

PALOS VERDES LANDFILL  
REMEDIAL INVESTIGATION REPORT

APPENDIX E.3

CONTAMINANT TRANSPORT REPORT  
(DAMES & MOORE, INC.) (CONTINUED)

**APPENDIX F**

**PREDICTIVE ANALYSIS RESULTS**

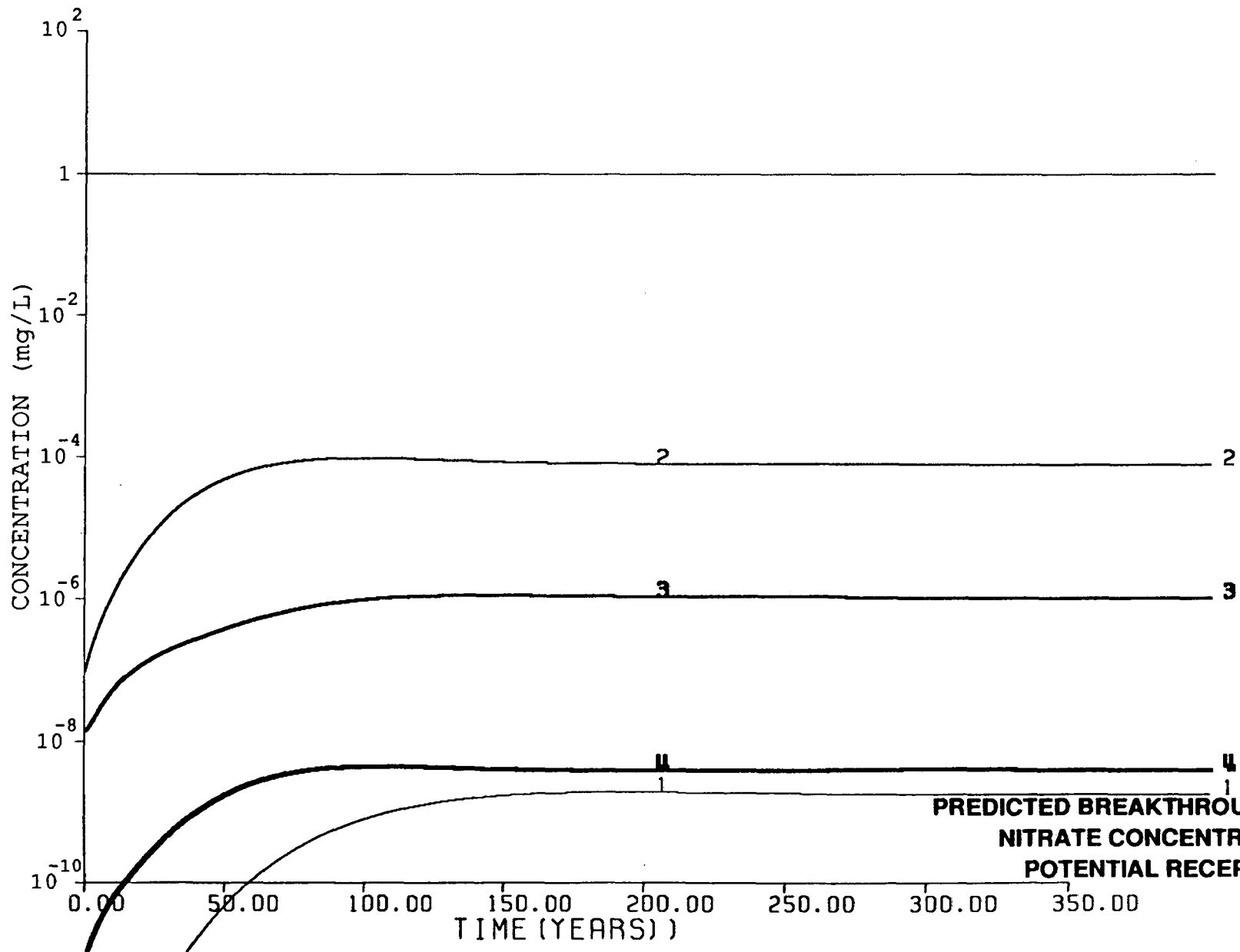


Figure F.1a  
**PREDICTED BREAKTHROUGH CURVES OF  
 NITRATE CONCENTRATION (mg/l) AT  
 POTENTIAL RECEPTORS, LAYER 1**

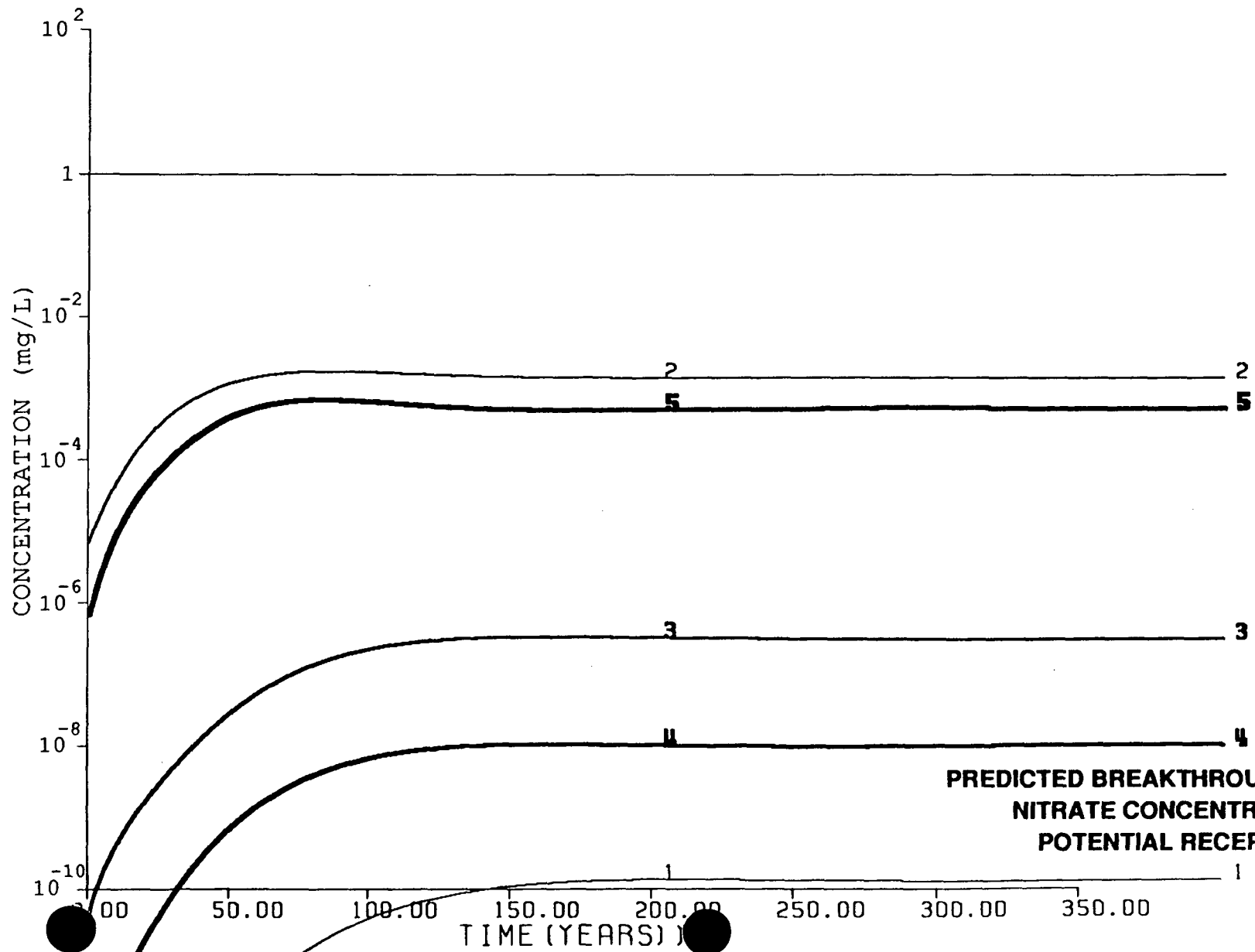


Figure F.1b  
**PREDICTED BREAKTHROUGH CURVES OF  
 NITRATE CONCENTRATION (mg/l) AT  
 POTENTIAL RECEPTORS, LAYER 2**

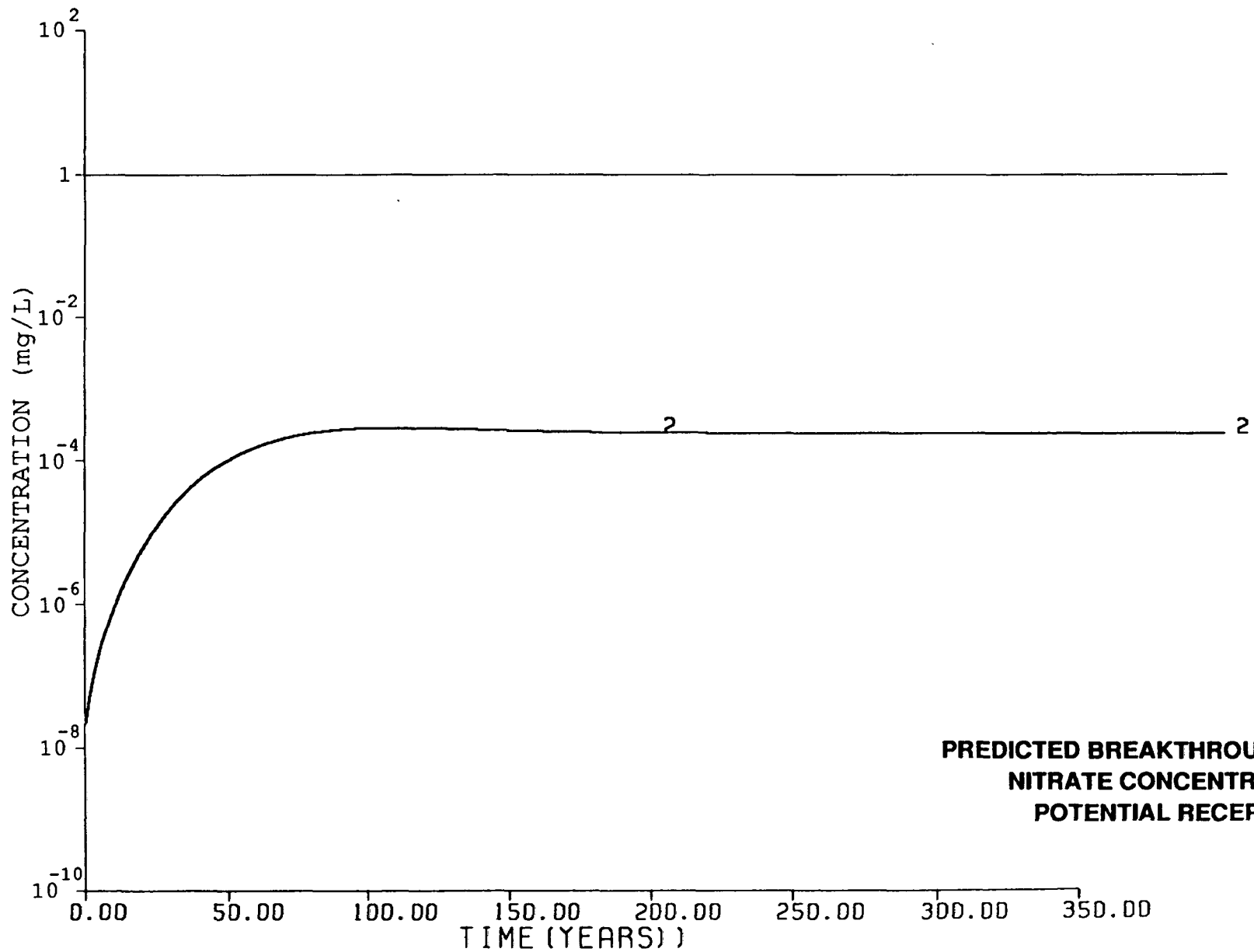


Figure F.1c  
**PREDICTED BREAKTHROUGH CURVES OF  
NITRATE CONCENTRATION (mg/l) AT  
POTENTIAL RECEPTORS, LAYER 3**

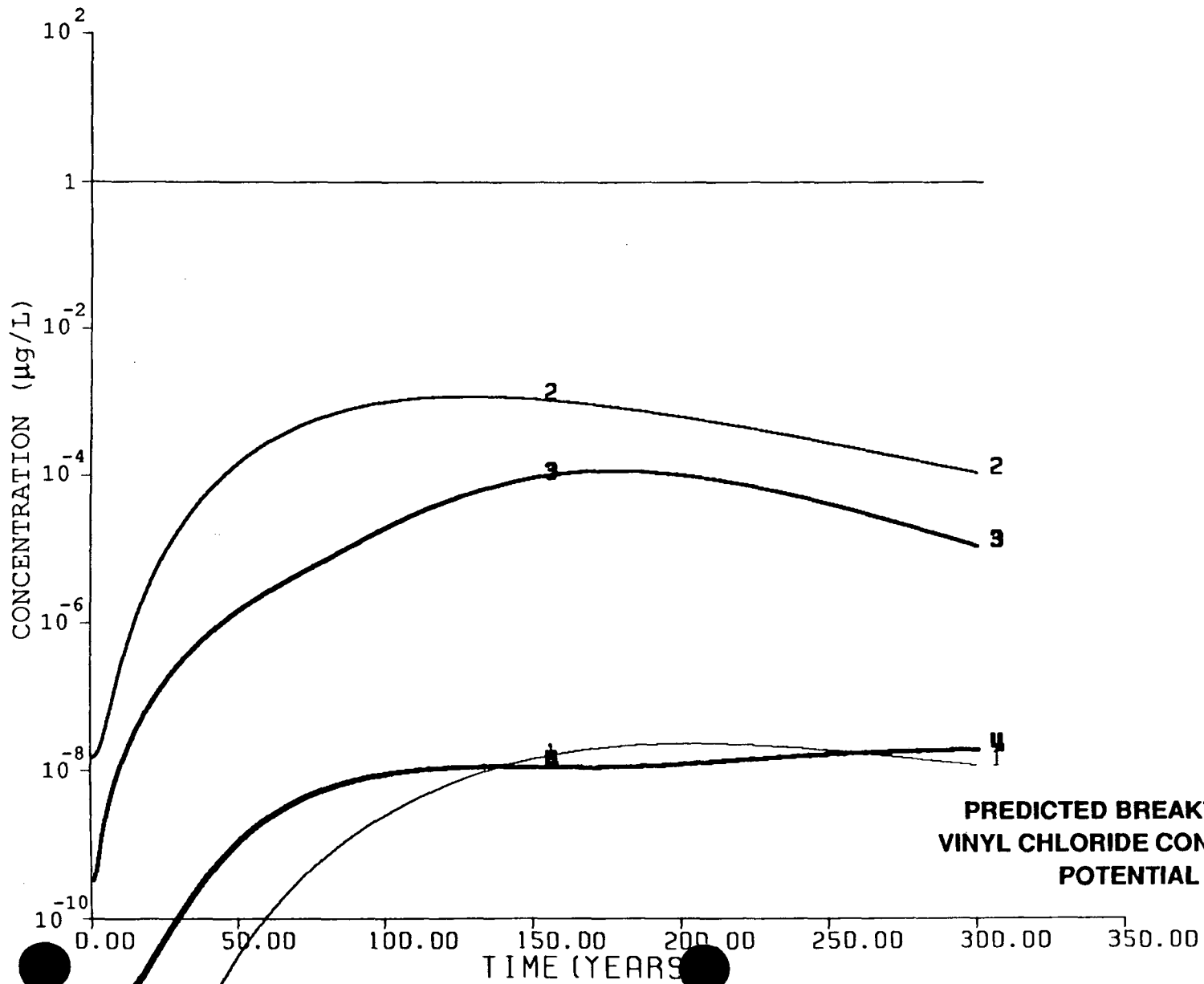


Figure F.2a  
**PREDICTED BREAKTHROUGH CURVES OF  
 VINYL CHLORIDE CONCENTRATION (µg/l) AT  
 POTENTIAL RECEPTORS, LAYER 1**

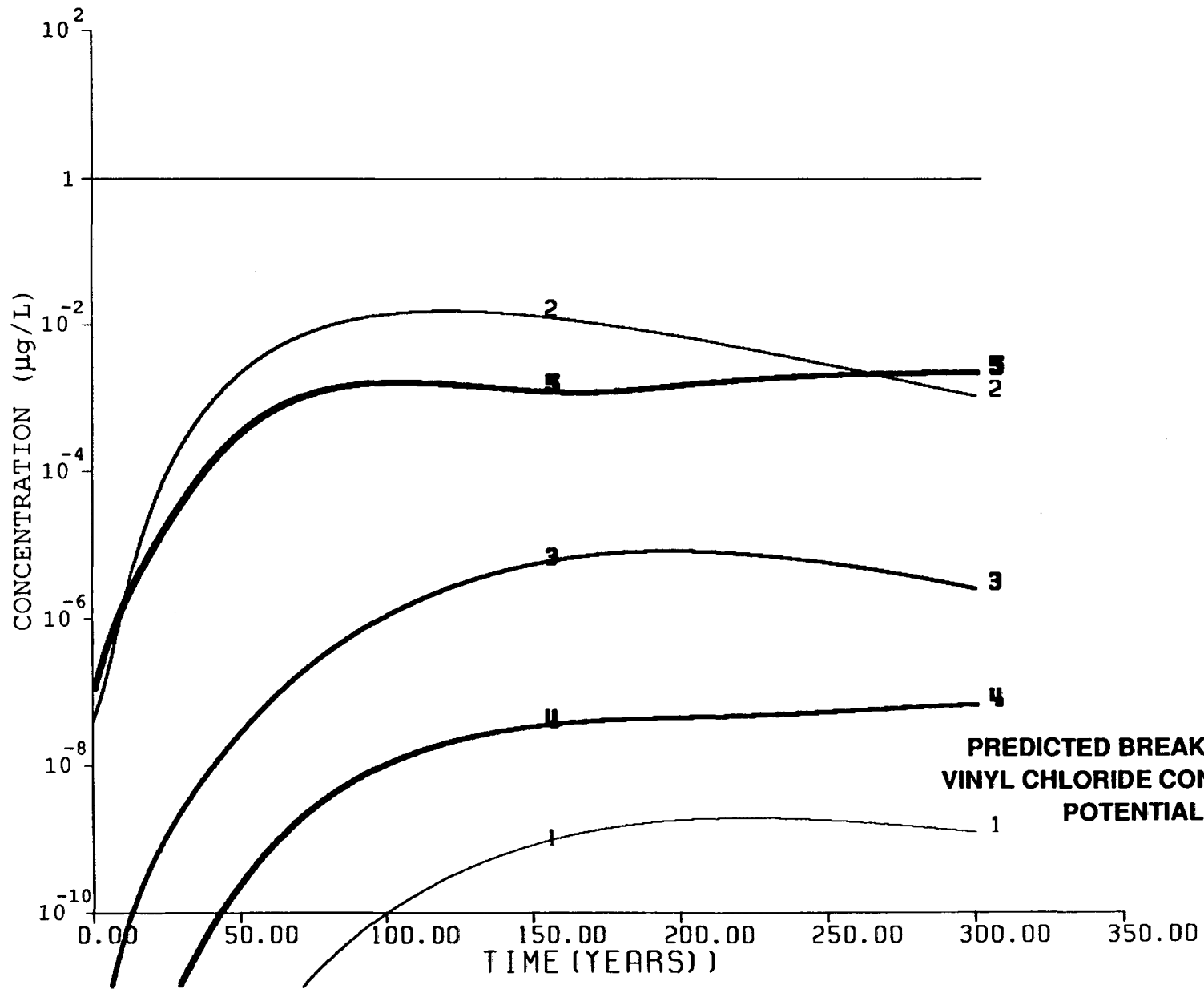


Figure F.2b  
**PREDICTED BREAKTHROUGH CURVES OF  
 VINYL CHLORIDE CONCENTRATION ( $\mu\text{g/l}$ ) AT  
 POTENTIAL RECEPTORS, LAYER 2**

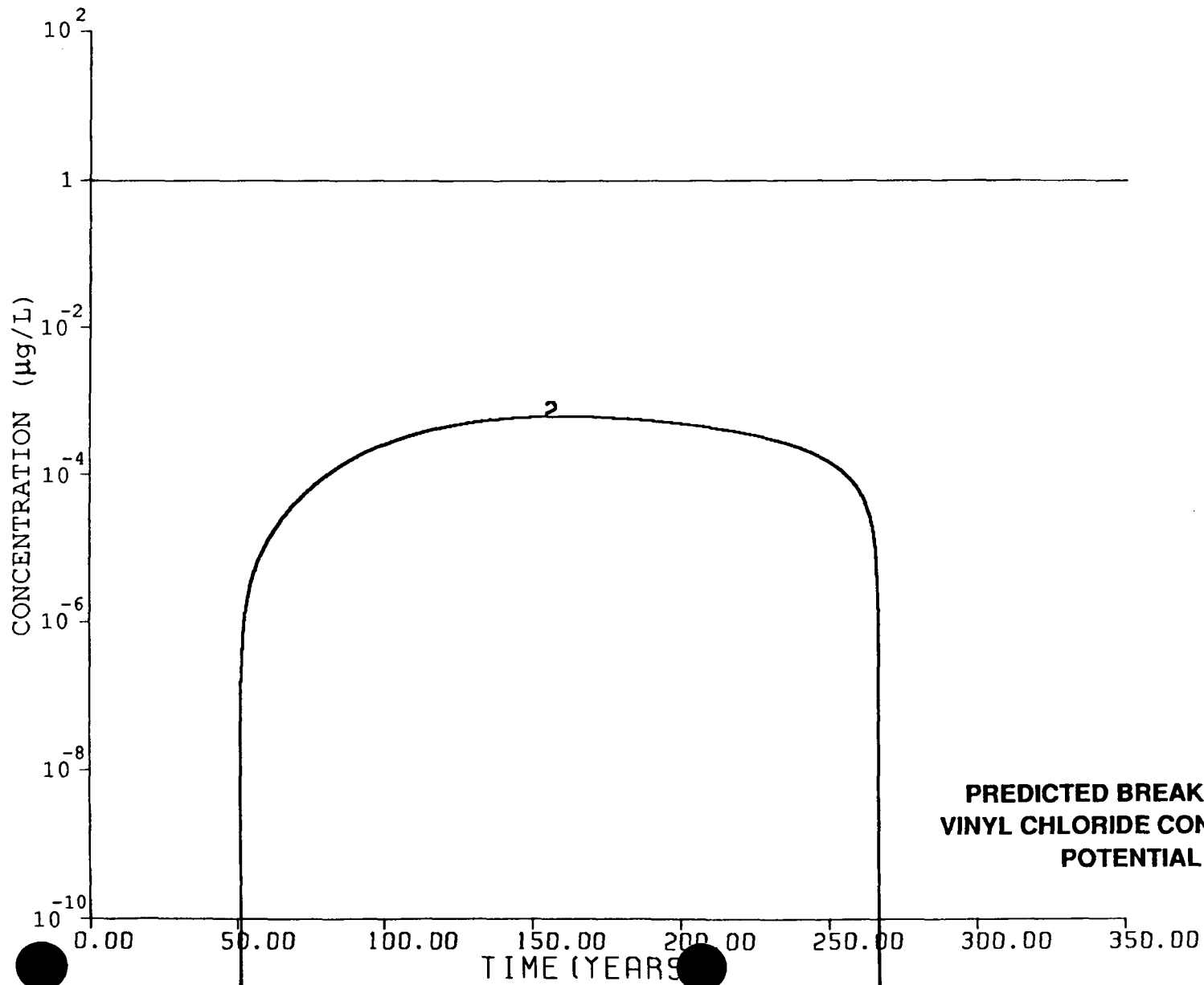


Figure F.2c  
**PREDICTED BREAKTHROUGH CURVES OF  
VINYL CHLORIDE CONCENTRATION (µg/l) AT  
POTENTIAL RECEPTORS, LAYER 3**



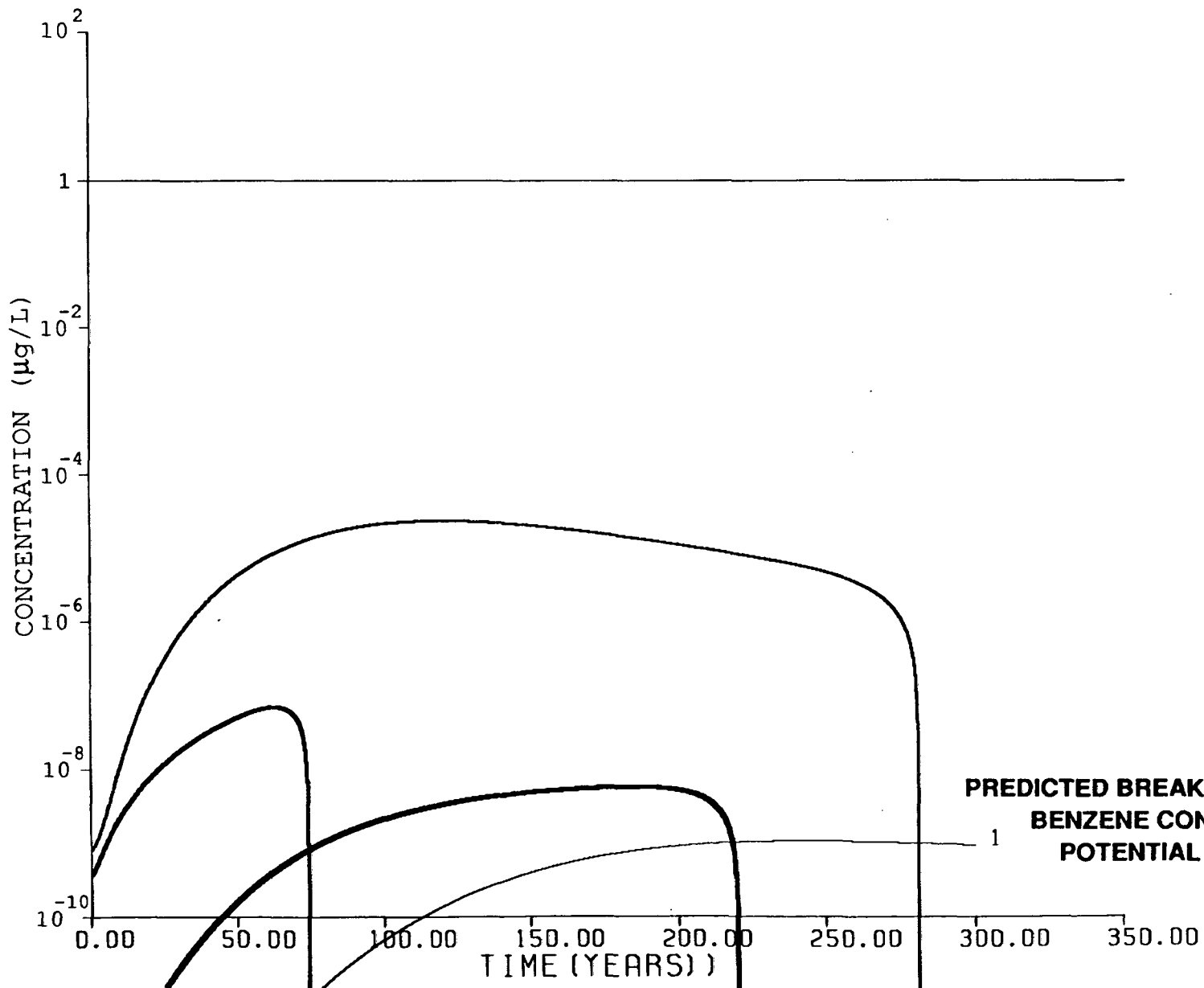


Figure F.3a  
**PREDICTED BREAKTHROUGH CURVES OF  
 BENZENE CONCENTRATION ( $\mu\text{g/l}$ ) AT  
 POTENTIAL RECEPTORS, LAYER 1**

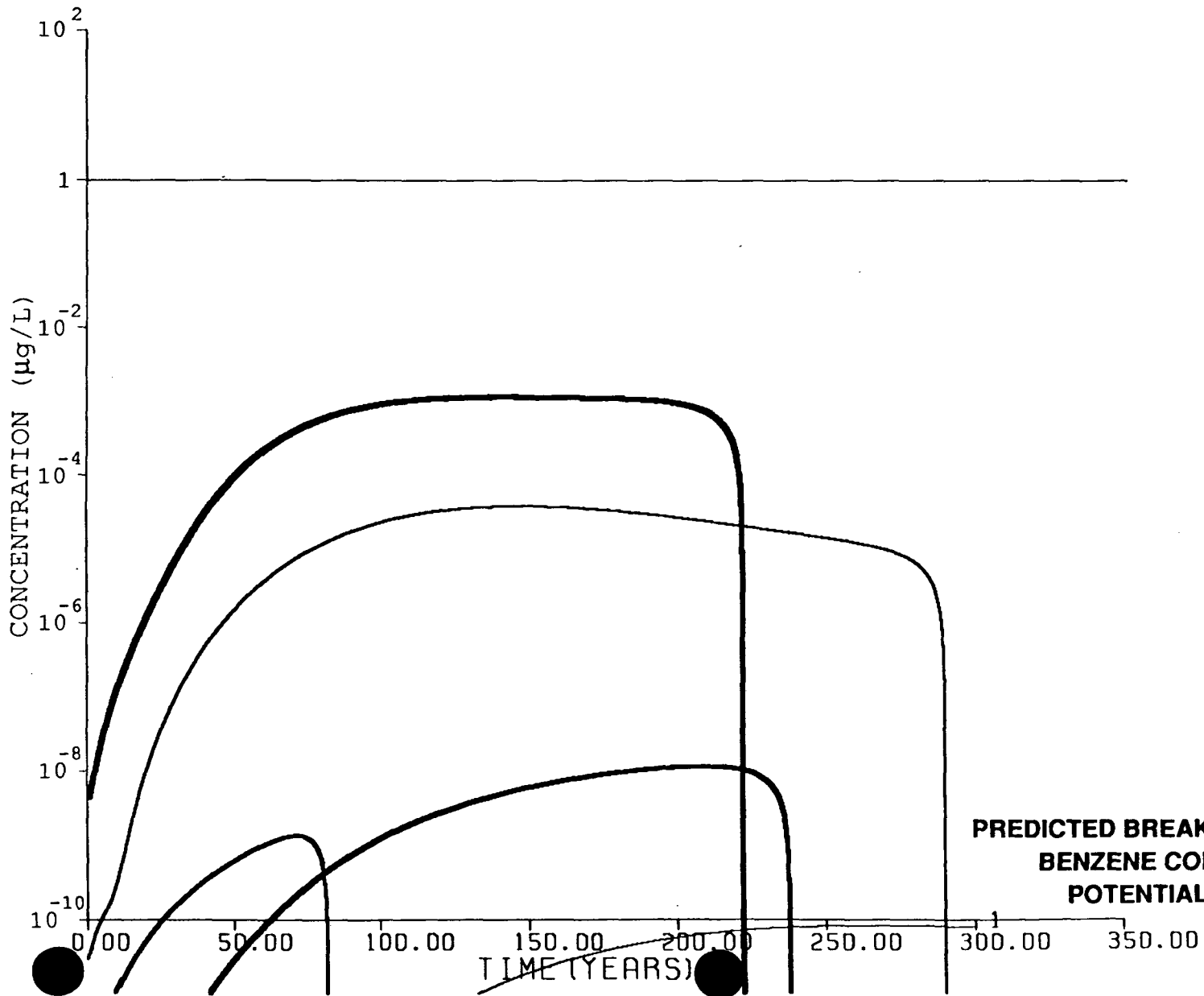


Figure F.3b  
PREDICTED BREAKTHROUGH CURVES OF  
BENZENE CONCENTRATION ( $\mu\text{g/l}$ ) AT  
POTENTIAL RECEPTORS, LAYER 2

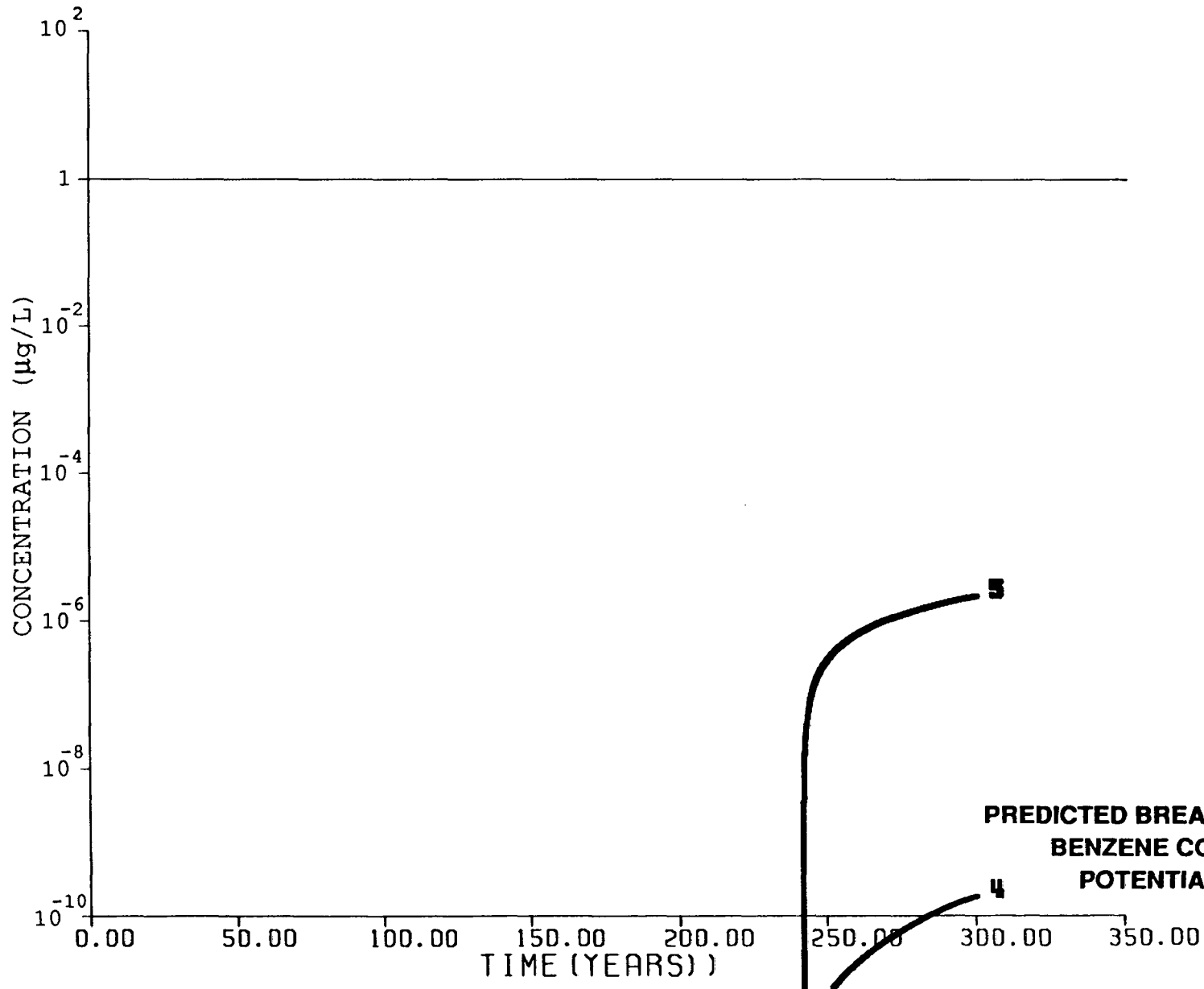


Figure F.3c  
**PREDICTED BREAKTHROUGH CURVES OF  
BENZENE CONCENTRATION (µg/l) AT  
POTENTIAL RECEPTORS, LAYER 3**

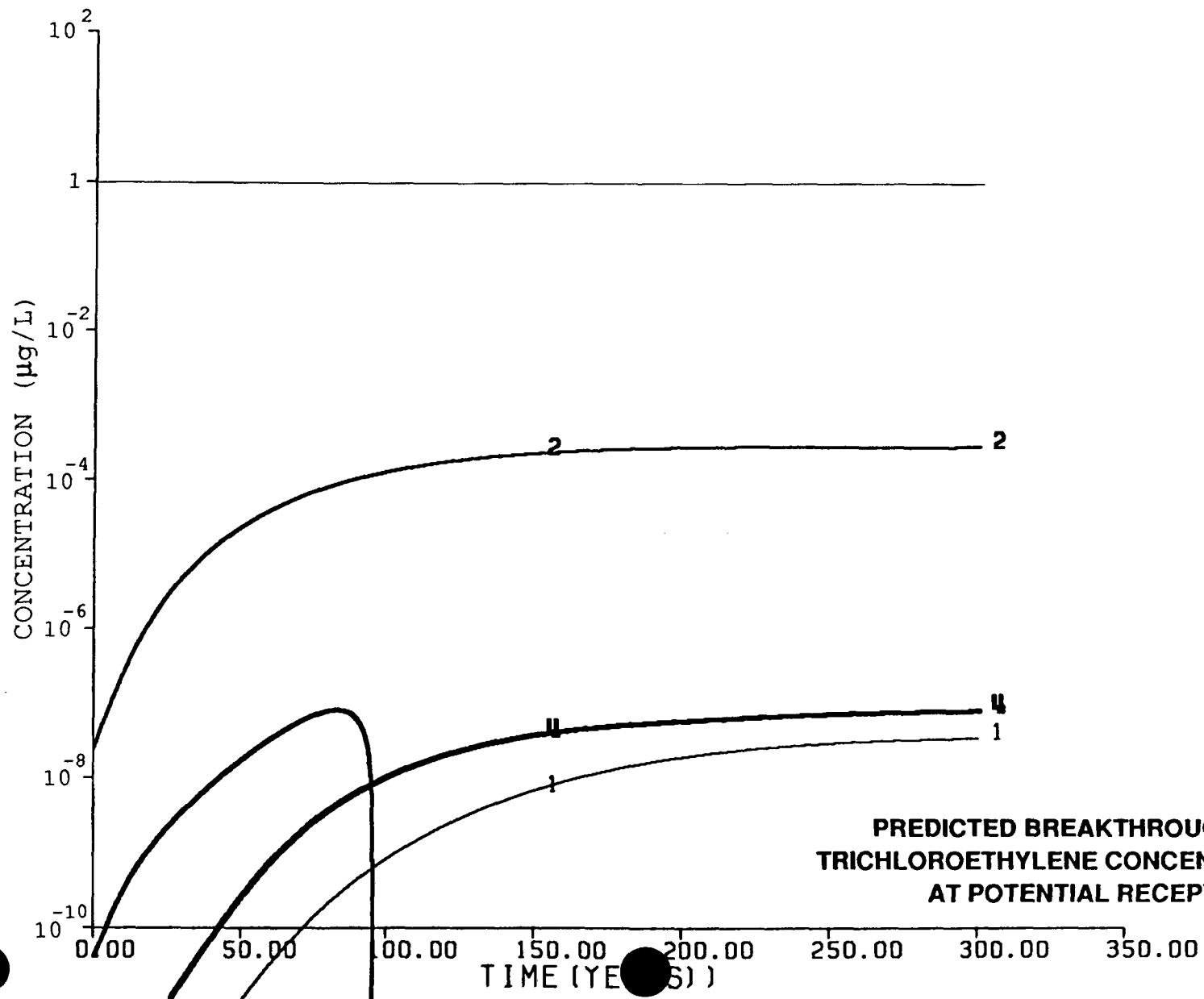


Figure F.4a  
**PREDICTED BREAKTHROUGH CURVES OF  
 TRICHLOROETHYLENE CONCENTRATION (µg/l)  
 AT POTENTIAL RECEPTORS, LAYER 1**

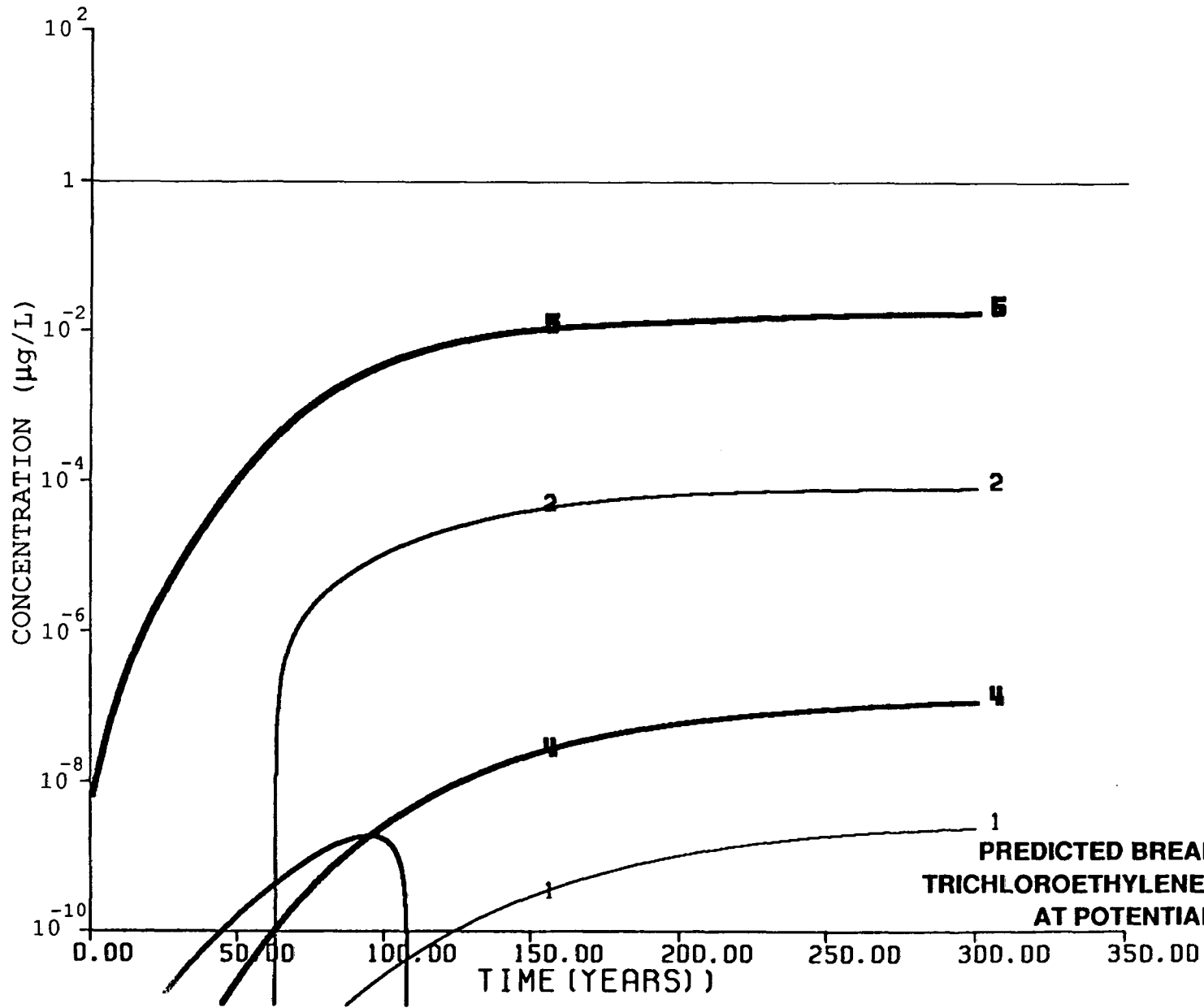


Figure F.4b  
**PREDICTED BREAKTHROUGH CURVES OF  
 TRICHLOROETHYLENE CONCENTRATION ( $\mu\text{g/l}$ )  
 AT POTENTIAL RECEPTORS, LAYER 2**

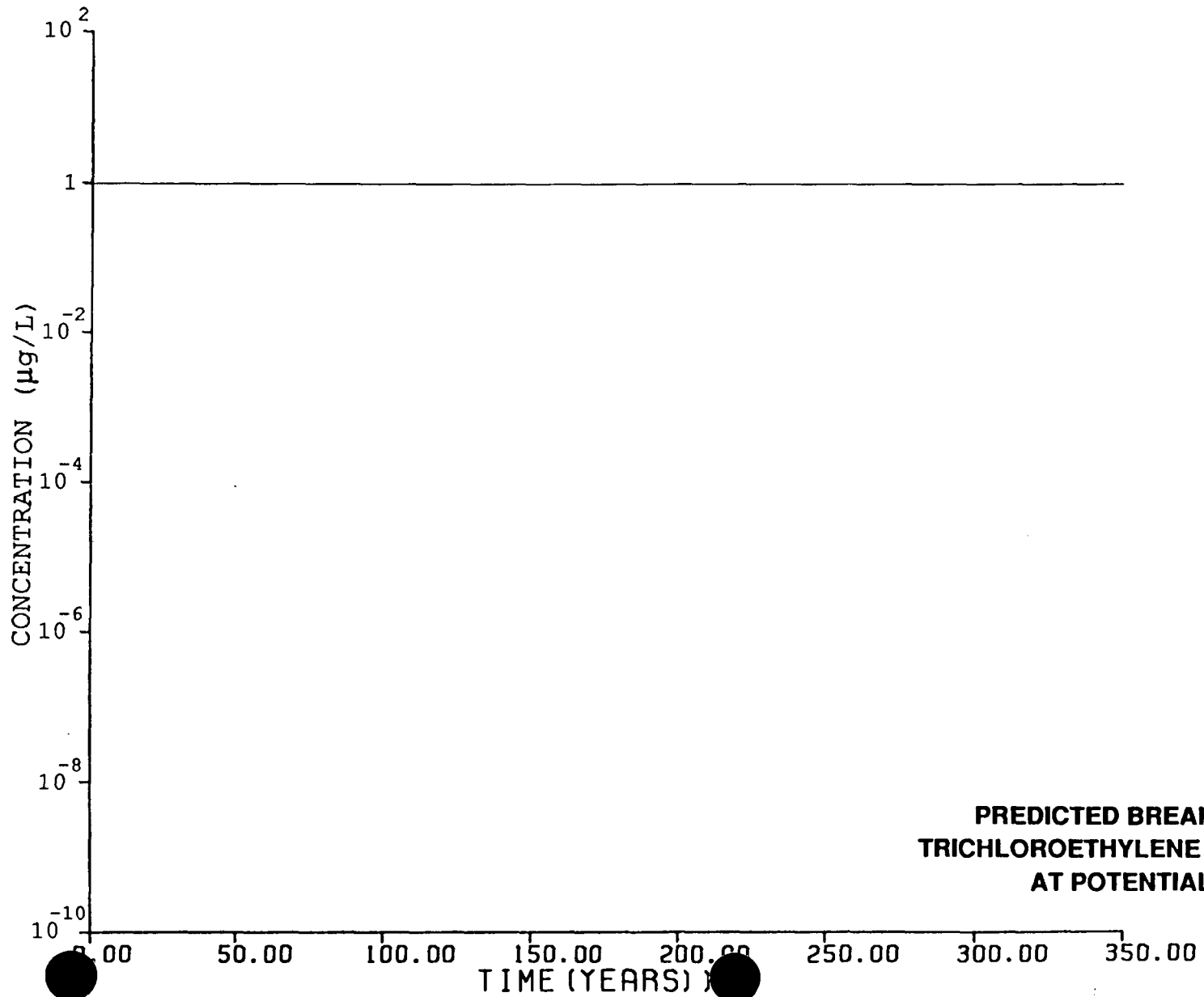


Figure F.4c  
**PREDICTED BREAKTHROUGH CURVES OF  
TRICHLOROETHYLENE CONCENTRATION (µg/l)  
AT POTENTIAL RECEPTORS, LAYER 3**

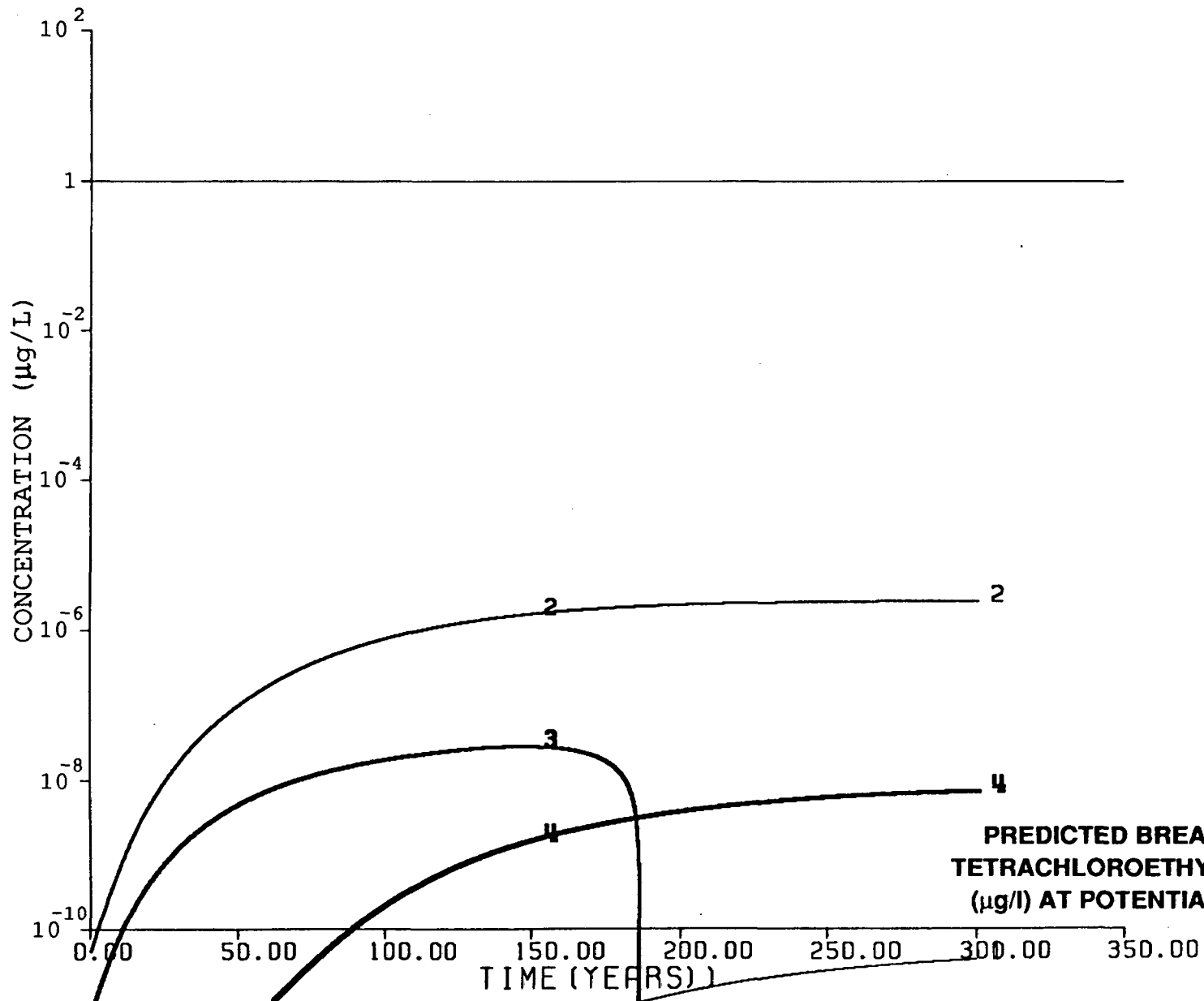


Figure F.5a  
**PREDICTED BREAKTHROUGH CURVES OF  
 TETRACHLOROETHYLENE CONCENTRATION  
 ( $\mu\text{g/l}$ ) AT POTENTIAL RECEPTORS, LAYER 1**

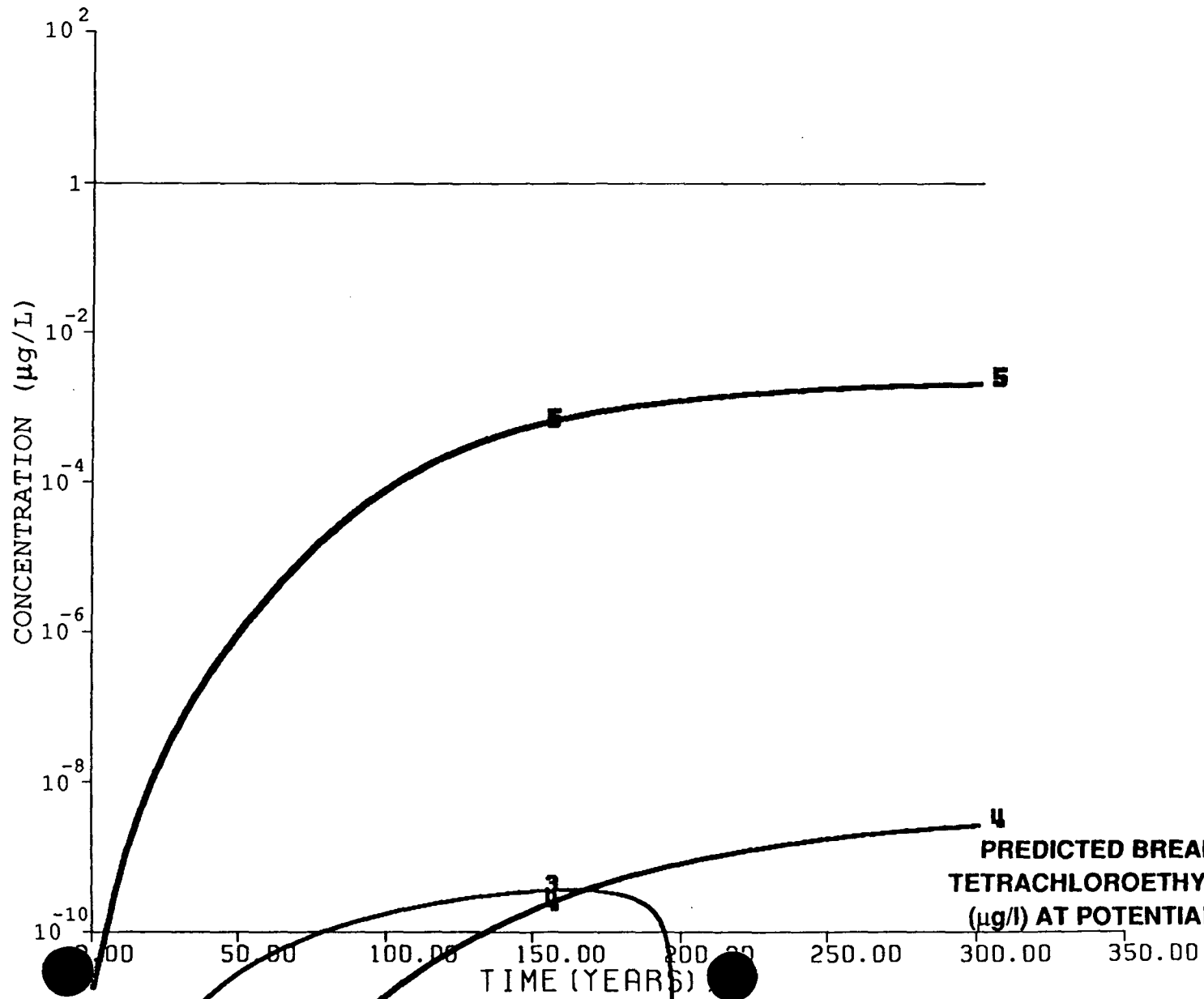


Figure F.5b  
**PREDICTED BREAKTHROUGH CURVES OF  
 TETRACHLOROETHYLENE CONCENTRATION  
 (µg/l) AT POTENTIAL RECEPTORS, LAYER 2**



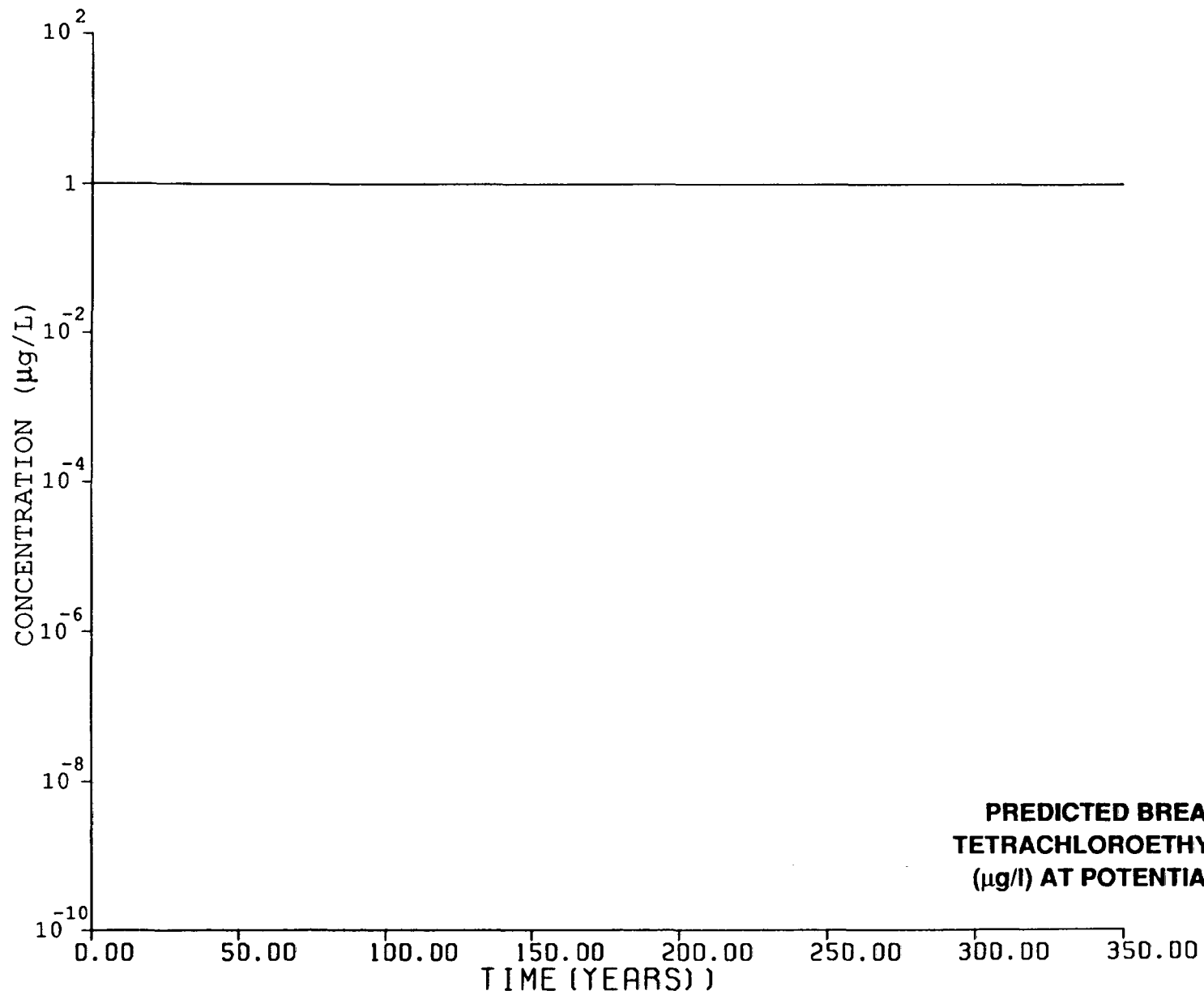


Figure F.5c  
**PREDICTED BREAKTHROUGH CURVES OF  
TETRACHLOROETHYLENE CONCENTRATION  
(µg/l) AT POTENTIAL RECEPTORS, LAYER 3**

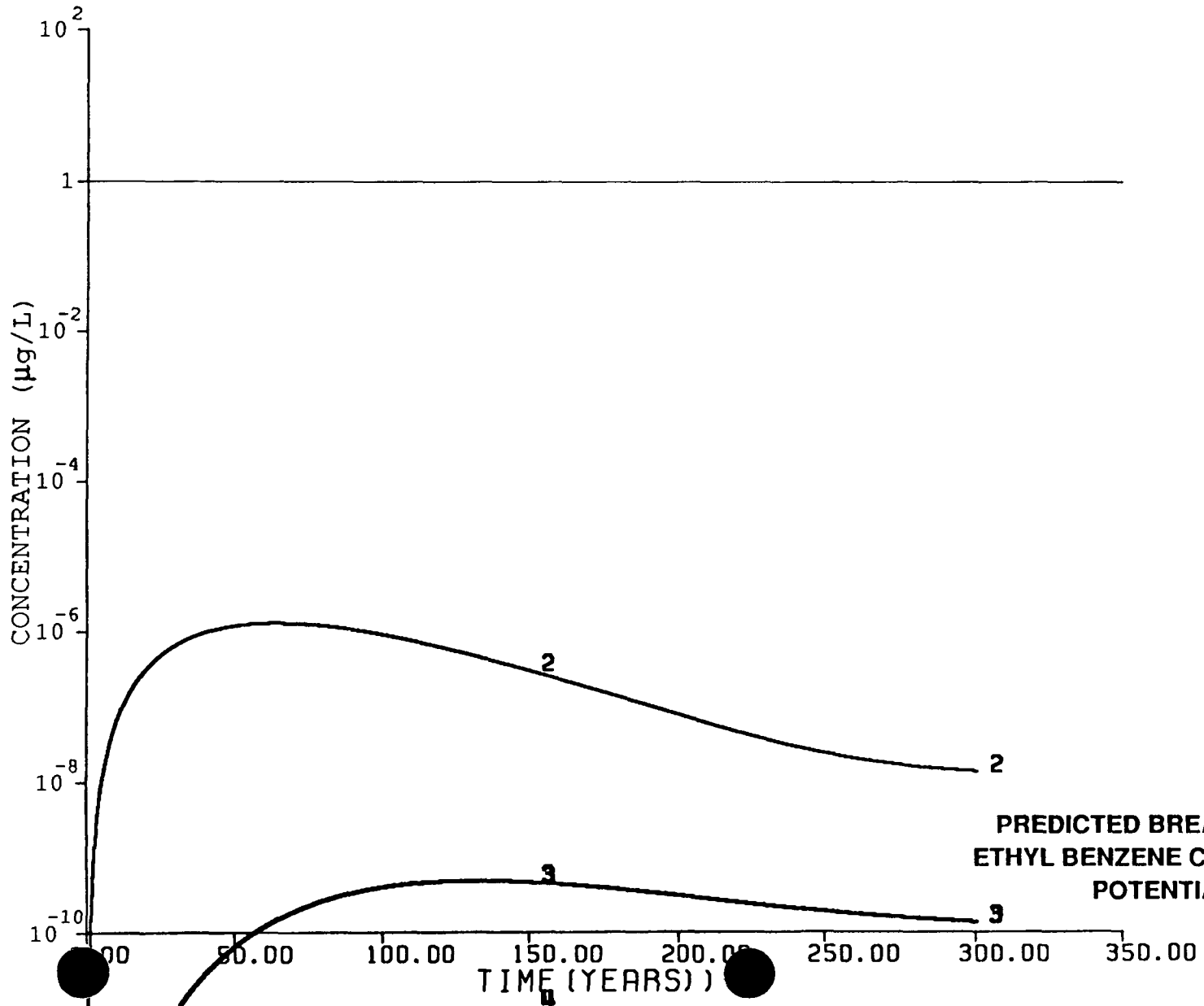


Figure F.6a  
PREDICTED BREAKTHROUGH CURVES OF  
ETHYL BENZENE CONCENTRATION ( $\mu\text{g/l}$ ) AT  
POTENTIAL RECEPTORS, LAYER 1

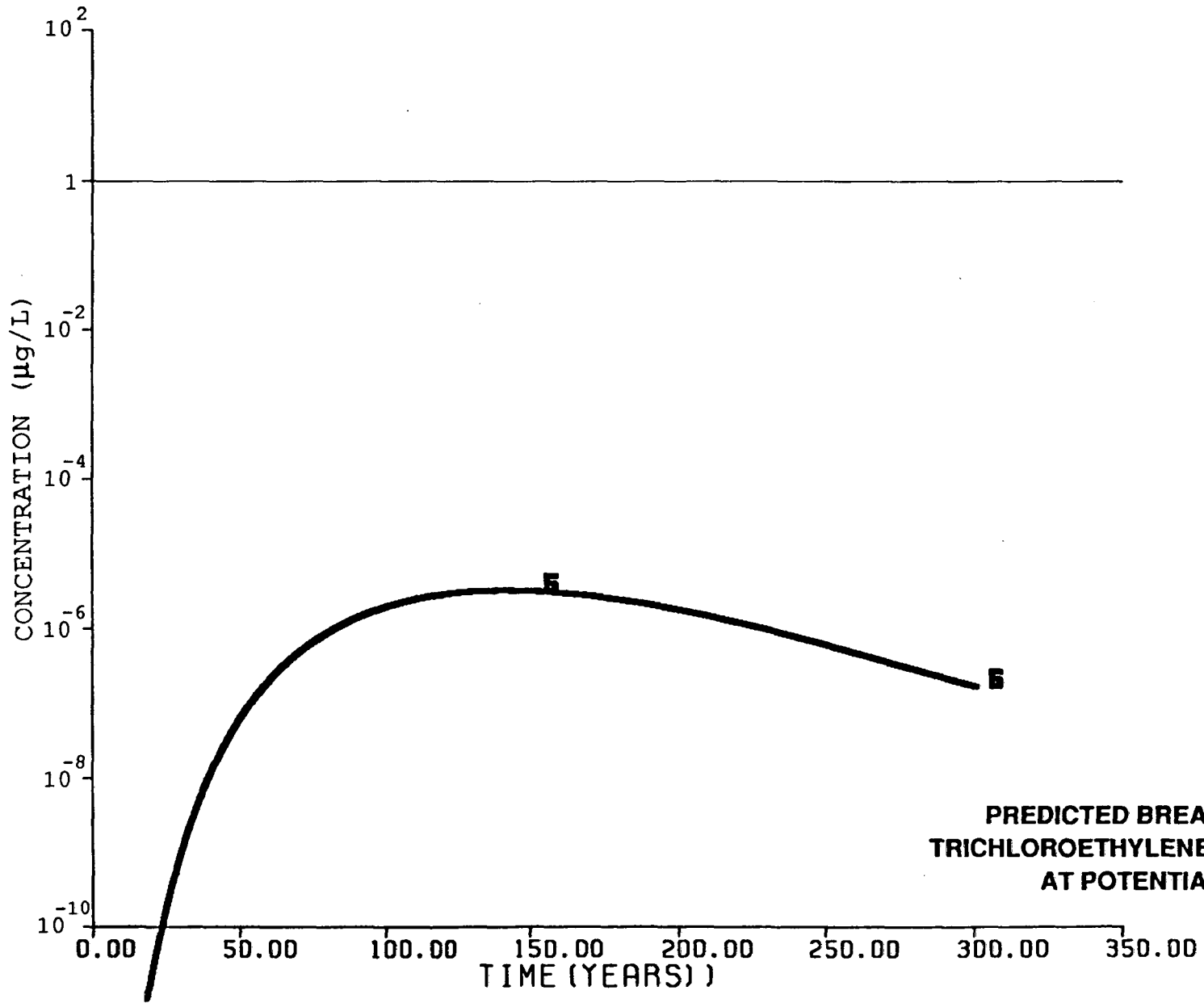


Figure F.6b  
PREDICTED BREAKTHROUGH CURVES OF  
TRICHLOROETHYLENE CONCENTRATION (µg/l)  
AT POTENTIAL RECEPTORS, LAYER 2

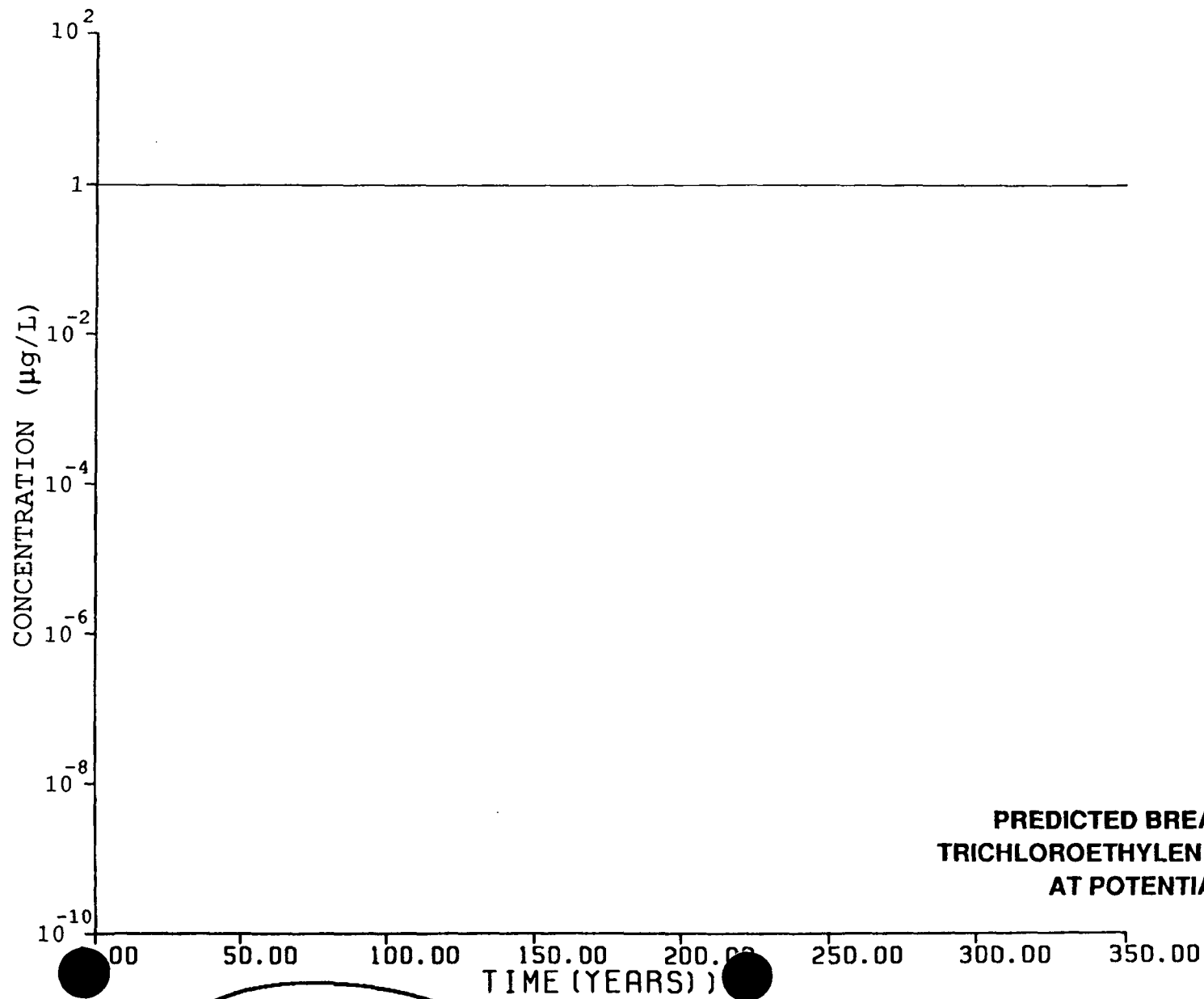


Figure F.6c  
**PREDICTED BREAKTHROUGH CURVES OF  
TRICHLOROETHYLENE CONCENTRATION (µg/l)  
AT POTENTIAL RECEPTORS, LAYER 3**

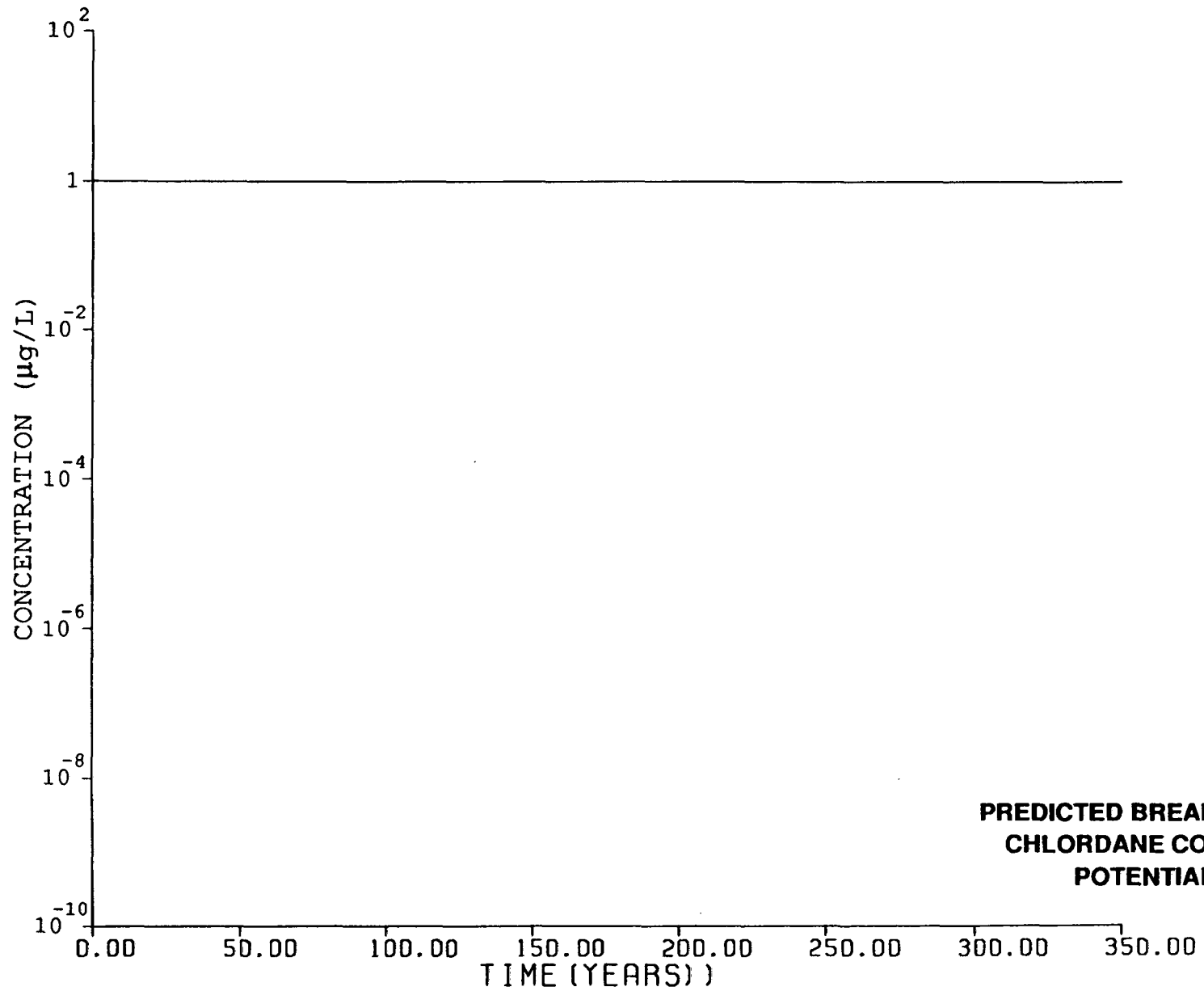


Figure F.7a  
**PREDICTED BREAKTHROUGH CURVES OF  
CHLORDANE CONCENTRATION (µg/l) AT  
POTENTIAL RECEPTORS, LAYER 1**

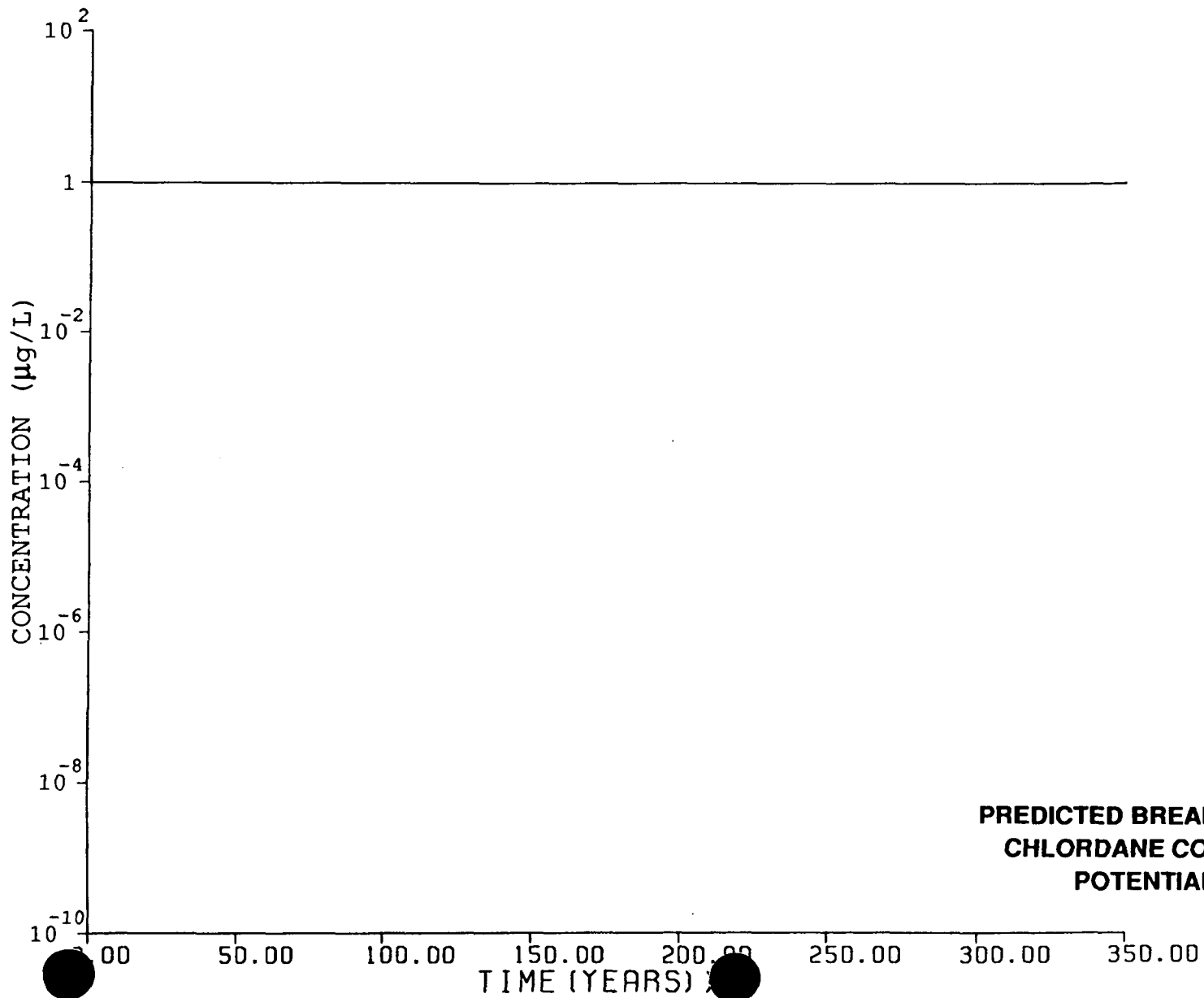


Figure F.7b  
**PREDICTED BREAKTHROUGH CURVES OF  
CHLORDANE CONCENTRATION (µg/l) AT  
POTENTIAL RECEPTORS, LAYER 2**

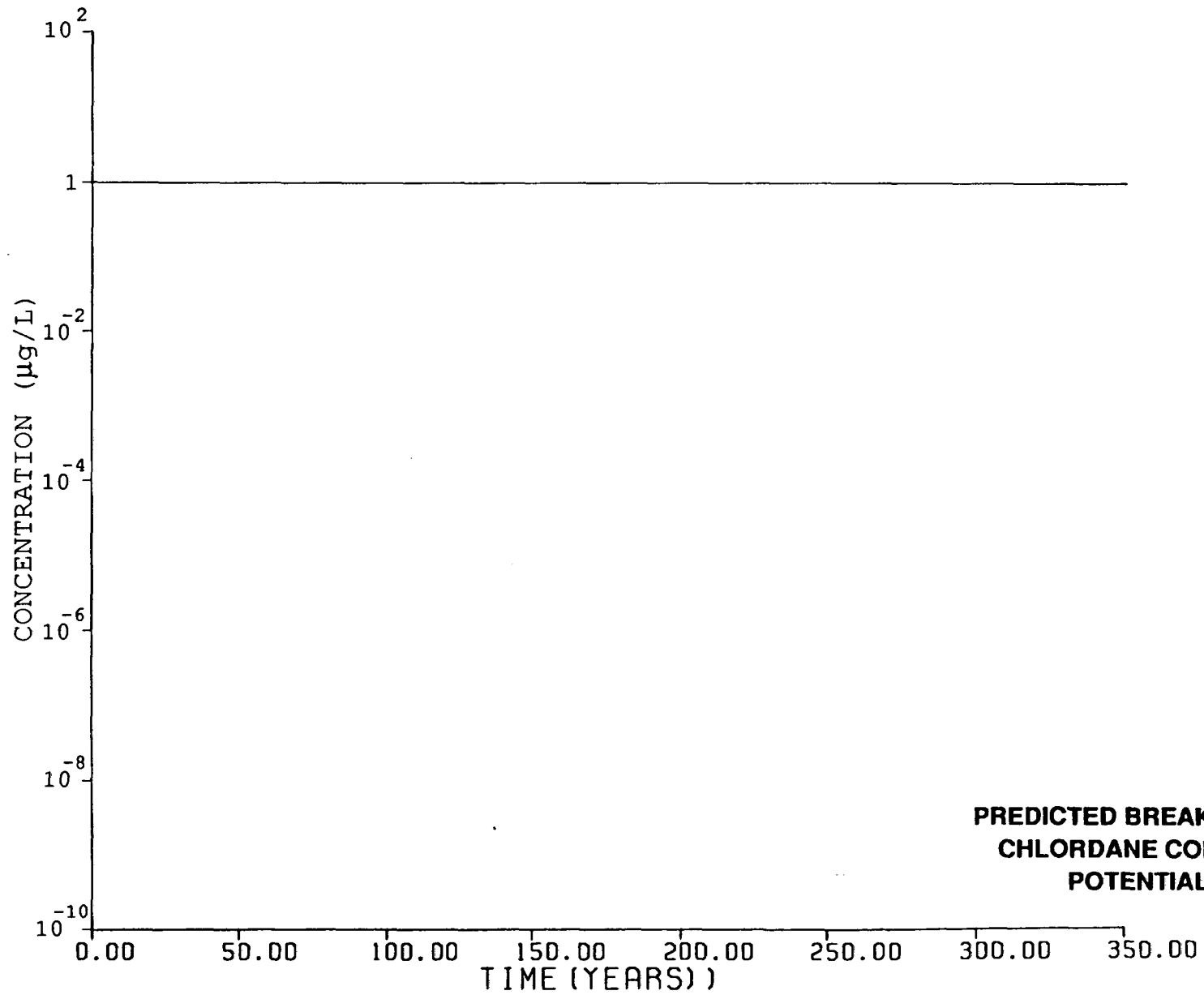


Figure F.7c  
**PREDICTED BREAKTHROUGH CURVES OF  
CHLORDANE CONCENTRATION (µg/l) AT  
POTENTIAL RECEPTORS, LAYER 3**

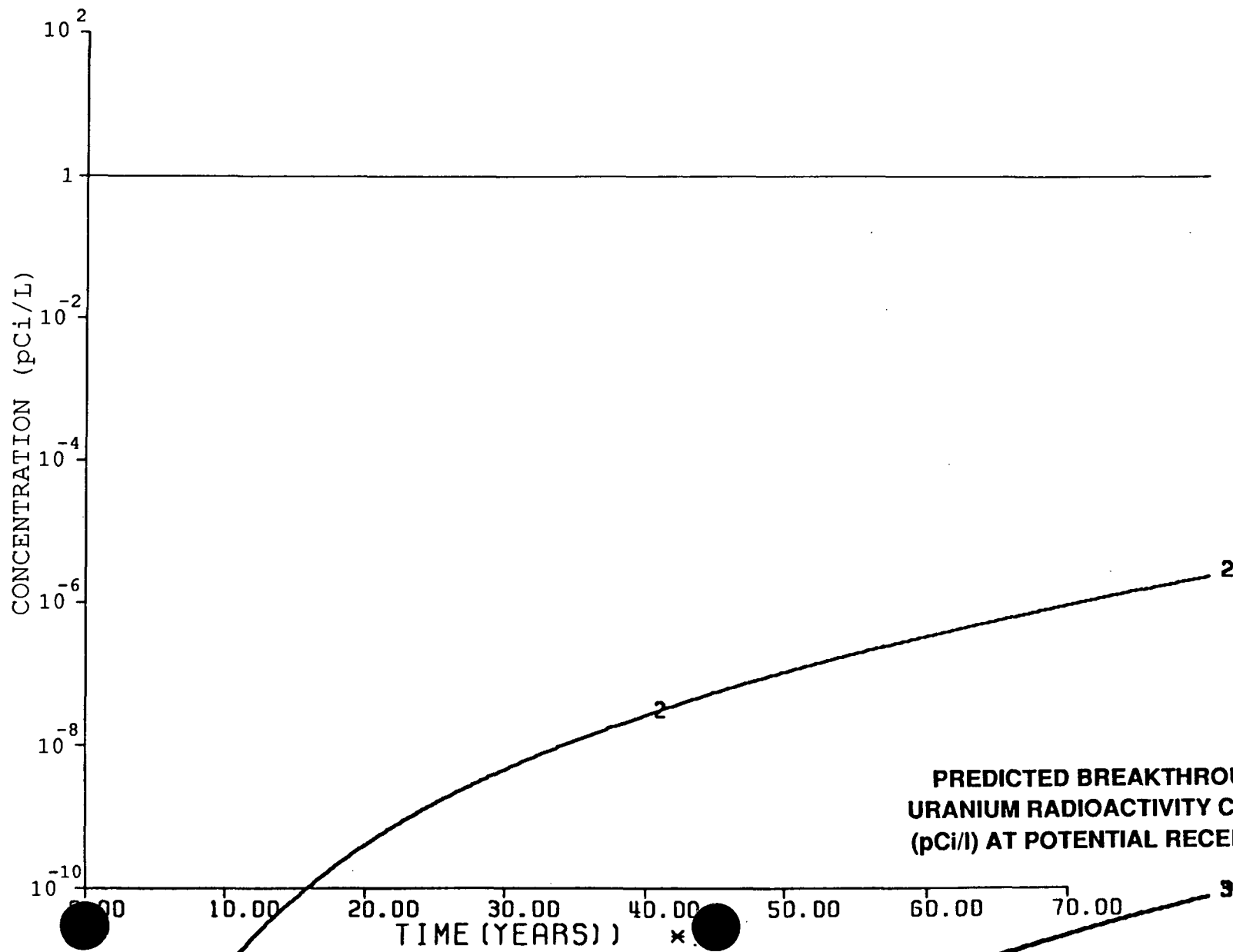


Figure F.8a  
**PREDICTED BREAKTHROUGH CURVES OF  
 URANIUM RADIOACTIVITY CONCENTRATION  
 (pCi/l) AT POTENTIAL RECEPTORS, LAYER 1**



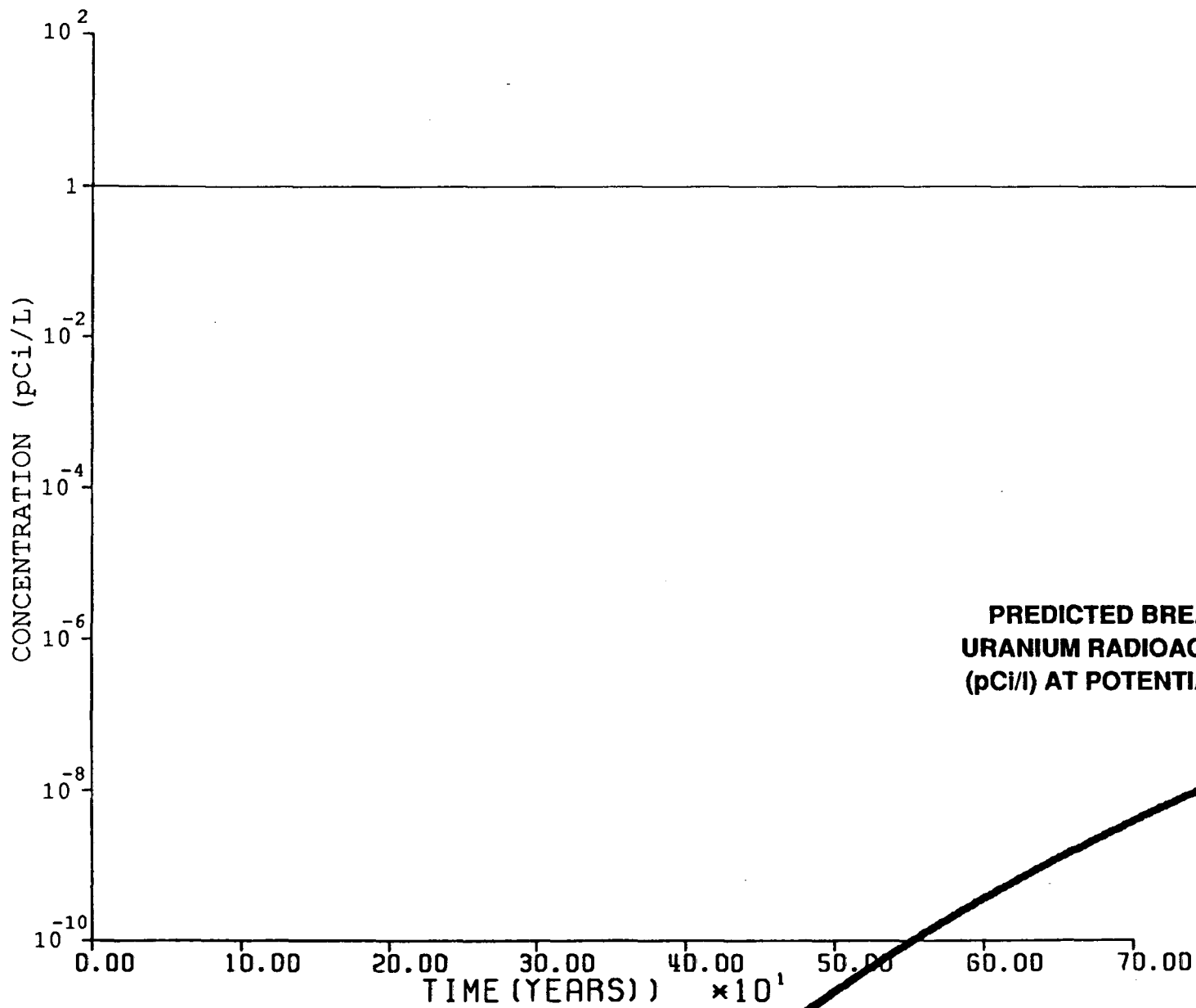


Figure F.8b  
**PREDICTED BREAKTHROUGH CURVES OF  
URANIUM RADIOACTIVITY CONCENTRATION  
(pCi/l) AT POTENTIAL RECEPTORS, LAYER 2**

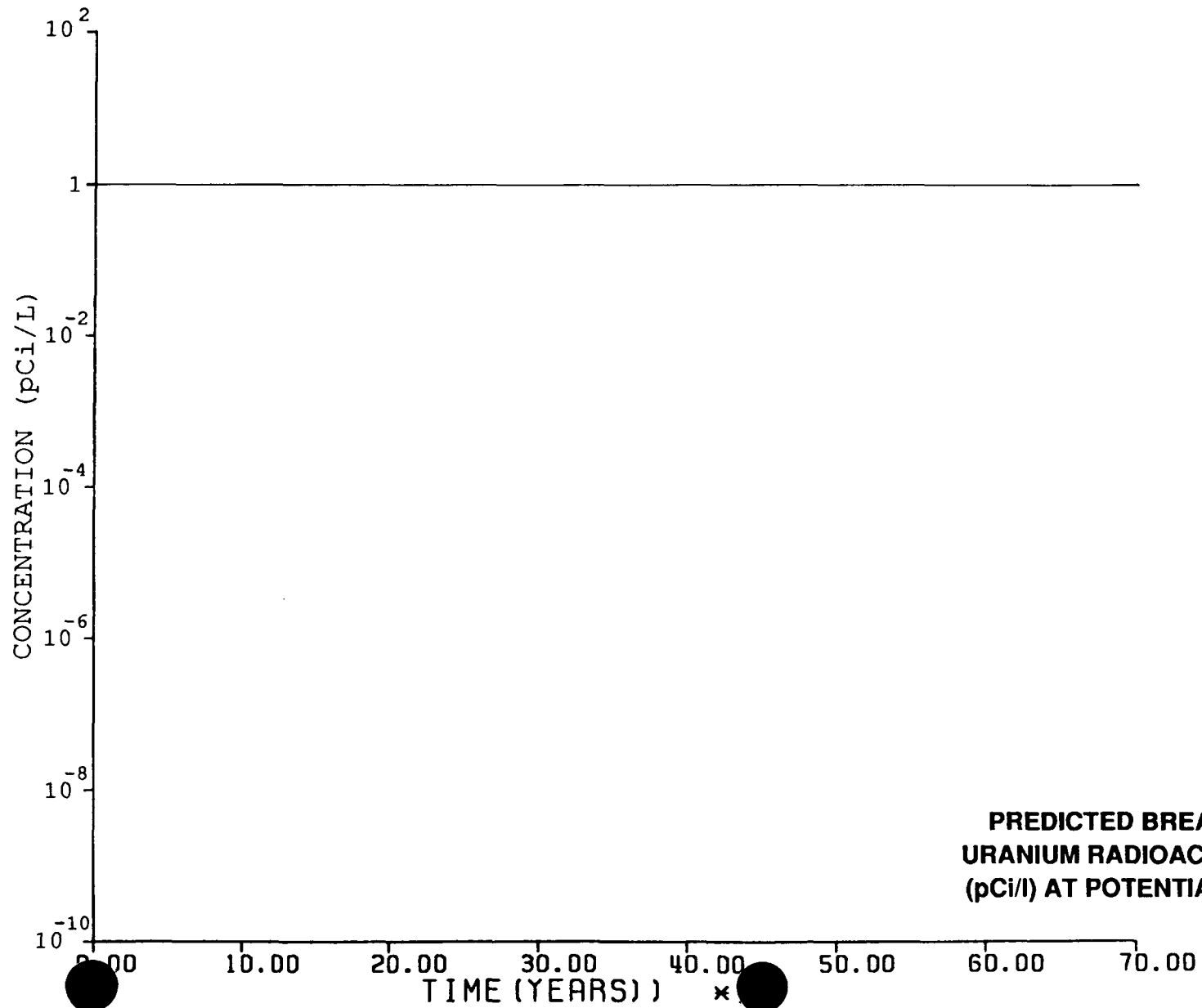


Figure F.8c  
**PREDICTED BREAKTHROUGH CURVES OF  
URANIUM RADIOACTIVITY CONCENTRATION  
(pCi/l) AT POTENTIAL RECEPTORS, LAYER 3**

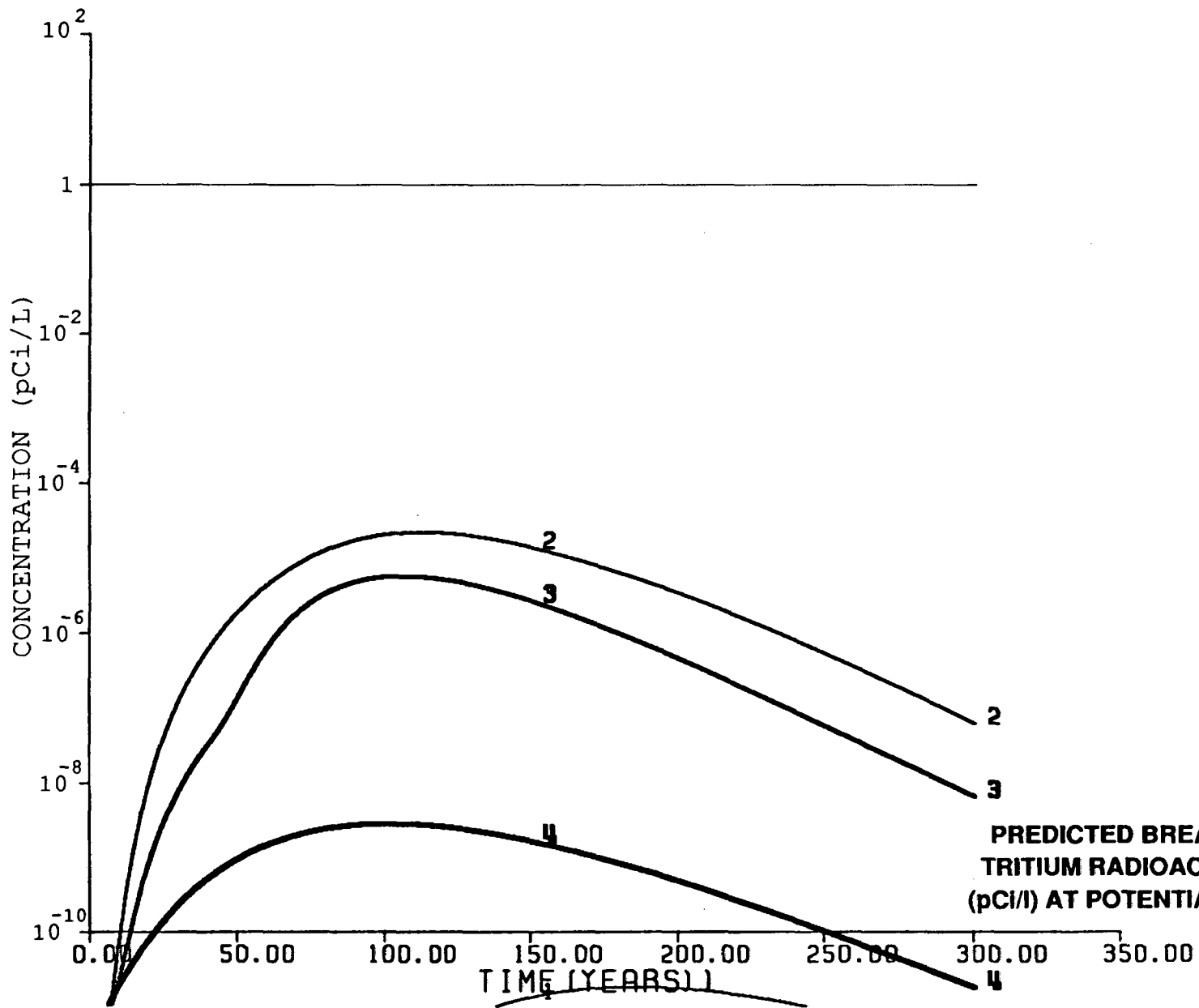


Figure F.9a  
**PREDICTED BREAKTHROUGH CURVES OF  
 TRITIUM RADIOACTIVITY CONCENTRATION  
 (pCi/l) AT POTENTIAL RECEPTORS, LAYER 1**

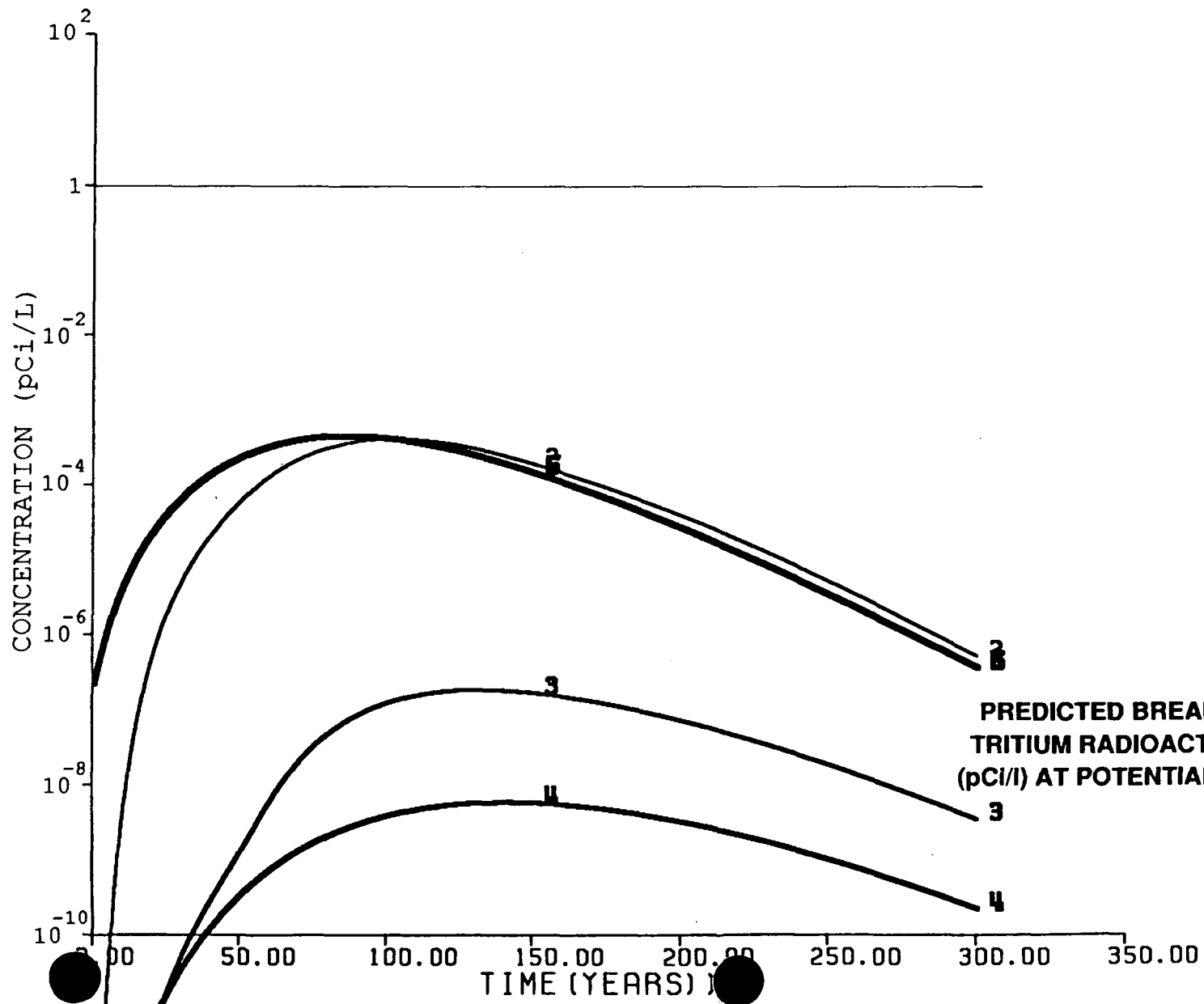


Figure F.9b  
PREDICTED BREAKTHROUGH CURVES OF  
TRITIUM RADIOACTIVITY CONCENTRATION  
(pCi/l) AT POTENTIAL RECEPTORS, LAYER 2

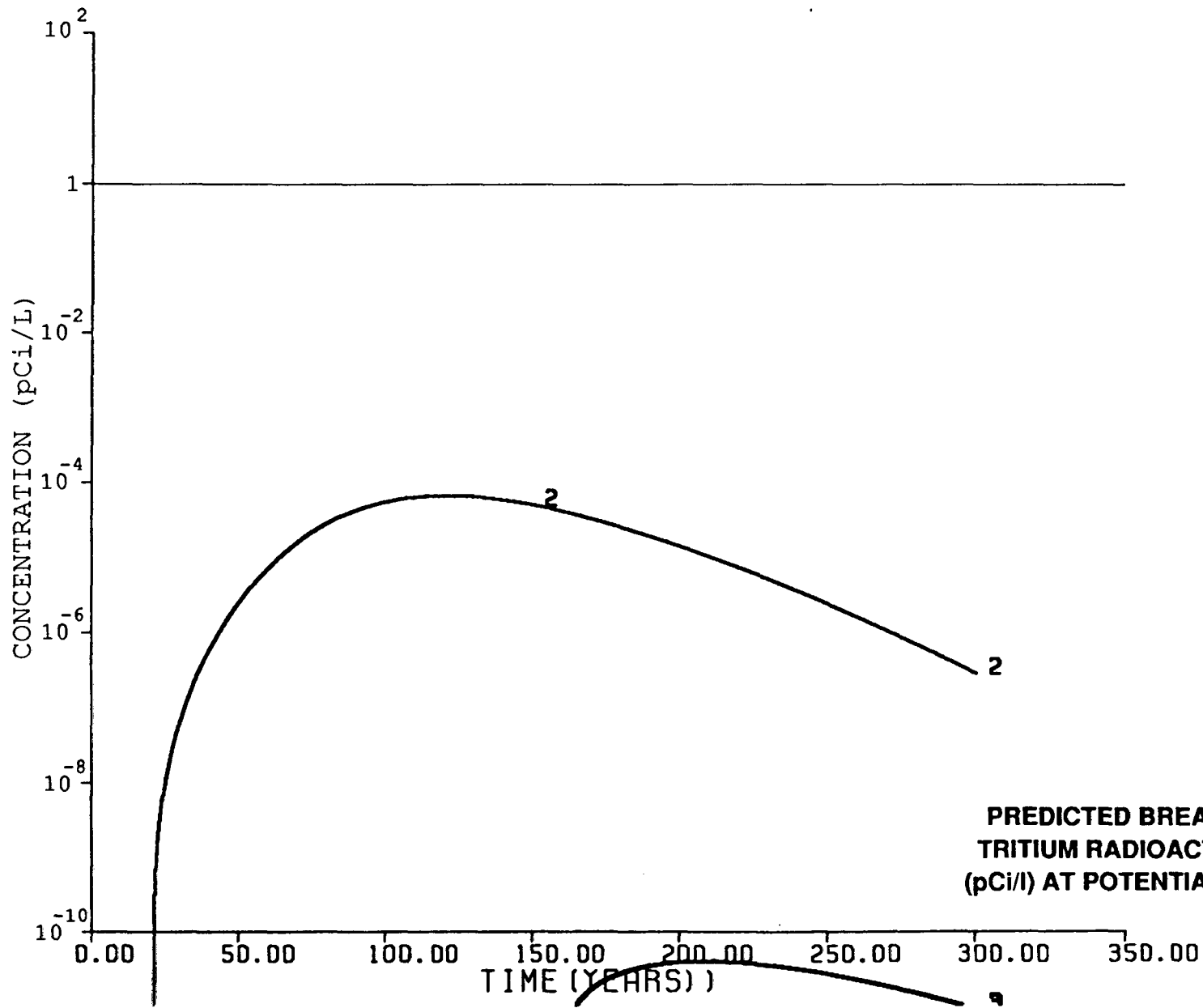


Figure F.9c  
**PREDICTED BREAKTHROUGH CURVES OF  
 TRITIUM RADIOACTIVITY CONCENTRATION  
 (pCi/l) AT POTENTIAL RECEPTORS, LAYER 3**

**APPENDIX G**

**SENSITIVITY ANALYSIS**

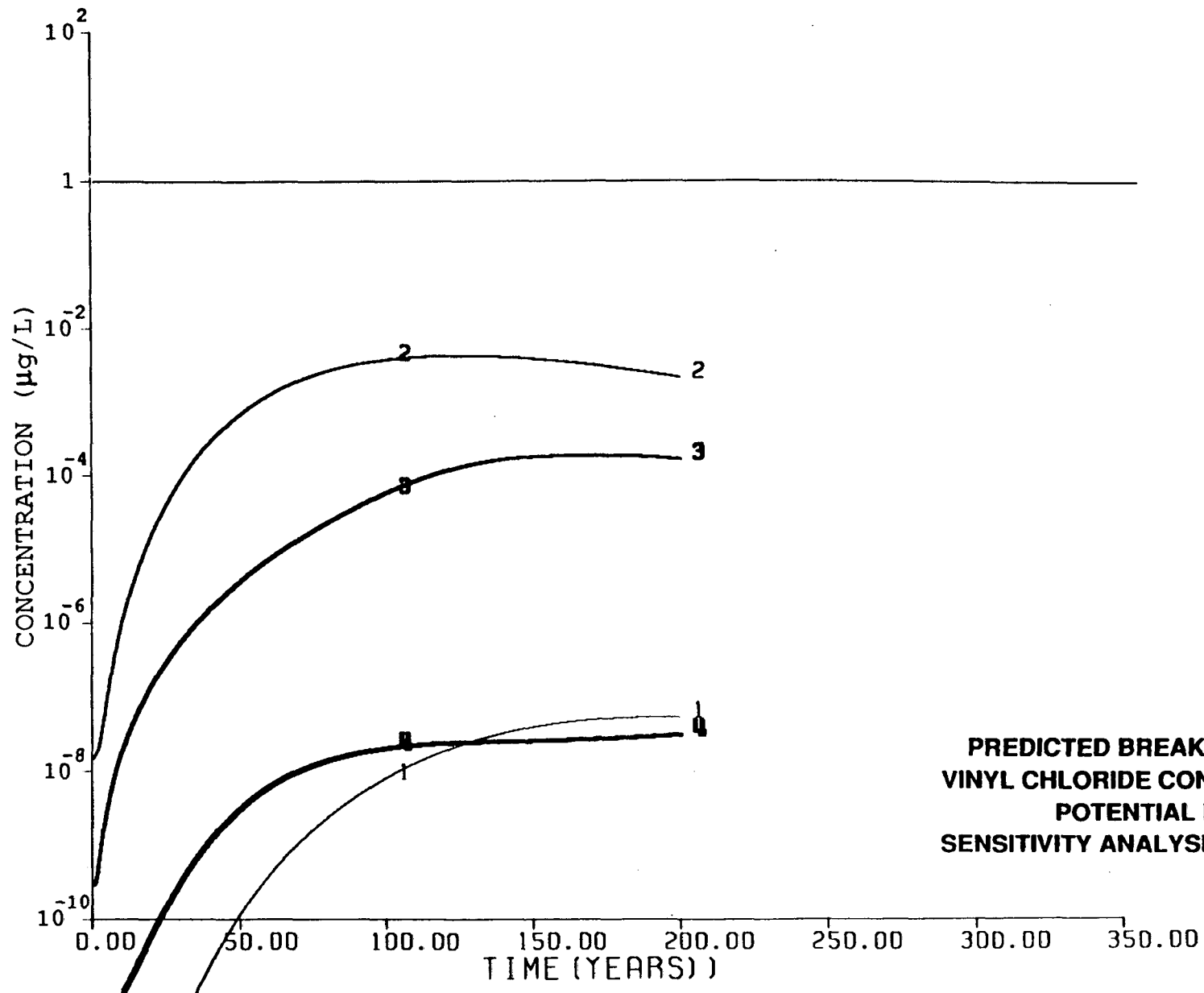


Figure G.1a  
**PREDICTED BREAKTHROUGH CURVES OF  
 VINYL CHLORIDE CONCENTRATION ( $\mu\text{g/l}$ ) AT  
 POTENTIAL RECEPTORS, LAYER 1,  
 SENSITIVITY ANALYSIS CASE 1, AL = 100 FT.**

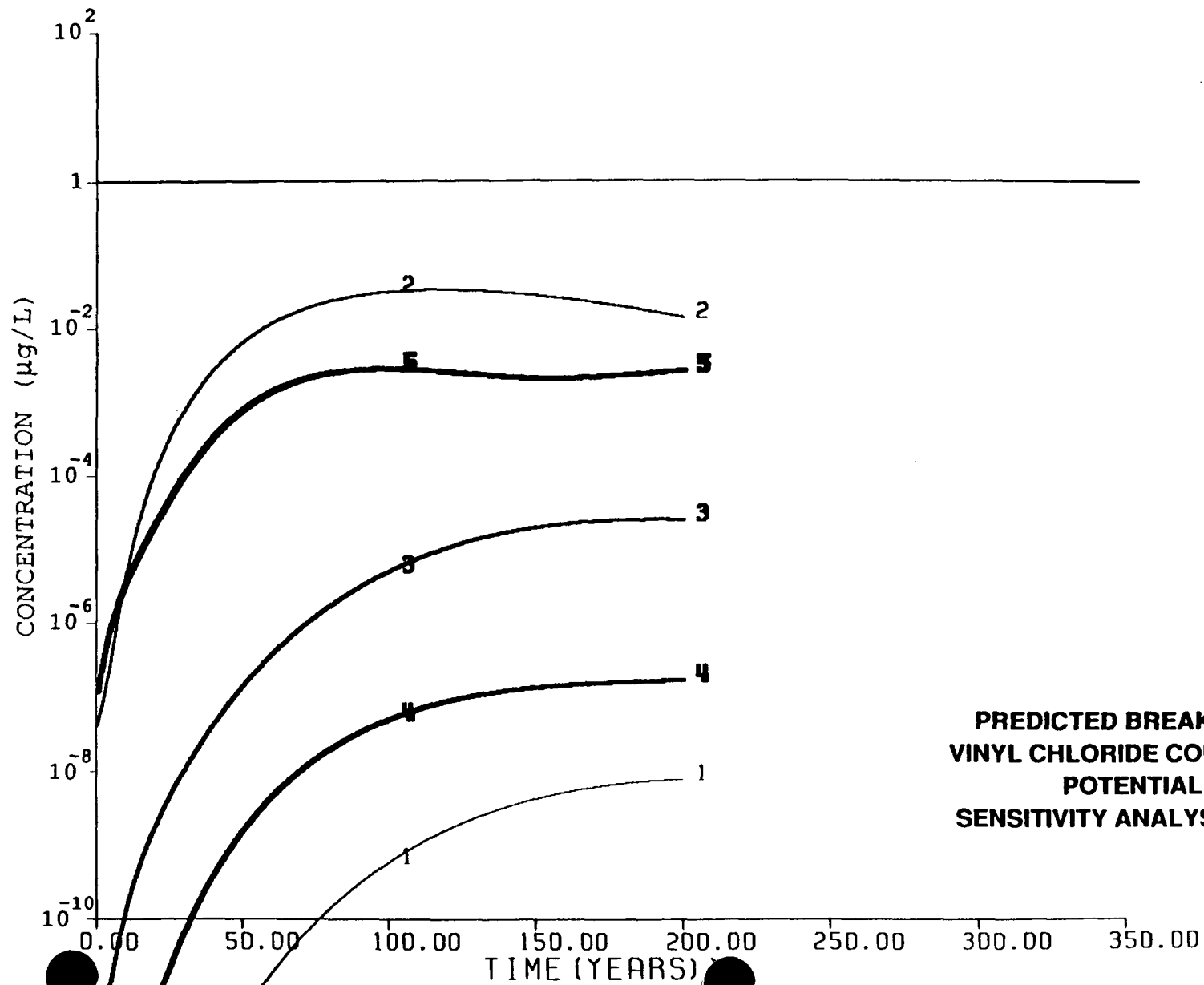


Figure G.1b  
PREDICTED BREAKTHROUGH CURVES OF  
VINYL CHLORIDE CONCENTRATION ( $\mu\text{g/l}$ ) AT  
POTENTIAL RECEPTORS, LAYER 2,  
SENSITIVITY ANALYSIS CASE1, AL = 100 FT.



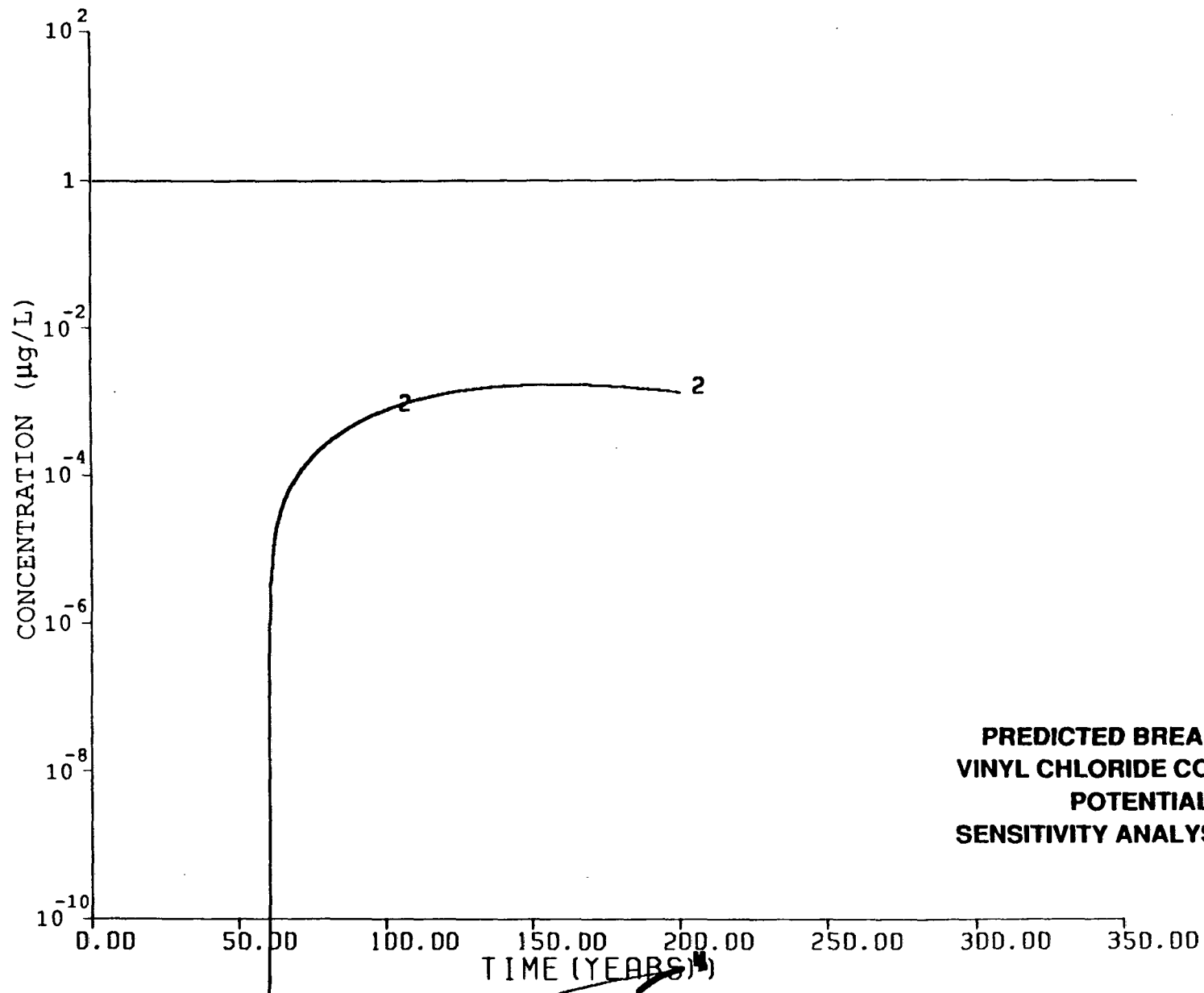


Figure G.1c  
**PREDICTED BREAKTHROUGH CURVES OF  
VINYL CHLORIDE CONCENTRATION (µg/l) AT  
POTENTIAL RECEPTORS, LAYER 2,  
SENSITIVITY ANALYSIS CASE 1, AL = 100 FT.**

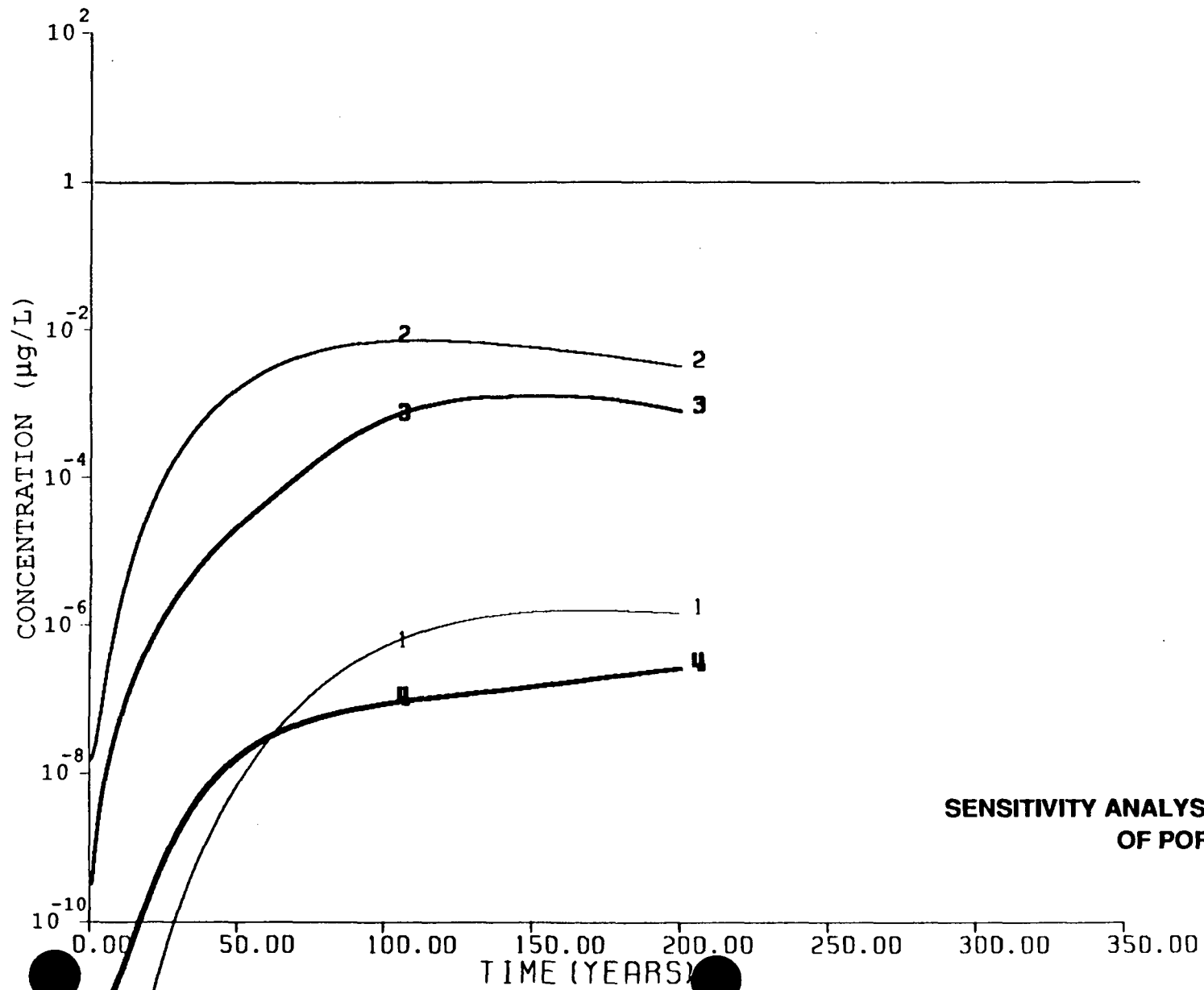


Figure G.2a  
SENSITIVITY ANALYSIS CASE 2, REDUCTION  
OF POROSITY BY 50 PERCENT

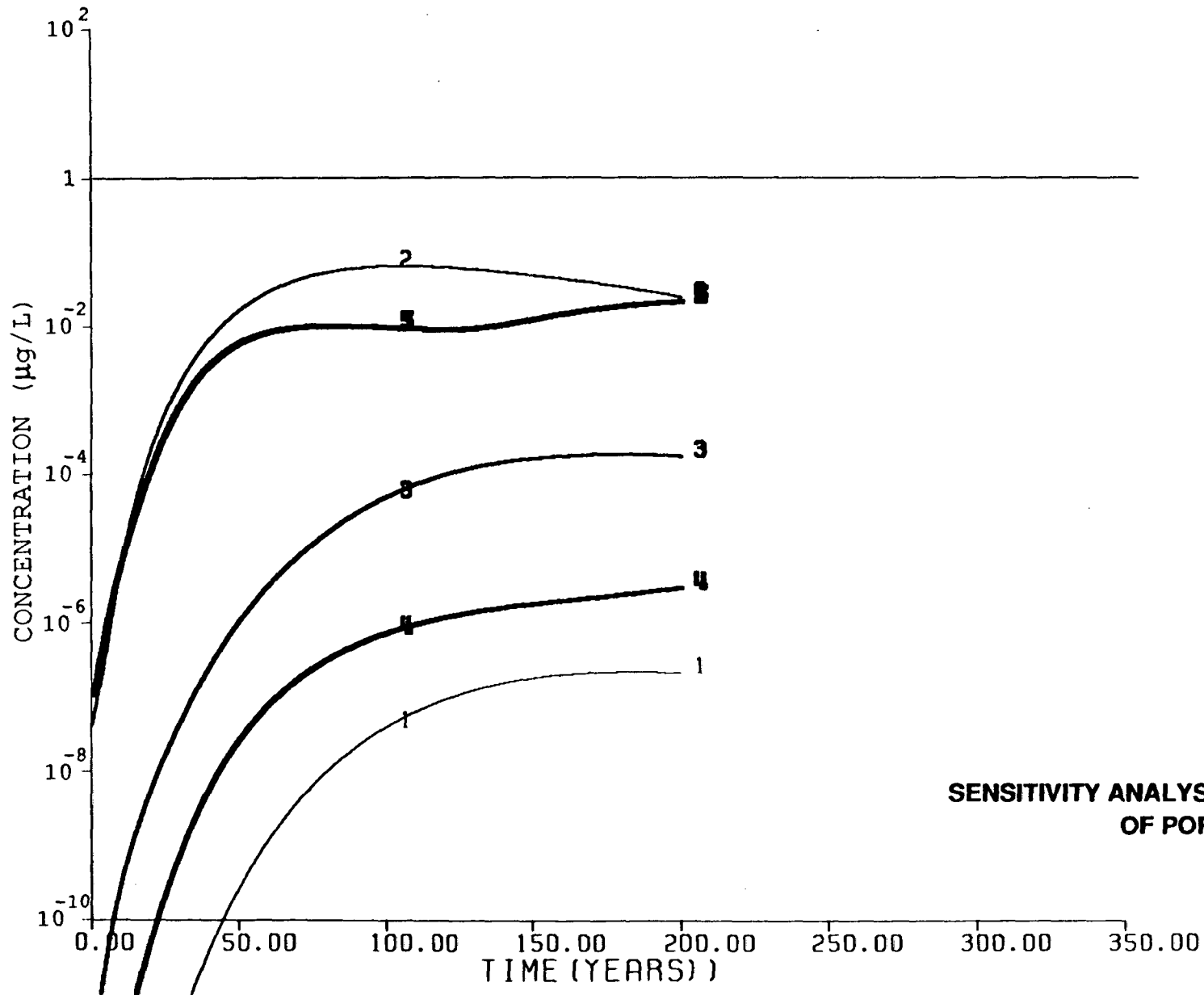


Figure G.2b  
**SENSITIVITY ANALYSIS CASE 2, REDUCTION  
OF POROSITY BY 50 PERCENT**

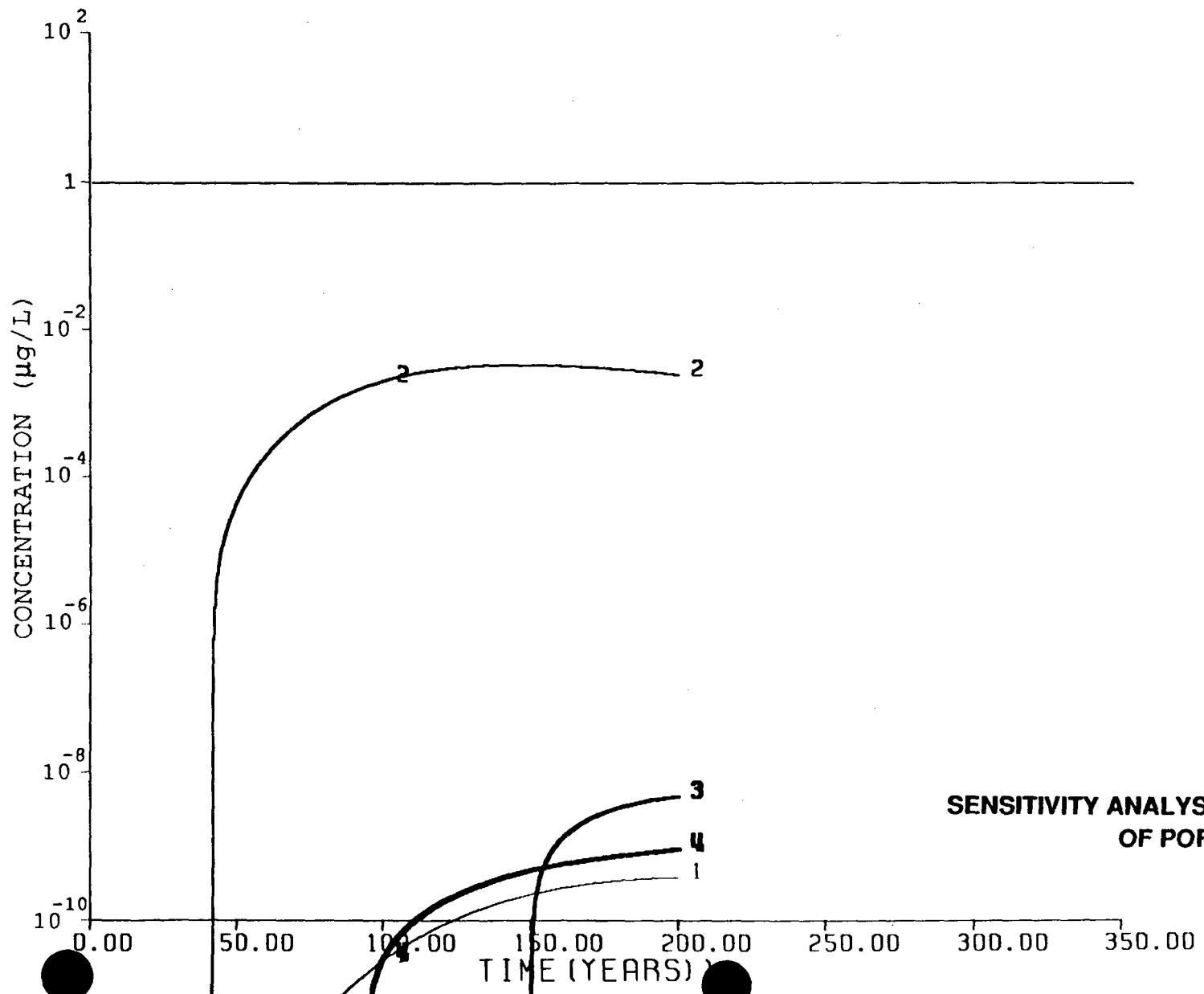


Figure G.2c  
**SENSITIVITY ANALYSIS CASE 2, REDUCTION  
 OF POROSITY BY 50 PERCENT**

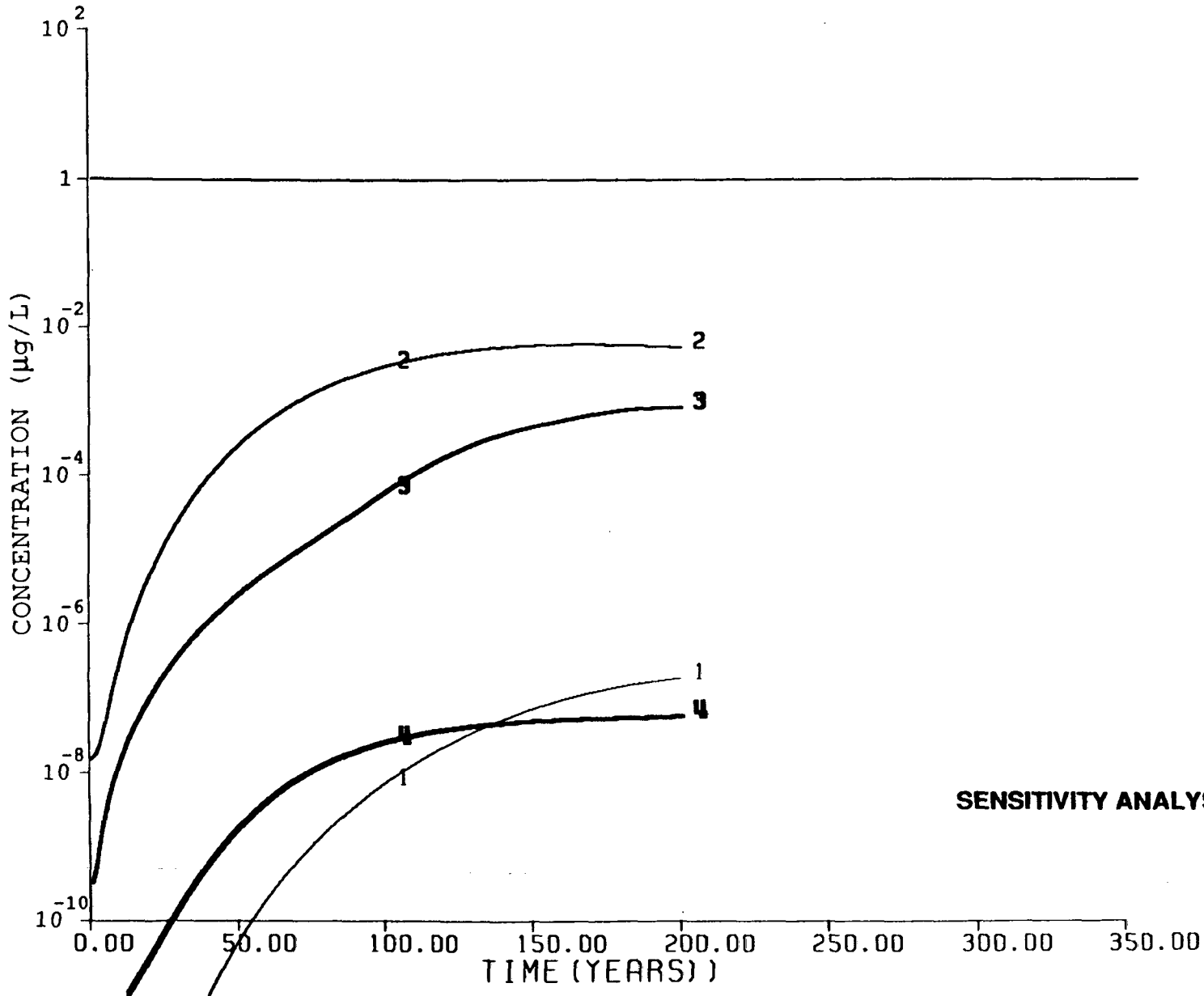


Figure G.3a  
**SENSITIVITY ANALYSIS CASE 3, WITH HALF  
LIFE OF 22 YEARS**

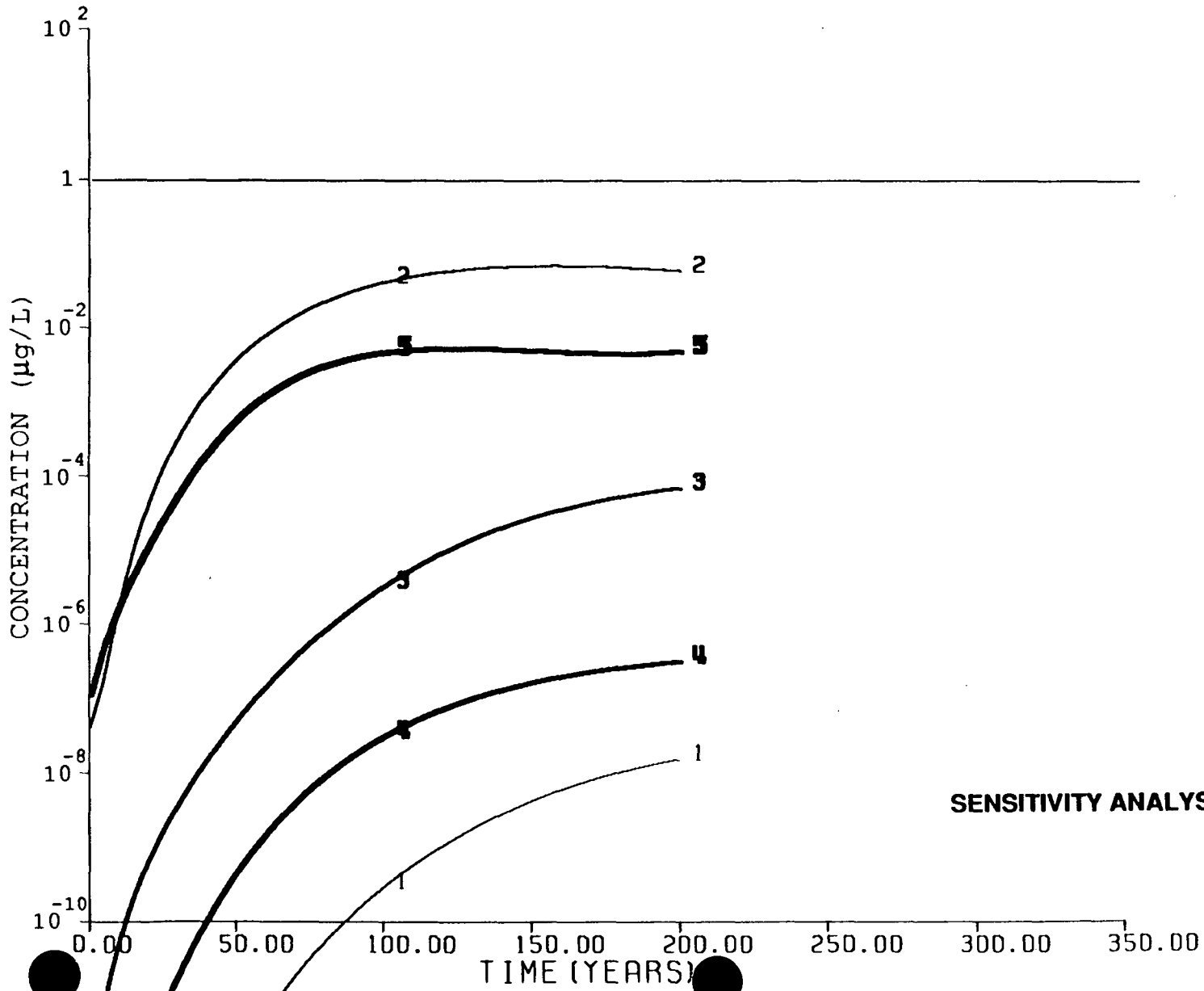


Figure G.3b  
SENSITIVITY ANALYSIS CASE 3, WITH HALF  
LIFE OF 22 YEARS

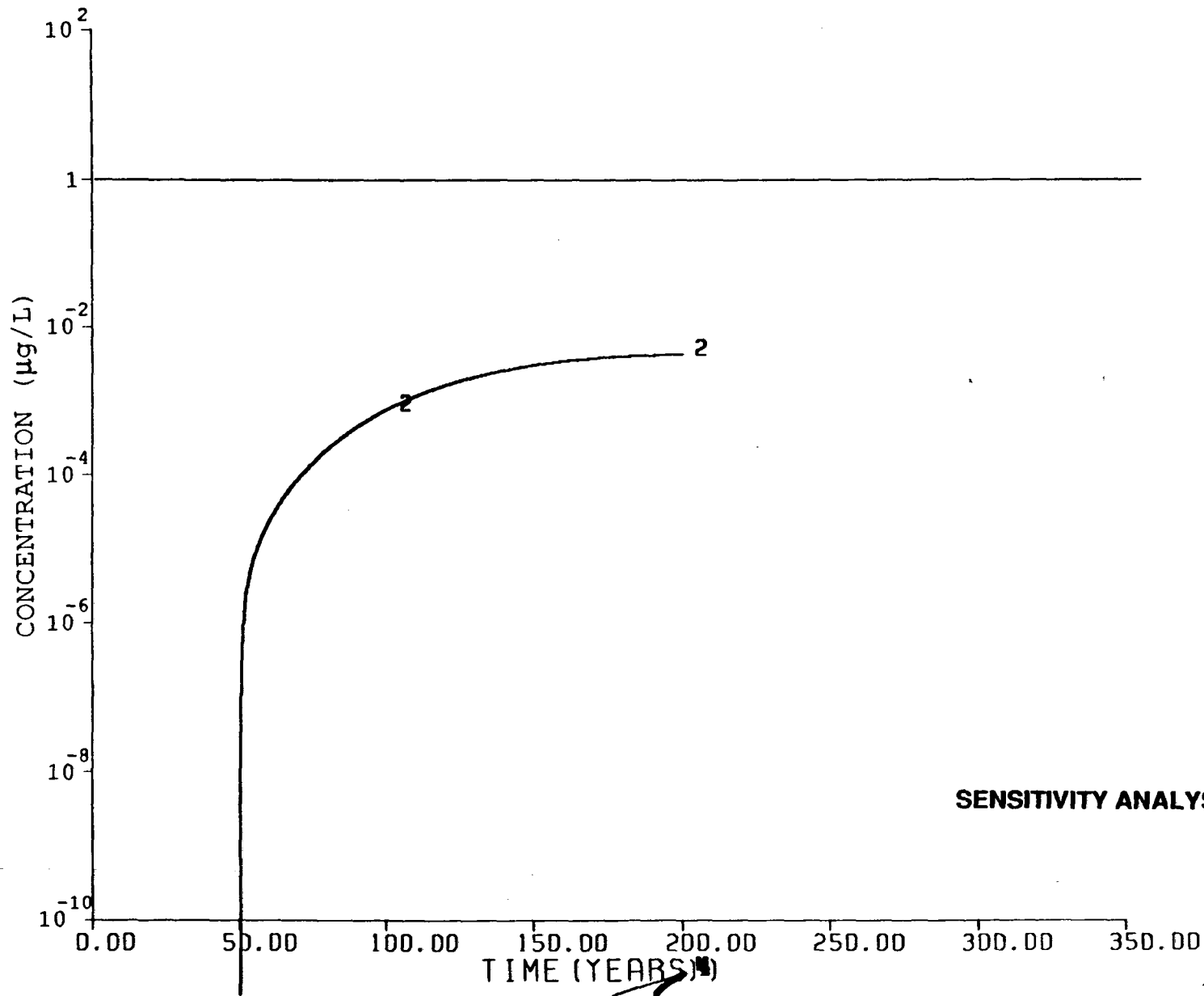


Figure G.3c  
**SENSITIVITY ANALYSIS CASE 3, WITH HALF  
LIFE OF 22 YEARS**

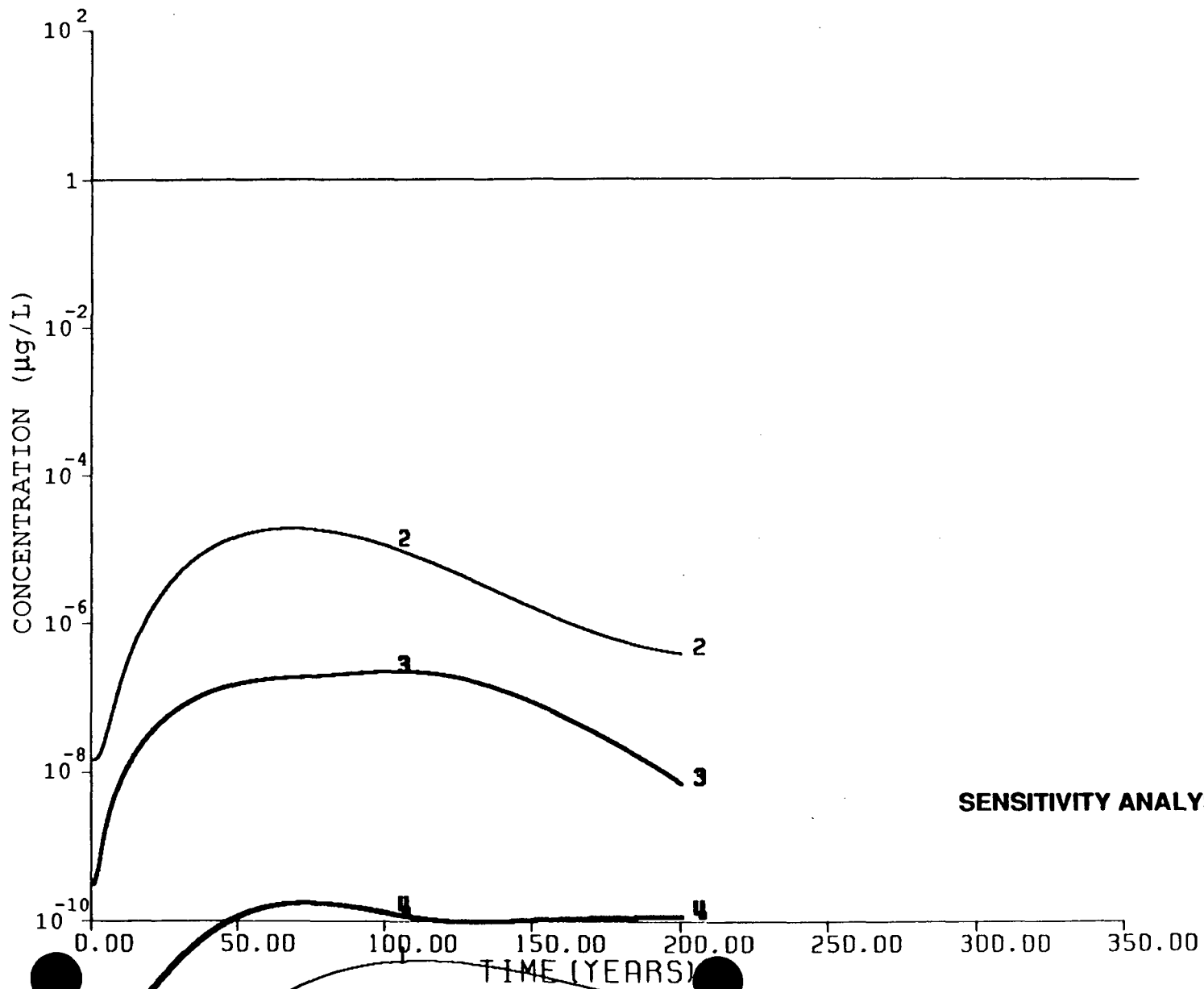


Figure G.4a  
SENSITIVITY ANALYSIS CASE 4, WITH HALF  
LIFE OF 22 YEARS



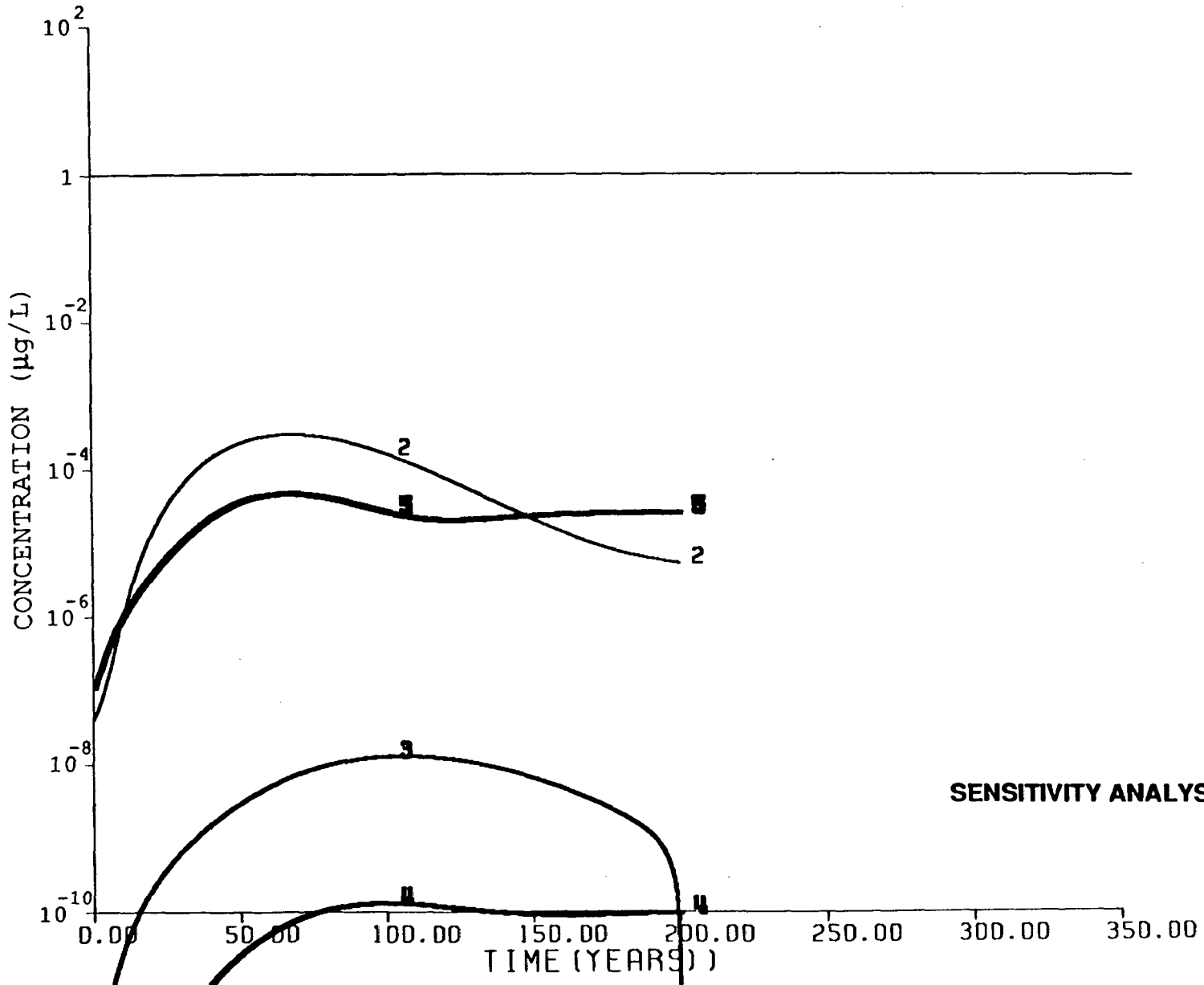


Figure G.4b  
**SENSITIVITY ANALYSIS CASE 4, WITH HALF  
 LIFE OF 22 YEARS**

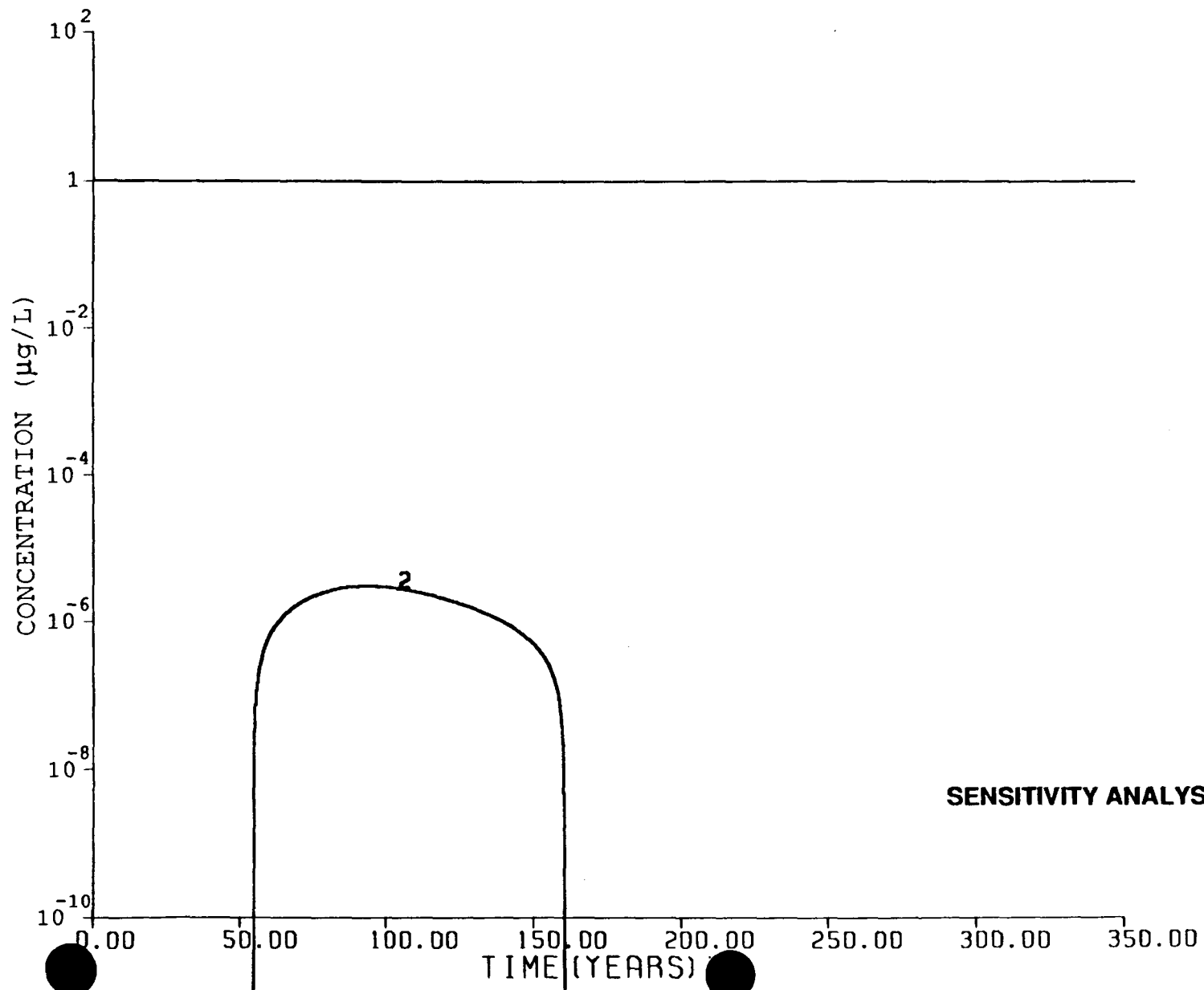


Figure G.4c  
**SENSITIVITY ANALYSIS CASE 4, WITH HALF  
LIFE OF 22 YEARS**

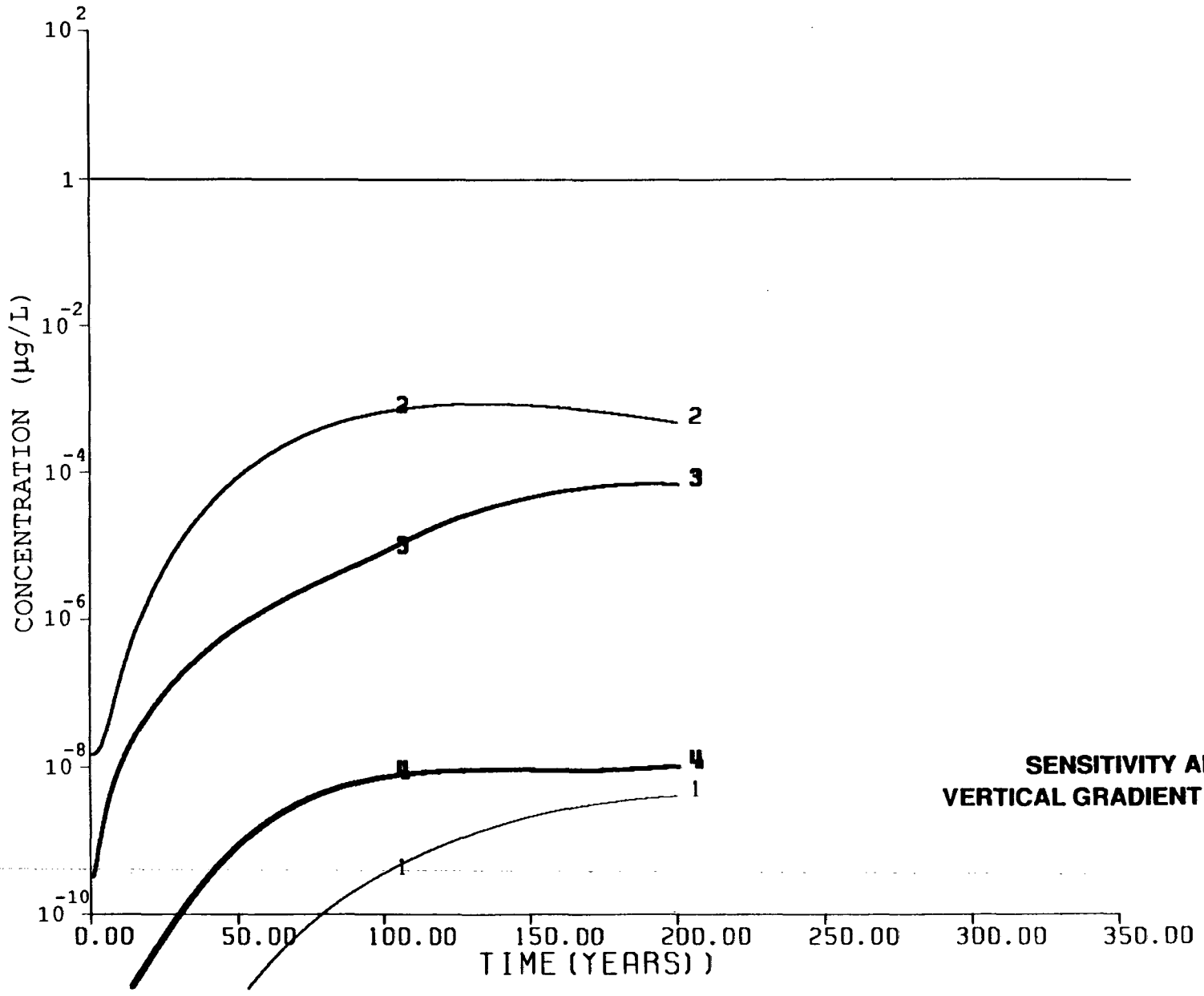


Figure G.5a  
**SENSITIVITY ANALYSIS CASE 5, WITH  
 VERTICAL GRADIENT INTRODUCED ON SIDE  
 BOUNDARIES**

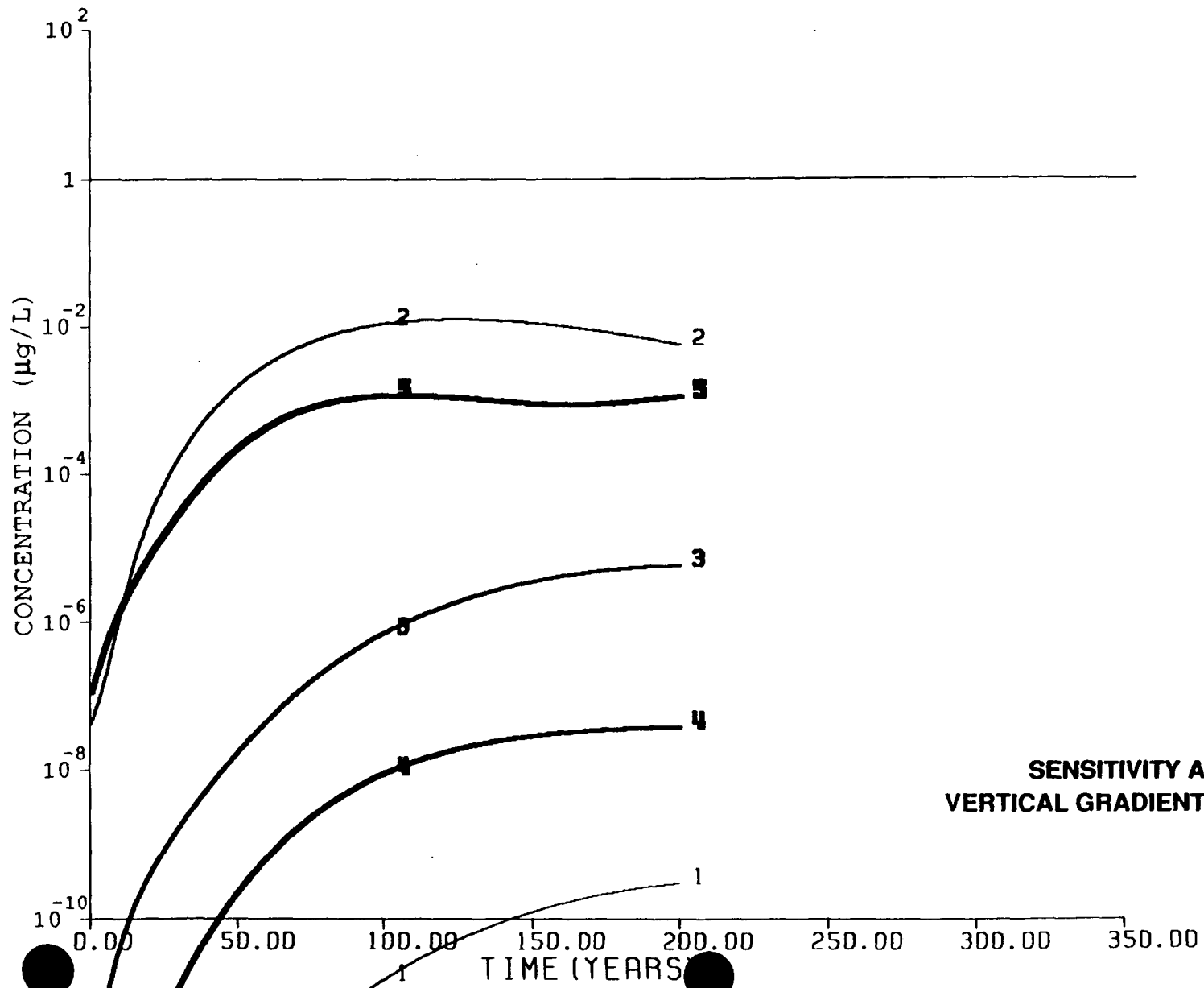


Figure G.5b  
**SENSITIVITY ANALYSIS CASE 5, WITH  
 VERTICAL GRADIENT INTRODUCED ON SIDE  
 BOUNDARIES**

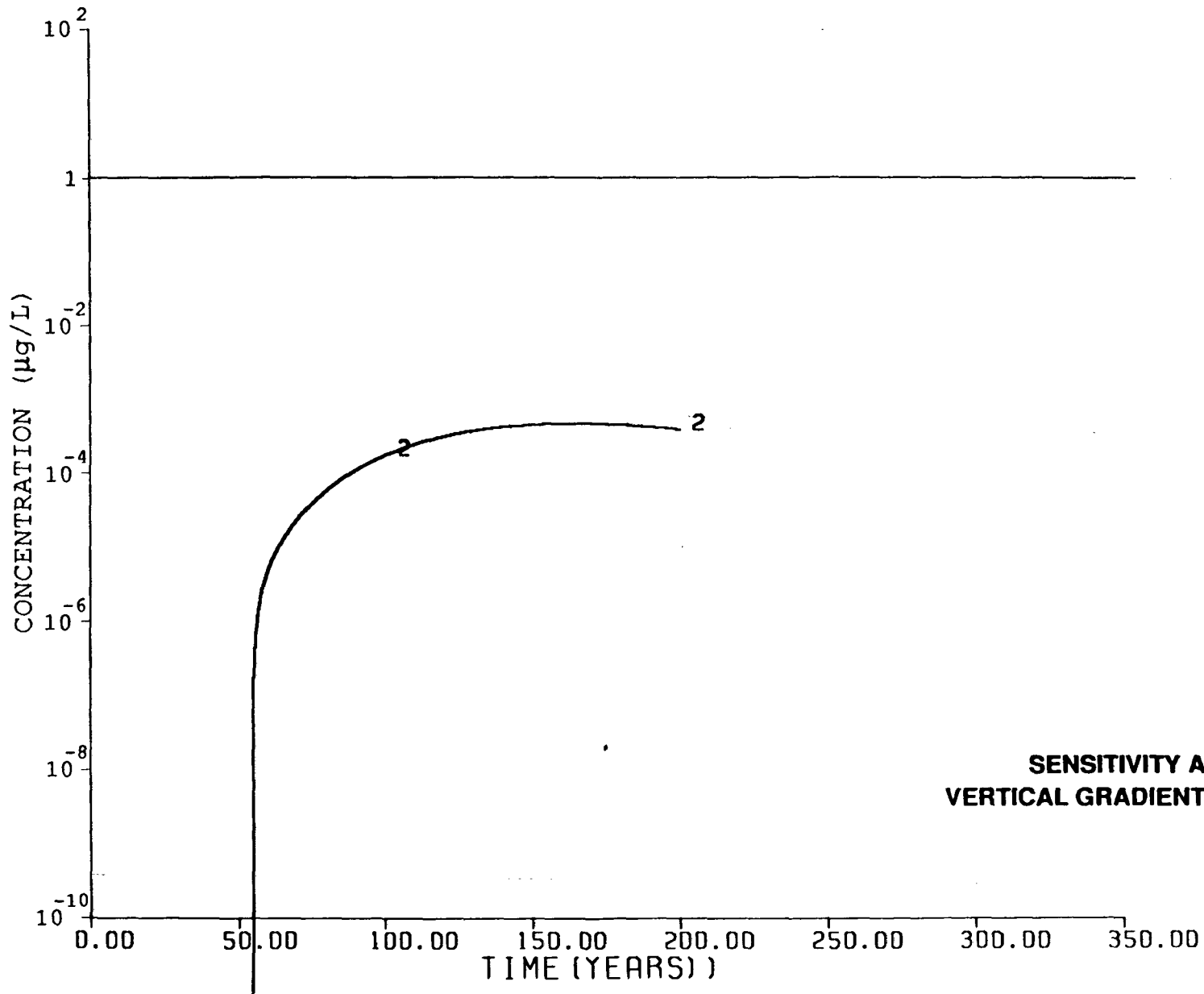


Figure G.5c  
**SENSITIVITY ANALYSIS CASE 5, WITH  
VERTICAL GRADIENT INTRODUCED ON SIDE  
BOUNDARIES**

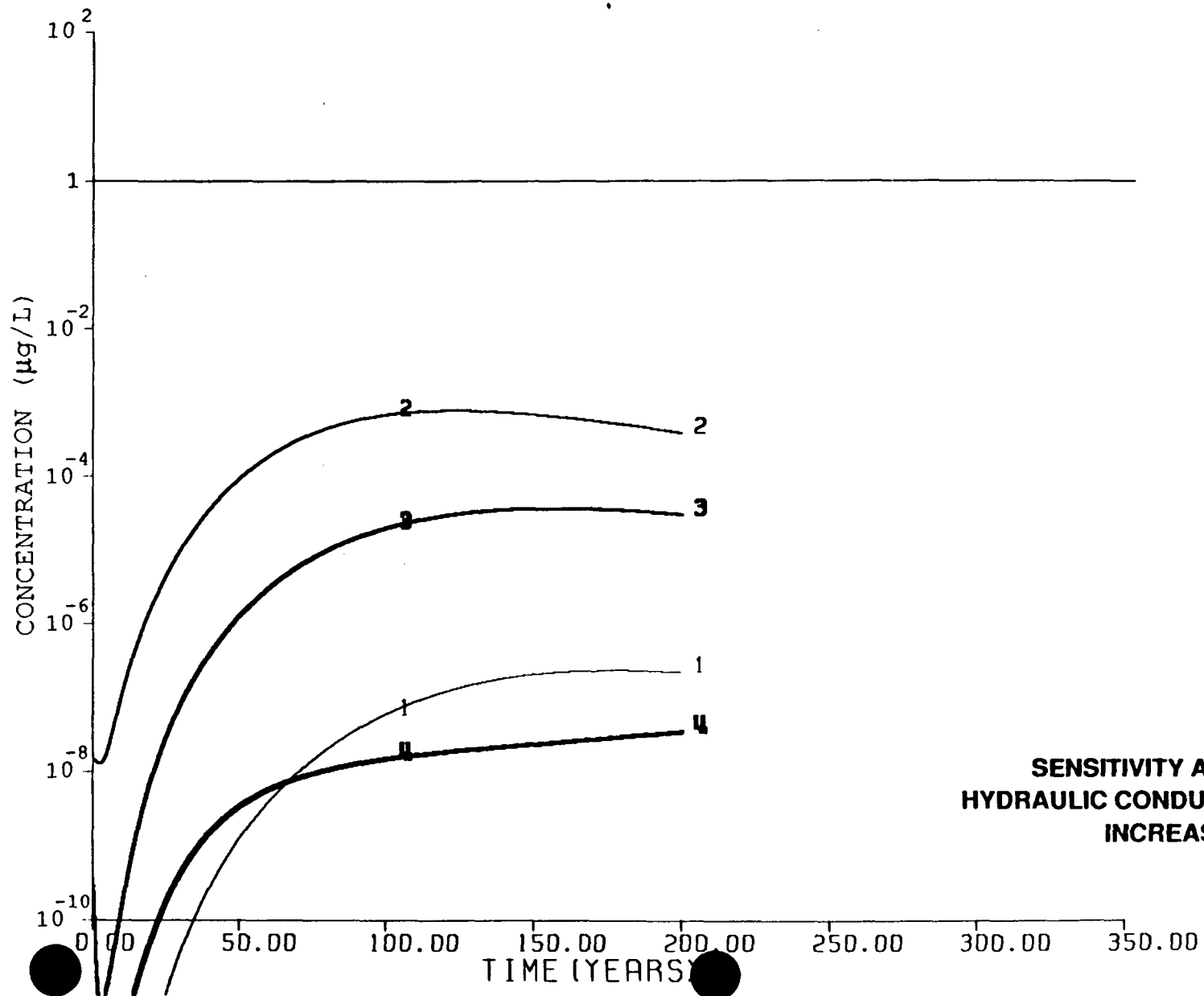


Figure G.6a  
**SENSITIVITY ANALYSIS CASE 6, WITH  
HYDRAULIC CONDUCTIVITY IN  $Q_0$  AND  $Q_{us}$   
INCREASED BY A FACTOR OF 2**

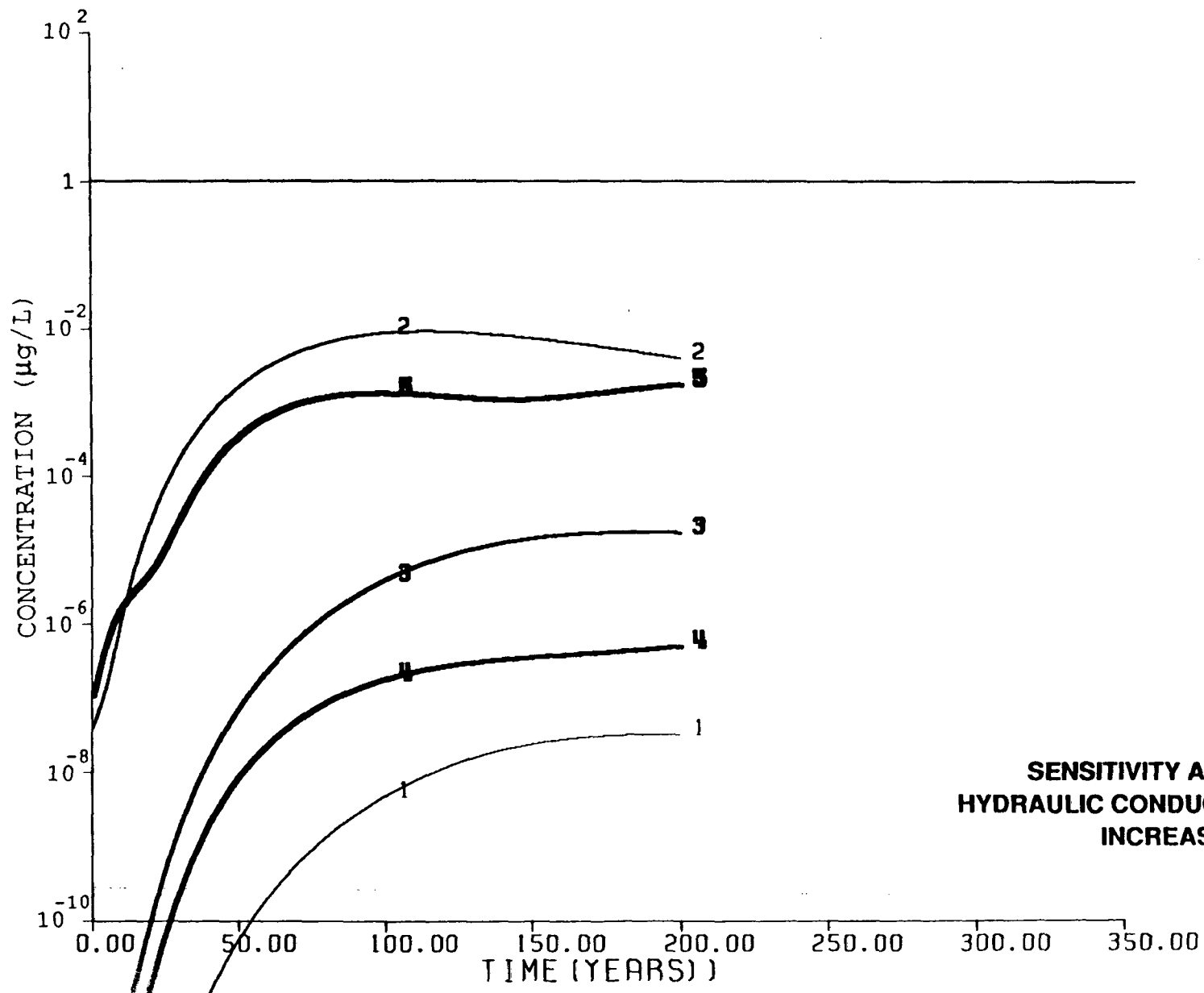


Figure G.6b  
**SENSITIVITY ANALYSIS CASE 6, WITH  
HYDRAULIC CONDUCTIVITY IN  $Q_0$  AND  $Q_{us}$   
INCREASED BY A FACTOR OF 2**

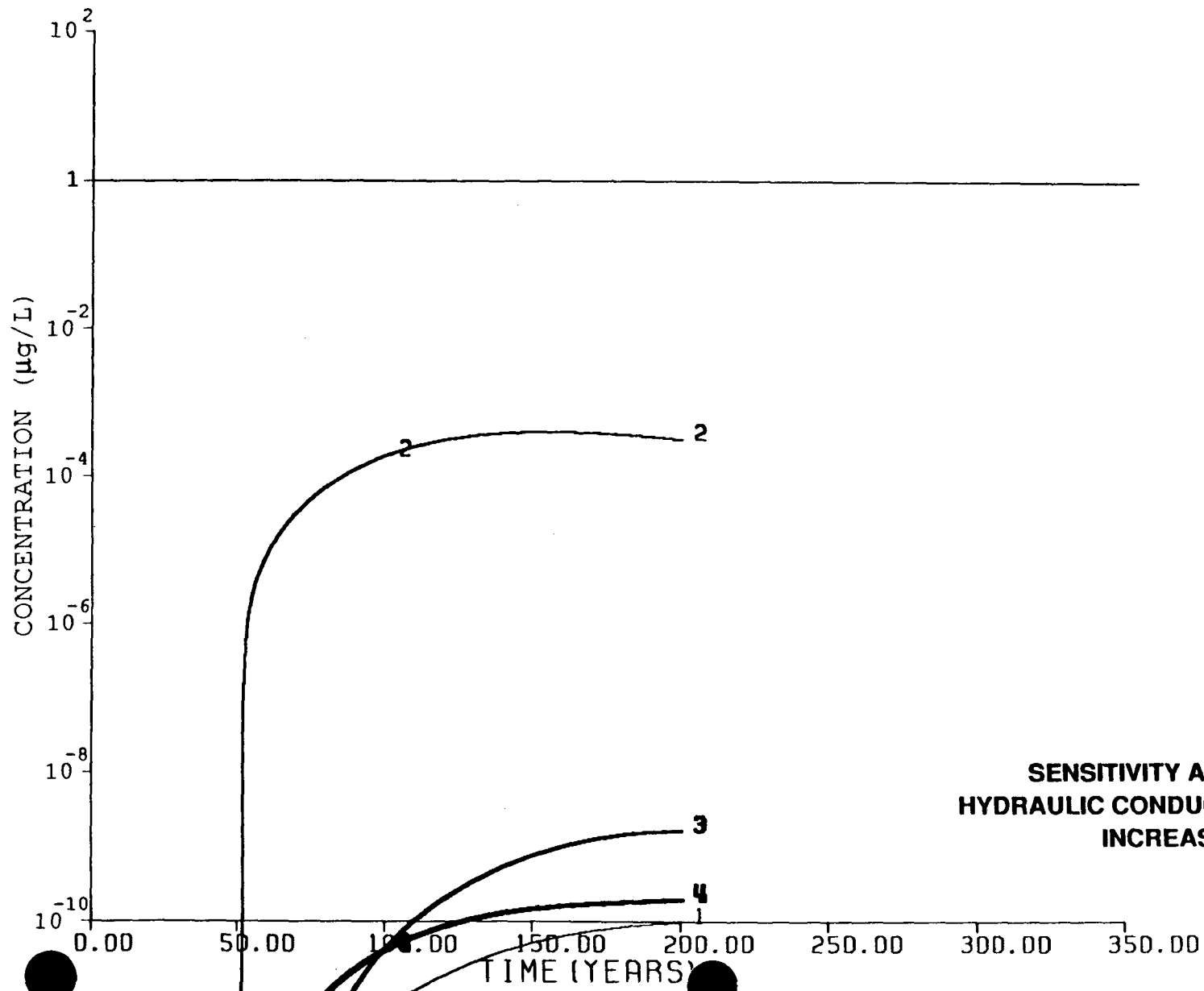


Figure G.6c  
**SENSITIVITY ANALYSIS CASE 6, WITH  
HYDRAULIC CONDUCTIVITY IN  $Q_0$  AND  $Q_{us}$   
INCREASED BY A FACTOR OF 2**



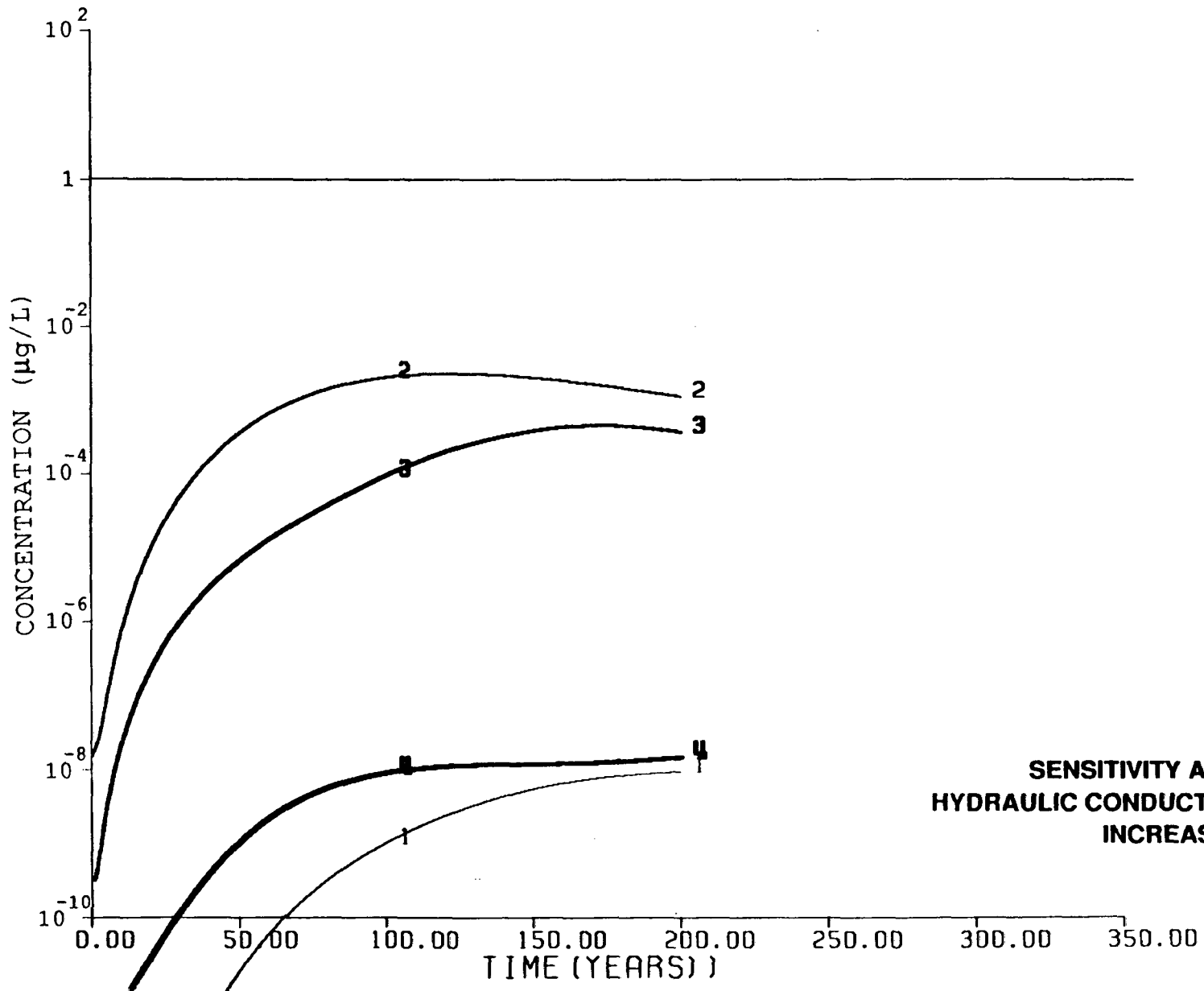


Figure G.7a  
**SENSITIVITY ANALYSIS CASE 7, WITH  
HYDRAULIC CONDUCTIVITY IN  $T_{mm}$  AND  $T_{vm}$   
INCREASED BY A FACTOR OF 2**

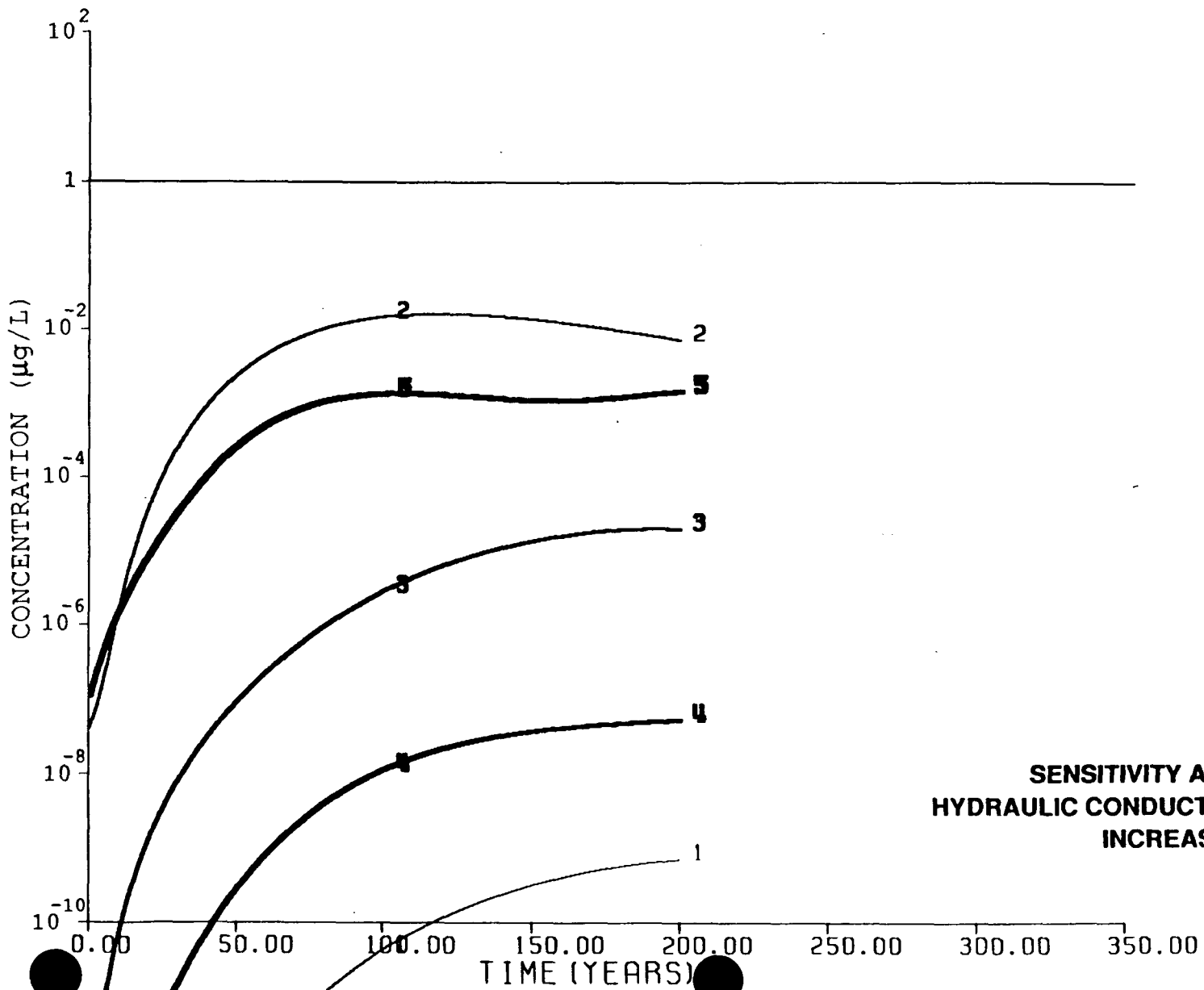


Figure G.7b  
**SENSITIVITY ANALYSIS CASE 7, WITH  
 HYDRAULIC CONDUCTIVITY IN T<sub>mm</sub> AND T<sub>vm</sub>  
 INCREASED BY A FACTOR OF 2**

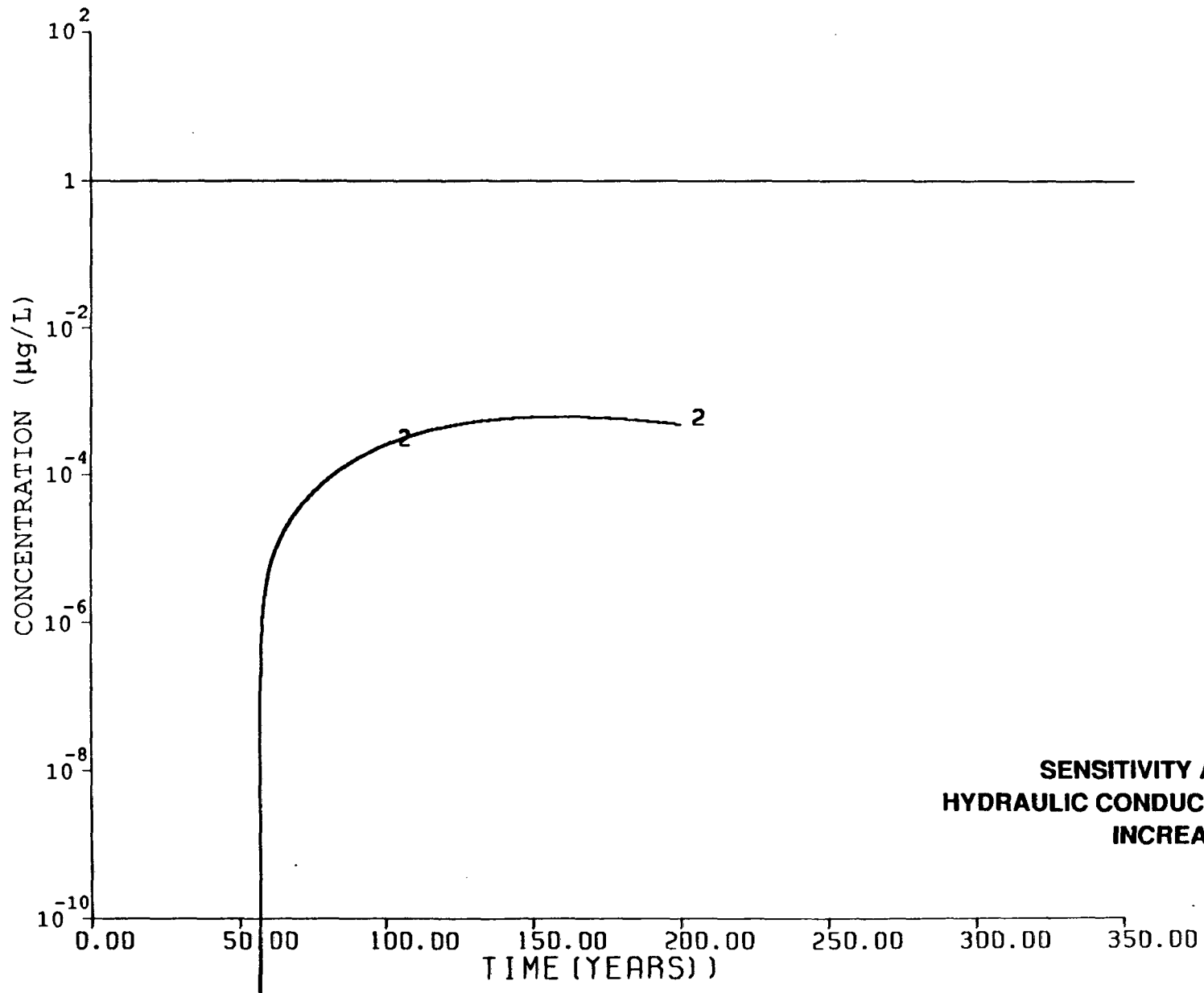


Figure G.7c  
**SENSITIVITY ANALYSIS CASE 7, WITH  
HYDRAULIC CONDUCTIVITY IN  $T_{mm}$  AND  $T_{vm}$   
INCREASED BY A FACTOR OF 2**

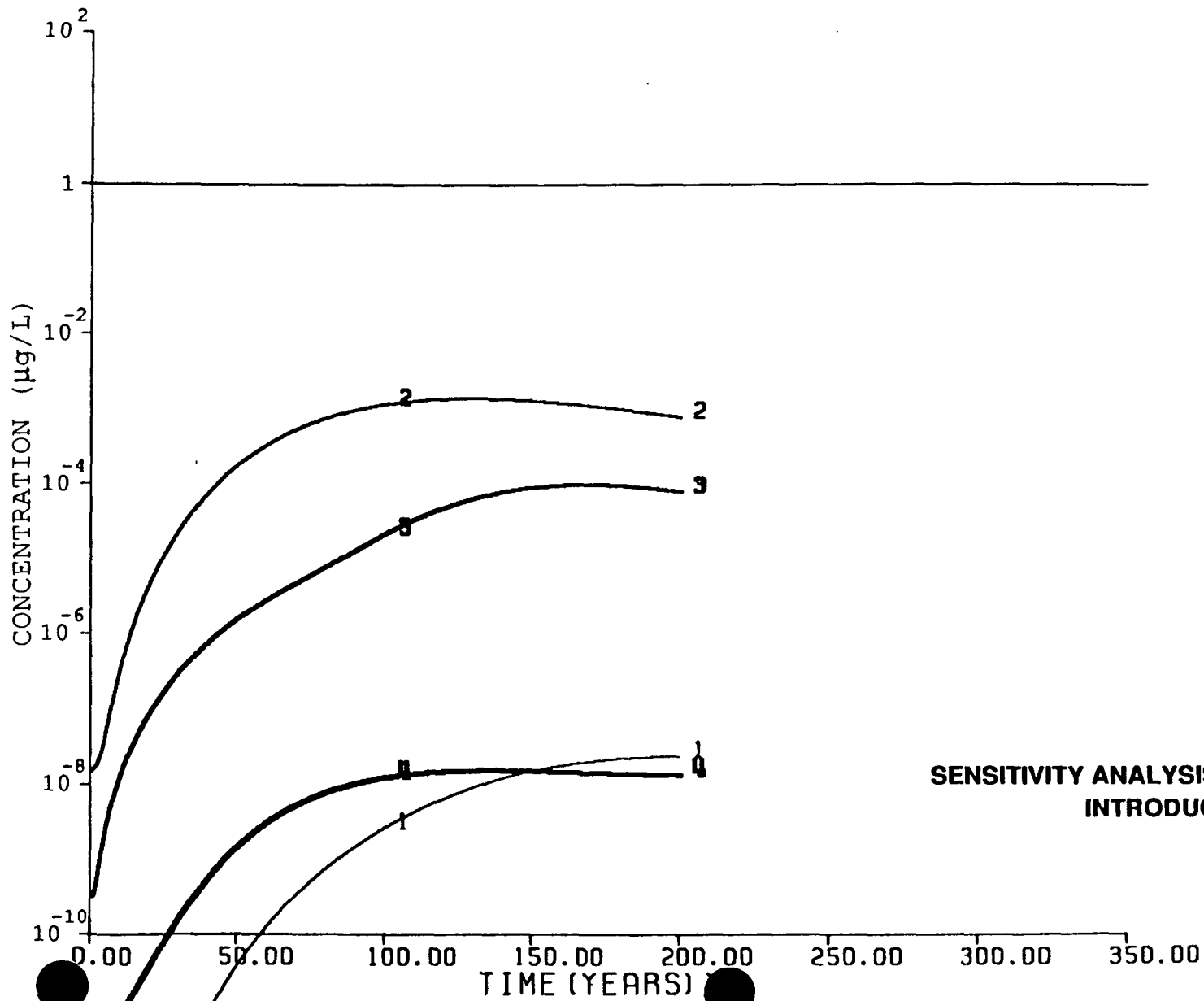


Figure G.8a  
**SENSITIVITY ANALYSIS CASE 8, WITH ERRORS  
INTRODUCED IN CONSTANT HEAD  
BOUNDARIES**

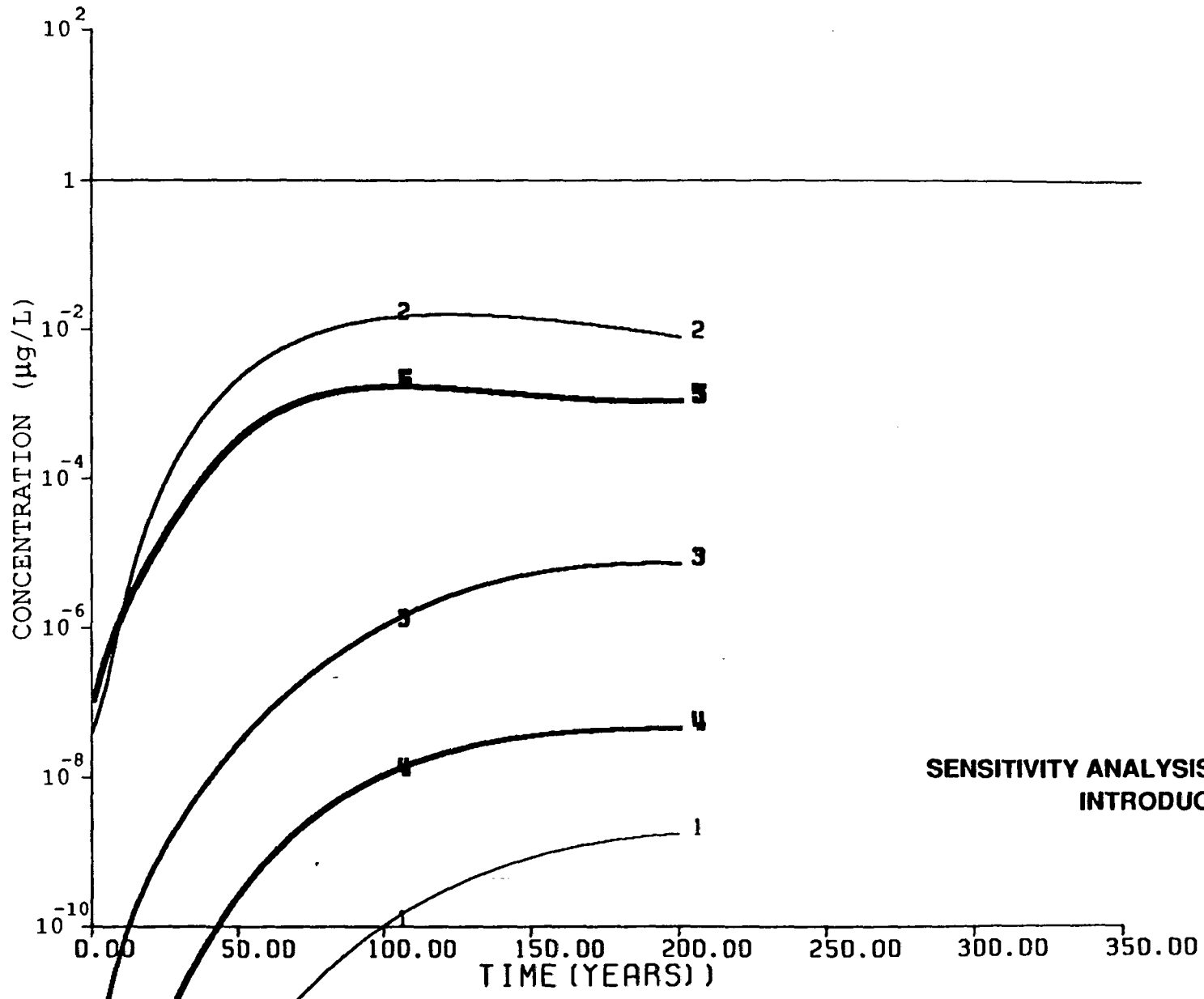


Figure G.8b  
**SENSITIVITY ANALYSIS CASE 8, WITH ERRORS  
INTRODUCED IN CONSTANT HEAD  
BOUNDARIES**

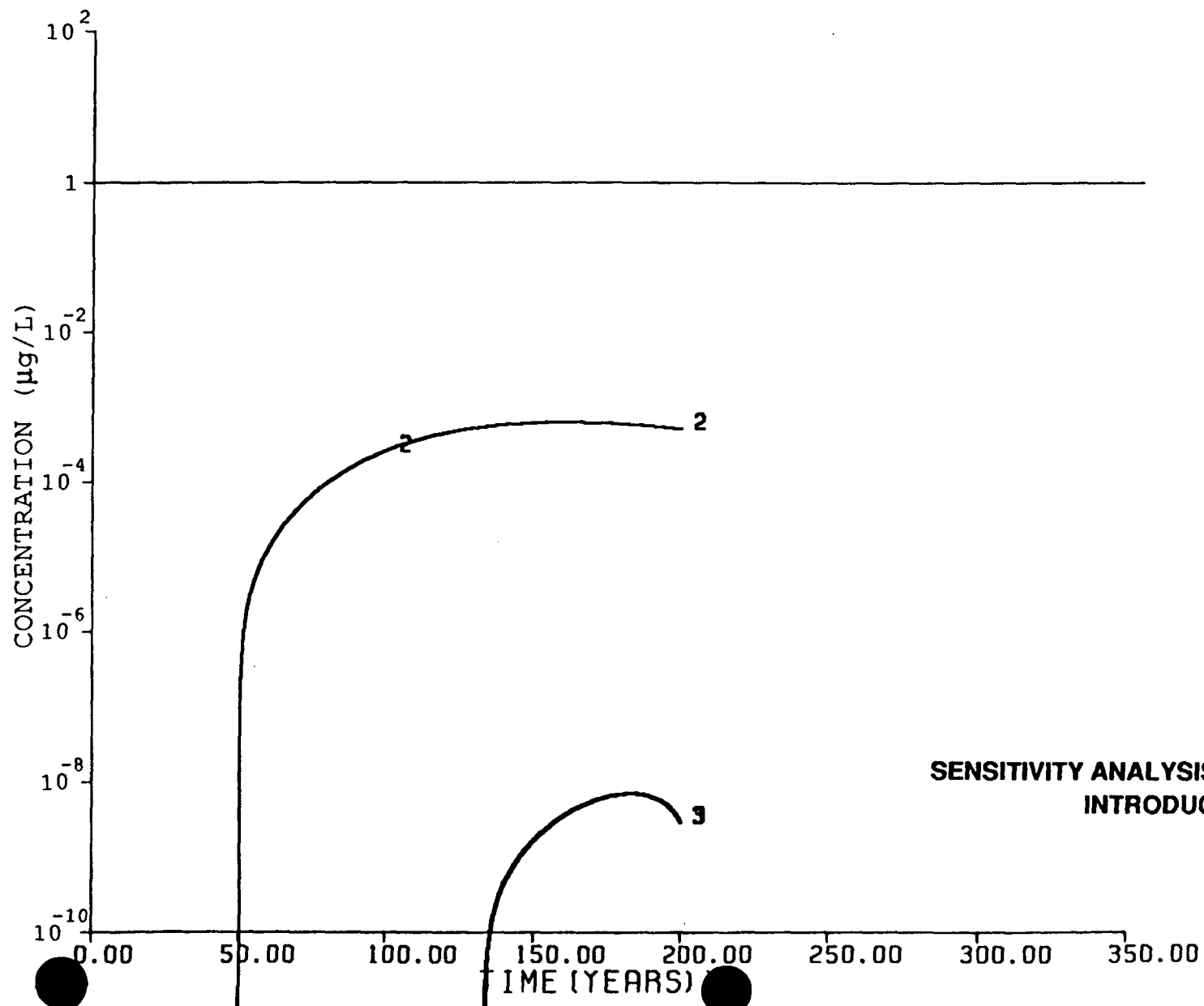


Figure G.8c  
**SENSITIVITY ANALYSIS CASE 8, WITH ERRORS  
INTRODUCED IN CONSTANT HEAD  
BOUNDARIES**

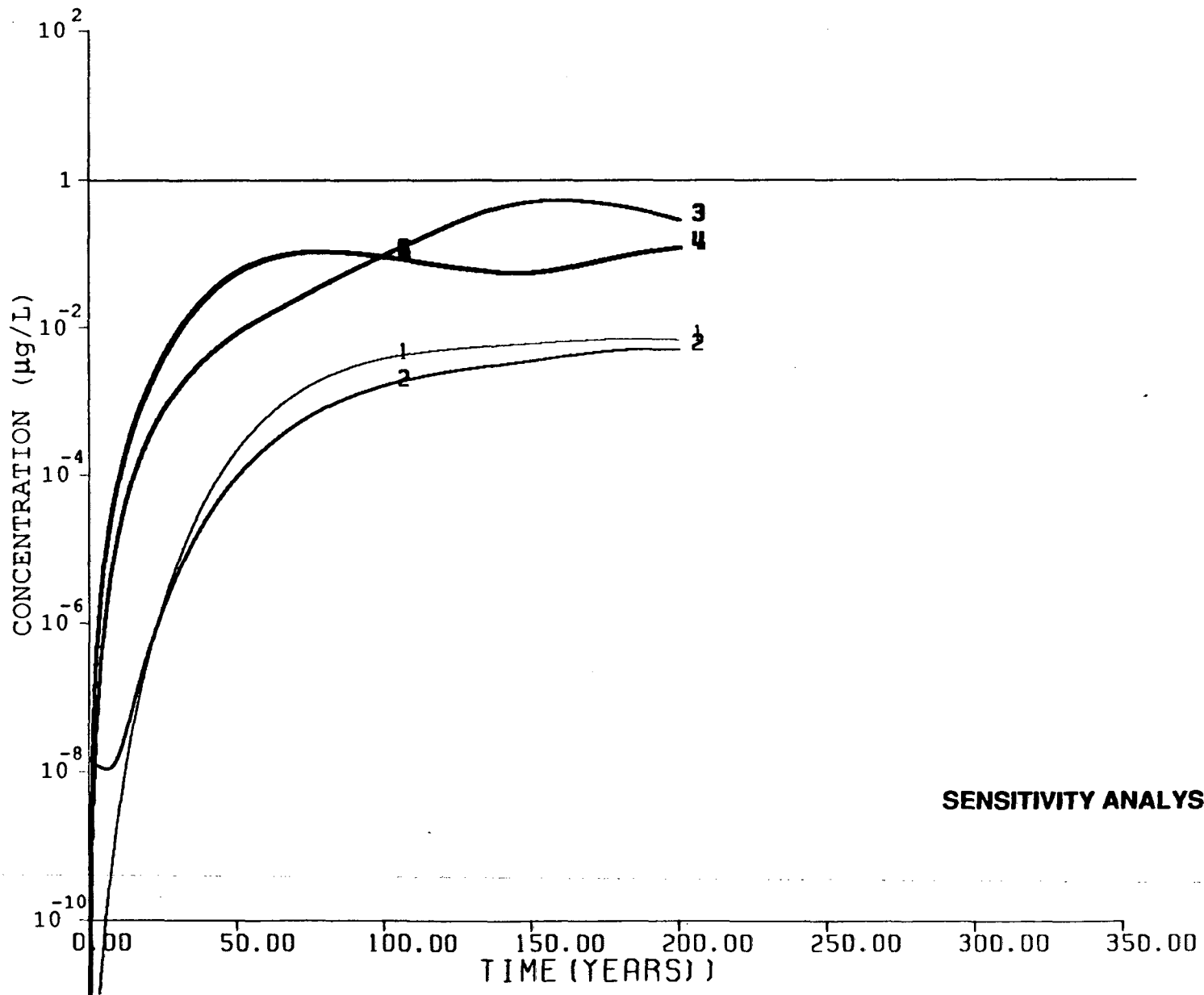


Figure G.9a  
SENSITIVITY ANALYSIS CASE 9, WITH FAULT  
PARTIALLY REMOVED

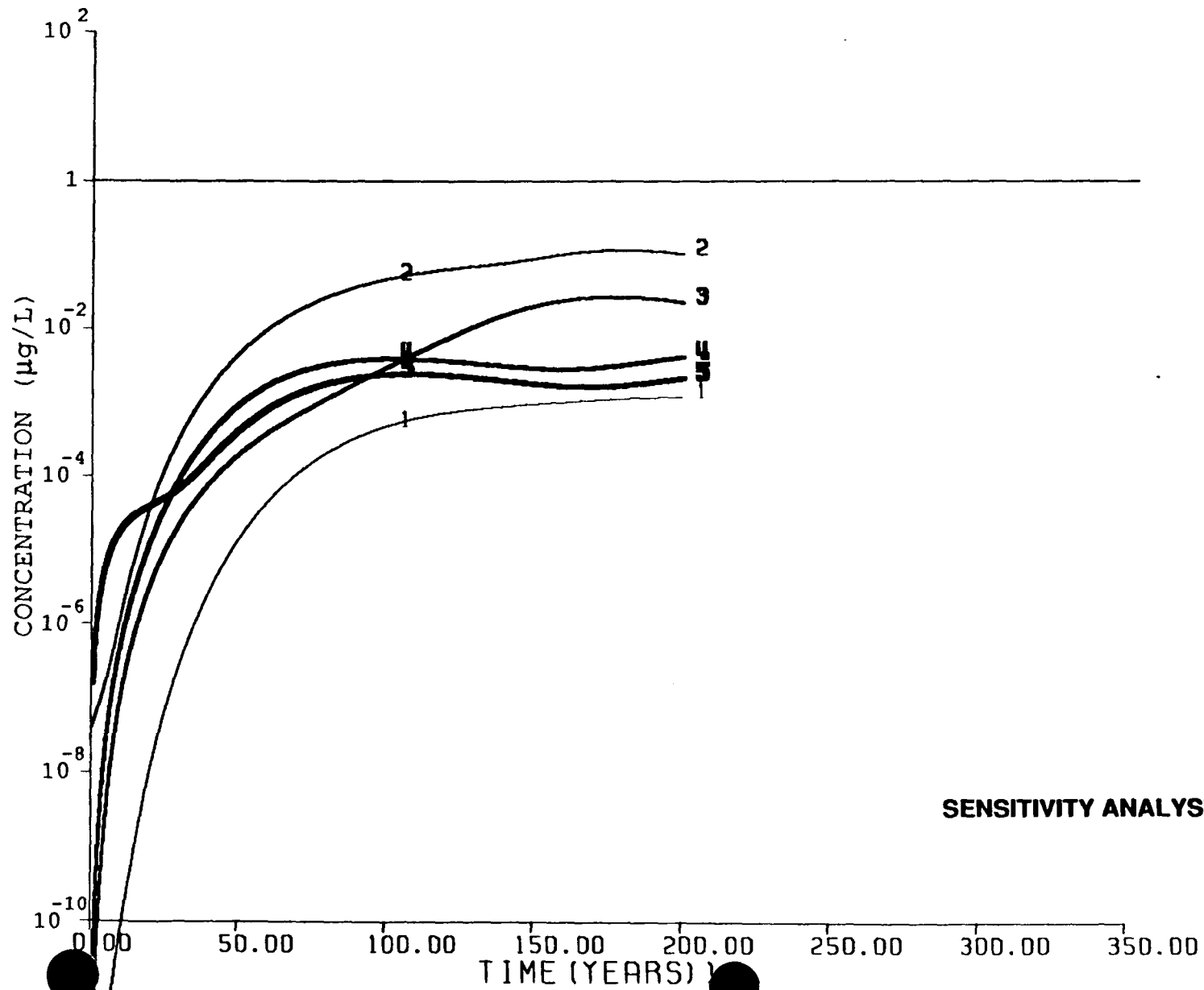


Figure G.9b  
**SENSITIVITY ANALYSIS CASE 9, WITH FAULT  
PARTIALLY REMOVED**



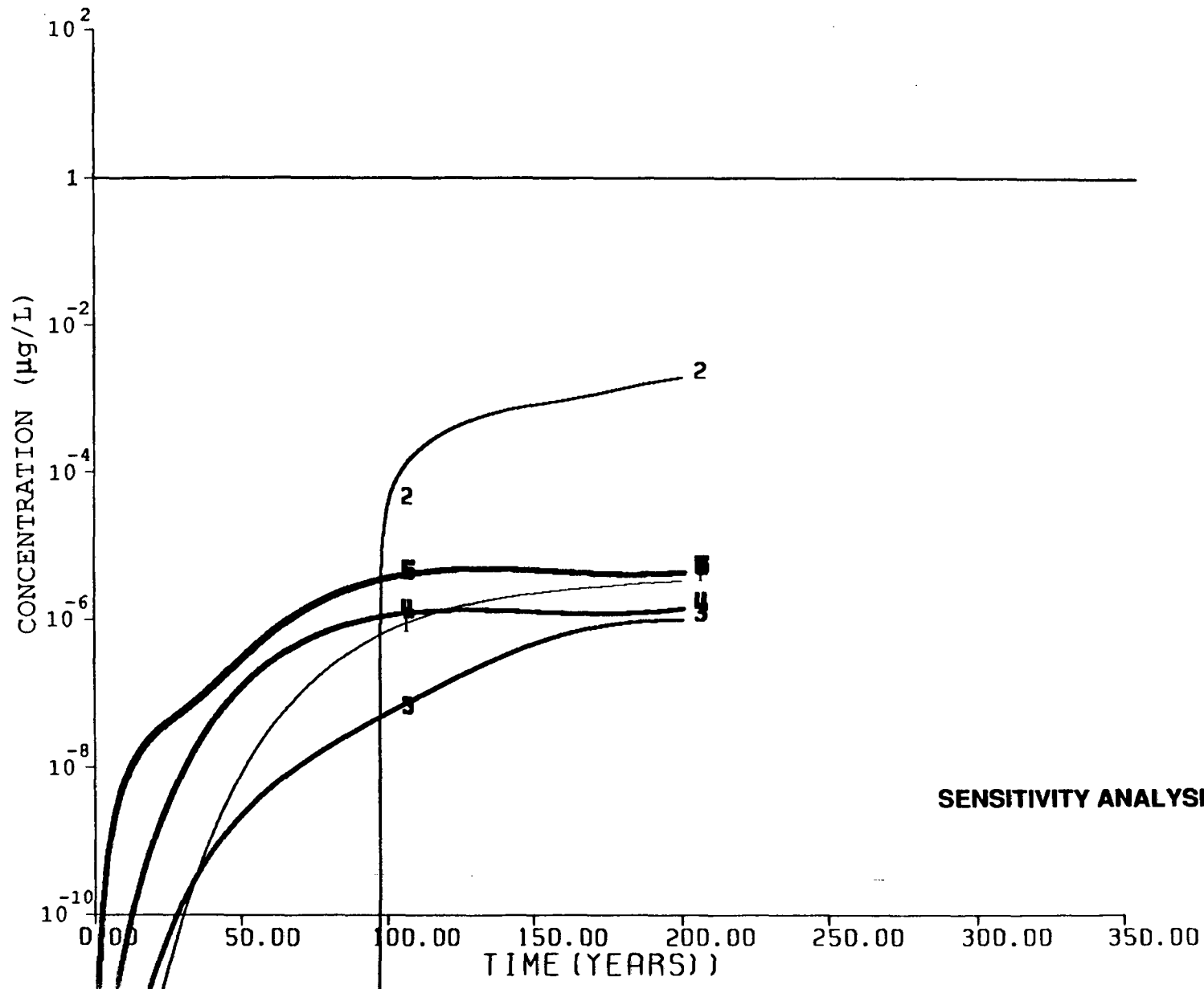


Figure G.9c  
**SENSITIVITY ANALYSIS CASE 9, WITH FAULT  
PARTIALLY REMOVED**

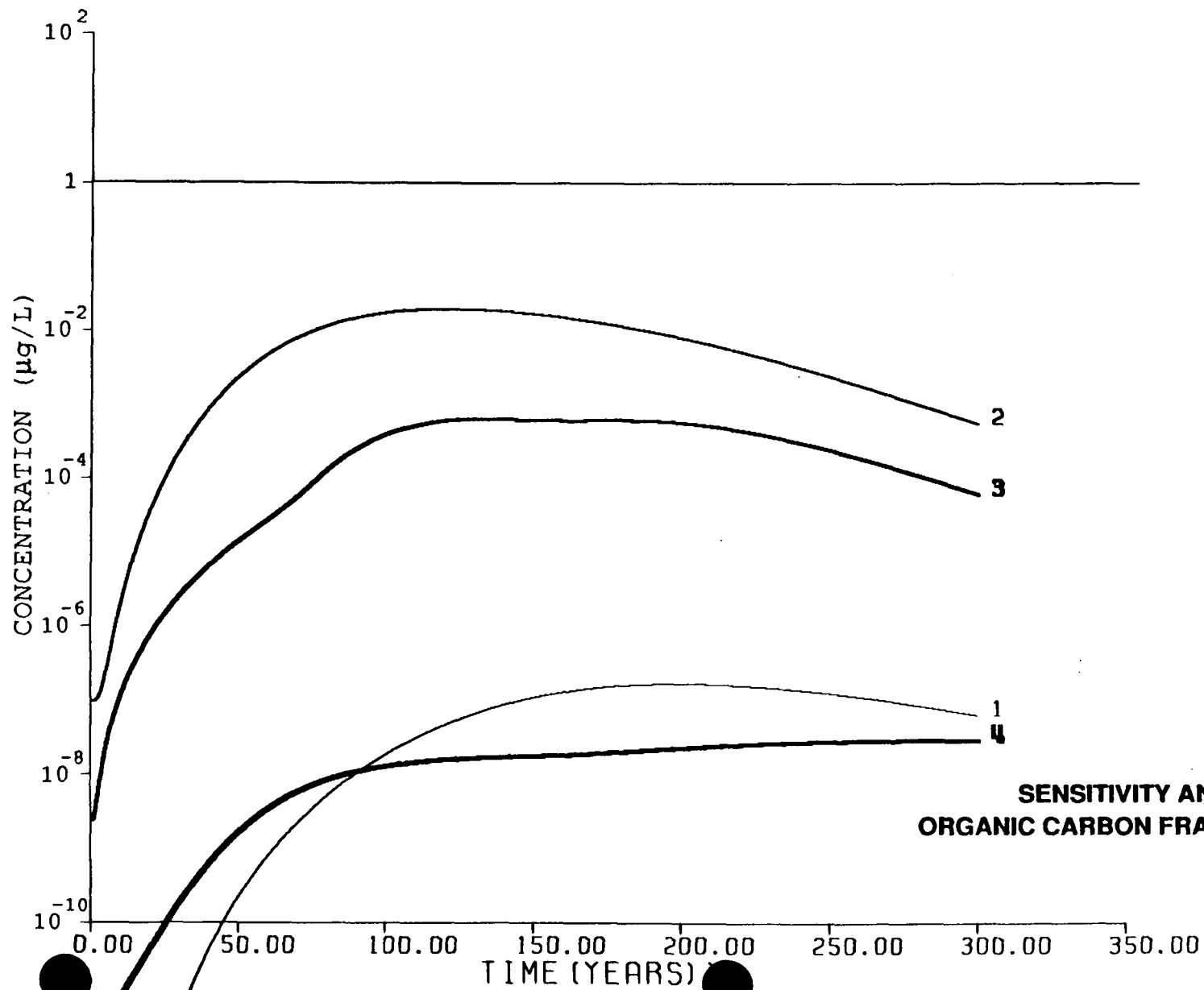


Figure G.10a  
**SENSITIVITY ANALYSIS CASE 10, WITH  
ORGANIC CARBON FRACTION DECREASED BY  
A FACTOR OF 3**

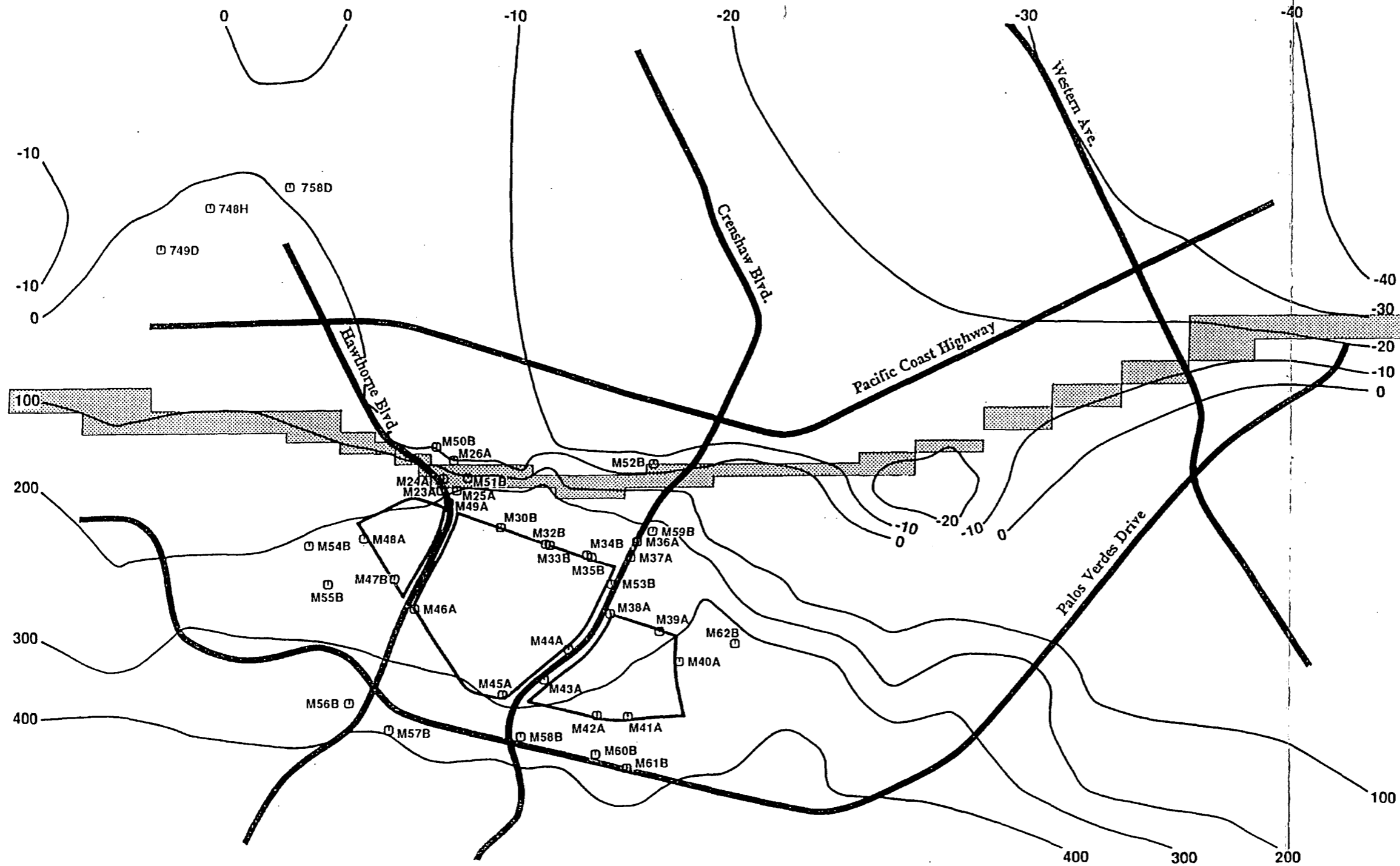


Figure G-9d  
 SENSITIVITY ANALYSIS, CASE #9,  
 SIMULATED GROUNDWATER ELEVATIONS,  
 TOP LAYER



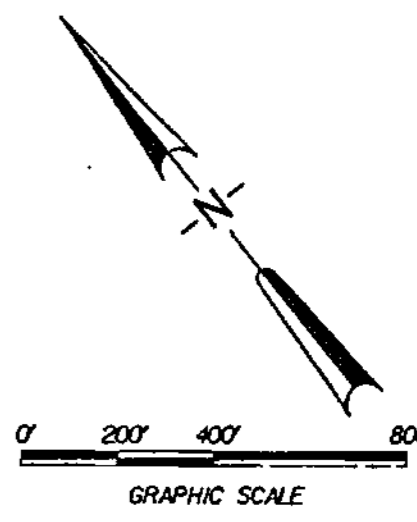
- M548 Ⓞ GROUNDWATER MONITORING WELL LOCATION
- Ⓞ BORING LOCATION
- PROPERTY LINE
- MODELED TRITIUM RADIOACTIVITY CONCENTRATION CONTOUR (pCi/l)

FIGURE F.9d  
 PREDICTED CONCENTRATION DISTRIBUTION  
 OF TRITIUM RADIOACTIVITY AT 200 YEARS

PALOS VERDES LANDFILL

SOURCE: AERIAL PHOTOGRAMMETRY TAKEN 4-12-91  
 BY AIRBORNE SYSTEMS, INC.

As2/imp/w/fields.dgn



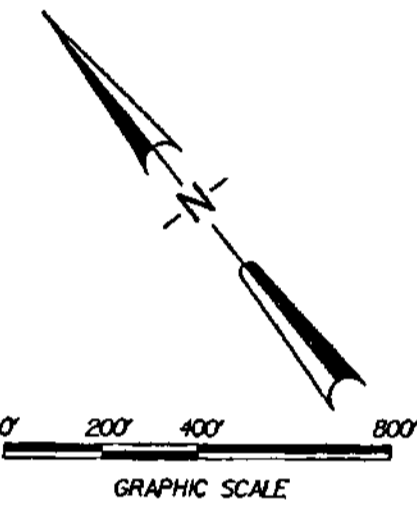
- M54B ○ GROUNDWATER MONITORING WELL LOCATION
- BORING LOCATION
- PROPERTY LINE
- 10 MODELED NITRATE CONCENTRATION CONTOUR (mg /l)

FIGURE F.1d  
 PREDICTED CONCENTRATION DISTRIBUTION  
 OF NITRATE AT 200 YEARS

PALOS VERDES LANDFILL

SOURCE: AERIAL PHOTOGRAMMETRY TAKEN 4-12-91  
 BY AIRBORNE SYSTEMS, INC.

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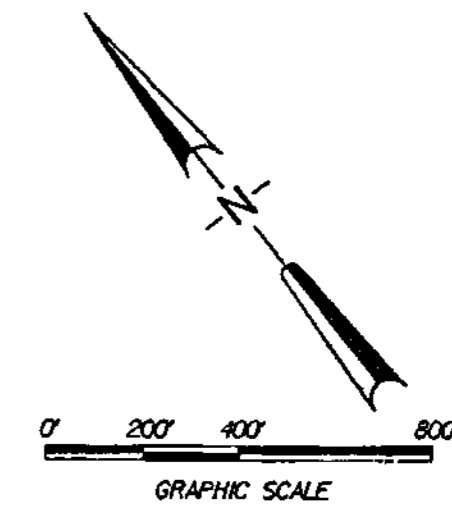
- M548 ◉ GROUNDWATER MONITORING WELL LOCATION
- ◉ BORING LOCATION
- PROPERTY LINE
- MODELED VINYL CHLORIDE CONCENTRATION CONTOUR (μg/l)

FIGURE F.2d  
 PREDICTED CONCENTRATION DISTRIBUTION  
 OF VINYL CHLORIDE AT 200 YEARS

PALOS VERDES LANDFILL

SOURCE: AERIAL PHOTOGRAMMETRY TAKEN 4-12-91  
 BY AIRBORNE SYSTEMS, INC.

User: 21/imp/wwf/forecast.dgn



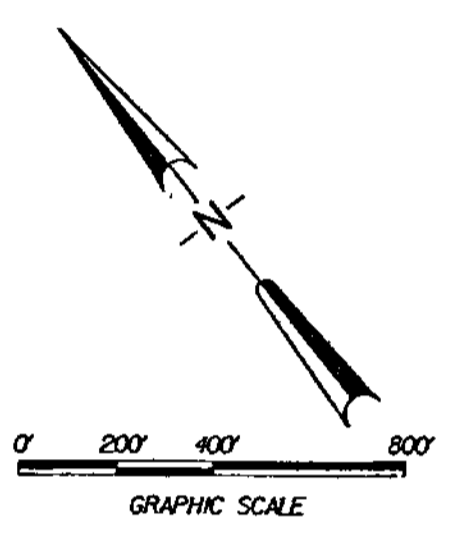
- M548 ○ GROUNDWATER MONITORING WELL LOCATION
- BORING LOCATION
- PROPERTY LINE
- MODELED BENZENE CONCENTRATION CONTOUR (μg/l)

FIGURE F.3d  
 PREDICTED CONCENTRATION DISTRIBUTION  
 OF BENZENE AT 200 YEARS

PALOS VERDES LANDFILL

SOURCE: AERIAL PHOTOGRAMMETRY TAKEN 4-12-91  
 BY AIRBORNE SYSTEMS, INC.

Use2\mwp\wfpredict.dgn



- M48B ● GROUNDWATER MONITORING WELL LOCATION
- BORING LOCATION
- PROPERTY LINE
- MODELED TRICHLOROETHYLENE CONCENTRATION CONTOUR (μg/l)

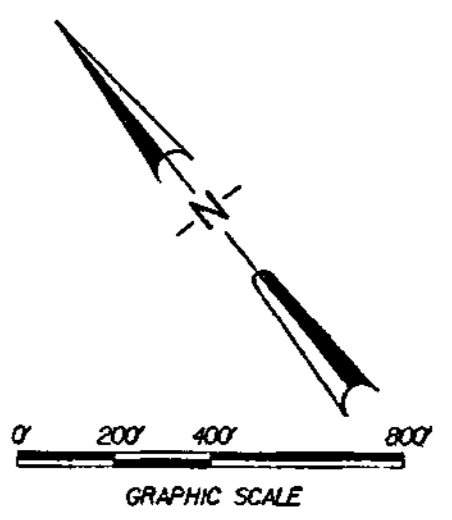
FIGURE F.4d  
 PREDICTED CONCENTRATION DISTRIBUTION  
 OF TRICHLOROETHYLENE AT 200 YEARS

PALOS VERDES LANDFILL

SOURCE: AERIAL PHOTOGRAMMETRY TAKEN 4-12-91  
 BY AIRBORNE SYSTEMS, INC.

A:\s2\mhw\predict.dgn





- M54B ○ GROUNDWATER MONITORING WELL LOCATION
- BORING LOCATION
- PROPERTY LINE
- MODELED TETRACHLOROETHYLENE CONCENTRATION CONTOUR (µg/l)

FIGURE F.5d  
 PREDICTED CONCENTRATION DISTRIBUTION  
 OF TETRACHLOROETHYLENE AT 200 YEARS

PALOS VERDES LANDFILL

SOURCE: AERIAL PHOTOGRAMMETRY TAKEN 4-12-91  
 BY AIRBORNE SYSTEMS, INC.

As21mpwffredia.com



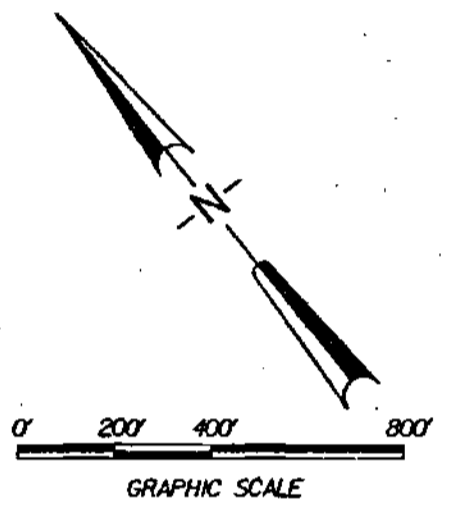
- M548 Ⓞ GROUNDWATER MONITORING WELL LOCATION
- Ⓞ BORING LOCATION
- PROPERTY LINE
- 10 MODELED ETHYL BENZENE CONCENTRATION CONTOUR (μg/l)

FIGURE F.6d  
 PREDICTED CONCENTRATION DISTRIBUTION  
 OF ETHYL BENZENE AT 200 YEARS

PALOS VERDES LANDFILL

SOURCE: AERIAL PHOTOGRAMMETRY TAKEN 4-12-91  
 BY AIRBORNE SYSTEMS, INC.

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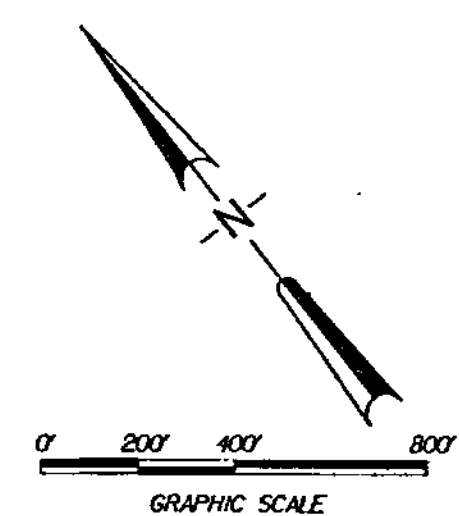
- M548 Ⓞ GROUNDWATER MONITORING WELL LOCATION
- Ⓞ BORING LOCATION
- PROPERTY LINE
- 100 MODELED CHLORDANE CONCENTRATION CONTOUR (μg/l)

FIGURE F.7d  
 PREDICTED CONCENTRATION DISTRIBUTION  
 OF CHLORDANE AT 200 YEARS

PALOS VERDES LANDFILL

SOURCE: AERIAL PHOTOGRAMMETRY TAKEN 4-12-91  
 BY AIRBORNE SYSTEMS, INC.

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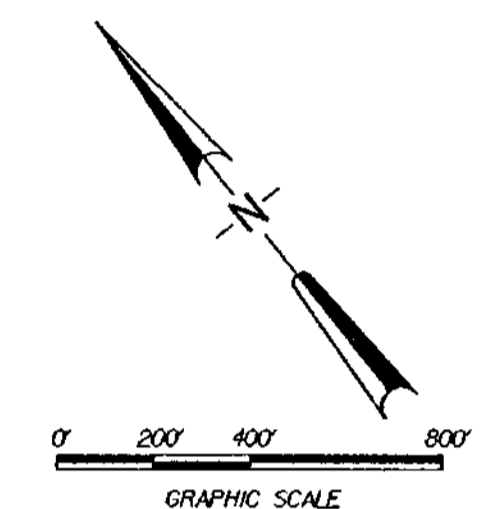
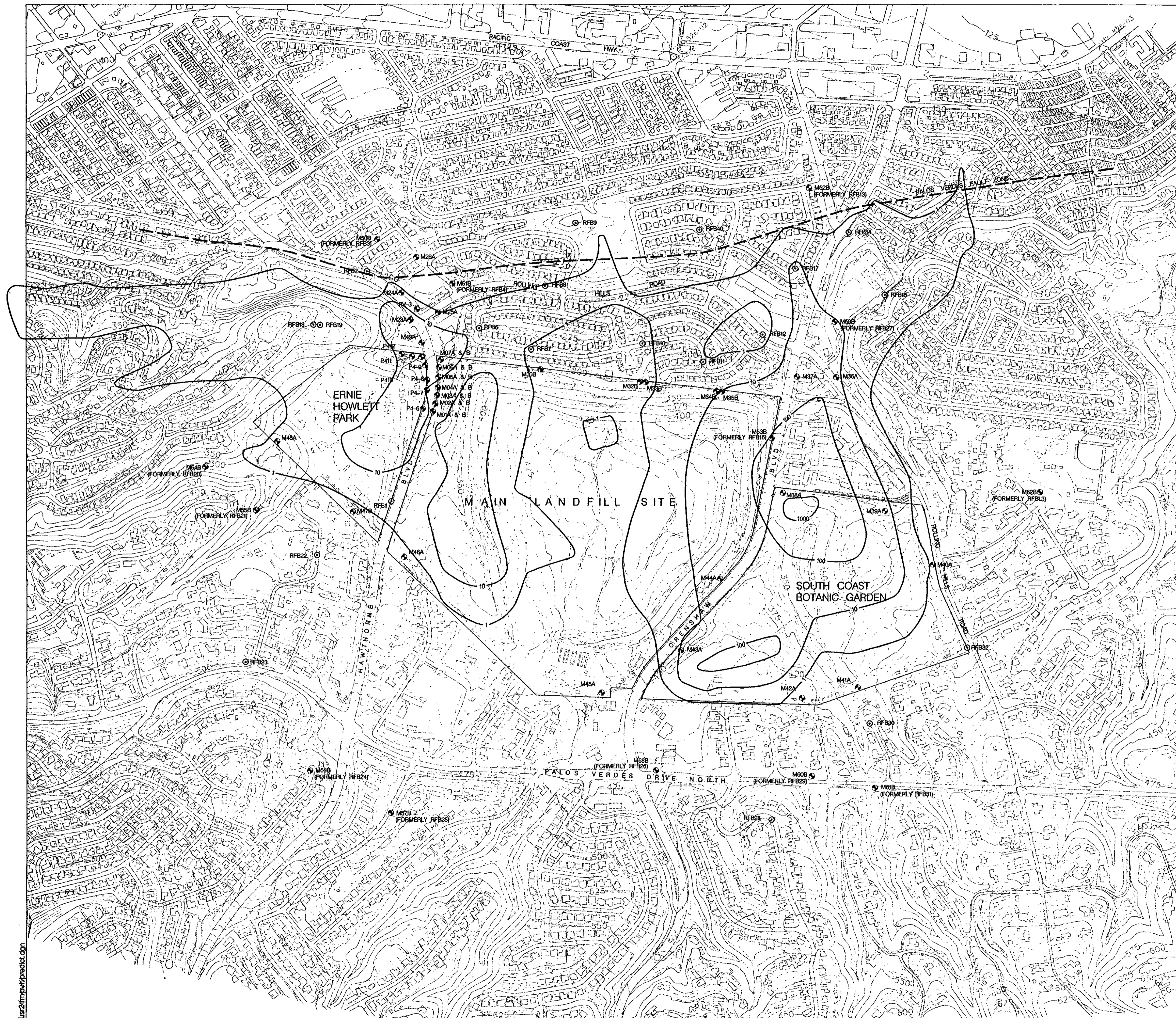
- M54B ● GROUNDWATER MONITORING WELL LOCATION
- BORING LOCATION
- PROPERTY LINE
- MODELED URANIUM RADIOACTIVITY CONCENTRATION CONTOUR (pCi/l)

FIGURE F.8d  
 PREDICTED CONCENTRATION DISTRIBUTION  
 OF URANIUM RADIOACTIVITY AT 200 YEARS

PALOS VERDES LANDFILL

SOURCE: AERIAL PHOTOGRAMMETRY TAKEN 4-12-91  
 BY AIRBORNE SYSTEMS, INC.

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- M548 ● GROUNDWATER MONITORING WELL LOCATION
- BORING LOCATION
- PROPERTY LINE
- 10 MODELED VINYL CHLORIDE CONCENTRATION CONTOUR (µg/l)
- ND NOT DETECTED

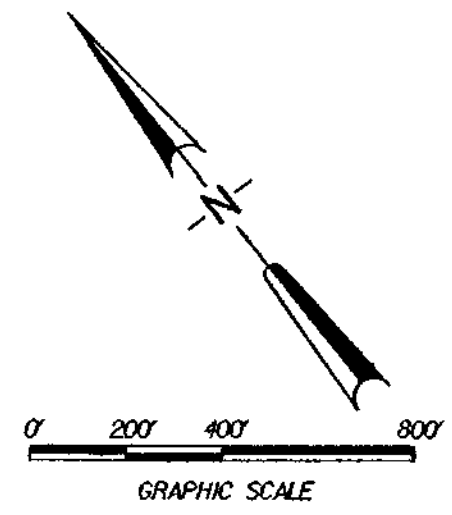
FIGURE G.9e  
 SENSITIVITY ANALYSIS, CASE 9,  
 SIMULATED VINYL CHLORIDE  
 CONCENTRATION AT 200 YEARS

ALL VALUES ARE IN UG/L

PALOS VERDES LANDFILL

SOURCE: AERIAL PHOTOGRAMMETRY TAKEN 4-12-91  
 BY AIRBORNE SYSTEMS, INC.  
 CONTOURS BY DAMES & MOORE, INC.

User21mpvrfpredict.dgn



- M548 ● GROUNDWATER MONITORING WELL LOCATION
- BORING LOCATION
- PROPERTY LINE
- 100 MODELED ETHYL BENZENE CONCENTRATION CONTOUR (ug/l)
- ND NOT DETECTED

FIGURE G.11d  
 ASSUMED ETHYL BENZENE CONCENTRATION DISTRIBUTION IN 1986 FOR SENSITIVITY ANALYSIS, CASE 11

ALL VALUES ARE IN UG/L  
 PALOS VERDES LANDFILL

SOURCE: AERIAL PHOTOGRAMMETRY TAKEN 4-12-91  
 BY AIRBORNE SYSTEMS, INC.  
 CONTOURS BY DAMES & MOORE, INC.

A:\s2\m\m\predict.dgn

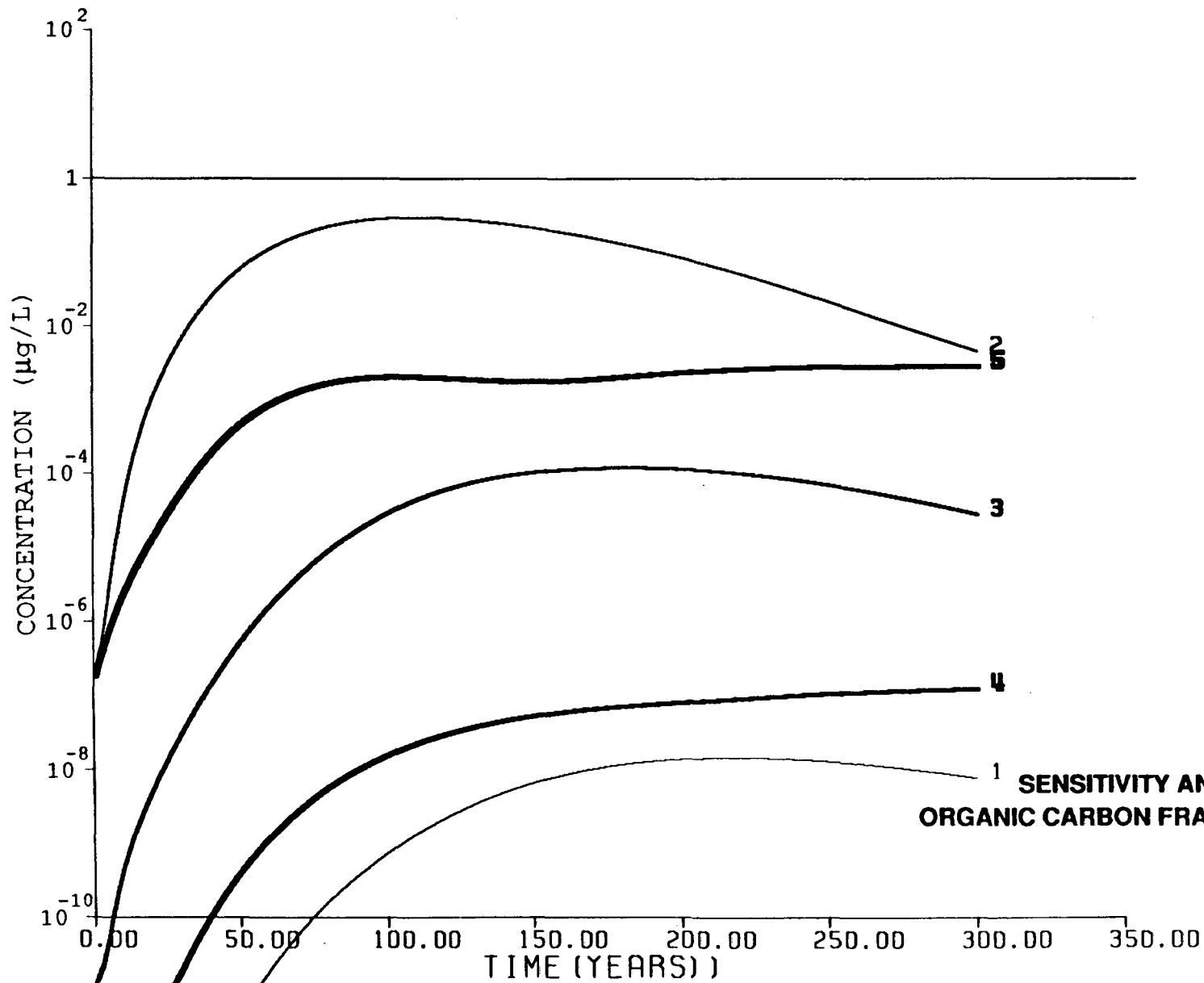


Figure G.10b  
**SENSITIVITY ANALYSIS CASE 10, WITH  
ORGANIC CARBON FRACTION DECREASED BY  
A FACTOR OF 3**

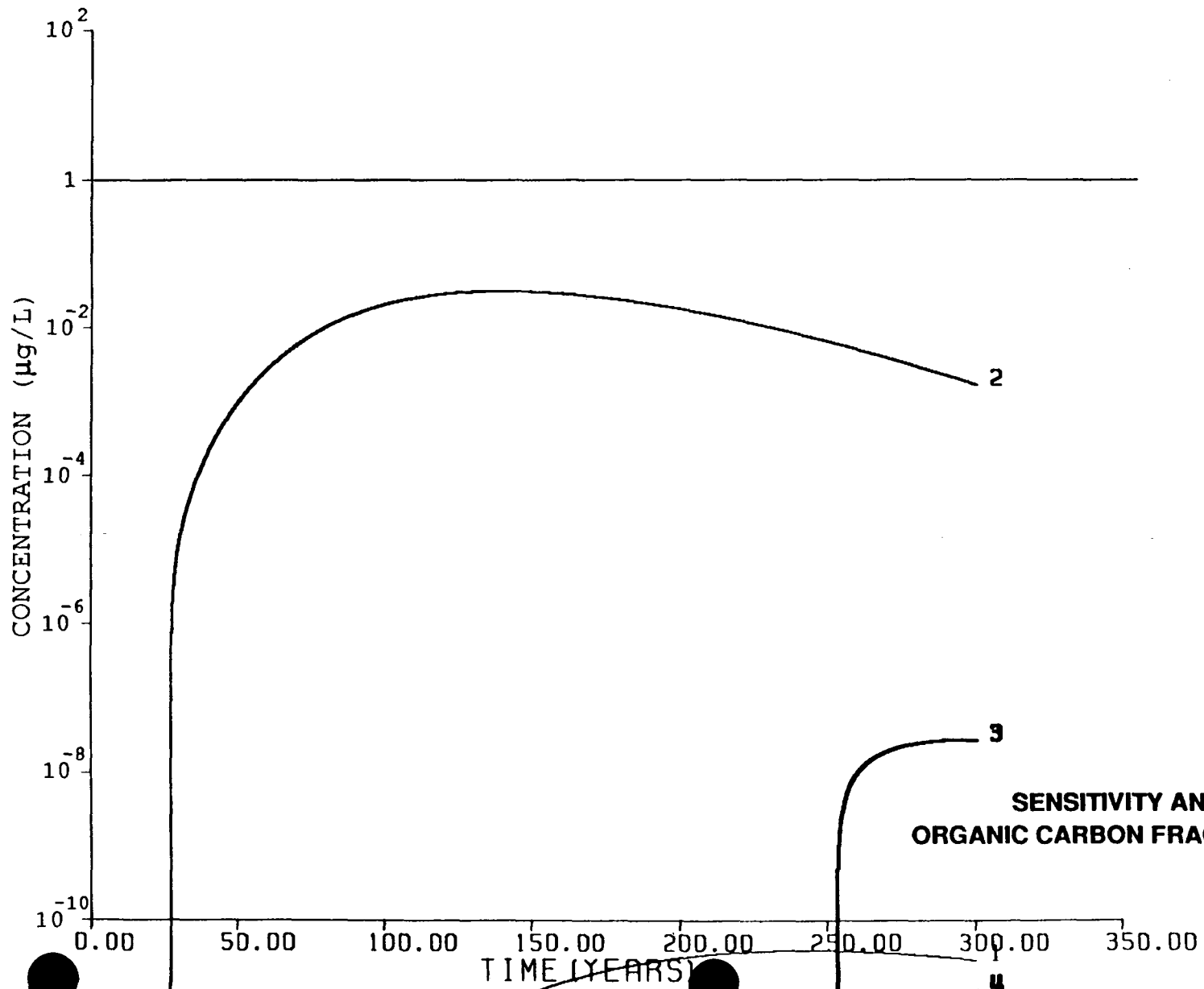


Figure G.10c  
**SENSITIVITY ANALYSIS CASE 10, WITH  
ORGANIC CARBON FRACTION DECREASED BY  
A FACTOR OF 3**



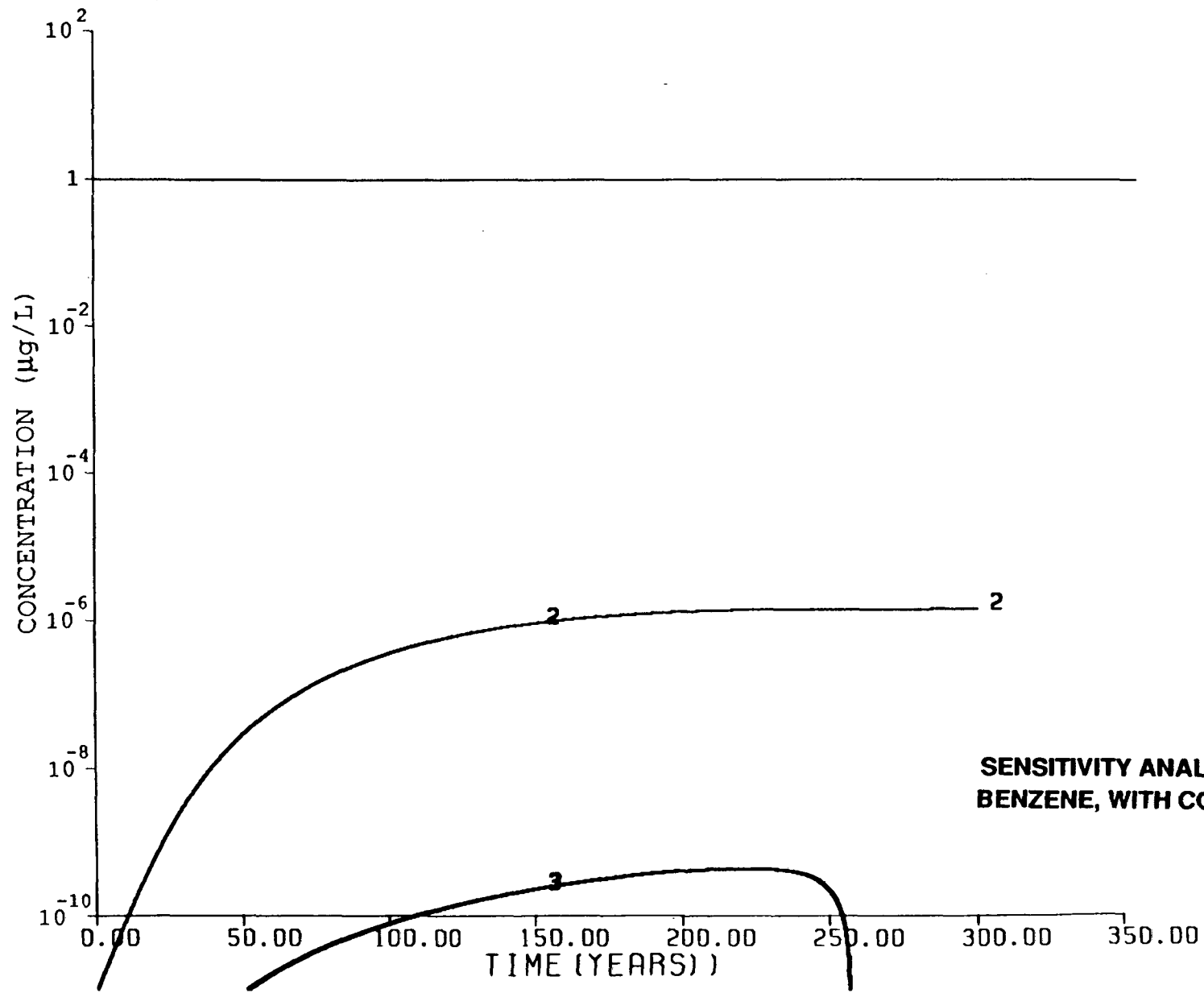


Figure G.11a  
**SENSITIVITY ANALYSIS CASE 11, ETHYL  
BENZENE, WITH CONSERVATIVE INITIAL  
CONDITION**

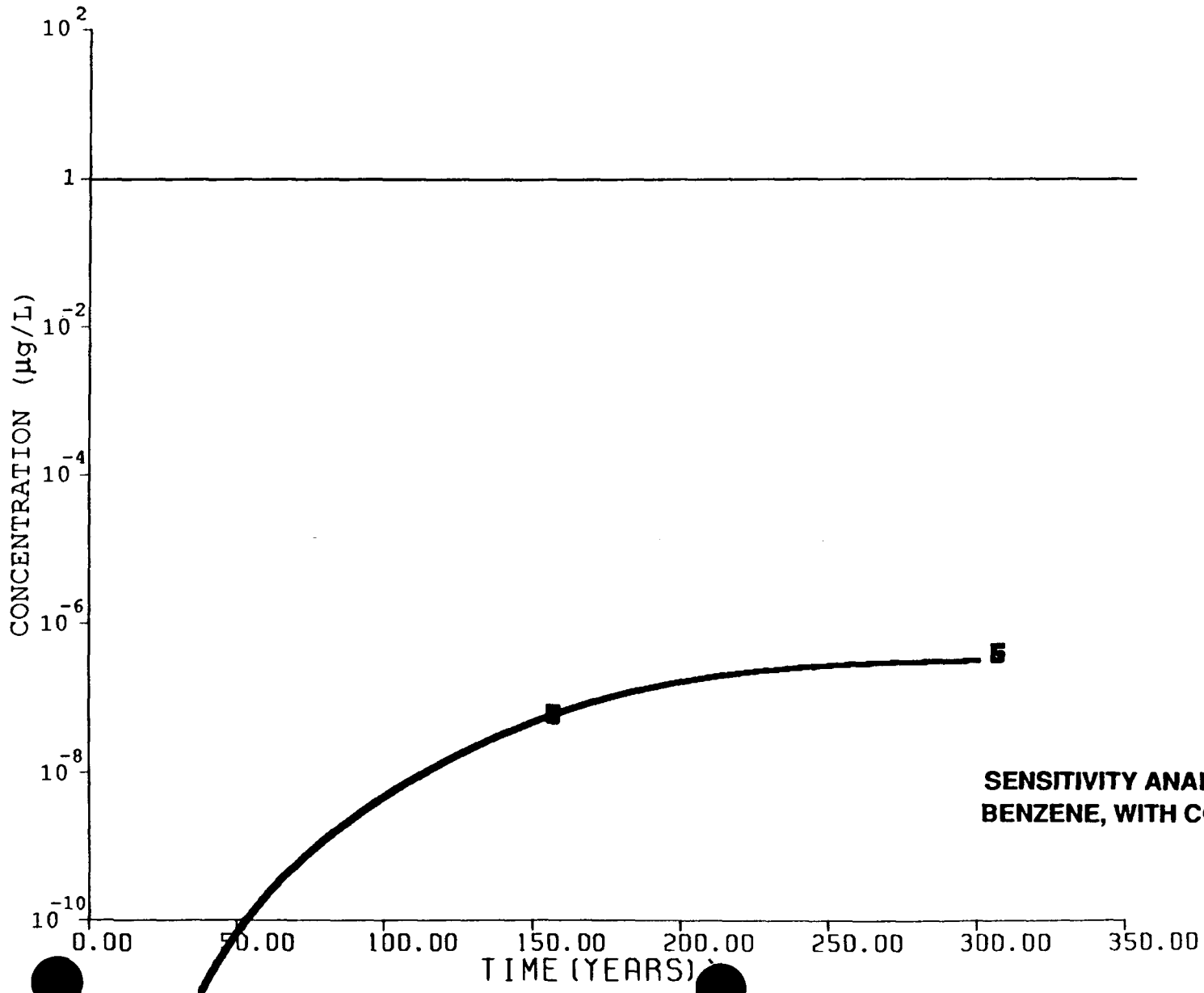


Figure G.11b  
**SENSITIVITY ANALYSIS CASE 11, ETHYL  
BENZENE, WITH CONSERVATIVE INITIAL  
CONDITION**

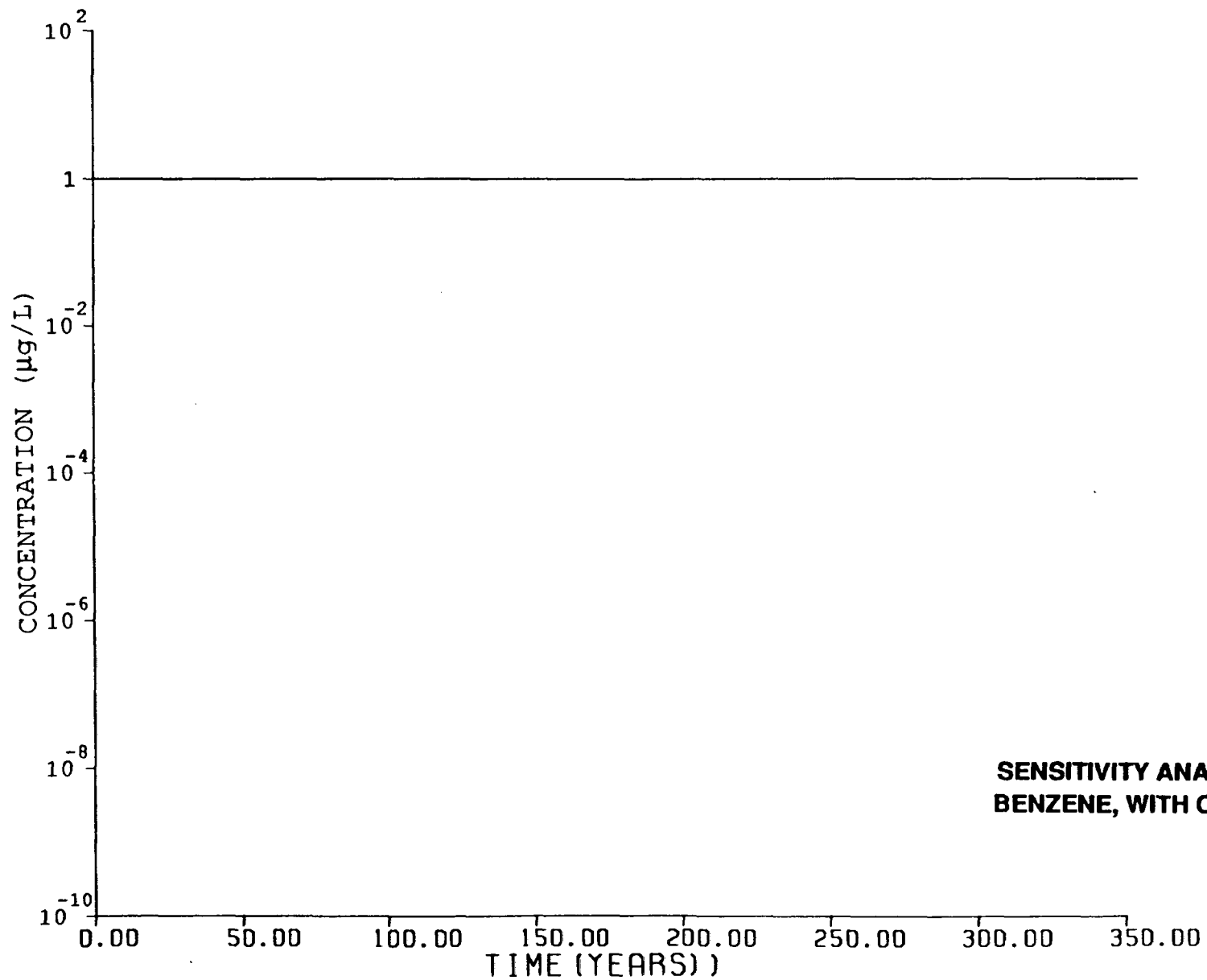
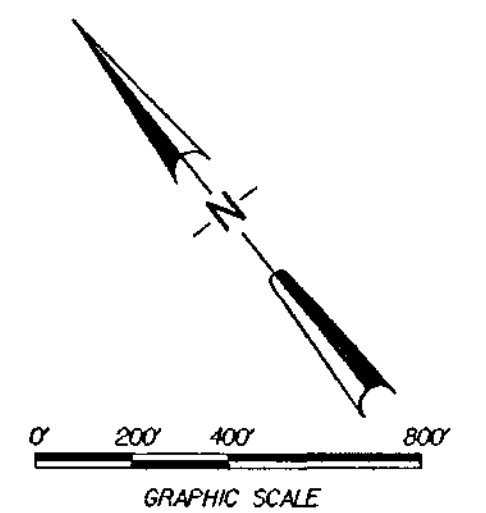


Figure G.11c  
**SENSITIVITY ANALYSIS CASE 11, ETHYL  
BENZENE, WITH CONSERVATIVE INITIAL  
CONDITION**



— PROPERTY LINE  
 A-A' LINE OF 2-D SLOPE STABILITY ANALYSIS

FIGURE E.10-1  
 CUT AND REFUSE FILL  
 SLOPES MAP  
 SUBGRADE CONTOURS ARE IN FEET MSL.  
 PALOS VERDES LANDFILL  
 DRAFT PRELIMINARY REMEDIAL  
 INVESTIGATION REPORT  
 SANITATION DISTRICTS, APRIL 1993  
 SOURCE: AERIAL PHOTOGRAMMETRY TAKEN  
 4-12-91 BY AIRBORNE SYSTEMS, INC.

4/8/93/imp/vfr/dgn