**Table 1: Water elevation before breakup (HBo) and maximum water elevation during breakup (HB) at the Water Survey Canada (WSC) gauge**

**below Fort McMurray.**

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| --- | --- | --- |
| **Year** | **HBo** | **HB** |
| 1973 | 239.0 | 240.5 |
| 1974 | 239.8 | 241.4 **a** |
| 1975 | 238.7 **a** | 239.7 **a** |
| 1976 | 239.0 | 242.4 **a b** |
| 1977 | 238.9 **a** | 244.2 **a b** |
| 1978 | 239.0 | 240.6 |
| 1979 | 239.4 | 244.9 **a** |
| 1980 | 238.9 | 240.7 |
| 1981 | 239.0 | 240.7 **a b** |
| 1982 | - | 238.9 **a b** |
| 1983 | 238.5 | 239.6 |
| 1984 | 238.4 | 240.9 |
| 1985 | 239.0 | 241.2 **a b** |
| 1986 | 239.0 | 240.9 |
| 1987 | 239.1 | 240.7 **a** |
| 1988 | 238.4 **a** | 240.6 **a** |
| 1989 | 238.2 **a** | 238.2 **a** |
| 1990 | 238.6 **a** | 239.3 **a** |
| 1991 | 238.7 | 240.1 **a** |
| 1992 | 238.6 | 239.5 |
| 1993 | 238.5 **a** | 238.5 **a** |
| 1994 | 238.7 | 242.8 |
| 1995 | 238.7 | 239.0 |
| 1996 | 239.1 | 243.2 |
| 1997 | - | - |
| 1998 | 238.7 | 239.0 |
| 1999 | 238.0 | 238.5 |
| 2000 | 238.3 | 238.6 |
| 2001 | - | - |

**a** WSC gauge below Fort McMurray malfunctioning

**b** Water level obtained from ARC

**Note:** - The breakup water elevation for 1973 to 1995 were retrieved from the original WSC strip charts. Tim Davis of the WSC office in Calgary provided electronic files for the years of 1996 to 1999. Newleaf was used to download the 2000 and 2001 water levels.

* The pre breakup elevation (HBo) was chosen as the water level at the end of a gradual increase in stage preceding breakup.
* For this research, initiation of breakup at the WSC gauge was defined as a sudden fluctuation of water level that generally results in a significant stage increase or when the WSC gauge starts to malfunction. The day of breakup initiation was defined as the breakup date.
* The error in determining HBo was evaluated as ± 0.2 m.
* The maximum breakup elevation (HB) represents the highest stage available during breakup from the WSC records.
* When the WSC gauge below Fort McMurray was malfunctioning, maximum water levels (HB) were obtained by other sources if they were greater then the ones measured with the gauge. The water level from Alberta Research Council (ARC) for the years of 1976, 1977, 1981, 1982, and 1985 as documented in Doyle (1987), were used in this research. Alberta Environment (1982) suggested a maximum water level for breakup 1982 greater than the one from ARC. The value appears to be a rough estimate and was not considered reliable. Therefore it was dismissed from this study. In the ARC report describing 1987 spring breakup, the WSC gauge measurements were documented. The peak water level referred in this report was dismissed since the reading was omitted by WSC because the gauge was malfunctioning at the time. This value was also excluded from this research.