Table 2

Base Case Assumptions and Calculations

Assumptions:

1. Coverage area = 5 965 044 km²

2. Frequency of coverage = Once every three months *

3. Aircraft and coverage = 3 000 km in 9.3 hrs at 7 620 m (25 000 ft.)*

4. Sensor coverage (Radar) = 25 km swath at 7 620 m *

Calculations:

1. Probability of Detection [p(d)]
   Aircraft coverage per sortie *
   at 7 620 m = 3 000 km × 25 km = 75 000 km²
   $p(o) = \frac{s}{m} = \frac{75\,000}{5\,965\,044} = .012$
   Therefore,
   $p(d) = p(o) \times p(i) = .012 \times p(i)$
   for $p(i) = (.05 \rightarrow 1.0)$ in .05 increments

2. Number of "Looks" [L]
   Number of sorties required $= \frac{5\,965\,044}{75\,000}$
   = 79.53 per quarter
   = 318.12 per year

   "Look" rate $= \frac{318.12}{365} = .87$ per day

   Interval length = 5 days
   Number of "looks" = t × r = 5 days × .87 per day
   = 4.35 ≈ 4 "looks"

* *Source:* Airborne Remote Sensing, *pp.17-19.*

identification represents the likelihood that the monitoring system recognizes a treaty violation given that the target lies within the swath of the airborne sensor. For example, p(i) = .05 denotes a 5 per cent chance that the target will be identified assuming the sensor platform has passed in its vicinity; alternatively, p(i) = 1.0 indicates that the system always identifies the target if it has been observed. As the probability of identification increases, that is, as the ability of the monitoring system to recognize a treaty violation improves, the probability of detecting a