
- Ice = If more than 6 hours with 50% or more of the 5-minute data points indicated temperature recordings at or below freezing, the day was designated as ice-influenced; no daily average flow was calculated for this day.
- *FE* = Stage exceeded flume height for at least one measurement on this day. For time steps where stage exceeded flume height, flow was estimated using maximum flume height.
- If calculated average daily flow fell below the minimum measureable flume flow, the daily average flow was set to 0 cfs.
- cfs = cubic feet per second

DAILY AVERAGE STREAMFLOW AT SHUN-04 (South Tributary)

| Day | 2009 | | | | | | | | | | | |
|--------------------|------|-----|-----|----------------|-------------|--------------|----------------|-------------|-------------|-------------|-------------|-----|
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
| 1 | -- | -- | -- | -- | 0.26 | 0.01 | 0.04 | 0.00 | 0.00 | 0.01 | 0.01 | -- |
| 2 | -- | -- | -- | -- | 0.05 | 0.01 | 0.02 | 0.01 | 0.00 | 0.01 | Ice | -- |
| 3 | -- | -- | -- | -- | 0.04 | 0.01 | 0.01 | 0.01 | 0.00 | 0.01 | 0.02 | -- |
| 4 | -- | -- | -- | -- | 0.01 | 0.01 | 0.01 | 0.01 | 0.00 | 0.01 | Ice | -- |
| 5 | -- | -- | -- | -- | 0.01 | 0.01 | 0.01 | 0.01 | 0.00 | 0.01 | Ice | -- |
| 6 | -- | -- | -- | -- | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 2.07 | 0.01 | -- |
| 7 | -- | -- | -- | -- | 0.01 | 3.83 | 0.00 | 0.00 | 0.00 | 2.91 | Ice | -- |
| 8 | -- | -- | -- | -- | 0.01 | 3.66 | 0.85 <i>FE</i> | 0.01 | 0.00 | 0.66 | Ice | -- |
| 9 | -- | -- | -- | -- | 0.41 | 1.34 | 5.20 <i>FE</i> | 0.01 | 0.00 | Ice | Ice | -- |
| 10 | -- | -- | -- | 1.75 | 0.15 | 3.38 | 1.67 | 0.01 | 0.00 | Ice | Ice | -- |
| 11 | -- | -- | -- | 3.12 <i>FE</i> | 0.02 | 0.93 | 0.20 | 0.01 | 0.00 | Ice | Ice | -- |
| 12 | -- | -- | -- | 5.33 <i>FE</i> | 0.18 | 0.26 | 0.06 | 0.01 | 0.00 | Ice | Ice | -- |
| 13 | -- | -- | -- | 5.33 <i>FE</i> | 1.09 | 0.11 | 0.59 | 0.01 | 0.00 | Ice | -- | -- |
| 14 | -- | -- | -- | 5.05 <i>FE</i> | 0.35 | 0.05 | 3.20 | 0.01 | 0.00 | Ice | -- | -- |
| 15 | -- | -- | -- | 4.88 <i>FE</i> | 0.07 | 0.03 | 0.51 | 0.01 | 0.00 | 2.07 | -- | -- |
| 16 | -- | -- | -- | 3.78 | Ice | 1.19 | 0.12 | 0.01 | 0.00 | 0.12 | -- | -- |
| 17 | -- | -- | -- | 2.91 | 0.00 | 0.61 | 0.04 | 0.01 | 0.00 | Ice | -- | -- |
| 18 | -- | -- | -- | 1.84 | 0.00 | 0.20 | 0.01 | 0.01 | 0.00 | 0.04 | -- | -- |
| 19 | -- | -- | -- | 1.47 | 0.00 | 0.07 | 0.00 | 0.01 | 0.00 | 0.04 | -- | -- |
| 20 | -- | -- | -- | 1.12 | 0.00 | 0.02 | 0.00 | 0.01 | 0.00 | 0.06 | -- | -- |
| 21 | -- | -- | -- | 0.54 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.55 | -- | -- |
| 22 | -- | -- | -- | 0.55 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.23 | -- | -- |
| 23 | -- | -- | -- | 0.33 | 0.01 | 0.00 | 0.00 | 0.01 | 0.00 | 0.13 | -- | -- |
| 24 | -- | -- | -- | 0.13 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.07 | -- | -- |
| 25 | -- | -- | -- | Ice | 2.36 | 0.61 | 0.00 | 0.01 | 0.00 | 0.04 | -- | -- |
| 26 | -- | -- | -- | 0.01 | 1.20 | 0.16 | 0.01 | 0.00 | 0.00 | Ice | -- | -- |
| 27 | -- | -- | -- | 2.00 | 0.19 | 1.67 | 0.01 | 0.00 | 0.00 | 0.01 | -- | -- |
| 28 | -- | -- | -- | 0.31 | 0.04 | 1.08 | 0.01 | 0.00 | 0.01 | 0.01 | -- | -- |
| 29 | -- | -- | -- | 0.72 | 0.01 | 0.20 | 0.01 | 0.00 | 0.01 | Ice | -- | -- |
| 30 | -- | -- | -- | 1.75 | 0.00 | 0.09 | 0.00 | 0.00 | 0.00 | Ice | -- | -- |
| 31 | -- | -- | -- | -- | 0.00 | -- | 0.00 | 0.00 | -- | Ice | -- | -- |
| Total (cfs) | -- | -- | -- | 42.90 | 6.45 | 19.55 | 12.55 | 0.16 | 0.09 | 9.05 | 0.04 | -- |
| Mean (cfs) | -- | -- | -- | 2.14 | 0.21 | 0.65 | 0.40 | 0.01 | 0.00 | 0.45 | 0.01 | -- |
| Max (cfs) | -- | -- | -- | 5.33 | 2.36 | 3.83 | 5.20 | 0.01 | 0.01 | 2.91 | 0.02 | -- |
| Min (cfs) | -- | -- | -- | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | -- |

Notes:

- "--" = No data
- Ice = If more than 6 hours with 50% or more of the 5-minute data points indicated temperature recordings at or below freezing, the day was designated as ice-influenced; no daily average flow was calculated for this day.
- *FE* = Stage exceeded flume height for at least one measurement on this day. For time steps where stage exceeded flume height, flow was estimated using maximum flume height.
- If calculated average daily flow fell below the minimum measureable flume flow, the daily average flow was set to 0 cfs.
- cfs = cubic feet per second