NITRATE SENSITIVITY ANALYSIS

SITE NAME: Absaroka Investments Property, Pray MT

COUNTY: Park

LOT #:   **S25, T05 S, R08 E**

NOTES:

VARIABLES	DESCRIPTION	VALUE	UNITS	
K	Hydraulic Conductivity	56.27	ft/day	
I	Hydraulic Gradient	0.0042	ft/ft	
D	Mixing Zone Thickness (usually constant)	15.0	ft	
L	Mixing Zone Length (see ARM 17.30.517(1)(d)(viii))	500	ft	
Y	Width of Drainfield Perpendicular to Ground Water Flow	150.0	ft	
Ng	Background Nitrate (as Nitrogen) Concentration	1.290	mg/L	
Nr	Nitrate (as Nitrogen) Concentration in Precipitation (usually constant)	1.0	mg/L	
Ne	Nitrate (as Nitrogen) Concentration in Effluent	24.00	mg/L	
#l	Number of Single Family Homes on the Drainfield of SFE	13.0		2600/200
Ql	Quantity of Effluent per Single Family Home	26.70	ft3/day	
P	Precipitation	16.0	in/year	
V	Percent of Precipitation Recharging Ground Water (usually constant)	0.2		

EQUATIONS

W	Width of Mixing Zone Perpendicular to Ground Water Flow $= (0.175)(L)+(Y)$	237.5	ft
Am	Cross Sectional Area of Aquifer Mixing Zone $= (D)(W)$	3562.5	ft2
As	Surface Area of Mixing Zone $= (L)(W)$	118750	ft2
Qg	Ground Water Flow Rate $= (K)(I)(Am)$	841.9399	ft3/day
Qr	Recharge Flow Rate $= (As)(P/12/365)(V)$	86.75799	ft3/day
Qe	Effluent Flow Rate $= (\#l)(Ql)$	347.1	ft3/day

SOLUTION

Nt   **Nitrate (as Nitrogen) Concentration at End of Mixing Zone**   **7.45** mg/L

$$=((Ng)(Qg)+(Nr)(Qr)+(Ne)(Qe)) / ((Qg)+(Qr)+(Qe))$$

BY: M. Dyba

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REV. 03/2005