



AMGD - *Abandoned mine gas decline*

This program predicts gas emission quantities decline from abandoned coal mine and sealed goaf area.

Two stages have been identified during which gas decline phenomenon is described by particular mathematic curves:

- Rapid Decline: 3 to 12 months, and**
- Slow Decline: 10 to 30 years**

The individual curves represent the quantity of coal mine gas decline versus time independently for DRY and FLOODED coal mine.



Abandoned Mine Gas Decline (AMGD)

Prediction of coal mine gas quantity from sealed goaf & abandoned coal mine

Gas quantity decline phenomenon based on two stages of coal mine production & background gas emission:

PRODUCTION GAS : rapid decline phase

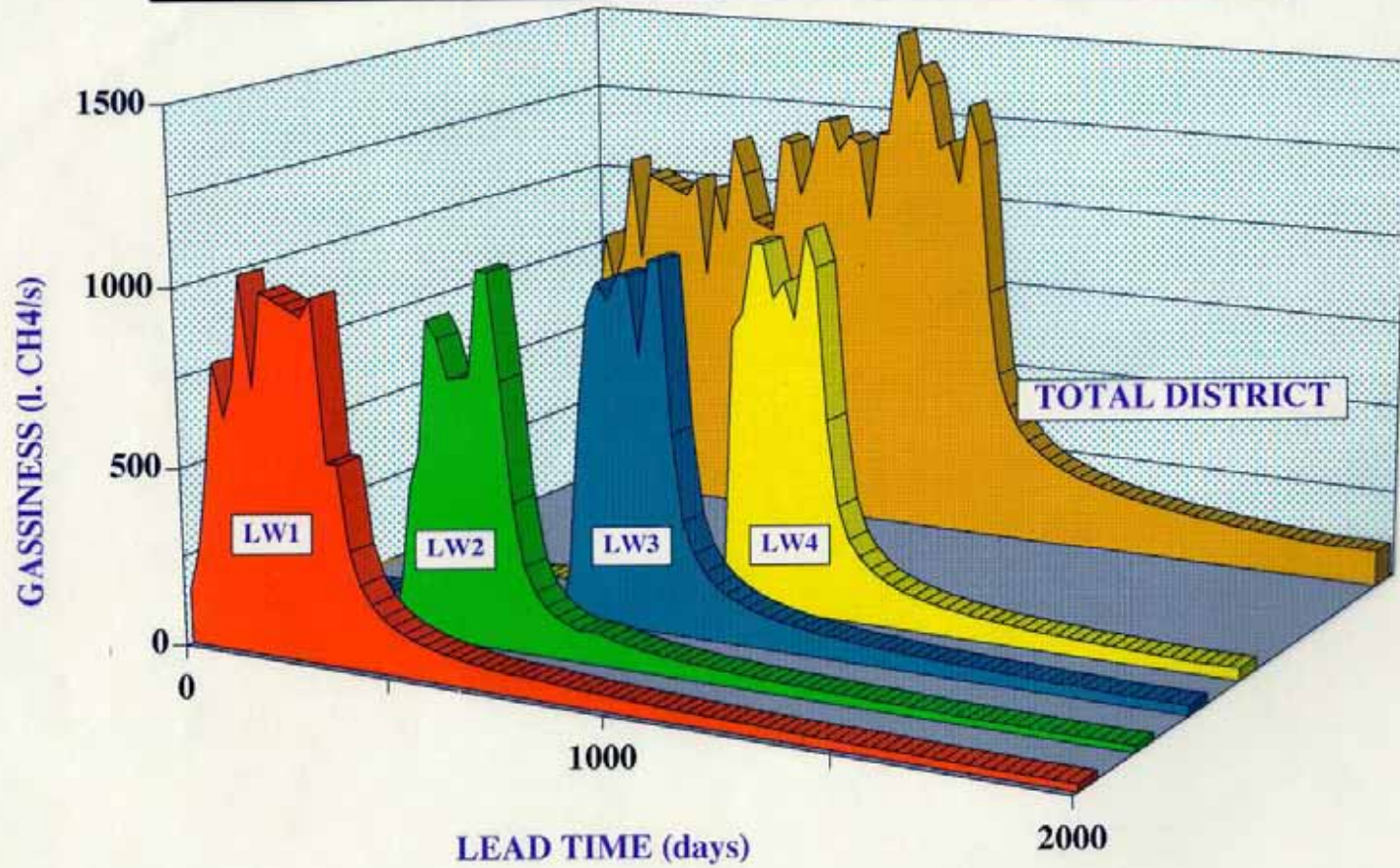
BACKGROUND GAS : slow-long term decline phase

Outputs: Closed mine gas emission decline prediction

- Dry mine gas decline rate versus time and
- Wet - flooded mine gas decline rate versus time



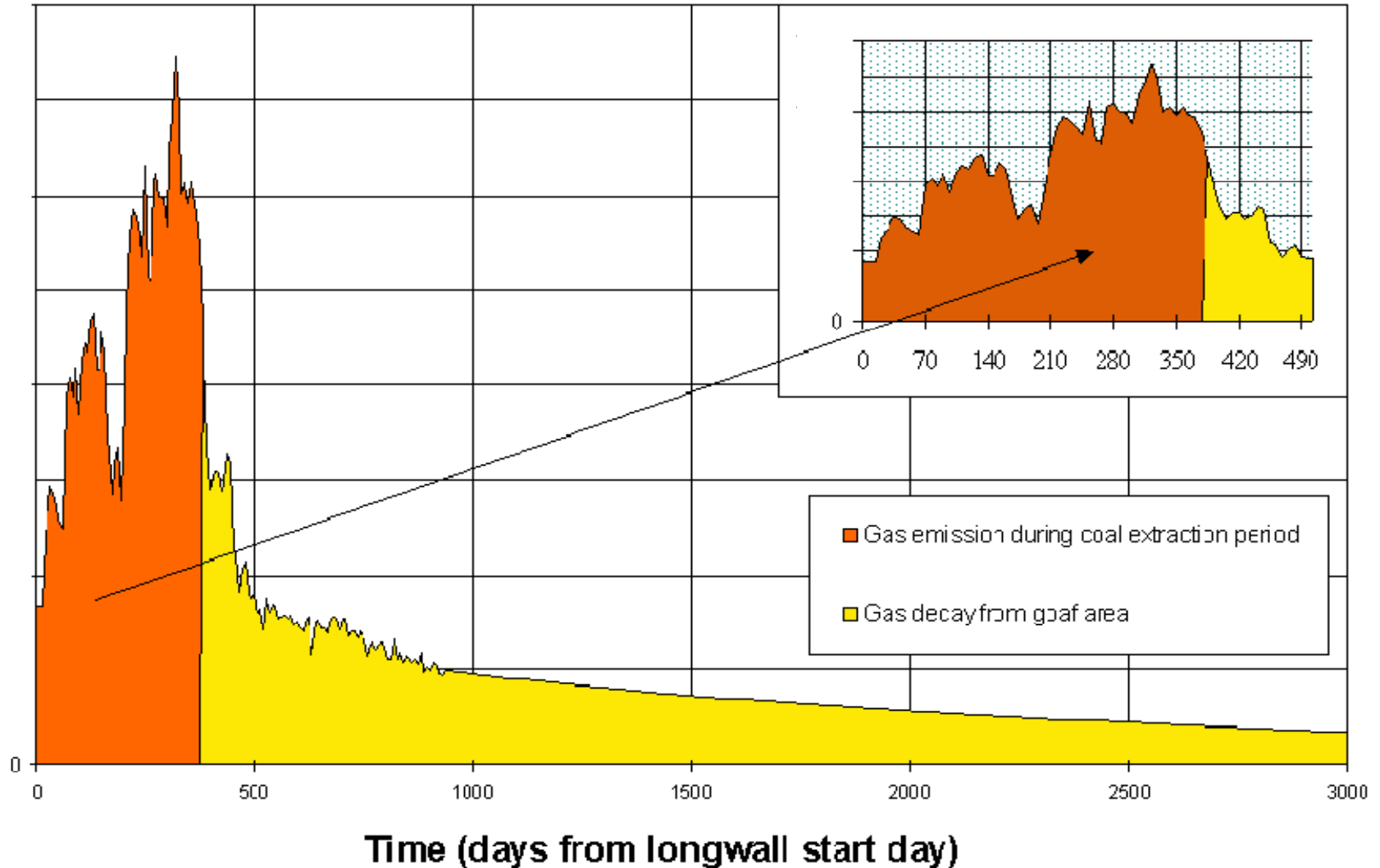
MULTI-LONGWALL GOAF GASSINESS DECAY





Gas emission during & post extraction

Absolute Gassiness (litres per second)





Abandoned mine gas emission decline curves

Stage 1 3 to 12 months

The logarithmic approximation curve

$$Q = -A * \ln(\text{Time}) + B$$

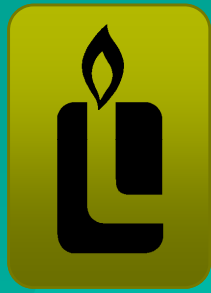
Stage 2 10 to 30 years

The exponential approximation curve

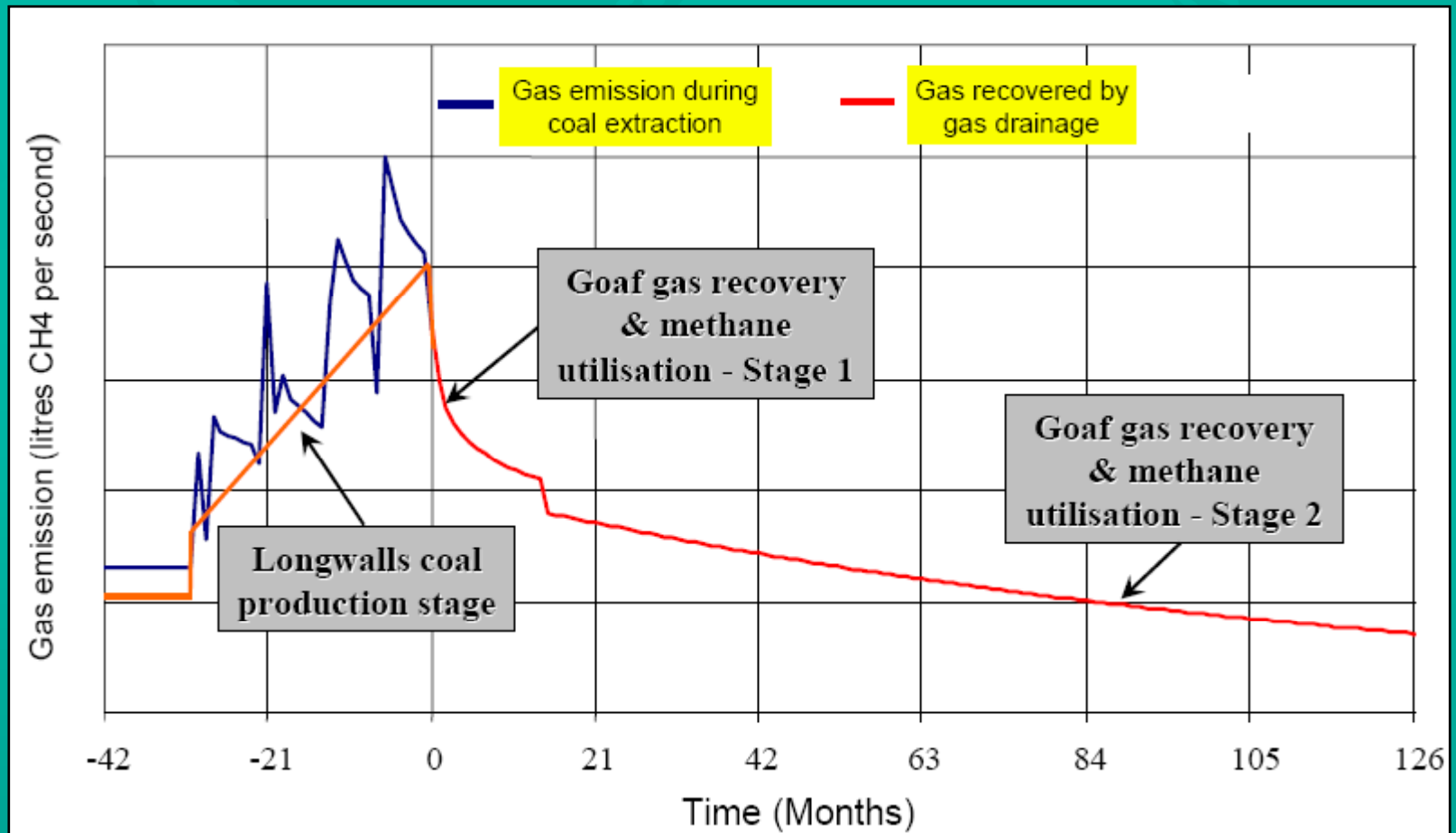
$$Q = C * e^{-D * (\text{Time})}$$

Mathematical equation coefficients

- A - Gas emission decay rate
- B - Gas emission initial magnitude & strata permeability
- C - Gas reservoir capacity & characteristics
- D - Rate and quickness of decline

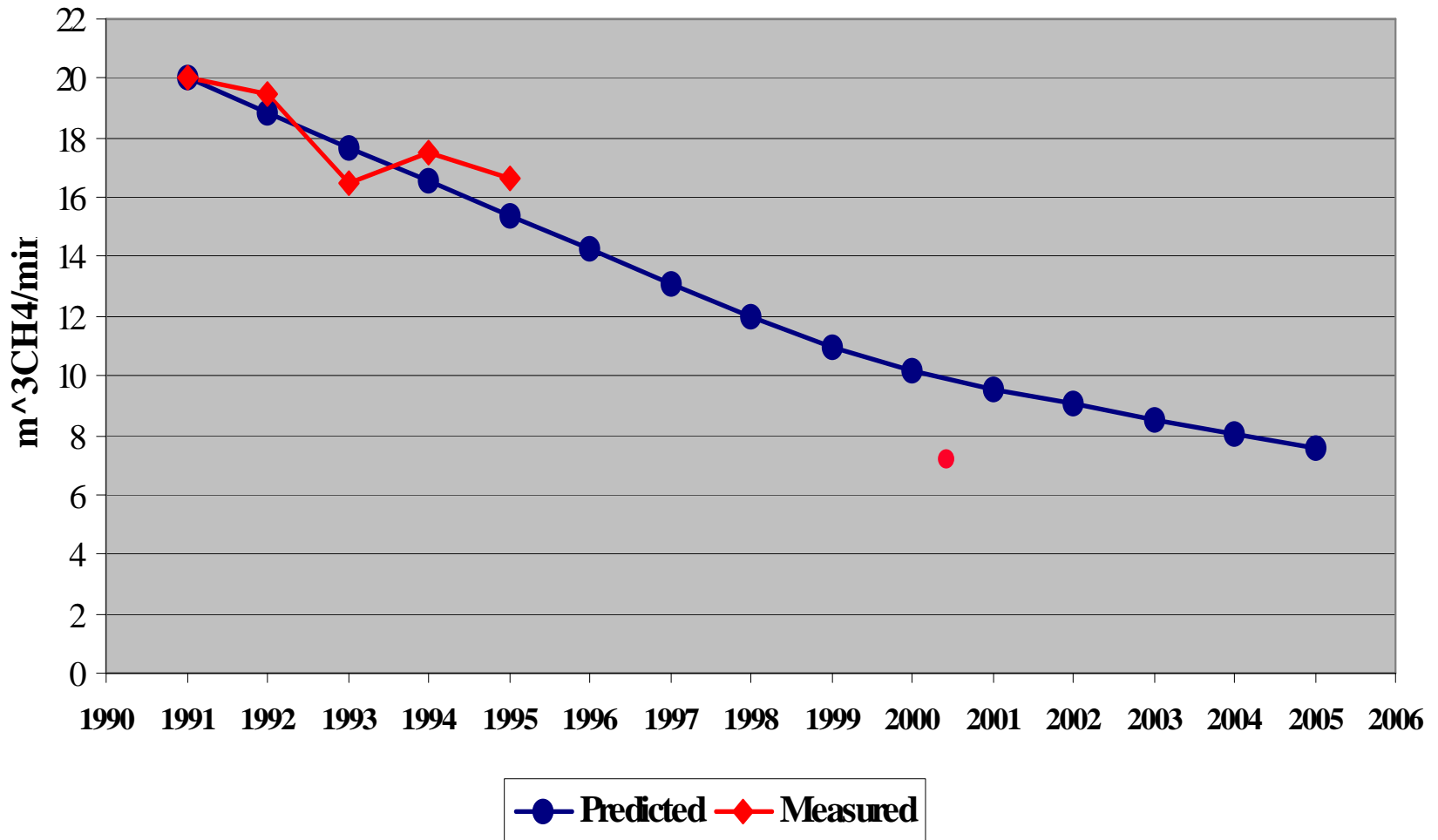


Multi longwall gas emission & abandoned mine gas decline vs. time



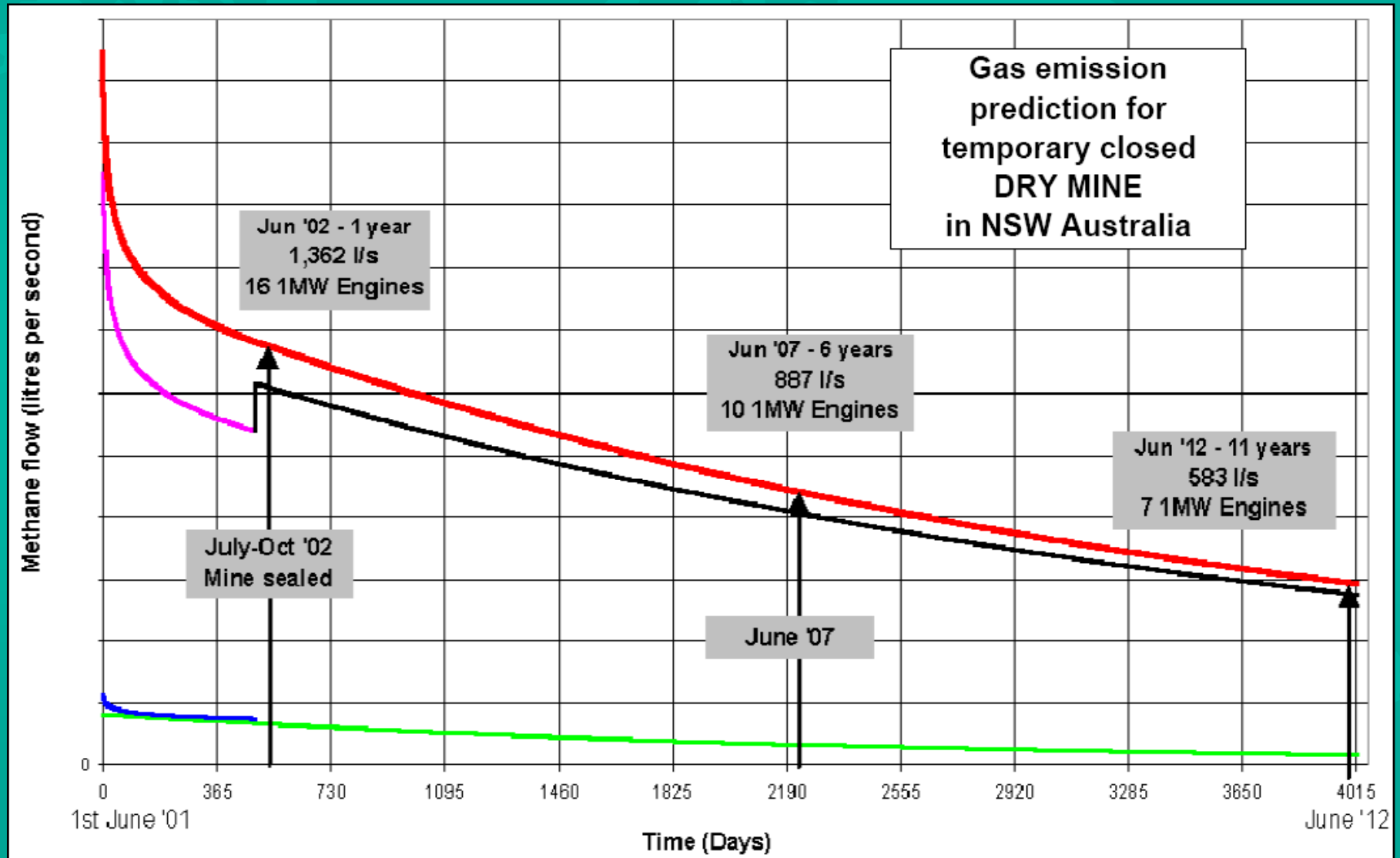


Predicted gas emission decline trend for dry abandoned mine





Temporary closed mine gas emission decline projection (water constantly pumped)





Gas emission decline projection for DRY & WET closed mine (QLD - Australia)

