

2295	FM10(1)=FM9(1)	2295
2296	FM10(5)=FM9(5)	2296
2297	IF(WRITEY)GO TO 9	2297
2298	FMT(1)=FMS(1)	2298
2299	FMT(2)=FMS(2)	2299
2300	FM9(7)=FMS(3)	2300
2301	DO 8 I=8,10	2301
2302	8 FM9(I)=BLANK	2302
2303	9 CONTINUE	2303
2304	IF(WRITEY)IXR=MAXCOL-7	2304
2305	IF(WRITEY)IXR=MAXCOL-IDEC-16	2305
2306	FILL = SINGLE.AND.FI.GT.0.	2306
2307		2307
2308		2308
2309	LIMITS	2309
2310	I = YL+0.1	2310
2311	JUMP = I.EQ.1.OR.I.GE.3	2311
2312	OUT = I.GE.2	2312
2313	YMIN = YMI	2313
2314	YMAX = YMA	2314
2315	IF(YMI.LT.YMA.AND..NOT.(JUMP.OR.OUT)) GOTO 40	2315
2316	IF(INDEX2.GE.INDEX1) GOTO 20	2316
2317	15 PRINT 802, (NAME(I),I=1,NP)	2317
2318	RETURN	2318
2319	20 IF(JUMP.OR.OUT) GOTO 25	2319
2320	JUMP = .TRUE.	2320
2321	OUT = JUMP	2321
2322	YMIN = Y(INDEX1)	2322
2323	YMAX = YMIN	2323
2324	25 J = INDEX2	2324
2325	IF(.NOT.SINGLE) J=J+(NP-1)*(INDEX2-ININDEX1+1)	2325
2326	DO 30 I=INDEX1,J	2326
2327	IF(JUMP.AND.Y(I).LT.YMIN) YMIN=Y(I)	2327
2328	30 IF(OUT.AND.Y(I).GT.YMAX) YMAX=Y(I)	2328
2329	IF(YMIN.EQ.YMAX) GOTO 15	2329
2330	40 IF(.NOT.FILL) GOTO 50	2330
2331	IF(YMIN.GT.0.) YMIN=0.	2331
2332	IF(YMAX.LT.0.) YMAX=0.	2332
2333		2333
2334	INITIAL VALUES	2334
2335	50 IFIRST = INDEX1	2335
2336	ILAST = INDEX1-1	2336
2337	I100 = INDEX1+50	2337
2338	J = 7	2338
2339		2339
2340	Y-SCALE	2340
2341	60 CALL SCALEY((YMAX-YMIN)/FLOAT(NCOL-J),YSCALE,PSCALY,IPOTY)	2341
2342		2342
2343	LENGTH, POSITION AND NUMBER MARKING OF THE Y-AXIS	2343
2344	S = 0.1/YSCALE	2344
2345	C = YMIN*S+0.04	2345
2346	IF(YMIN.LT.0.) C=C-1.	2346
2347	KYMIN = IFIX(C)*10	2347
2348	C = YMAX*S+0.96	2348
2349	IF(YMAX.LT.0.) C=C-1.	2349
2350	KYMAX = IFIX(C)*10	2350
	IF(KYMIN.EQ.0) KYMIN=0	

2351	IF(KYMAX.EQ.0) KYMAX=0	2351
2352	NY = KYMAX-KYMIN+1	2352
2353	I = NCOL-6-NY	2353
2354	IF(I.GE.0) GOTO 70	2354
2355	J = J+11	2355
2356	GOTO 60	2356
2357	70 NXB = 5+I/2	2357
2358	NXE = NXB+NY-1	2358
2359	IF(NXE+2.GT.MAXCOL) GOTO 5	2359
2360	NNMARK = NY/10	2360
2361	INCR = 10.*PSCALY+0.1	2361
2362	IY(1) = INCR*KYMIN/10	2362
2363	DO 80 I=2,NNMARK	2363
2364	80 IY(I) = IY(I-1)+INCR	2364
2365	C	2365
2366	C POSITION OF THE X-AXIS (ORIGO)	2366
2367	NXO = NXB	2367
2368	MLEFT = 0	2368
2369	IF(KYMIN.LT.0.AND.KYMAX.GT.0) GOTO 90	2369
2370	IF(KYMAX.GT.0) GOTO 110	2370
2371	NXO = NXE	2371
2372	MLEFT = NNMARK	2372
2373	GOTO 110	2373
2374	90 DO 100 I=1,NNMARK	2374
2375	IF(IY(I).EQ.0) GOTO 110	2375
2376	NXO = NXO+10	2376
2377	100 MLEFT = MLEFT+1	2377
2378	110 CALL DECODH(NXO,HNXO,1,3)	2378
2379	C	2379
2380	C FORMATS AND SOME OTHER PRINTING PREPARATIONS	2380
2381	C	2381
2382	C THE NUMBERING OF THE Y-AXIS	2382
2383	I = NXB-5	2383
2384	IF(I.GT.0) GOTO 130	2384
2385	DO 120 I=2,4	2385
2386	120 FM1(I) = BLANK	2386
2387	GOTO 140	2387
2388	130 FM1(4) = FMX(1)	2388
2389	CALL DECODH(I,FM1,2,2)	2389
2390	140 CALL DECODH(NNMARK,FM1,5,2)	2390
2391	C	2391
2392	C THE Y-AXIS ITSELF	2392
2393	CALL DECODH(NXB,FM2,2,2)	2393
2394	FM2(5) = FM1(5)	2394
2395	FM2(6) = FM1(6)	2395
2396	C	2396
2397	C MARKS FOR EVERY 10 AND EVERY 100 LINES (FM3 RESP. FM4)	2397
2398	DO 150 I=2,4	2398
2399	FM3(I) = FM1(I)	2399
2400	150 FM4(I) = FM1(I)	2400
2401	DO 160 I=5,13	2401
2402	IF(I.EQ.9) GOTO 160	2402
2403	FM3(I) = BLANK	2403
2404	FM4(I) = BLANK	2404
2405	160 CONTINUE	2405
2406	IF(MLEFT.EQ.NNMARK) GOTO 210	2406

```

2407 DO 170 I=12,13
2408 FM3(I) = FMX(I-7)
2409 170 FM4(I) = FMX(I-4)
2410 IF(MLEFT.GT.0) GOTO 190
2411 DO 180 I=10,11
2412 FM3(I) = FM1(I-5)
2413 180 FM4(I) = FM3(I)
2414 GOTO 230
2415 190 CALL DECODH(NNMARK-MLEFT,FM3,10,2)
2416 DO 200 I=10,11
2417 FM4(I) = FM3(I)
2418 200 CALL DECODH(MLEFT,FM3,5,2)
2419 DO 220 I=5,6
2420 FM3(I+2) = FMX(I-3)
2421 FM4(I+2) = FMX(9-I)
2422 220 FM4(I) = FM3(I)
2423 230 NNMARK = NNMARK+2
2424 IIX = MLEFT+1
2425 DO 240 I=1,NNMARK
2426 240 IX(I) = IPLUS
2427 IX(IIX+1) = IAST
2428 C
2429 C SPECIAL NUMBER MARK ON THE X-AXIS
2430 I = NXO-5
2431 IF(I.GT.0) GOTO 260
2432 DO 250 I=2,5
2433 250 FM5(I) = BLANK
2434 GOTO 270
2435 260 CALL DECODH(I,FM5,2,3)
2436 FM5(5) = FMX(1)
2437 C
2438 C INITIAL PRINTING
2439 270 IF(IS.LT.0) WRITE(IO,901)
2440 IS = 1
2441 S = BLANK
2442 IF(.NOT.SINGLE) S=PLURAL
2443 WRITE(IO,902) S,IPOTY
2444 WRITE(IO,903) (NAME(I),YMARK(I),I=1,NP)
2445 NUMBER=NP+1
2446 IF(NUMBER.GT.NR)GO TO 1
2447 IF(NAME(NUMBER).EQ.BLANK)GC TO 1
2448 WRITE(IO,905)(NAME(I),I=NUMBER,NR)
2449 1 CONTINUE
2450 IF(.NOT.WRITEY)GO TO 275
2451 CALL DECODH(IXR,FM9,2,3)
2452 IF(.NOT.WRITEY)GO TO 271
2453 IXR1=IDEC+2
2454 CALL DECODH(IXR1,FM9,8,1)
2455 271 CONTINUE
2456 WRITE(IO,FM9)
2457 IF(.NOT.WRITEY)IXR=IXR+2
2458 IXR=IXR-IDEC-2
2459 CALL DECODH(IXR,FM10,2,3)
2460 IFIELD=IDEC+9
2461 IF(.NOT.WRITEY)IFIELD=IFIELD-2
2462 CALL DECODH(IFIELD,FM10,7,2)

```

```

2407
2408
2409
2410
2411
2412
2413
2414
2415
2416
2417
2418
2419
2420
2421
2422
2423
2424
2425
2426
2427
2428
2429
2430
2431
2432
2433
2434
2435
2436
2437
2438
2439
2440
2441
2442
2443
2444
2445
2446
2447
2448
2449
2450
2451
2452
2453
2454
2455
2456
2457
2458
2459
2460
2461
2462

```

316-CMPACK	PAGE	50		
2463		CALL DECODH(IDEK,FM10,10,1)		2463
2464		FM10(6)=FMT(1)		2464
2465		FM10(9)=DOT		2465
2466		FM10(11)=FMT(2)		2466
2467	275	CONTINUE		2467
2468		IF(NP.NE.4) WRITE(IO,904)		2468
2469		WRITE(IO,FM1) (IY(I),I=1,NNMARK)		2469
2470		WRITE(IO,FM2) (YAXIS,I=1,NNMARK)		2470
2471	C			2471
2472	C	THE NUMBERING OF THE EVERY 100 LINES MARKING		2472
2473		J = NNMARK-1		2473
2474		IF(IIX.GT.J) GOTO 290		2474
2475		DO 280 I=IIX,J		2475
2476	280	IY(I) = IY(I+1)		2476
2477	290	IY(NNMARK) = IY(J)+INCR		2477
2478	C			2478
2479	C	PREP. OF THE NXX-CALCULATION (INTERPOLATION)		2479
2480		YMIN = FLOAT(KYMIN)*YSCALE		2480
2481		S = FLOAT(NY-1)/(FLOAT(KYMAX)*YSCALE-YMIN)		2481
2482		ANXB = FLOAT(NXB)+0.5		2482
2483	C			2483
2484	C	NOW EVERYTHING IS READY FOR THE ACTUAL PLOTTING		2484
2485	C			2485
2486	300	INCR = MOD(INDEX1,10)		2486
2487		JUMP = INDEX1.NE.ILAST+1.AND.INCR.NE.0		2487
2488		ILAST = INDEX2		2488
2489		NPOINT = INDEX1-1		2489
2490		IF(INCR.EQ.0.AND.INDEX1.GT.IFIRST) INCR=10		2490
2491	C			2491
2492	C	THE PLOTTING LOOP ITSELF		2492
2493		DO 500 I=INDEX1,INDEX2		2493
2494		NPOINT = NPOINT+1		2494
2495		NXX = ANXB+S*(Y(NPOINT)-YMIN)		2495
2496		OUT = NXX.LT.NXB.OR.NXX.GT.NXE		2496
2497		IF(INCR.EQ.10) GOTC 420		2497
2498		IF(JUMP) GOTO 410		2498
2499	C			2499
2500	C	NORMAL PLOTTING		2500
2501		DO 310 J=6,10		2501
2502	310	FM6(J) = BLANK		2502
2503		IF(OUT) GOTO 350		2503
2504		NV = 2		2504
2505		NX = NXX-NX0		2505
2506		IF(NX) 320,330,340		2506
2507	C	Y TO THE LEFT OF THE X-AXIS		2507
2508	320	CALL DECODH(NXX,FM6,2,3)		2508
2509		XD(1) = XMARK		2509
2510		XD(2) = DOT		2510
2511		GOTO 390		2511
2512	C	Y ON THE X-AXIS		2512
2513	330	IF(FILL) GOTO 350		2513
2514		NV = 1		2514
2515		XD(1) = XMARK		2515
2516		GOTO 360		2516
2517	C	Y TO THE RIGHT OF THE X-AXIS		2517
2518	340	XD(1) = DOT		2518

2519		XD(2) = XMARK	2519
2520		GOTO 360	2520
2521	C	Y OUT OF RANGE	2521
2522	350	NV = 1	2522
2523		XD(1) = DOT	2523
2524	C		2524
2525	360	DO 370 J=2,4	2525
2526	370	FM6(J) = HNXD(J-1)	2526
2527		IF(NV.EQ.1) GOTO 400	2527
2528	390	FM6(10) = FMX(7)	2528
2529		J = IABS(NX)-1	2529
2530		IF(J.EQ.0) GOTO 400	2530
2531		CALL DECODH(J,FM6,6,3)	2531
2532		FM6(9) = FMX(1)	2532
2533	400	WRITE(IO,FM6) (XD(J),J=1,NV)	2533
2534		IF(WRITEX.AND..NOT.WRITEY)WRITE(IO,FM10)X(I)	2534
2535		IF(WRITEY)WRITE(IO,FM10)X(I),YREAL(I)	2535
2536		GOTO 440	2536
2537	C		2537
2538	C	IF REPEATED CALL WITH A JUMP IN INDEX	2538
2539	410	JUMP = .FALSE.	2539
2540		WRITE(IO,FM5) I	2540
2541		GOTO 430	2541
2542	C		2542
2543	C	MARK AT EVERY 10 LINES	2543
2544	420	INCR = 0	2544
2545		IX(IIX) = I	2545
2546		WRITE(IO,FM3) (IX(J),J=1,NMARK)	2546
2547	C		2547
2548	C	PRINTING OF A SINGLE X	2548
2549	430	IF(OUT.OR.FILL.AND.NXX.EQ.NXO) GOTO 440	2549
2550		CALL DECODH(NXX,FM7,2,3)	2550
2551		WRITE(IO,FM7) XMARK	2551
2552	C		2552
2553	C	ADDITIONAL POINTS PLOTTED ON THE SAME LINE	2553
2554	440	IF(SINGLE) GOTO 445	2554
2555		DO 442 J=2,NP	2555
2556		NPOINT = NPOINT+1	2556
2557		NXX = ANXB+S*(Y(NPOINT)-YMIN)	2557
2558		IF(NXX.LT.NXB.OR.NXX.GT.NXE) GOTO 442	2558
2559		CALL DECODH(NXX,FM7,2,3)	2559
2560		WRITE(IO,FM7) YMARK(J)	2560
2561		IF(WRITEX)WRITE(IO,FM10)X(I)	2561
2562	442	CONTINUE	2562
2563		GOTO 480	2563
2564	C		2564
2565	C	FILLING THE SPACE BETWEEN X-AXIS AND THE Y-POSITION WITH	2565
2566	C	XMARKS (STAPLE DIAGRAM).	2566
2567	445	IF(.NOT.FILL) GOTO 480	2567
2568		IF(OUT) NXX=MAXO(NXB,MINO(NXE,NXX))	2568
2569		NX = NXX-NXO	2569
2570		K = IABS(NX)-1	2570
2571		IF(K.LE.0) GOTO 500	2571
2572		IF(INCR.NE.0.AND..NOT.OUT) GOTO 450	2572
2573		CALL DECODH(K,FM8,6,3)	2573
2574		GOTO 470	2574

316-CMPACK	PAGE	52		
2575	450	DO 460	J=6,8	2575
2576	460	FM8(J) = FM6(J)		2576
2577	470	CALL DECODH(MINO(NXO,NXX)+1,FM8,2,3)		2577
2578		WRITE(IO,FM8) (XMARK,J=1,K)		2578
2579		GOTO 500		2579
2580	C			2580
2581	C		CHECK FOR AND PRINTING OF THE EVERY 100 LINES MARK	2581
2582	480	IF(INCR.NE.9) GOTO 500		2582
2583		IF(MOD(I+1,100).NE.0.OR.I.LT.I100) GOTO 500		2583
2584		I100 = I+50		2584
2585		WRITE(IO,FM4) (IY(J),J=1,NNMARK)		2585
2586	C			2586
2587	500	INCR = INCR+1		2587
2588		RETURN		2588
2589	C			2589
2590	801	FORMAT(/3X,60H***PLOTY: ERROR IN NPC OR NCOL OR IU***FIRST VARIAB		2590
2591		LE NAME: ,A6,3H***//)		2591
2592	802	FORMAT(/3X,52H***PLOTY: ERROR IN LIMITS OR INDEX OF THE VARIABLES		2592
2593		1 ,A6,3H***/(55X,A6,3H***))		2593
2594	901	FORMAT(1H1)		2594
2595	902	FORMAT(/3X,19HPLOT OF THE NUCLIDE,A1,57X, 30HSCALE: VARIABLE VALUE		2595
2596		1 = Y*10**,I3)		2596
2597	903	FORMAT(1H+,23X,4(2X,A6,2H (,A1,1H))/(24X,4(2X,A6,2H (,A1,1H)))		2597
2598	904	FORMAT(1H)		2598
2599	905	FORMAT(3X,19HCONTRIBUTICNS FROM: ,2X,4(2X,A6,4X)		2599
2600		* /(24X,4(2X,A6,4X)))		2600
2601		END		2601
2602		SUBROUTINE SCALEY(S,SCAL,CSCAL,IPOT)		2602
2603	C			2603
2604	C		THIS ROUTINE CALCULATES THE Y-AXIS FOR THE LINE-PRINTER PLOT	2604
2605	C			2605
2606	C			2606
2607	C		THIS ROUTINE IS USED FOR PLOTTING ON THE LINE PRINTER	2607
2608	C			2608
2609	C			2609
2610	C		CALCULATION OF THE SCALE FOR LINE PRINTER PLOTTING ROUTINES.	2610
2611	C		S = THE PRELIMINARY NUMBER OF UNITS PER COLUMN OR LINE	2611
2612	C		SCAL = THE RESULTING SCALE IN UNITS PER COLUMN OR LINE	2612
2613	C		CSCAL = THE NUMBER OF PRINTED UNITS PER COLUMN OR LINE	2613
2614	C		IPOT = THE POWER OF 10.	2614
2615	C			2615
2616		DIMENSION CSCALE(7)		2616
2617	C			2617
2618		DATA EPS/0.0001/, NSCALE/7/, CSCALE/1.,1.5,2.,2.5,4.,5.,7.5/		2618
2619	C			2619
2620		C = ALOG10(S)+EPS		2620
2621		IPOT = ABS(C)		2621
2622		IF(C.LT.0.) IPOT=-IPOT-1		2622
2623		SCAL = S/10.**IPOT		2623
2624		IF(SCAL.LE.CSCALE(NSCALE)) GOTO 10		2624
2625		IPOT = IPOT+1		2625
2626		SCAL = SCAL/10.		2626
2627	10	DO 20 I=1,NSCALE		2627
2628		CSCAL = CSCALE(I)		2628
2629		IF(CSCAL.GE.SCAL) GOTO 30		2629
2630	20	CONTINUE		2630

2631		30 IF(IPOT.LT.1.OR.IPOT.GT.2) GOTO 40	2631
2632		CSCAL = CSCAL*10.**IPOT	2632
2633		IPOT = 0	2633
2634		SCAL = CSCAL	2634
2635		RETURN	2635
2636		40 SCAL = CSCAL*10.**IPOT	2636
2637		RETURN	2637
2638		END	2638
2639		SUBROUTINE DECODH(N,IH,IL,NP)	2639
2640	C		2640
2641	C	THIS ROUTINE CONVERTS INTEGRERS TO HOLLERITH DATA	2641
2642	C		2642
2643	C		2643
2644	C	THIS SUBROUTINE DECODES THE INTEGER NUMBER N AND PUTS THE NP	2644
2645	C	RIGHTMOST FIGURES CONVERTED INTO IH-HOLLERITH INTO THE ARRAY	2645
2646	C	IH. IH(IL) IS THE LEFTMOST OF THE NP IH-ELEMENTS CONCERNED.	2646
2647	C	THE IH-ELEMENTS ARE FILLED FROM THE RIGHT, AND IF NP IS GREATER	2647
2648	C	THAN THE NUMBER OF SIGNIFICANT DIGITS IN N, THE LEFT ZEROS	2648
2649	C	ARE BLANKED. AND IF BESIDES N<0, THE SIGN WILL BE SUPPLIED.	2649
2650	C		2650
2651		REAL*8 IH(1),NH(10),MINUS,IBLANK	2651
2652	C		2652
2653		LOGICAL POS,NOZERO	2653
2654	C		2654
2655		DATA NH/IH0,IH1,IH2,IH3,IH4,IH5,IH6,IH7,IH8,IH9/, MINUS/IH-/,	2655
2656		1 IBLANK/IH /	2656
2657	C		2657
2658		POS = N.GE.0	2658
2659		NOZERO = .TRUE.	2659
2660		NN = IABS(N)	2660
2661		J = IL+NP	2661
2662		DO 20 I=1,NP	2662
2663		IF(NOZERO) GOTO 10	2663
2664		IH(J-I) = IBLANK	2664
2665		IF(POS) GOTO 20	2665
2666		POS = .TRUE.	2666
2667		IH(J-I) = MINUS	2667
2668		GOTO 20	2668
2669	10	M = MOD(NN,10)	2669
2670		IH(J-I) = NH(M+1)	2670
2671		NN = NN/10	2671
2672		NOZERO = NN.GT.0	2672
2673	20	CONTINUE	2673
2674		RETURN	2674
2675		END	2675
2676		REAL FUNCTION TEXP*8(ARG)	2676
2677		REAL*8 ARG	2677
2678		IF(ARG.LT.-180..OR.ARG.GT.174.6)GO TO 1	2678
2679		TEXP=DEXP(ARG)	2679
2680		RETURN	2680
2681	1	TEXP=0.0D0	2681
2682		RETURN	2682
2683		END	2683
2684		REAL FUNCTION TEXP1*16(X)	2684
2685		REAL*16 QEXP,X	2685
2686		IF(X.LT.-180.0.OR.X.GT.174.6)GO TO 1	2686

316-CMPACK	PAGE	54		
2687			TEXP1=QEXP(X)	2687
2688			RETURN	2688
2689	1		TEXP1=0.0	2689
2690			RETURN	2690
2691			END	2691
<hr/>				
2692			REAL FUNCTION TDERFC*8(X)	2692
2693			REAL*8 X	2693
2694			IF(X.GT.12.0)GO TO 1	2694
2695			TDERFC=DERFC(X)	2695
2696			RETURN	2696
2697	1		TDERFC=0.0	2697
2698			RETURN	2698
2699			END	2699
<hr/>				
2700			FUNCTION INTNUK(BNAME)	2700
2701			REAL*8 BNAME	2701
2702			REAL*16 ETEXP(75),AN(75),C(75)	2702
2703			REAL*8 ANAME(76)	2703
2704			COMMON/DEY2/ ETEXP,AN,C,ANAME,SF(75),NUK(75),IN,ISL	2704
2705	999		FORMAT('1'///10X,'*** INTNUK HAR ANROPATS MED '.A6,' ***')	2705
2706			DO 10 I=1,ISL	2706
2707			IF (ANAME(I).NE.BNAME) GO TO 10	2707
2708			INTNUK=I	2708
2709			RETURN	2709
2710	10		CONTINUE	2710
2711			WRITE(6,999) BNAME	2711
2712			STOP	2712
2713			END	2713
<hr/>				
2714			SUBROUTINE Fwd2	2714
2715	C			2715
2716	C		---- THIS ROUTINE IS FOR STEP RELEASE WITH DISPERSION	2716
2717	C		---- FOR TWO-NUCLIDE CHAINS	2717
2718	C			2718
2719	C		K1 .NE. K2 .NE. K3	2719
2720	C			2720
2721			IMPLICIT	2721
2722			* REAL*8 (A-H,O-Z)	2722
2723			LOGICAL LSW	2723
2724			LOGICAL LG	2724
2725			COMMON /LLL/	2725
2726			* LSN,LSW	2726
2727			COMMON /XXX/	2727
2728			+ XX5, XX6, XX7, XX19.	2728
2729			+ XX29, XX39	2729
2730			COMMON/FFFFF/ ENAME(3),THALF(3),CIN(3),ALAMB(3),AC(3),R(3),	2730
2731			* GAP(6),TO,T,P,ETA,THETA,V,SCL	2731
2732			COMMON /LGTEST/ LG(6)	2732
2733			COMMON /DIV/	2733
2734			* DSW,DSN	2734
2735			DATA EXPMIN/174.D0/	2735
2736			F11A12=F11(1,2)	2736
2737			F15A12=F15(1,2)	2737
2738			F16A12=F16(1,2)	2738
2739			CALL FF7M (1,2,F7ME12)	2739
2740			CALL FF7P (1,2,F7PE12)	2740
2741			CALL FF20M(1,2,F20ME)	2741
2742			CALL FF20P(1,2,F20PE)	2742

2743	CALL BB16 (1,2,1,BE121)	2743
2744	RETURN	2744
2745		2745
2746	ENTRY BWD2(SWD1,SWD2,SWD3,NT,J)	2746
2747	LSW=.TRUE.	2747
2748	TAU=T/SCL*V	2748
2749	ETRM=P*ETA	2749
2750	G9ME=0.D0	2750
2751	G9MA=0.D0	2751
2752	Y9M=0.D0	2752
2753	D9M=0.D0	2753
2754	B9M=0.D0	2754
2755	G9ME12=0.D0	2755
2756	G9MA12=0.D0	2756
2757	Y9M12=0.D0	2757
2758	D9M12=0.D0	2758
2759	B9M12=0.D0	2759
2760	G9PE=0.D0	2760
2761	G9PA=0.D0	2761
2762	G9PE12=0.D0	2762
2763	G9PA12=0.D0	2763
2764	G21E1=0.D0	2764
2765	G21A1=0.D0	2765
2766	G21PE2=0.0D0	2766
2767	G21PA2=0.0D0	2767
2768	Y211=0.D0	2768
2769	D211=0.D0	2769
2770	B211=0.D0	2770
2771	G21E2=0.D0	2771
2772	G21A2=0.D0	2772
2773	Y212=0.D0	2773
2774	D212=0.D0	2774
2775	B212=0.D0	2775
2776	G22E1=0.D0	2776
2777	G22A1=0.D0	2777
2778	G22E2=0.D0	2778
2779	G22A2=0.D0	2779
2780	G23ME=0.D0	2780
2781	G23MA=0.D0	2781
2782	Y23M=0.D0	2782
2783	D23M=0.D0	2783
2784	B23M=0.D0	2784
2785	G23PE=0.D0	2785
2786	G23PA=0.D0	2786
2787		2787
2788	C... BEGIN CALCULATIONS FOR TWO MEMBER CHAINS.	2788
2789	C	2789
2790	CALL FF5 (1,2,F5E12)	2790
2791	CALL FF9M (1,2,1,2,F9ME,F9MA,X9M,E9M,A9M)	2791
2792	CALL FF9M (1,2,2,1,F9ME12,F9MA12,X9M12,E9M12,A9M12)	2792
2793	CALL FF9P (1,2,1,2,F9PE,F9PA)	2793
2794	CALL FF9P (1,2,2,1,F9PE12,F9PA12)	2794
2795	CALL FF19 (1,F19E1)	2795
2796	CALL FF19 (2,F19E2)	2796
2797	CALL FF21 (1,F21E1,F21A1,X211,E211,A211)	2797
2798	CALL FF21 (2,F21E2,F21A2,X212,E212,A212)	2798

2799	CALL FF21P(2,F21PE2,F21PA2)	2799
2800	CALL FF22 (1,F22E1,F22A1)	2800
2801	CALL FF22 (2,F22E2,F22A2)	2801
2802	CALL FF23M (1,2,F23ME,F23MA,X23M,E23M,A23M)	2802
2803	CALL FF23P (1,2,F23PE,F23PA)	2803
2804	Y9M12=0.0D0	2804
2805	Y9M=0.0D0	2805
2806	Y211=0.0D0	2806
2807	Y212=0.0D0	2807
2808	Y23M=0.0D0	2808
2809	B9P12=0.0D0	2809
2810	B9P=0.0D0	2810
2811	B9M12=0.0D0	2811
2812	B9M=0.0D0	2812
2813	B211=0.0D0	2813
2814	B212=0.0D0	2814
2815	B23P=0.0D0	2815
2816	B23M=0.0D0	2816
2817	G22A2=0.0D0	2817
2818	G22A1=0.0D0	2818
2819	SAVE=THETA	2819
2820	TERME1=THETA-T/SCL*V	2820
2821	IF (TERME1.LT.0.0D0) GO TO 110	2821
2822	THETA=TERME1	2822
2823	CALL FF9M (1,2,1,2,G9ME,G9MA,Y9M,D9M,B9M)	2823
2824	CALL FF9M (1,2,2,1,G9ME12,G9MA12,Y9M12,D9M12,B9M12)	2824
2825	CALL FF9P (1,2,1,2,G9PE,G9PA)	2825
2826	CALL FF9P (1,2,2,1,G9PE12,G9PA12)	2826
2827	CALL FF21 (1,G21E1,G21A1,Y211,D211,B211)	2827
2828	CALL FF21 (2,G21E2,G21A2,Y212,D212,B212)	2828
2829	CALL FF22 (1,G22E1,G22A1)	2829
2830	CALL FF22 (2,G22E2,G22A2)	2830
2831	CALL FF23M (1,2,G23ME,G23MA,Y23M,D23M,B23M)	2831
2832	CALL FF23P (1,2,G23PE,G23PA)	2832
2833	CALL FF21P(2,G21PE2,G21PA2)	2833
2834	THETA=SAVE	2834
2835	110 CONTINUE	2835
2836	TERME3=0.0D0	2836
2837	TERMA3=0.0D0	2837
2838	C	2838
2839	C	2839
2840	----- 4-TH TERM	2840
2841	IF(.NOT.LG(2))GO TO 300	2841
2842	CALL SUM2 (F9PE12,F9PA12,F9PE,-F9PA,TERME1,TERMA1)	2842
2843	CALL SUM2 (G9PE12,G9PA12,G9PE,-G9PA,UERME1,UERMA1)	2843
2844	UERME1=UERME1+BE121	2844
2845	CALL SUM2 (TERME1,TERMA1,UERME1,-UERMA1,TERME1,TERMA1)	2845
2846	TERME1=TERME1+F7PE12	2846
2847	CALL DIFERF (X9M12,E9M12,A9M12,X9M,E9M,A9M,TERME2,TERMA2)	2847
2848	CALL DIFERF (Y9M12,D9M12,B9M12,Y9M,D9M,B9M,UERME2,UERMA2)	2848
2849	UERME2=UERME2+BE121	2849
2850	CALL SUM2 (TERME2,TERMA2,UERME2,-UERMA2,TERME2,TERMA2)	2850
2851	TERME2=TERME2+F7ME12	2851
2852	CALL SUM2 (TERME1,TERMA1,TERME2,TERMA2,TERME3,TERMA3)	2852
2853	TERME3=TERME3+F5E12	2853
2854	TERMA3=TERMA3+F11A12*F16A12	2854
	TRME4=TERME3	

```

2855 TRMA4=TERMA3
2856 C
2857 C ----- 3-RD TERM
2858 300 CONTINUE
2859 CALL DIFERF(X211,E211,A211,Y211,D211,B211,TERME5,TERMA5)
2860 CALL SUM2(F22E1,F22A1,G22E1,-G22A1,TERME7,TERMA7)
2861 CALL SUM2(TERME7,TERMA7,TERME5,TERMA5,TERME5,TERMA5)
2862 TERMA5=TERMA5*F16A12
2863 TERME5=TERME5+F19E1
2864 C
2865 CALL DIFERF(X212,E212,A212,Y212,D212,B212,TERME8,TERMA8)
2866 CALL SUM2(F21PE2,F21PA2,G21PE2,-G21PA2,TERME7,TERMA7)
2867 TERME7=TERME7+ETRM
2868 CALL SUM2(TERME8,TERMA8,TERME7,TERMA7,TERME4,TERMA4)
2869 TERME4=TERME4+F19E2
2870 CALL SUM2(TERME5,TERMA5,TERME4,-TERMA4,TERME4,TERMA4)
2871 TERMA4=TERMA4*F11A12
2872 C
2873 CALL SUM2(TERME3,TERMA3,TERME4,TERMA4,TERME9,TERMA9)
2874 TRME3=TERME4
2875 TRMA3=TERMA4
2876 C
2877 C ----- 2-ND TERM
2878 IF(.NOT.LG(1))GO TO 400
2879 CALL SUM2(F23PE,F23PA,G23PE,-G23PA,TERME3,TERMA3)
2880 CALL DIFERF(X23M,E23M,A23M,Y23M,D23M,B23M,TERME1,TERMA1)
2881 TERME3=TERME3+F20PE
2882 TERME1=TERME1+F20ME
2883 CALL SUM2(TERME3,TERMA3,TERME1,TERMA1,TERME2,TERMA2)
2884 TERME2=TERME2+F19E1
2885 TERMA2=TERMA2*F11A12*F15A12
2886 C
2887 CALL SUM2(TERME9,TERMA9,TERME2,TERMA2,TERME3,TERMA3)
2888 TRME2=TERME2
2889 TRMA2=TERMA2
2890 GO TO 500
2891 400 CONTINUE
2892 TERME3=TERME9
2893 TERMA3=TERMA9
2894 500 CONTINUE
2895 C
2896 SWD2=0.D0
2897 IF(TERMA3.EQ.0.D0) GO TO 120
2898 C TERME3=TERME3+DLOG(DABS(TERMA3))
2899 IF(TERME3.LE.-EXPMIN) GO TO 120
2900 IF(TERME3.GT.174.D0) LSW=.FALSE.
2901 9000 FORMAT(' BWD2',1P3G20.12/5X,3G20.12/5X,3G20.12)
2902 IF(.NOT.LSW)WRITE(6,9000)THETA,TERME3,TERMA3,TRME4,TRMA4,TRME3,
2903 * TRMA3,TRME2,TRMA2
2904 IF(.NOT.LSW) RETURN
2905 C SWD2=DSIGN(DEXP(TERME3),TERMA3)
2906 SWD2=TERMA3*DEXP(TERME3)
2907 120 RETURN
2908 END
2909 SUBROUTINE FNOD2
2910 C

```

```

2855
2856
2857
2858
2859
2860
2861
2862
2863
2864
2865
2866
2867
2868
2869
2870
2871
2872
2873
2874
2875
2876
2877
2878
2879
2880
2881
2882
2883
2884
2885
2886
2887
2888
2889
2890
2891
2892
2893
2894
2895
2896
2897
2898
2899
2900
2901
2902
2903
2904
2905
2906
2907
2908
2909
2910

```

```

2911 C ----- THIS ROUTINE IS FOR STEP RELEASE WITHOUT DISPERSION
2912 C ----- FOR TWO-NUCLIDE CHAINS
2913 C
2914 C K1 .NE. K2 .NE. K3
2915 C
2916 C IMPLICIT
2917 * REAL*8 (A-H,O-Z)
2918 LOGICAL LSN
2919 COMMON /LLL/
2920 * LSN,LSW
2921 COMMON/FFFFF/ ENAME(3),THALF(3),CIN(3),ALAMB(3),AC(3),R(3),
2922 * GAP(6),TO,T,P,ETA,THETA,V,SCL
2923 COMMON /XXX/
2924 + XX5, XX6, XX7, XX19,
2925 + XX29, XX39
2926 F11A12= F11(1,2)
2927 F15A12=F15(1,2)
2928 F16A12=F16(1,2)
2929 CALL FF30(1,2,F30E12)
2930 CALL FF33 (1,2,F33E12)
2931 RETURN
2932 C
2933 ENTRY BNOD2(SNOD1,SNOD2,SNOD3,NT,J)
2934 LSN=.TRUE.
2935 DATA EXPMIN/174.D0/
2936 TAU=T*V/SCL
2937 SAVET=THETA
2938 THMT=THETA-TAU
2939 C
2940 C... BEGIN CALCULATIONS FOR TWO MEMBER CHAINS.
2941 C
2942 F34A1=F34(1)
2943 F34A2=F34(2)
2944 C
2945 CALL FF5 (1,2,F5E12)
2946 CALL FF19 (1,F19E1)
2947 CALL FF19 (2,F19E2)
2948 CALL FF30 (1,2,F30E12)
2949 G34A1=0.0
2950 G34A2=0.0
2951 IF (THMT.LT.0.) GO TO 120
2952 THETA=THMT
2953 G34A1=F34(1)
2954 G34A2=F34(2)
2955 THETA=SAVET
2956 C ----- 4-TH TERM
2957 120 CONTINUE
2958 TERME4=0.0D0
2959 TERMA4=0.0D0
2960 GD=G34A1-G34A2
2961 IF (DABS(GD).LT.1.E-30) GO TO 130
2962 TERMA4=F11A12*F16A12*GD
2963 TERME4=F5E12+(XX5-XX19)+F30E12
2964 C
2965 C ----- 3RD TERM
2966 130 CONTINUE

```

```

2911
2912
2913
2914
2915
2916
2917
2918
2919
2920
2921
2922
2923
2924
2925
2926
2927
2928
2929
2930
2931
2932
2933
2934
2935
2936
2937
2938
2939
2940
2941
2942
2943
2944
2945
2946
2947
2948
2949
2950
2951
2952
2953
2954
2955
2956
2957
2958
2959
2960
2961
2962
2963
2964
2965
2966

```

```

2967 TERME3=0.0D0
2968 TERMA3=0.0D0
2969 TERMA5=0.0D0
2970 TERME5=0.0D0
2971 FD=F34A2-F34A1
2972 IF (DABS(FD).LT.1.E-30) GO TO 140
2973 TERMA3=F11A12*F16A12*FD
2974 TERME3=F5E12+F30E12
2975 140 CALL SUM2 (TERME4,TERMA4,TERME3,TERMA3,TERME5,TERMA5)
2976 C
2977 C ---- 2ND TERM
2978 TERME2=0.0D0
2979 TERMA2=0.0D0
2980 FMG1=F34A1-G34A1
2981 FMG2=F34A2-G34A2
2982 IF (DABS(FMG1).LT.1.E-30.AND.DABS(FMG2).LT.1.E-30) GO TO 150
2983 ARG2=F16A12*FMG1
2984 CALL SUM2 (F19E1,ARG2,F19E2,-FMG2,TERME2,TERMA2)
2985 TERMA2=TERMA2*F11A12
2986 C
2987 C ---- 1ST TERM
2988 150 CONTINUE
2989 TERME1=0.0D0
2990 TERMA1=0.0D0
2991 TERME6=0.0D0
2992 TERMA6=0.0D0
2993 FMG=F34A2-G34A2
2994 IF (DABS(FMG).LT.1.E-30) GO TO 160
2995 TERMA1=F11A12*F15A12*FMG
2996 TERME1=F19E1+F33E12
2997 160 CALL SUM2 (TERME1,TERMA1,TERME2,TERMA2,TERME6,TERMA6)
2998 CALL SUM2 (TERME5,TERMA5,TERME6,TERMA6,TERME7,TERMA7)
2999 C
3000 SNOD2=0.0
3001 IF (TERME7.GT.174.D0) LSN=.FALSE.
3002 IF (.NOT.LSN) WRITE (6,9000) THETA,TERME7,TERMA7,TERME5,TERMA5,TERME2,
3003 * TERMA2,TERME1,TERMA1
3004 9000 FORMAT (' BNOD2',1P10G12.4)
3005 IF (.NOT.LSN) RETURN
3006 IF (TERME7.GT.-EXPMIN) SNOD2=2.D0*TERMA7*DEXP(TERME7)
3007 RETURN
3008 END
3009 SUBROUTINE FWD3
3010 C
3011 C THIS ROUTINE CALCULATES THE VALUES OF THE TIME INDEPENDENT
3012 C FUNCTIONS FOR BWD3
3013 C
3014 C
3015 C
3016 C K1 .NE. K2 .NE. K3
3017 C
3018 IMPLICIT
3019 * REAL*8 (A-H,O-Z)
3020 COMMON/FFFFF/ ENAME(3),THALF(3),CIN(3),ALAMB(3),AC(3),R(3),
3021 * GAP(6),TO,T,P,ETA,THETA,V,SCL
3022 COMMON /VFUNC/ F4A121,F4A131,F4A122,F4A231,F12A,F13A,F14A1,F14A2.

```

```

2967
2968
2969
2970
2971
2972
2973
2974
2975
2976
2977
2978
2979
2980
2981
2982
2983
2984
2985
2986
2987
2988
2989
2990
2991
2992
2993
2994
2995
2996
2997
2998
2999
3000
3001
3002
3003
3004
3005
3006
3007
3008
3009
3010
3011
3012
3013
3014
3015
3016
3017
3018
3019
3020
3021
3022

```

3023	*	F16A23,F17A12,F17A13,F17A21,F17A23,F17A31,F17A32.	3023
3024	*	F18A12,F18A13,F18A23,F18A22,F6ME,F6PE,F7ME13.	3024
3025	*	F7ME12,F7ME23,F7PE12,F7PE13,F7PE23,F20ME,F20PE.	3025
3026	*	F20ME1,F20ME2,F20PE1,F20PE2,BE231,BE232,BE121,BE131	3026
3027		F4A121=F4(1,2,1,3)	3027
3028		F4A131=F4(1,3,1,2)	3028
3029		F4A122=F4(1,2,2,3)	3029
3030		F4A231=F4(2,3,1,2)	3030
3031		F12A=F12(1,2)	3031
3032		F13A=F13(1,2,3)	3032
3033		F14A1=F14(1,2,3,1)	3033
3034		F14A2=F14(1,2,3,2)	3034
3035		F16A23=F16(2,3)	3035
3036		F17A12=F17(1,2)	3036
3037		F17A13=F17(1,3)	3037
3038		F17A21=F17(2,1)	3038
3039		F17A23=F17(2,3)	3039
3040		F17A31=F17(3,1)	3040
3041		F17A32=F17(3,2)	3041
3042		F18A12=F18(1,1,2)	3042
3043		F18A13=F18(1,1,3)	3043
3044		F18A23=F18(1,2,3)	3044
3045		F18A22=F18(2,2,3)	3045
3046		CALL FF6M (1,2,3,F6ME)	3046
3047		CALL FF6P (1,2,3,F6PE)	3047
3048		CALL FF7M (1,3,F7ME13)	3048
3049		CALL FF7M (1,2,F7ME12)	3049
3050		CALL FF7M (2,3,F7ME23)	3050
3051		CALL FF7P (1,2,F7PE12)	3051
3052		CALL FF7P (1,3,F7PE13)	3052
3053		CALL FF7P (2,3,F7PE23)	3053
3054		CALL FF20M (1,2,F20ME)	3054
3055		CALL FF20P (1,2,F20PE)	3055
3056		CALL FF20M (1,3,F20ME1)	3056
3057		CALL FF20M (2,3,F20ME2)	3057
3058		CALL FF20P (1,3,F20PE1)	3058
3059		CALL FF20P (2,3,F20PE2)	3059
3060		CALL BB16(2,3,1,BE231)	3060
3061		CALL BB16(2,3,2,BE232)	3061
3062		CALL BB16(1,2,1,BE121)	3062
3063		CALL BB16(1,3,1,BE131)	3063
3064		RETURN	3064
3065		END	3065
3066		SUBROUTINE BWD3 (SWD1,SWD2,SWD3,NT,J)	3066
3067	C		3067
3068	C	---- THIS ROUTINE IS FOR STEP RELEASE WITH DISPERSION	3068
3069	C	---- FOR THREE-NUCLIDE CHAINS	3069
3070	C		3070
3071	C	K1 .NE. K2 .NE. K3	3071
3072	C		3072
3073		IMPLICIT	3073
3074	*	REAL*8 (A-H,O-Z)	3074
3075		LOGICAL LSW	3075
3076		LOGICAL LG	3076
3077		COMMON /LLL/	3077
3078	*	LSN,LSW	3078

3079	COMMON /XXX/				3079
3080	+ XX5,	XX6,	XX7,	XX19.	3080
3081	+ XX29,	XX39			3081
3082	COMMON/FFFFF/	ENAME(3),	THALF(3),	CIN(3),ALAMB(3),	3082
3083	* GAP(6),	T0,T,P,ETA,	THETA,V,SCL		3083
3084	COMMON /VFUNC/	F4A121,F4A131,	F4A122,F4A231,	F12A,F13A,F14A1,F14A2,	3084
3085	* F16A23,	F17A12,F17A13,	F17A21,F17A23,	F17A31,F17A32,	3085
3086	* F18A12,	F18A13,F18A23,	F18A22,F6ME,	F6PE,F7ME13,	3086
3087	* F7ME12,	F7ME23,F7PE12,	F7PE13,F7PE23,	F20ME,F20PE,	3087
3088	* F20ME1,	F20ME2,F20PE1,	F20PE2,BE231,	BE232,BE121,BE131	3088
3089	COMMON /LGTEST/	LG(6)			3089
3090	COMMON /DIV/				3090
3091	* DSW,DSN				3091
3092	DATA EXPMIN/174.D0/				3092
3093	LSW=.TRUE.				3093
3094	DATA ELP/-34.5387764/				3094
3095	TAU=T/SCL*V				3095
3096	ETRM=P*ETA				3096
3097	G9ME=0.D0				3097
3098	G9MA=0.D0				3098
3099	Y9M=0.D0				3099
3100	D9M=0.D0				3100
3101	B9M=0.D0				3101
3102	G9ME12=0.D0				3102
3103	G9MA12=0.D0				3103
3104	Y9M12=0.D0				3104
3105	D9M12=0.D0				3105
3106	B9M12=0.D0				3106
3107	G9PE=0.D0				3107
3108	G9PA=0.D0				3108
3109	G9PE12=0.D0				3109
3110	G9PA12=0.D0				3110
3111	G21E1=0.D0				3111
3112	G21A1=0.D0				3112
3113	G21PE2=0.0D0				3113
3114	G21PA2=0.0D0				3114
3115	Y211=0.D0				3115
3116	D211=0.D0				3116
3117	B211=0.D0				3117
3118	G21E2=0.D0				3118
3119	G21A2=0.D0				3119
3120	Y212=0.D0				3120
3121	D212=0.D0				3121
3122	B212=0.D0				3122
3123	G22E1=0.D0				3123
3124	G22A1=0.D0				3124
3125	G22E2=0.D0				3125
3126	G22A2=0.D0				3126
3127	G23ME=0.D0				3127
3128	G23MA=0.D0				3128
3129	Y23M=0.D0				3129
3130	D23M=0.D0				3130
3131	B23M=0.D0				3131
3132	G23PE=0.D0				3132
3133	G23PA=0.D0				3133
3134					3134

```

3135 C... BEGIN CALCULATIONS FOR THREE MEMBER CHAINS
3136 C
3137 CALL FF5 (1,2,F5E12)
3138 CALL FF5 (1,3,F5E13)
3139 CALL FF5 (2,3,F5E23)
3140 CALL FF8M (1,2,3,F8ME,F8MA,X8M,E8M,A8M)
3141 CALL FF8P (1,2,3,F8PE,F8PA)
3142 CALL FF9M (1,2,1,2,F9ME,F9MA,X9M,E9M,A9M)
3143 CALL FF9M (1,2,2,1,F9ME12,F9MA12,X9M12,E9M12,A9M12)
3144 CALL FF9P (1,2,1,2,F9PE,F9PA)
3145 CALL FF9P (1,2,2,1,F9PE12,F9PA12)
3146 CALL FF9M (1,3,1,3,F9ME13,F9MA13,X9M13,E9M13,A9M13)
3147 CALL FF9M (1,3,3,1,F9ME11,F9MA11,X9M11,E9M11,A9M11)
3148 CALL FF9M (2,3,2,3,F9ME23,F9MA23,X9M23,E9M23,A9M23)
3149 CALL FF9M (2,3,3,2,F9ME22,F9MA22,X9M22,E9M22,A9M22)
3150 CALL FF9P (1,3,1,3,F9PE13,F9PA13)
3151 CALL FF9P (1,3,3,1,F9PE11,F9PA11)
3152 CALL FF9P (2,3,2,3,F9PE23,F9PA23)
3153 CALL FF9P (2,3,3,2,F9PE22,F9PA22)
3154 CALL FF19 (1,F19E1)
3155 CALL FF19 (2,F19E2)
3156 CALL FF19 (3,F19E3)
3157 CALL FF21 (1,F21E1,F21A1,X211,E211,A211)
3158 CALL FF21 (2,F21E2,F21A2,X212,E212,A212)
3159 CALL FF21 (3,F21E3,F21A3,X213,E213,A213)
3160 CALL FF22 (1,F22E1,F22A1)
3161 CALL FF22 (2,F22E2,F22A2)
3162 CALL FF22 (3,F22E3,F22A3)
3163 CALL FF23M (1,2,F23ME,F23MA,X23M,E23M,A23M)
3164 CALL FF23M (1,3,F23ME1,F23MA1,X23M1,E23M1,A23M1)
3165 CALL FF23M (2,3,F23ME2,F23MA2,X23M2,E23M2,A23M2)
3166 CALL FF23P (1,2,F23PE,F23PA)
3167 CALL FF23P (1,3,F23PE1,F23PA1)
3168 CALL FF23P (2,3,F23PE2,F23PA2)
3169 SAVE=THETA
3170 TERME1=THETA-(T/SCL*V)
3171 G8ME=0.D0
3172 G8MA=0.D0
3173 Y8M=0.D0
3174 D8M=0.D0
3175 B8M=0.D0
3176 G8PE=0.D0
3177 G8PA=0.D0
3178 G9ME13=0.D0
3179 G9MA13=0.D0
3180 Y9M13=0.D0
3181 D9M13=0.D0
3182 B9M13=0.D0
3183 G9ME11=0.D0
3184 G9MA11=0.D0
3185 Y9M11=0.D0
3186 D9M11=0.D0
3187 B9M11=0.D0
3188 G9ME23=0.D0
3189 G9MA23=0.D0
3190 Y9M23=0.D0

```

```

3135
3136
3137
3138
3139
3140
3141
3142
3143
3144
3145
3146
3147
3148
3149
3150
3151
3152
3153
3154
3155
3156
3157
3158
3159
3160
3161
3162
3163
3164
3165
3166
3167
3168
3169
3170
3171
3172
3173
3174
3175
3176
3177
3178
3179
3180
3181
3182
3183
3184
3185
3186
3187
3188
3189
3190

```


3191 D9M23=0.D0
3192 B9M23=0.D0
3193 G9ME22=0.D0
3194 G9MA22=0.D0
3195 Y9M22=0.D0
3196 D9M22=0.D0
3197 B9M22=0.D0
3198 G9PE13=0.D0
3199 G9PA13=0.D0
3200 G9PE11=0.D0
3201 G9PA11=0.D0
3202 G9PE23=0.D0
3203 G9PA23=0.D0
3204 G9PA22=0.D0
3205 G9PE22=0.D0
3206 G21E1=0.D0
3207 G21A1=0.D0
3208 Y211=0.D0
3209 D211=0.D0
3210 B211=0.D0
3211 G21E2=0.D0
3212 G21A2=0.D0
3213 Y212=0.D0
3214 D212=0.D0
3215 B212=0.D0
3216 G21E3=0.D0
3217 G21A3=0.D0
3218 Y213=0.D0
3219 D213=0.D0
3220 B213=0.D0
3221 G22E3=0.D0
3222 G22A3=0.D0
3223 G23ME1=0.D0
3224 G23MA1=0.D0
3225 Y23M1=0.D0
3226 D23M1=0.D0
3227 B23M1=0.D0
3228 G23MA2=0.D0
3229 G23ME2=0.D0
3230 Y23M2=0.D0
3231 D23M2=0.D0
3232 B23M2=0.D0
3233 G23PE1=0.D0
3234 G23PA1=0.D0
3235 G23PE2=0.D0
3236 G23PA2=0.D0
3237 G23PE=0.D0
3238 G23PA=0.D0
3239 G23ME=0.D0
3240 G23MA=0.D0
3241 Y23M=0.D0
3242 D23M=0.D0
3243 B23M=0.D0
3244 G9PE12=0.D0
3245 G9PA12=0.D0
3246 G9PE=0.D0

3191
3192
3193
3194
3195
3196
3197
3198
3199
3200
3201
3202
3203
3204
3205
3206
3207
3208
3209
3210
3211
3212
3213
3214
3215
3216
3217
3218
3219
3220
3221
3222
3223
3224
3225
3226
3227
3228
3229
3230
3231
3232
3233
3234
3235
3236
3237
3238
3239
3240
3241
3242
3243
3244
3245
3246

3247	G9PA=0.D0	3247
3248	G9ME=0.D0	3248
3249	G9MA=0.D0	3249
3250	Y9M=0.D0	3250
3251	D9M=0.D0	3251
3252	B9M=0.D0	3252
3253	G9ME12=0.D0	3253
3254	G9MA12=0.D0	3254
3255	Y9M12=0.D0	3255
3256	D9M12=0.D0	3256
3257	B9M12=0.D0	3257
3258	G22E1=0.D0	3258
3259	G22A1=0.D0	3259
3260	G22E2=0.D0	3260
3261	G22A2=0.D0	3261
3262	IF (TERME1.LT.0.00) GO TO 135	3262
3263	THETA=TERME1	3263
3264	CALL FF8M (1,2,3,G8ME,G8MA,Y8M,D8M,B8M)	3264
3265	CALL FF8P (1,2,3,G8PE,G8PA)	3265
3266	CALL FF9M (1,2,1,2,G9ME,G9MA,Y9M,D9M,B9M)	3266
3267	CALL FF9M (1,2,2,1,G9ME12,G9MA12,Y9M12,D9M12,B9M12)	3267
3268	CALL FF9M (1,3,1,3,G9ME13,G9MA13,Y9M13,D9M13,B9M13)	3268
3269	CALL FF9M (1,3,3,1,G9ME11,G9MA11,Y9M11,D9M11,B9M11)	3269
3270	CALL FF9M (2,3,2,3,G9ME23,G9MA23,Y9M23,D9M23,B9M23)	3270
3271	CALL FF9M (2,3,3,2,G9ME22,G9MA22,Y9M22,D9M22,B9M22)	3271
3272	CALL FF9P (1,2,1,2,G9PE,G9PA)	3272
3273	CALL FF9P (1,2,2,1,G9PE12,G9PA12)	3273
3274	CALL FF9P (1,3,1,3,G9PE13,G9PA13)	3274
3275	CALL FF9P (1,3,3,1,G9PE11,G9PA11)	3275
3276	CALL FF9P (2,3,2,3,G9PE23,G9PA23)	3276
3277	CALL FF9P (2,3,3,2,G9PE22,G9PA22)	3277
3278	CALL FF21 (1,G21E1,G21A1,Y211,D211,B211)	3278
3279	CALL FF21 (2,G21E2,G21A2,Y212,D212,B212)	3279
3280	CALL FF21 (3,G21E3,G21A3,Y213,D213,B213)	3280
3281	CALL FF22 (1,G22E1,G22A1)	3281
3282	CALL FF22 (2,G22E2,G22A2)	3282
3283	CALL FF22 (3,G22E3,G22A3)	3283
3284	CALL FF23M (1,2,G23ME,G23MA,Y23M,D23M,B23M)	3284
3285	CALL FF23M (1,3,G23ME1,G23MA1,Y23M1,D23M1,B23M1)	3285
3286	CALL FF23M (2,3,G23ME2,G23MA2,Y23M2,D23M2,B23M2)	3286
3287	CALL FF23P (1,2,G23PE,G23PA)	3287
3288	CALL FF23P (1,3,G23PE1,G23PA1)	3288
3289	CALL FF23P (2,3,G23PE2,G23PA2)	3289
3290	THETA=SAVE	3290
3291	135 CONTINUE	3291
3292	SUME=0.0D0	3292
3293	SUMA=0.0D0	3293
3294	TERMA1=0.0D0	3294
3295	TERMA2=0.0D0	3295
3296	TERMA3=0.0D0	3296
3297	TERMA4=0.0D0	3297
3298	TERMA5=0.0D0	3298
3299	TERMA8=0.0D0	3299
3300	TERMA9=0.0D0	3300
3301	TERME8=0.0D0	3301
3302	IF (.NOT.LG(3))GO TO 1400	3302

```

3303 C
3304 C
3305 C
3306 C ----- 15-TH TERM
3307 C Z0=F13(1,2,3)*F5(2,3)/(F17(1,2)*F18(2,2,3))
3308 C Z1=F7M(2,3) Z2=F9M(2,3,3,2) Z3=F9M(2,3,2,3)
3309 C Z4=F7P(2,3) Z5=F9P(2,3,3,2) Z6=F9P(2,3,2,3)
3310 C Z7=BB16(2,3,2) Z8=G9M(2,3,2,3) Z9=G9M(2,3,3,2)
3311 C Z10=G9P(2,3,2,3) Z11=G9P(2,3,3,2)
3312 C Z2-Z3
3313 C CALL DIFERF(X9M22,E9M22,A9M22,X9M23,E9M23,A9M23,TERME1,TERMA1)
3314 C
3315 C Z1*(Z2-Z3)
3316 C TERME1=TERME1+F7ME23
3317 C
3318 C Z5-Z6
3319 C CALL SUM2(F9PE22,F9PA22,F9PE23,-F9PA23,TERME2,TERMA2)
3320 C
3321 C Z4*(Z5-Z6)
3322 C TERME2=TERME2+F7PE23
3323 C
3324 C Z8-Z9
3325 C CALL DIFERF(Y9M23,D9M23,B9M23,Y9M22,D9M22,B9M22,TERME3,TERMA3)
3326 C
3327 C Z1*(Z8-Z9)
3328 C TERME3=TERME3+F7ME23
3329 C
3330 C Z10-Z11
3331 C CALL SUM2(G9PE23,G9PA23,G9PE22,-G9PA22,TERME4,TERMA4)
3332 C
3333 C Z4*(Z10-Z11)
3334 C TERME4=TERME4+F7PE23
3335 C
3336 C Z1*(Z2-Z3) + Z4*(Z5-Z6)
3337 C CALL SUM2(TERME1,TERMA1,TERME2,TERMA2,TERME1,TERMA1)
3338 C
3339 C Z1*(Z8-Z9) + Z4*(Z10-Z11)
3340 C CALL SUM2(TERME3,TERMA3,TERME4,TERMA4,TERME2,TERMA2)
3341 C
3342 C Z7*(Z1*(Z8-Z9) + Z4*(Z10-Z11))
3343 C TERME2=TERME2+BE232
3344 C
3345 C Z1*(Z2-Z3)+Z4*(Z5-Z6)+Z7*(Z1*(Z8-Z9)+Z4*(Z10-Z11))
3346 C CALL SUM2(TERME1,TERMA1,TERME2,TERMA2,TERME3,TERMA3)
3347 C
3348 C Z0*(Z1*(Z2-Z3)+Z4*(Z5-Z6)+Z7*(Z1*(Z8-Z9)+Z4*(Z10-Z11)))
3349 C TERME8=TERME3+F5E23
3350 C TERMA8=TERMA3*F13A/(F17A12*F18A22)
3351 C
3352 C ----- 14-TH TERM
3353 C 1400 CONTINUE
3354 C IF(.NOT.LG(2))GO TO 1300
3355 C 140 CALL SUM2 (F9PE11,F9PA11,F9PE13,-F9PA13,TERME1,TERMA1)
3356 C CALL SUM2 (G9PE11,G9PA11,G9PE13,-G9PA13,TERME2,TERMA2)
3357 C TERME2=TERME2+BE131
3358 C CALL SUM2 (TERME1,TERMA1,TERME2,-TERMA2,TERME1,TERMA1)

```

```

3303
3304
3305
3306
3307
3308
3309
3310
3311
3312
3313
3314
3315
3316
3317
3318
3319
3320
3321
3322
3323
3324
3325
3326
3327
3328
3329
3330
3331
3332
3333
3334
3335
3336
3337
3338
3339
3340
3341
3342
3343
3344
3345
3346
3347
3348
3349
3350
3351
3352
3353
3354
3355
3356
3357
3358

```

```

3359 TERME1=TERME1+F7PE13 3359
3360 CALL DIFERF (X9M11,E9M11,A9M11,X9M13,E9M13,A9M13,TERME2,TERMA2) 3360
3361 CALL DIFERF (Y9M11,D9M11,B9M11,Y9M13,D9M13,B9M13,TERME3,TERMA3) 3361
3362 TERME3=TERME3+BE131 3362
3363 CALL SUM2 (TERME2,TERMA2,TERME3,-TERMA3,TERME2,TERMA2) 3363
3364 TERME2=TERME2+F7ME13 3364
3365 CALL SUM2 (TERME2,TERMA2,TERME1,TERMA1,TERME3,TERMA3) 3365
3366 TERME9=TERME3+F5E13 3366
3367 TERMA9=TERMA3/F18A13*F14A1/F4A121 3367
3368 3368
3369 C CALL SUM2 (TERME8,-TERMA8,TERME9,TERMA9,SUME,SUMA) 3369
3370 C ----- 13-TH TERM 3370
3371 1300 CONTINUE 3371
3372 IF (.NOT.LG(1))GO TO 1200 3372
3373 TERME1=F6PE+F8PE 3373
3374 TERME2=F7PE12+F9PE 3374
3375 CALL SUM2 (TERME1,F8PA,TERME2,-F9PA,TERME3,TERMA3) 3375
3376 TERME1=F7ME12+F9ME 3376
3377 CALL SUM2 (TERME3,TERMA3,TERME1,-F9MA,TERME2,TERMA2) 3377
3378 TERME3=F6ME+F8ME 3378
3379 CALL SUM2 (TERME2,TERMA2,TERME3,F8MA,TERME1,TERMA1) 3379
3380 TERME2=F6PE+G8PE 3380
3381 TERME3=F7PE12+G9PE 3381
3382 CALL SUM2 (TERME2,G8PA,TERME3,-G9PA,TERME3,TERMA3) 3382
3383 TERME2=F7ME12+G9ME 3383
3384 CALL SUM2 (TERME3,TERMA3,TERME2,-G9MA,TERME3,TERMA3) 3384
3385 TERME2=F6ME+G8ME 3385
3386 CALL SUM2 (TERME3,TERMA3,TERME2,G8MA,TERME3,TERMA3) 3386
3387 TERME3=TERME3+BE121 3387
3388 CALL SUM2 (TERME1,TERMA1,TERME3,-TERMA3,TERME1,TERMA1) 3388
3389 TERME5=TERME1+F5E12 3389
3390 TERMA5=TERMA1/F18A12*F14A1/F4A131 3390
3391 C ----- 12-TH TERM 3391
3392 C 3392
3393 1200 CONTINUE 3393
3394 IF (.NOT.LG(5))GO TO 1100 3394
3395 TERME1=F20ME1+F23ME1 3395
3396 TERME2=F20PE1+F23PE1 3396
3397 CALL SUM2 (TERME1,F23MA1,TERME2,F23PA1,TERME1,TERMA1) 3397
3398 CALL SUM2 (TERME1,TERMA1,F21E1,-F21A1,TERME1,TERMA1) 3398
3399 CALL SUM2 (TERME1,TERMA1,F22E1,-F22A1,TERME1,TERMA1) 3399
3400 TERME2=F20PE1+G23PE1 3400
3401 TERME3=F20ME1+G23ME1 3401
3402 CALL SUM2 (TERME3,G23MA1,TERME2,G23PA1,TERME3,TERMA3) 3402
3403 CALL SUM2 (TERME3,TERMA3,G21E1,-G21A1,TERME3,TERMA3) 3403
3404 CALL SUM2 (TERME3,TERMA3,G22E1,-G22A1,TERME3,TERMA3) 3404
3405 CALL SUM2 (TERME1,TERMA1,TERME3,-TERMA3,TERME2,TERMA2) 3405
3406 TERME3=TERME2+F19E1 3406
3407 TERMA3=TERMA2/F18A12*F14A1/F18A13 3407
3408 C 3408
3409 CALL SUM2 (SUME,SUMA,TERME3,TERMA3,SUME,SUMA) 3409
3410 C 3410
3411 C ----- 11-TH TERM 3411
3412 1100 CONTINUE 3412
3413 IF (.NOT.LG(3))GO TO 1000 3413
3414 CALL SUM2 (F9PE22,F9PA22,F9PE23,-F9PA23,TERME2,TERMA2) 3414

```

3415		CALL SUM2 (G9PE22,G9PA22,G9PE23,-G9PA23,TERME3,TERMA3)	3415
3416		TERME3=TERME3+BE231	3416
3417		CALL SUM2 (TERME2,TERMA2,TERME3,-TERMA3,TERME2,TERMA2)	3417
3418		TERME2=TERME2+F7PE23	3418
3419		CALL DIFERF (X9M22,E9M22,A9M22,X9M23,E9M23,A9M23,TERME1,TERMA1)	3419
3420		CALL DIFERF (Y9M22,D9M22,B9M22,Y9M23,D9M23,B9M23,TERME3,TERMA3)	3420
3421		TERME3=TERME3+BE231	3421
3422		CALL SUM2 (TERME1,TERMA1,TERME3,-TERMA3,TERME1,TERMA1)	3422
3423		TERME1=TERME1+F7ME23	3423
3424		CALL SUM2 (TERME1,TERMA1,TERME2,TERMA2,TERME8,TERMA8)	3424
3425		TERME8=TERME8+F5E23	3425
3426		TERMA8=TERMA8/F18A23*F14A2/F4A122	3426
3427	C		3427
3428	1000	CONTINUE	3428
3429		CALL SUM2 (TERME8,TERMA8,SUME,-SUMA,SUME,SUMA)	3429
3430	C		3430
3431	C	----- 10-TH TERM	3431
3432		IF(.NOT.LG(1))GO TO 900	3432
3433		TERME2=F6PE+F8PE	3433
3434		TERME3=F7PE12+F9PE12	3434
3435		CALL SUM2 (TERME2,F8PA,TERME3,-F9PA12,TERME9,TERMA9)	3435
3436		TERME3=F7ME12+F9ME12	3436
3437		CALL SUM2 (TERME9,TERMA9,TERME3,-F9MA12,TERME8,TERMA8)	3437
3438		TERME2=F6ME+F8ME	3438
3439		CALL SUM2 (TERME8,TERMA8,TERME2,F8MA,TERME9,TERMA9)	3439
3440		TERME2=F6PE+G8PE	3440
3441		TERME3=F7PE12+G9PE12	3441
3442		CALL SUM2 (TERME2,G8PA,TERME3,-G9PA12,TERME2,TERMA2)	3442
3443		TERME3=F7ME12+G9ME12	3443
3444		CALL SUM2 (TERME2,TERMA2,TERME3,-G9MA12,TERME2,TERMA2)	3444
3445		TERME3=F6ME+G8ME	3445
3446		CALL SUM2 (TERME2,TERMA2,TERME3,G8MA,TERME2,TERMA2)	3446
3447		TERME2=TERME2+BE121	3447
3448		CALL SUM2 (TERME9,TERMA9,TERME2,-TERMA2,TERME9,TERMA9)	3448
3449		TERME9=TERME9+F5E12	3449
3450		TERMA9=TERMA9/F18A12*F14A2/F4A231	3450
3451	C	ELP IS NATURAL LOG OF .5*E-16	3451
3452		CALL SUM2 (TERME9,TERMA9,TERME5,-TERMA5,TERME2,TERMA2)	3452
3453		IF (TERMA5.EQ.0.DO.OR.TERMA2.EQ.0.DO) GO TO 150	3453
3454		CHE=TERME2-TERME5+DLOG(DABS(TERMA2/TERMA5))	3454
3455		IF (CHE.LT.ELP) TERMA2=0.	3455
3456		IF (CHE.LT.ELP) TERME2=0.	3456
3457	C		3457
3458	150	CONTINUE	3458
3459		CALL SUM2 (SUME,SUMA,TERME2,TERMA2,SUME,SUMA)	3459
3460	C		3460
3461	C	----- 9-TH TERM	3461
3462	900	CONTINUE	3462
3463		IF(.NOT.LG(5).OR..NOT.LG(4))GO TO 800	3463
3464		CALL SUM2 (F23PE1,F23PA1,G23PE1,-G23PA1,TERME1,TERMA1)	3464
3465		CALL SUM2 (F23PE,F23PA,G23PE,-G23PA,TERME2,TERMA2)	3465
3466		TERME2=TERME2+F20PE	3466
3467		TERME1=TERME1+F20PE1	3467
3468		CALL SUM2 (TERME1,TERMA1,TERME2,-TERMA2,TERME1,TERMA1)	3468
3469		CALL DIFERF (X23M1,E23M1,A23M1,Y23M1,D23M1,B23M1,TERME2,TERMA2)	3469
3470		TERME2=TERME2+F20ME1	3470

```

3471 CALL DIFERF (X23M,E23M,A23M,Y23M,D23M,B23M,TERME3,TERMA3)
3472 TERME3=TERME3+F20ME
3473 CALL SUM2 (TERME2,TERMA2,TERME3,-TERMA3,TERME2,TERMA2)
3474 CALL SUM2 (TERME2,TERMA2,TERME1,TERMA1,TERME3,TERMA3)
3475 TERME3=TERME3+F19E1
3476 TERMA3=TERMA3/F18A12*F14A2/F18A23
3477 C
3478 CALL SUM2 (TERME3,TERMA3,SUME,SUMA,SUME,SUMA)
3479 C
3480 C ----- 8-TH TERM
3481 800 CONTINUE
3482 IF(.NOT.LG(3))GO TO 700
3483 C Z0=F13(1,2,3)*F5(2,3)/(F17(2,1)*F18(1,2,3))
3484 C Z1=F7M(2,3) Z2=F9M(2,3,3,2) Z3=F9M(2,3,2,3)
3485 C Z4=F7P(2,3) Z5=F9P(2,3,3,2) Z6=F9P(2,3,2,3)
3486 C Z7=AB16(2,3,1) Z8=G9M(2,3,2,3) Z9=G9M(2,3,3,2)
3487 C Z10=G9P(2,3,2,3) Z11=G9P(2,3,3,2)
3488 C
3489 C Z2-Z3
3490 CALL DIFERF (X9M22,E9M22,A9M22,X9M23,E9M23,A9M23,TERME1,TERMA1)
3491 C
3492 C Z1*(Z2-Z3)
3493 C TERME1=TERME1+F7ME23
3494 C
3495 C Z5-Z6
3496 CALL SUM2 (F9PE22,F9PA22,F9PE23,-F9PA23,TERME2,TERMA2)
3497 C
3498 C Z4*(Z5-Z6)
3499 C TERME2=TERME2+F7PE23
3500 C
3501 C Z8-Z9
3502 CALL DIFERF (Y9M23,D9M23,B9M23,Y9M22,D9M22,B9M22,TERME3,TERMA3)
3503 C
3504 C Z1*(Z8-Z9)
3505 C TERME3=TERME3+F7ME23
3506 C
3507 C Z10-Z11
3508 CALL SUM2 (G9PE23,G9PA23,G9PE22,-G9PA22,TERME4,TERMA4)
3509 C
3510 C Z4*(Z10-Z11)
3511 C TERME4=TERME4+F7PE23
3512 C
3513 C Z1*(Z2-Z3) + Z4*(Z5-Z6)
3514 CALL SUM2 (TERME1,TERMA1,TERME2,TERMA2,TERME1,TERMA1)
3515 C
3516 C Z1*(Z8-Z9) + Z4*(Z10-Z11)
3517 CALL SUM2 (TERME3,TERMA3,TERME4,TERMA4,TERME2,TERMA2)
3518 C
3519 C Z7*(Z1*(Z8-Z9) + Z4*(Z10-Z11))
3520 C TERME2=TERME2+BE231
3521 C
3522 C Z1*(Z2-Z3)+Z4*(Z5-Z6)+Z7*(Z1*(Z8-Z9)+Z4*(Z10-Z11))
3523 CALL SUM2 (TERME1,TERMA1,TERME2,TERMA2,TERME3,TERMA3)
3524 C
3525 C Z0*(Z1*(Z2-Z3)+Z4*(Z5-Z6)+Z7*(Z1*(Z8-Z9)+Z4*(Z10-Z11)))
3526 C TERME3=TERME3+F5E23

```

```

3471
3472
3473
3474
3475
3476
3477
3478
3479
3480
3481
3482
3483
3484
3485
3486
3487
3488
3489
3490
3491
3492
3493
3494
3495
3496
3497
3498
3499
3500
3501
3502
3503
3504
3505
3506
3507
3508
3509
3510
3511
3512
3513
3514
3515
3516
3517
3518
3519
3520
3521
3522
3523
3524
3525
3526

```

3527		TERMA3=TERMA3*F13A/(F17A21*F18A23)	3527
3528	C		3528
3529	C		3529
3530		CALL SUM2 (TERME3,TERMA3,SUME,SUMA,SUME,SUMA)	3530
3531	C		3531
3532	C	----- 7-TH TERM	3532
3533	700	CONTINUE	3533
3534		IF(.NOT.LG(6))GO TO 600	3534
3535		TERME1=F20ME2+F23ME2	3535
3536		TERME2=F20PE2+F23PE2	3536
3537		CALL SUM2 (TERME1,F23MA2,TERME2,F23PA2,TERME1,TERMA1)	3537
3538		CALL SUM2 (TERME1,TERMA1,F21E2,-F21A2,TERME1,TERMA1)	3538
3539		CALL SUM2 (TERME1,TERMA1,F22E2,-F22A2,TERME1,TERMA1)	3539
3540		TERME2=F20PE2+G23PE2	3540
3541		TERME3=F20ME2+G23ME2	3541
3542		CALL SUM2 (TERME3,G23MA2,TERME2,G23PA2,TERME3,TERMA3)	3542
3543		CALL SUM2 (TERME3,TERMA3,G21E2,-G21A2,TERME3,TERMA3)	3543
3544		CALL SUM2 (TERME3,TERMA3,G22E2,-G22A2,TERME3,TERMA3)	3544
3545		CALL SUM2 (TERME1,TERMA1,TERME3,-TERMA3,TERME2,TERMA2)	3545
3546		TERME3=TERME2+F19E2	3546
3547		TERMA3=TERMA2/F17A21*F13A/F18A22	3547
3548	C		3548
3549		CALL SUM2 (SUME,SUMA,TERME3,TERMA3,SUME,SUMA)	3549
3550	C		3550
3551	C	----- 6-TH TERM	3551
3552	600	CONTINUE	3552
3553		IF(.NOT.LG(4).OR..NOT.LG(5))GO TO 500	3553
3554		CALL SUM2 (F23PE,F23PA,G23PE,-G23PA,TERME1,TERMA1)	3554
3555		TERME1=TERME1+F20PE	3555
3556		CALL SUM2 (F23PE1,F23PA1,G23PE1,-G23PA1,TERME2,TERMA2)	3556
3557		TERME2=TERME2+F20PE1	3557
3558		CALL SUM2 (TERME3,TERMA2,TERME1,-TERMA1,TERME2,TERMA2)	3558
3559		CALL DIFERF (X23M,E23M,A23M,Y23M,D23M,B23M,TERME1,TERMA1)	3559
3560		TERME1=TERME1+F20ME	3560
3561		CALL DIFERF (X23M1,E23M1,A23M1,Y23M1,D23M1,B23M1,TERME3,TERMA3)	3561
3562		TERME3=TERME3+F20ME1	3562
3563		CALL SUM2 (TERME3,TERMA3,TERME1,-TERMA1,TERME3,TERMA3)	3563
3564		CALL SUM2 (TERME3,TERMA3,TERME2,TERMA2,TERME3,TERMA3)	3564
3565		TERME3=TERME3+F19E1	3565
3566		TERMA3=TERMA3/F17A12*F13A/F18A23	3566
3567	C		3567
3568		CALL SUM2 (TERME3,TERMA3,SUME,SUMA,SUME,SUMA)	3568
3569	C		3569
3570	C	----- 5-TH TERM	3570
3571	500	CONTINUE	3571
3572		TERMA9=0.0D0	3572
3573		TERME9=0.0D0	3573
3574		IF(.NOT.LG(5).OR..NOT.LG(6))GO TO 400	3574
3575		CALL SUM2 (F21E3,F21A3,F22E3,F22A3,TERME1,TERMA1)	3575
3576		CALL SUM2 (G21E3,G21A3,G22E3,G22A3,TERME2,TERMA2)	3576
3577		CALL SUM2 (TERME1,TERMA1,TERME2,-TERMA2,TERME1,TERMA1)	3577
3578		TERME1=TERME1+F19E3	3578
3579		TERMA1=TERMA1/F17A31/F17A32	3579
3580		CALL DIFERF (X23M2,E23M2,A23M2,Y23M2,D23M2,B23M2,TERME3,TERMA3)	3580
3581		CALL SUM2 (F23PE2,F23PA2,G23PE2,-G23PA2,TERME4,TERMA4)	3581
3582		TERME4=TERME4+F20PE2	3582

3583		TERME3=TERME3+F20ME2	3583
3584		CALL SUM2 (TERME4,TERMA4,TERME3,TERMA3,TERME9,TERMA9)	3584
3585		TERME9=TERME9+F19E2	3585
3586		TERMA9=TERMA9/F17A21/F17A23	3586
3587		CALL SUM2 (TERME1,TERMA1,TERME9,TERMA9,TERME4,TERMA4)	3587
3588		CALL SUM2 (F23PE1,F23PA1,G23PE1,-G23PA1,TERME2,TERMA2)	3588
3589		TERME2=TERME2+F20PE1	3589
3590		CALL DIFERF (X23M1,E23M1,A23M1,Y23M1,D23M1,B23M1,TERME3,TERMA3)	3590
3591		TERME3=TERME3+F20ME1	3591
3592		CALL SUM2 (TERME2,TERMA2,TERME3,TERMA3,TERME1,TERMA1)	3592
3593		TERME1=TERME1+F19E1	3593
3594		TERMA1=TERMA1/F17A12/F17A13	3594
3595		CALL SUM2 (TERME4,TERMA4,TERME1,TERMA1,TERME9,TERMA9)	3595
3596		TERMA9=TERMA9*F12A	3596
3597		CALL SUM2 (SUME,SUMA,TERME9,TERMA9,TERME4,TERMA4)	3597
3598	C		3598
3599		GO TO 300	3599
3600	400	CONTINUE	3600
3601		TERME4=SUME	3601
3602		TERMA4=SUMA	3602
3603	300	CONTINUE	3603
3604		SWD3=0.D0	3604
3605		DSW=0.0D0	3605
3606		IF (TERME4.GT.174.D0) LSW=.FALSE.	3606
3607		IF (.NOT.LSW) WRITE (6,9000) THETA,TERME4,TERMA4	3607
3608		IF (.NOT.LSW) RETURN	3608
3609		IF (TERME4.GT.-EXPMIN) SWD3=DEXP (TERME4)*TERMA4	3609
3610		RETURN	3610
3611	9000	FORMAT (' BWD3',1P3G12.4)	3611
3612		END	3612
<hr/>			
3613		SUBROUTINE FNOD3	3613
3614	C		3614
3615	C	---- THIS ROUTINE IS FOR STEP RELEASE WITHOUT DISPERSION	3615
3616	C	---- FOR THREE-NUCLIDE CHAINS	3616
3617	C		3617
3618	C	K1 .NE. K2 .NE. K3	3618
3619	C		3619
3620		IMPLICIT	3620
3621		* REAL*8 (A-H,O-Z)	3621
3622		LOGICAL LSN	3622
3623		COMMON /LLL/	3623
3624		* LSN,LSW	3624
3625		COMMON/FFFFF/ ENAME(3),THALF(3),CIN(3),ALAMB(3),AC(3),R(3),	3625
3626		* GAP(6),TO,T,P,ETA,THETA,V,SCL	3626
3627		COMMON /XXX/	3627
3628		+ XX5, XX6, XX7, XX19,	3628
3629		+ XX29, XX39	3629
3630		DATA EXPMIN/174.D0/	3630
3631		DATA ELP/-34.5387764/	3631
3632	C		3632
3633	C...	BEGIN CALCULATIONS FOR THREE MEMBER CHAINS.	3633
3634	C		3634
3635		F4A121=F4(1,2,1,3)	3635
3636		F4A131=F4(1,3,1,2)	3636
3637		F4A122=F4(1,2,2,3)	3637
3638		F4A231=F4(2,3,1,2)	3638

3639	F12A12=F12(1,2)	3639
3640	F13A=F13(1,2,3)	3640
3641	F14A1=F14(1,2,3,1)	3641
3642	F14A2=F14(1,2,3,2)	3642
3643	F15A23=F15(2,3)	3643
3644	F17A12=F17(1,2)	3644
3645	F17A13=F17(1,3)	3645
3646	F17A21=F17(2,1)	3646
3647	F17A23=F17(2,3)	3647
3648	F17A31=F17(3,1)	3648
3649	F17A32=F17(3,2)	3649
3650	F18A12=F18(1,1,2)	3650
3651	F18A13=F18(1,1,3)	3651
3652	F18A23=F18(1,2,3)	3652
3653	F18A22=F18(2,2,3)	3653
3654	CALL FF30 (1,2,F30E12)	3654
3655	CALL FF30 (1,3,F30E13)	3655
3656	CALL FF30 (2,3,F30E23)	3656
3657	CALL FF31 (1,2,3,F31E)	3657
3658	CALL FF33 (1,2,F33E12)	3658
3659	CALL FF33 (1,3,F33E13)	3659
3660	CALL FF33 (2,3,F33E23)	3660
3661	RETURN	3661
3662	C	3662
3663	ENTRY BNOD3(SNOD1,SNOD2,SNOD3,NT,J)	3663
3664	LSN=.TRUE.	3664
3665	TAU=T*V/SCL	3665
3666	SAVET=THETA	3666
3667	THMT=THETA-TAU	3667
3668	F34A1=F34(1)	3668
3669	F34A2=F34(2)	3669
3670	F34A3=F34(3)	3670
3671	CALL FF5 (1,2,F5E12)	3671
3672	CALL FF5 (1,3,F5E13)	3672
3673	CALL FF5 (2,3,F5E23)	3673
3674	CALL FF19 (1,F19E1)	3674
3675	CALL FF19 (2,F19E2)	3675
3676	CALL FF19 (3,F19E3)	3676
3677	G34A1=0.0	3677
3678	G34A2=0.0	3678
3679	G34A3=0.0	3679
3680	IF (THMT.LT.0.D0) GO TO 180	3680
3681	THETA=THMT	3681
3682	G34A1=F34(1)	3682
3683	G34A2=F34(2)	3683
3684	G34A3=F34(3)	3684
3685	THETA=SAVET	3685
3686	C	3686
3687	C	3687
3688	180 ---- 14-TH TERM	3688
3689	TERMA9=F34A1-F34A3	3689
3690	TERME1=XX7-XX19	3690
3691	TERMA1=G34A3-G34A1	3691
3692	CALL SUM2 (0.0D0,TERMA9,TERME1,TERMA1,TERME9,TERMA9)	3692
3693	IF (TERMA9.NE.0.D0) GO TO 190	3693
3694	TERME9=0.D0	3694
	GO TO 200	

3695		190	TERMA9=TERMA9*F14A1/F18A13/F4A121	3695
3696			TERME9=TERME9+F5E13+F30E13	3696
3697	C			3697
3698	C		----- 13-TH TERM	3698
3699		200	CALL SUM2 (F31E,F34A3,F30E12,-F34A1,TERME1,TERMA1)	3699
3700			TERMA8=0.D0	3700
3701			TERME8=0.D0	3701
3702			CALL SUM2 (F31E,G34A3,F30E12,-G34A1,TERME3,TERMA3)	3702
3703			TERME3=TERME3+XX5-XX19	3703
3704			CALL SUM2 (TERME1,TERMA1,TERME3,-TERMA3,TERME1,TERMA1)	3704
3705			IF (TERMA1.EQ.0.D0) GO TO 210	3705
3706			TERME1=TERME1+F5E12	3706
3707			TERMA1=TERMA1*F14A1/F18A12/F4A131	3707
3708			TERME8=TERME1	3708
3709			TERMA8=TERMA1	3709
3710	C			3710
3711	C		----- 12-TH TERM	3711
3712		210	TERMA3=F34A3-G34A3	3712
3713			TERMA4=F34A1-G34A1	3713
3714			CALL SUM2 (F33E13,-TERMA3,0.D0,TERMA4,TERME1,TERMA1)	3714
3715			IF (TERMA1.EQ.0.D0) GO TO 220	3715
3716			TERME1=TERME1+F19E1	3716
3717			TERMA1=TERMA1*F14A1/F18A12/F18A13	3717
3718			CALL SUM2 (TERME9,TERMA9,TERME1,TERMA1,TERME9,TERMA9)	3718
3719	C			3719
3720	C		----- 11-TH TERM	3720
3721		220	TERMA1=F34A3-F34A2	3721
3722			TERMA3=G34A3-G34A2	3722
3723			TERME3=XX6-XX19	3723
3724			CALL SUM2 (0.D0,TERMA1,TERME3,-TERMA3,TERME1,TERMA1)	3724
3725			IF (TERMA1.EQ.0.D0) GO TO 230	3725
3726			TERMA1=TERMA1*F14A2/F18A23/F4A122	3726
3727			TERME1=TERME1+F5E23+F30E23	3727
3728			CALL SUM2 (TERME9,TERMA9,TERME1,TERMA1,TERME9,TERMA9)	3728
3729	C			3729
3730	C		----- 10-TH TERM	3730
3731		230	CALL SUM2 (F31E,F34A3,F30E12,-F34A2,TERME1,TERMA1)	3731
3732			CALL SUM2 (F31E,G34A3,F30E12,-G34A2,TERME3,TERMA3)	3732
3733			TERME3=TERME3+XX5-XX19	3733
3734			CALL SUM2 (TERME1,TERMA1,TERME3,-TERMA3,TERME1,TERMA1)	3734
3735			IF (TERMA1.EQ.0.D0) GO TO 240	3735
3736			TERME1=TERME1+F5E12	3736
3737			TERMA1=TERMA1/F18A12*F14A2/F4A231	3737
3738		240	CONTINUE	3738
3739	C		ELP IS NATURAL LOG OF .5*E-16	3739
3740			CALL SUM2 (TERME1,TERMA1,TERME8,-TERMA8,TERME2,TERMA2)	3740
3741			IF (TERMA1.EQ.0.D0.OR.TERMA2.EQ.0.D0) GO TO 250	3741
3742			CHE=TERME2-TERME1+DLOG(DABS(TERMA2/TERMA1))	3742
3743			IF (CHE.LT.ELP) TERMA2=0.D0	3743
3744		250	CALL SUM2 (TERME9,TERMA9,TERME2,TERMA2,TERME9,TERMA9)	3744
3745	C			3745
3746	C		----- 9-TH TERM	3746
3747			TERMA3=F34A3-G34A3	3747
3748			TERMA4=F34A2-G34A2	3748
3749			CALL SUM2 (F33E13,TERMA3,F33E12,-TERMA4,TERME1,TERMA1)	3749
3750			IF (TERMA1.EQ.0.D0) GO TO 260	3750

3751		TERME1=TERME1+F19E1	3751
3752		TERMA1=TERMA1/F18A12*F14A2/F18A23	3752
3753		CALL SUM2 (TERME9,TERMA9,TERME1,TERMA1,TERME9,TERMA9)	3753
3754	C		3754
3755	C	----- 8-TH TERM	3755
3756	260	TERME1=F5E23+F30E23	3756
3757		TERMA1=F13A/(F17A21*F18A23)	3757
3758		XX69R=XX6-XX19	3758
3759		CALL SUM2 (XX69R,G34A3,XX69R,-G34A2,TERME2,TERMA2)	3759
3760		CALL SUM2 (0.D0,F34A3-F34A2,TERME2,-TERMA2,TERME2,TERMA2)	3760
3761		TERMA3=TERMA1*TERMA2	3761
3762		TERME3=TERME1+TERME2	3762
3763		TERME1=F5E23+F30E23	3763
3764		TERMA1=F13A/(F17A12*F18A22)	3764
3765		CALL SUM2 (XX6-XX29,G34A3,XX6-XX29,-G34A2,TERME2,TERMA2)	3765
3766		CALL SUM2 (0.D0,F34A3-F34A2,TERME2,-TERMA2,TERME2,TERMA2)	3766
3767		TERMA1=TERMA1*TERMA2	3767
3768		TERME1=TERME1+TERME2	3768
3769		CALL SUM2 (TERME3,TERMA3,TERME1,TERMA1,TERME1,TERMA1)	3769
3770		CALL SUM2 (TERME9,TERMA9,TERME1,TERMA1,TERME9,TERMA9)	3770
3771	C		3771
3772	C	----- 7-TH TERM	3772
3773		TERMA1=F34A3-G34A3	3773
3774		TERMA3=F34A2-G34A2	3774
3775		CALL SUM2(F33E23,TERMA1,0.D0,-TERMA3,TERME1,TERMA1)	3775
3776		IF (TERMA1.EQ.0.D0) GO TO 270	3776
3777		TERME1=TERME1+F19E2	3777
3778		TERMA1=TERMA1/F17A21*F13A/F18A22	3778
3779		CALL SUM2 (TERME9,TERMA9,TERME1,TERMA1,TERME9,TERMA9)	3779
3780	C		3780
3781	C	----- 6-TH TERM	3781
3782	270	TERMA3=F34A3-G34A3	3782
3783		TERMA4=F34A2-G34A2	3783
3784		CALL SUM2 (F33E13,TERMA3,F33E12,-TERMA4,TERME1,TERMA1)	3784
3785		IF (TERMA1.EQ.0.D0) GO TO 280	3785
3786		TERME1=TERME1+F19E1	3786
3787		TERMA1=TERMA1*F13A/F17A12/F18A23	3787
3788		CALL SUM2 (TERME9,TERMA9,TERME1,TERMA1,TERME9,TERMA9)	3788
3789	C		3789
3790	C	----- 5-TH TERM	3790
3791	280	IF (F34A3.EQ.0.D0.AND.G34A3.EQ.0.D0) GO TO 290	3791
3792		IF (F34A3.EQ.1.D0.AND.G34A3.EQ.1.D0) GO TO 290	3792
3793		TERME1=F19E2+F33E23	3793
3794		TERMA1=1.D0/(F17A21*F17A23)	3794
3795		TERME2=F19E1+F33E13	3795
3796		TERMA2=1.D0/(F17A12*F17A13)	3796
3797		CALL SUM2 (TERME1,TERMA1,TERME2,TERMA2,TERME3,TERMA3)	3797
3798		TERME2=F19E3	3798
3799		TERMA2=1.D0/(F17A31*F17A32)	3799
3800		CALL SUM2 (TERME3,TERMA3,TERME2,TERMA2,TERME1,TERMA1)	3800
3801		TERMA1=TERMA1*F12A12*(F34A3-G34A3)	3801
3802		CALL SUM2 (TERME9,TERMA9,TERME1,TERMA1,TERME9,TERMA9)	3802
3803	C		3803
3804	290	TERMA9=TERMA9*2.D0	3804
3805	C		3805
3806		SNOD3=0.D0	3806

316-CMPACK	PAGE	74	
3807		DSN=0	3807
3808		IF (TERME9.GT.174.D0) LSN=.FALSE.	3808
3809		IF (.NOT.LSN) WRITE (6,9000) THETA,TERME9,TERMA9	3809
3810		IF (.NOT.LSN) RETURN	3810
3811		IF (TERME9.GT.-EXPMIN) SNOD3=DEXP (TERME9)*TERMA9	3811
3812		RETURN	3812
3813	9000	FORMAT (' 0NOD3',1P3G12.4)	3813
3814		END	3814

3815		SUBROUTINE BB16(I,J,K,B16E)	3815
3816		IMPLICIT REAL*8 (A-H,O-Z)	3816
3817		COMMON /FFFFF/ ENAME(3),THALF(3),CIN(3),ALAMB(3),AC(3),R(3),	3817
3818		GAP(6),TO,T,P,ETA,THETA,V,SCL	3818
3819		* B16E=(((AC(I)*R(I)-AC(J)*R(J)))/(AC(I)-AC(J))-R(K))*(T*V)/SCL)	3819
3820		RETURN	3820
3821		END	3821

Description of input data to a GETOUT run

As is evident from Appendix 1, two input data files are required for a GETOUT run.

- File 1 is a source strength file that is described in Appendix 1.
- File 5 with other information is described below.

A listing of the input data cards in file 5 follows immediately after the following description:

1. (1 card) FORMAT (4L5)

Variables: LINK, PUNCH, WRITEX, MIGOUT

LINK = .TRUE. => Addition of the chain fragments from SINGLE, EQUAL, DOUBLE, TRIPLE and SPEC to the total nuclide flow as a function of time. If LINK = .FALSE. only the chain fragments are obtained, i.e. not the line printer plot and the result punch.

PUNCH = .TRUE. => Punchout on data set 7 of nuclide inflows as a function of time. without effect if LINK = .FALSE.

WRITEX = .TRUE. Printout of time and inflow values in clear text to the right of the line printer plot. Without effect if LINK = .FALSE.

MIGOUT = .TRUE. Listing of all chain fragments on data set 9. If MIGOUT = .FALSE. and LINK = .FALSE., the execution is terminated with the following printout:

NO OUTPUT WAS SPECIFIED AND AS IT
IS LATE THE COMPUTER CHOOSES TO
TERMINATE EXECUTION

2. (1 card) FORMAT (2I5)
Variables: NS, J3
NS = Number of time steps in calculation of SINGLE fragments.
J3 = Number of time steps per interval for DOUBLE and TRIPLE fragments. In DOUBLE, the number of time steps is a maximum of $9 \cdot J3 + 1$ and in TRIPLE $14 \cdot J3 + 1$.

3. (1 card) FORMAT (4E10.2)
Variables: BREAK, DUR, DIFF, TONNE
BREAK = Time of canister breakthrough (years).
DUR = Leach duration (years).
DIFF = Diffusion coefficient (m^2/s).
TONNE = Number of tonne-equivalents of waste that are leached (tonnes of uranium in the unirradiated fuel).

4. (1 card) FORMAT (4E15.4, L5)
Variables: PERM, GRAD, SPACE, PATH, CLAY
PERM = Permeability (m/s).
GRAD = Hydrostatic gradient (m/m).
SPACE = Average spacing between fractures in the case of rock (m) or porosity in the case of soils (m^3/m^3).
PATH = Length of transport path (m).
CLAY = .TRUE.=>SPACE is interpreted as porosity for a soil and the retention factors are calculated on the basis of mass-based coefficients of distribution.

CLAY = .FALSE:=>SPACE is interpreted as average fracture spacing in rock and the retention factors are calculated on the basis of surface-based coefficients of distribution.

5. (1 card) FORMAT (F10.0)

Variables: TUPP

TUPP = Time for reprocessing (years). If TUPP = 0 or TUPP > BREAK, the source strengths are calculated at the time of canister breakthrough. Otherwise, the source strengths are calculated in two steps, one up to the time of reprocessing, when the source strengths are reduced by factors corresponding to the separation in reprocessing, and the other up to the time of canister breakthrough.

If TUPP=0 or TUPP>BREAK: go to step 8.

6. (1 card) FORMAT (I2)

Variables: IANT

IANT = Number of nuclides for which less than 100% of the inventory in the fuel ends up in the high-level waste in connection with reprocessing.

7. (IANT number of cards) FORMAT (A6, 4X, F10.0)
Variables: BNAME, VAERDE
BNAME = Name of nuclide for which amount in the high-level waste is less than 100% of the inventory in the fuel.
VAERDE = The fraction of the nuclide BNAME which ends up in the high-level waste in connection with reprocessing.
8. (2 cards per nuclide to be calculated) FORMAT (A6, L2/3E10.2)
Variables: SNAME, AKT, AREAK, VOLK, DOSE
SNAME = Nuclide name.
AKT = .TRUE. Linear time scale in SINGLE, otherwise the time scale will be logarithmic.
AREAK = Surface-based coefficient of distribution (used for calculation of retention factor when CLAY=.FALSE.) (m).
VOLK = Mass-based coefficient of distribution (m^3/kg) (used for calculation of retention factor when CLAY=.TRUE.).
9. One card with -1 punched in columns 1 and 2 and one blank card.
10. (One card for each EQUAL fragment) FORMAT (A6,4X,A6)
Variables: SNAME 1, SNAME 2
SNAME 1 = Parent nuclide
SNAME 2 = Daughter nuclide

11. One card with -1 punched in columns 1 and 2.
12. (One card for each DOUBLE fragment) FORMAT (A6,4X,A6)
Variables: SNAME 1, SNAME 2
SNAME 1 = Parent nuclide
SNAME 2 = Daughter nuclide
13. One card with -1 punched in columns 1 and 2.
14. (One card for each TRIPLE-EQUAL fragment)
FORMAT (A6,4X,A6,4X,A6)
Variables: SNAME 1, SNAME 2, SNAME 3
SNAME 1 = Parent nuclide
SNAME 2 = Daughter nuclide
SNAME 3 = Granddaughter nuclide
15. One card with -1 punched in columns 1 and 2.
16. (One card for each TRIPLE fragment) FORMAT (A6,4X,
A6,4X,A6)
Variables: SNAME 1, SNAME 2, SNAME 3
SNAME 1 = Parent nuclide
SNAME 2 = Daughter nuclide
SNAME 3 = Granddaughter nuclide
17. One card with -1 punched in columns 1 and 2.

18. (One card for each SPEC approximation)

FORMAT (3A8, I6, 3A8)

Variables: GNAME 1, GNAME 2, GNAME 3, IAPPR, ENAME 1,
ENAME 2, ENAME 3

ENAME(1)= Daughter nuclide in the approximate
calculation.

ENAME(2)= } Parent nuclide(s) in the approximate
GNAME(3)= } calculation.

IAPPR = Code for approximation type.

1 = Short-lived daughter nuclide
in radioactive equilibrium with
its parent nuclide.

2 = Short-lived parent nuclide which is
assumed to decay completely before
start of leaching.

ENAME = The chain fragment on which the
approximation is based (sequence:
parent, daughter, granddaughter).

19. One card with -1 punched in columns 1 and 2.

```

216-INDATA PAGE 4
//GC0FT01F001 DD DSN=KTH.SLY846D.P1110 INPUT(FUEL),DISP=SHR,
// LABEL=(,.,IN)
//FT05F001 DD CINAME=SYSIN
//FT06F001 DD SYSCUT=A
//FT07F001 DD SYSCUT=B
//FT09F001 DD SYSCUT=A,DCB=(RECFM=UA,BLKSIZE=133)
//FT13F001 DD DSN=88SINGLE,UNIT=SYSDA,DISP=NEW,
// DCB=(RECFM=VSE,LRECL=32,BLKSIZE=324),SPACE=(324,(10,5))
//FT14F001 DD DSN=88DOUBLE,UNIT=SYSDA,DISP=NEW,
// DCB=(RECFM=VSE,LRECL=32,BLKSIZE=324),SPACE=(324,(10,5))
//FT15F001 DD DSN=88TRIPLE,UNIT=SYSDA,DISP=NEW,
// DCB=(RECFM=VSE,LRECL=32,BLKSIZE=324),SPACE=(324,(10,5))
//FT16F001 DD DSN=88SPECIA,UNIT=SYSDA,DISP=NEW,
// DCB=(RECFM=VSE,LRECL=32,BLKSIZE=324),SPACE=(324,(10,5))
//FT17F001 DD DSN=88DCSE,UNIT=SYSDA,DISP=NEW,
// DCB=(LRECL=16,RECFM=VSB,BLKSIZE=1620),SPACE=(1620,(50))
//FT20F001 DD SYSCUT=A,DCB=(RECFM=CA,BLKSIZE=133)
//SYSIN DD *

```

	T	T	T	T	T
	125	20			
	1.00+05	5.00+05	1.50-09	1.00+04	
	1.0000-05		2.0000-03	1.0000+00	2.2736+03
	C				
SR90	6.30-04	0.00+00	5.50+00		
ZR93	2.50-02	0.00+00	8.00-05		
TC99	0.00+00	0.00+00	8.20-04		
I 129	0.00+00	0.00+00	6.20-01		
CS135	6.30-03	0.00+00	2.30-02		
CS137	6.30-03	0.00+00	1.50-01		
RA226	6.30-03	0.00+00	7.10-01		
TH229	1.10-02		1.60+00		
TF230	1.10-02		1.20-01		
TF232	1.10-02				
PA231	1.90-04	0.00+00	1.00+02		
U 232	1.00-02				
U 233	1.00-02	0.00+00	1.70-01		
U 234	1.00-02	0.00+00	1.50-01		
U 235	1.00-02		1.40-01		
U 236	1.00-02				
U 238	1.00-02		1.30-01		
NF237	9.90-03	0.00+00	2.00+01		
PU238	1.40-02				
FU239	1.40-02	0.00+00	2.30-01		
PU240	1.40-02	0.00+00	2.40-01		
PU241	1.40-02				
PU242	1.40-02		4.70-01		
PU244	1.40-02				
AM241	1.00-01	0.00+00	1.30-01		
AM242M	1.00-01				
AM243	1.00-01	0.00+00	1.30-01		
CM242	5.00-02				
CM243	5.00-02				
CM244	5.00-02				
CM245	5.00-02				
CM246	5.00-02				

Listing of files and input data for
GETOUT run

U 238	U 234				
-1					
TH230	RA226				
U 233	TH229				
U 234	TH230				
U 238	TH230				
U 236	TH232				
U 235	PA231				
NP237	U 233				
PL238	U 234				
AM242M	U 234				
PU239	U 235				
PL240	U 236				
PU242	U 232				
AM241	NP237				
AM242M	PU238				
AM243	PL239				
CM243	PL239				
CM244	PU240				
PU241	AM241				
-1					
-1					
U 234	TH230	RA226			
U 238	TH230	RA226			
NP237	U 233	TH229			
PU238	U 234	TH230			
PU240	U 236	TH232			
PL239	U 235	PA231			
AM241	NP237	U 233			
AM243	PL239	U 235			
CM243	PL239	U 235			
CM244	PL240	U 236			
PL241	AM241	NP237			
-1					
RA226	PU242	CM242	1PU242	U 238	
RA226	PU238		2U 234	TH230	RA226
RA226	AM242M		2U 234	TH230	RA226
TH229	AM241	PL241	2NP237	U 233	TH229
TH230	PU242		1PU242	U 238	
TH230	AM242M	CM242	2U 234	TH230	
TH232	CM244		2PU240	U 236	TH232
PA231	CM243	AM243	2PU239	U 235	PA231
U 233	PU241		2AM241	NP237	U 233
U 234	CM242		2PU238	U 234	
U 234	PU242		1PU242	U 238	
-1					
/*					

Continued.

Examples of output from a GETOUT run

SOURCE STRENGTHS AND HALFLIVES FOR SPENT PWR-FUEL, HALFLIVES ARE ACCORDING TO
ORIGEN'S DATA LIBRARY, SOURCE STRENGTHS ARE TAKEN FROM KBS TR 01 (1977-04-05)

	NUCL.	THALF	CO	ALAMB	ANZERO
1	H 3	1.230Q+01	7.300Q+02	5.635Q-02	1.295Q+04
2	C 14	5.740Q+03	1.450Q+00	1.208Q-04	1.201Q+04
3	SE79	6.500Q+04	3.950Q-01	0.0	0.0
4	KR85	1.080Q+01	1.120Q+04	6.418Q-02	1.745Q+05
5	RB87	5.000Q+10	1.920Q-05	0.0	0.0
6	SR89	1.430Q-01	7.990Q+05	4.847Q+00	1.648Q+05
7	SR90	2.810Q+01	7.620Q+04	2.467Q-02	3.089Q+06
8	Y 91	1.620Q-01	1.050Q+06	4.279Q+00	2.454Q+05
9	ZR93	1.500Q+06	1.860Q+00	4.621Q-07	4.025Q+06
10	ZR95	1.790Q-01	1.570Q+06	3.872Q+00	4.054Q+05
11	NB95	9.590Q-02	1.580Q+06	7.228Q+00	2.186Q+05
12	TC99	2.110Q+05	1.430Q+01	3.285Q-06	4.353Q+06
13	RU103	1.080Q-01	1.420Q+06	6.418Q+00	2.213Q+05
14	RU106	1.000Q+00	6.180Q+05	6.931Q-01	8.916Q+05
15	PD107	7.000Q+06	1.170Q-01	0.0	0.0
16	CD109	1.240Q+00	4.520Q-06	0.0	0.0
17	AG110M	6.930Q-01	4.330Q+03	0.0	0.0
18	CD113M	1.400Q+01	1.170Q+01	0.0	0.0
19	SB125	2.700Q+00	9.450Q+03	2.567Q-01	3.681Q+04
20	TE125M	1.590Q-01	3.330Q+03	4.359Q+00	7.639Q+02
21	TE127M	2.980Q-01	1.800Q+04	2.326Q+00	7.739Q+03
22	SN126	9.980Q+04	5.690Q-01	0.0	0.0
23	I 129	1.700Q+07	3.750Q-02	4.077Q-08	9.197Q+05
24	CS134	2.050Q+00	2.650Q+05	3.381Q-01	7.837Q+05
25	CS135	3.000Q+06	2.510Q-01	2.310Q-07	1.086Q+06
26	CS137	3.000Q+01	1.090Q+05	2.310Q-02	4.718Q+06
27	CE144	7.790Q-01	1.230Q+06	8.898Q-01	1.382Q+06
28	PM147	2.620Q+00	1.010Q+05	2.646Q-01	3.818Q+05
29	SM151	8.720Q+01	1.260Q+03	7.949Q-03	1.585Q+05
30	EU152	1.200Q+01	1.060Q+01	0.0	0.0
31	EU154	1.600Q+01	7.340Q+03	4.332Q-02	1.694Q+05
32	EU155	1.820Q+00	7.860Q+03	3.809Q-01	2.064Q+04
33	HO166M	1.200Q+03	8.200Q-04	0.0	0.0
34	RA226	1.600Q+03	1.120Q-08	4.332Q-04	2.585Q-05
35	TH228	1.910Q+00	1.210Q-03	3.629Q-01	3.334Q-03
36	TH229	7.300Q+03	2.800Q-08	9.495Q-05	2.949Q-04
37	TH230	8.000Q+04	1.380Q-05	8.664Q-06	1.593Q+00
38	TH232	1.410Q+10	2.130Q-11	4.916Q-11	4.333Q-01
39	PA231	3.250Q+04	1.970Q-05	2.133Q-05	9.237Q-01
40	U 232	7.200Q+01	5.410Q-03	9.627Q-03	5.620Q-01
41	U 233	1.620Q+05	4.160Q-05	4.279Q-06	9.723Q+00
42	U 234	2.470Q+05	6.720Q-01	2.806Q-06	2.395Q+05
43	U 235	7.100Q+08	1.480Q-02	9.763Q-10	1.516Q+07
44	U 236	2.390Q+07	2.710Q-01	2.900Q-08	9.344Q+06
45	U 238	4.510Q+09	3.150Q-01	1.537Q-10	2.050Q+09
46	NP237	2.130Q+06	3.280Q-01	3.254Q-07	1.008Q+06
47	PU236	2.850Q+00	3.740Q-01	2.432Q-01	1.538Q+00
48	PU238	8.900Q+01	2.780Q+03	7.788Q-03	3.570Q+05
49	PU239	2.440Q+04	3.180Q+02	2.841Q-05	1.119Q+07
50	PU240	6.760Q+03	4.900Q+02	1.025Q-04	4.779Q+06
51	PU241	1.460Q+01	1.100Q+05	4.748Q-02	2.317Q+06
52	PU242	3.790Q+05	1.530Q+00	1.829Q-06	8.366Q+05
53	PU244	8.000Q+07	2.210Q-15	0.000Q-00	0.000Q-00

LISTING OF SOURCE STRENGTHS

- THALF = HALF-LIFE
- CO = ACTIVITY UPON DISCHARGE FROM REACTOR
- ALAMB = DECAY CONSTANT
- ANZERO = CO/ALAMB

55	AM242M	1.5200+02	8.3600+00	4.5600-03	1.8330+03
56	AM243	7.6500+03	2.1000+01	9.0610-05	2.3180+05
57	CM242	4.4600-01	3.4500+04	1.5540+00	2.2200+04
58	CM243	3.2000+01	3.9600+00	2.1660-02	1.8280+02
59	CM244	1.8200+01	3.0000+03	3.8090-02	7.8770+04
60	CM245	8.2600+03	4.3200-01	8.3920-05	5.1480+03
61	CM246	4.7100+03	9.2000-02	1.4720-04	6.2510+02
62	CM248	3.5200+05	1.1800-06	1.9690-06	5.9920-01

FISSION PRODUCTS:

1	H 3
2	C 14
3	KR85
4	SR89
5	SR90
6	Y 91
7	ZR93
8	ZR95
9	NB95
10	TC99
11	RU103
12	RU106
13	SB125
14	TE125M
15	TE127M
16	I 129
17	CS134
18	CS135
19	CS137
20	CE144
21	PM147
22	SM151
23	EU154
24	EU155

LISTING OF FISSION PRODUCTS.

DECAY CHAINS:

1	CM246	AM242M	
	PU242	CM242	
	U 238	PU238	
	U 234	U 234	
	TH230	TH230	
	RA226	RA226	
2		CM248	
	CM244	PU244	
	PU240	PU240	
	U 236	U 236	PU236
	TH232	TH232	U 232
	TH228	TH228	TH228
3			
	CM243	AM243	
	PU239	PU239	

LISTING OF DECAY CHAINS IN DECAY.

4 CM245
PU241
AM241
NP237
U 233
TH229

CHANGED ACTIVITIES AT THE TIME OF REPROCESSING=

10.000 YR

AT THE TIME OF PROCESSING,
A LISTING OF CHANGED ACTIVITIES
AT THE TIME OF REPROCESSING
IS OBTAINED.

NR	FNR	NUKLID	SF	CZERO	ANZERO
1	1	H 3	0.0	0.0	0.0
2	2	C 14	0.0	0.0	0.0
3	4	KR85	0.0	0.0	0.0
4	6	SR89	1.0000	7.1040-16	1.4660-16
5	7	SR90	1.0000	5.9540+04	2.4140+06
6	8	Y 91	1.0000	2.7480-13	6.4240-14
7	9	ZR93	1.0000	1.8600+00	4.0250+06
8	10	ZR95	1.0000	2.3910-11	6.1750-12
9	11	NB95	1.0000	6.4370-26	8.9060-27
10	12	TC99	1.0000	1.4300+01	4.3530+06
11	13	RU103	1.0000	1.9020-22	2.9630-23
12	14	RU106	1.0000	6.0350+02	8.7070+02
13	19	SB125	1.0000	7.2530+02	2.8250+03
14	20	TE125M	1.0000	3.8880-16	8.9190-17
15	21	TE127M	1.0000	1.4240-06	6.1230-07
16	23	I 129	0.0100	3.7500-04	9.1970+03
17	24	CS134	1.0000	9.0120+03	2.6650+04
18	25	CS135	1.0000	2.5100-01	1.0860+06
19	26	CS137	1.0000	8.6510+04	3.7440+06
20	27	CE144	1.0000	1.6810+02	1.8890+02
21	28	PM147	1.0000	7.1670+03	2.7090+04
22	29	SM151	1.0000	1.1640+03	1.4640+05
23	31	EU154	1.0000	4.7590+03	1.0990+05
24	32	EU155	1.0000	1.7430+02	4.5780+02
25	61	CM246	1.0000	9.1860-02	6.2420+02
26	55	AM242M	1.0000	7.9870+00	1.7520+03
27	52	PU242	0.0050	7.6500-03	4.1830+03
28	57	CM242	1.0000	8.0170+00	5.1580+00
29	45	U 238	0.0010	3.1500-04	2.0500+06
30	48	PU238	0.0050	1.3670+01	1.7550+03
31	42	U 234	0.0010	7.5140-04	2.6780+02
32	37	TH230	1.0000	7.5490-05	8.7130+00
33	34	RA226	1.0000	2.0180-07	4.6570-04
34	62	CM248	1.0000	1.1800-06	5.9920-01
35	59	CM244	1.0000	2.0500+03	5.3820+04
36	53	PU244	0.0050	5.2220-16	6.0270-08
37	50	PU240	0.0050	2.4600+00	2.3990+04
38	44	U 236	0.0010	2.7110-04	9.3490+03
39	47	PU236	0.0050	1.6430-04	6.7550-04
40	38	TH232	1.0000	1.5460-10	3.1440+00
41	40	U 232	0.0010	1.7560-05	1.8240-03
42	35	TH228	1.0000	1.6030-02	4.4160-02
43	58	CM243	1.0000	3.1890+00	1.4720+02
44	56	AM243	1.0000	2.0980+01	2.3160+05
45	49	PU239	0.0050	1.5900+00	5.5960+04
46	43	U 235	0.0010	1.4800-05	1.5160+04
47	39	PA231	1.0000	2.2850-05	1.0710+00
48	60	CM245	1.0000	4.3160-01	5.1440+03
49	51	PU241	0.0050	3.4210+02	7.2060+03
50	54	AM241	1.0000	1.4660+03	9.1600+05
51	46	NP237	1.0000	3.3070-01	1.0160+06
52	41	U 233	0.0010	5.5670-08	1.3010-02
53	36	TH229	1.0000	7.4120-08	7.8070-04

SF = FRACTION OF NUCLIDE LEFT
AFTER REPROCESSING
CZERO = ACTIVITY AFTER REPROCESSING
ANZERO = CZERO/DECAY CONSTANT

191-PESSFUEL PAGE	6	
TIME	1.00Q+05	
H 3	1.23Q+01	0.0
C 14	5.74Q+03	8.26E-02
SE79	6.50Q+04	0.0
KR85	1.08Q+01	0.0
RB87	5.00Q+10	0.0
SR89	1.43Q-01	0.0
SR90	2.81Q+01	0.0
Y 91	1.62Q-01	0.0
ZR93	1.50Q+06	1.78E+04
ZR95	1.79Q-01	0.0
NB95	9.59Q-02	0.0
TC99	2.11Q+05	1.03E+05
RU103	1.08Q-01	0.0
RU106	1.00Q+00	0.0
PD107	7.00Q+06	0.0
CD109	1.24Q+00	0.0
AG110M	6.93Q-01	0.0
CD113M	1.40Q+01	0.0
SB125	2.70Q+00	0.0
TE125M	1.59Q-01	0.0
TE127M	2.98Q-01	0.0
SN126	9.98Q+04	0.0
I 129	1.70Q+07	3.73E+02
CS134	2.05Q+00	0.0
CS135	3.00Q+06	2.45E+03
CS137	3.00Q+01	0.0
CE144	7.79Q-01	0.0
PM147	2.62Q+00	0.0
SM151	8.72Q+01	0.0
EU152	1.20Q+01	0.0
EU154	1.60Q+01	0.0
EU155	1.82Q+00	0.0
HD166M	1.20Q+03	0.0
RA226	1.60Q+03	8.78E+03
TH228	1.91Q+00	1.95E-02
TH229	7.30Q+03	3.42E+03
TH230	8.00Q+04	8.89E+03
TH232	1.41Q+10	1.95E-02
PA231	3.25Q+04	2.08E+02
U 232	7.20Q+01	0.0
U 233	1.62Q+05	3.75E+03
U 234	2.47Q+05	1.39E+04
U 235	7.10Q+08	2.53E+02
U 236	2.39Q+07	4.11E+03
U 238	4.51Q+09	3.15E+03
NP237	2.13Q+06	1.06E+04
PU236	2.85Q+00	0.0
PU238	8.90Q+01	0.0
PU239	2.44Q+04	1.91E+05
PU240	6.76Q+03	1.75E+02
PU241	1.46Q+01	9.81E-01
PU242	3.79Q+05	1.28E+04
PU244	8.00Q+07	9.28E-06
AM241	4.33Q+02	1.04E+00
AM242M	1.52Q+02	0.0
AM243	7.65Q+03	2.44E+01
CM242	4.46Q-01	0.0
CM243	3.20Q+01	0.0
CM244	1.82Q+01	0.0
CM245	8.26Q+03	9.80E-01

LISTING OF ACTIVITIES AT TIME OF CANISTER BREAKTHROUGH

WASTE FORM: FUEL

TIME OF LEACH INCIDENT 1.00+05 YEARS AFTER REACTOR DISCHARGE
 LEACH DURATION 5.00+05 YEARS
 MIGRATION PATH LENGTH 2.30+03 METERS
 GROUNDWATER VELOCITY 5.70+00 METERS/YEAR
 GROUNDWATER TRAVEL TIME 4.0E+02 YEARS
 DISPERSION COEFFICIENT 4.7E-02 SQ.METERS/YEAR
 INVOLVED WASTE AMOUNT 1.0E+04 TONNES
 PERMEABILITY 1.0E-09 METERS/SECOND
 GRADIENT 2.0E-03 METERS/METER
 SPACING 1.0E+00 METERS

SUMMARY OF INPUT DATA

NUCL.	H.LIFE (Y)	SOURCE (CI)	RET.	DOSE FACT
SR90	2.81D+01	0.0	1.21D+02	5.50E+00
ZR93	1.50D+06	1.78D+04	4.76D+03	8.00E-05
TC99	2.11D+05	1.03D+05	1.00D+00	4.90E-04
I 129	1.70D+07	3.73D+02	1.00D+00	5.50E-01
CS135	3.00D+06	2.45D+03	1.20D+03	2.30E-02
CS137	3.00D+01	0.0	1.20D+03	1.50E-01
RA226	1.60D+03	8.78D+03	1.20D+03	2.10E+00
TH229	7.30D+03	3.42D+03	2.10D+03	8.50E-01
TH230	8.00D+04	8.89D+03	2.10D+03	4.70E-01
TH232	1.41D+10	1.95D-02	2.10D+03	0.0
PA231	3.25D+04	2.08D+02	3.72D+01	0.0
U 232	7.20D+01	0.0	1.91D+03	0.0
U 233	1.62D+05	3.75D+03	1.91D+03	6.12E-02
U 234	2.47D+05	1.39D+04	1.91D+03	6.06E-02
U 235	7.10D+08	2.53D+02	1.91D+03	0.0
U 236	2.39D+07	4.11D+03	1.91D+03	0.0
U 238	4.51D+09	3.15D+03	1.91D+03	0.0
NP237	2.13D+06	1.06D+04	1.89D+03	1.20E-01
PU238	8.90D+01	0.0	2.67D+03	0.0
PU239	2.44D+04	1.91D+05	2.67D+03	8.50E-02
PU240	6.76D+03	1.75D+02	2.67D+03	9.00E-02
PU241	1.46D+01	9.81D-01	2.67D+03	0.0
PU242	3.79D+05	1.28D+04	2.67D+03	0.0
PU244	8.00D+07	9.28D-06	2.67D+03	0.0
AM241	4.33D+02	1.04D+00	1.90D+04	1.30E-01
AM242M	1.52D+02	0.0	1.90D+04	0.0
AM243	7.65D+03	2.44D+01	1.90D+04	1.30E-01
CM242	4.46D-01	0.0	9.52D+03	0.0
CM243	3.20D+01	0.0	9.52D+03	0.0
CM244	1.82D+01	0.0	9.52D+03	0.0
CM245	8.26D+03	9.80D-01	9.52D+03	0.0
CM246	4.71D+03	3.74D-04	9.52D+03	0.0

INPUT DATA FOR NUCLIDES. ALSO PROVIDE A CHECK OF WHICH SINGLE NUCLIDES HAVE BEEN CALCULATED

EQUAL: U 238 U 234

DOUBLE: TH230 RA226
 DOUBLE: U 233 TH229
 DOUBLE: U 234 TH230

THE CALCULATED EQUAL, DOUBLE, TRIPLE-EQUAL, TRIPLE AND SPECIAL APPROXIMATION NUCLIDE CHAIN FRAGMENTS ARE LISTED.

DOUBLE: U 236 TH232
 DOUBLE: U 235 PA231
 DOUBLE: NP237 U 233
 DOUBLE: PU238 U 234
 DOUBLE: AM242M U 234
 DOUBLE: PU239 U 235
 DOUBLE: PU240 U 236
 DOUBLE: PU242 U 238
 DOUBLE: AM241 NP237
 DOUBLE: AM242M PU238
 DOUBLE: AM243 PU239
 DOUBLE: CM243 PU239
 DOUBLE: CM244 PU240
 DOUBLE: PU241 AM241

TERMS OMITTED IN BWD2: 2(F), 4(T)

CASES WHERE TERMS HAVE BEEN OMITTED DUE TO NUMERICAL PROBLEMS ARE MARKED IN THE LIST.

T = THE TERM HAS BEEN CALCULATED

F = THE TERM HAS BEEN OMITTED

TRIPLE: U 234 TH230 RA226
 TRIPLE: U 238 TH230 RA226
 TRIPLE: NP237 U 233 TH229
 TRIPLE: PU238 U 234 TH230
 TRIPLE: PU240 U 236 TH232
 TRIPLE: PU239 U 235 PA231
 TRIPLE: AM241 NP237 U 233
 TRIPLE: AM243 PU239 U 235
 TRIPLE: CM243 PU239 U 235
 TRIPLE: CM244 PU240 U 236
 TRIPLE: PU241 AM241 NP237

TERMS OMITTED IN BWD3: 5(TT), 6(TF), 7(T), 8(T), 9(FT), 10(T), 11(T), 12(T)

SPEC: RA226 PU242 PU242 U 238 IAPPR= 1
 THE CHAIN RA226 PU238 CM242 WAS NOT CALCULATED BY SPEC BECAUSE
 THE CHAIN U 234 TH230 RA226 GAVE FACT= 0.0

THE NUCLIDES WHICH HAVE NOT BEEN CALCULATED OR WHICH DO NOT GIVE ANY CONTRIBUTION WHEN

SPEC: RA226 AM242M U 234 TH230 RA226 IAPPR= 2
 SPEC: TH229 AM241 PU241 NP237 U 233 TH229 IAPPR= 2
 SPEC: TH230 PU242 PU242 U 238 IAPPR= 1

THE CHAIN FRAGMENTS ARE ADDED ARE GIVEN IN THE LIST.

THE CHAIN TH230 AM242M CM242 WAS NOT CALCULATED BY SPEC BECAUSE
 THE CHAIN U 234 TH230 GAVE FACT= 0.0

SPEC: TH232 CM244 PU240 U 236 TH232 IAPPR= 2
 SPEC: PA231 CM243 AM243 PU239 U 235 PA231 IAPPR= 2
 SPEC: U 233 PU241 AM241 NP237 U 233 IAPPR= 2

THE CHAIN U 234 FROM CM242 WAS NOT CALCULATED BY SPEC BECAUSE OF 0.0 -INVENTORY FOR PU238
 SPEC: U 234 PU242 PU242 U 238 IAPPR= 1

WHILE EXECUTING PEAK COMBINATION LOOP OF MAIN PROGRAM NO PEAKS WHERE FOUND FOR SR90
 TMIN= 0.0 TMAX= 0.0

WHILE EXECUTING PEAK COMBINATION LOOP OF MAIN PROGRAM NO PEAKS WHERE FOUND FOR CS137
 TMIN= 0.0 TMAX= 0.0

WHILE EXECUTING PEAK COMBINATION LOOP OF MAIN PROGRAM NO PEAKS WHERE FOUND FOR U 232
 TMIN= 0.0 TMAX= 0.0

SUMMARY OF INFLOW TIME, INFLOW MAXIMA
 AND CALCULATED DOSES

NUCLIDE	TPEAK	CMAX	DOSEMAX
SR90	0.0	0.0	0.0
ZR93	2.02E+06	1.46E-02	1.17E-06
TC99	1.02E+05	2.05E-01	1.00E-04
I 129	1.02E+05	7.47E-04	4.11E-04
CS135	5.87E+05	4.38E-03	1.01E-04
CS137	0.0	0.0	0.0
RA226	9.16E+05	1.49E-02	3.14E-02
TH229	8.69E+05	1.57E-02	1.33E-02
TH230	9.19E+05	8.54E-03	4.01E-03
TH232	1.36E+06	5.06E-07	0.0
PA231	8.60E+05	5.08E-03	0.0
U 232	0.0	0.0	0.0
U 233	8.68E+05	1.72E-02	1.05E-03
U 234	8.69E+05	8.78E-03	5.32E-04
U 235	9.02E+05	5.20E-04	0.0
U 236	8.73E+05	8.03E-03	0.0
U 238	1.16E+06	6.30E-03	0.0
NP237	8.61E+05	1.66E-02	1.99E-03
PU238	0.0	0.0	0.0
PU239	1.17E+06	2.12E-14	1.80E-15
PU240	0.0	0.0	0.0
PU241	0.0	0.0	0.0
PU242	1.17E+06	3.55E-03	0.0
PU244	1.18E+06	1.84E-11	0.0
AM241	0.0	0.0	0.0
AM242M	0.0	0.0	0.0
AM243	0.0	0.0	0.0
CM242	0.0	0.0	0.0
CM243	0.0	0.0	0.0
CM244	0.0	0.0	0.0
CM245	0.0	0.0	0.0
CM246	0.0	0.0	0.0

NUCLIDE: TH230

DESCRIPTION OF LEACH SCENARIO:

TIME OF LEACH INCIDENT:	100000.	YEARS AFTER REACTOR DISCHARGE DATA FOR LEACHING AND GROUNDWATER FLOW.
LEACH DURATION:	500000.	YEARS
MIGRATION PATH LENGTH:	2273.60	METERS
GROUNDWATER VELOCITY:	5.68400	METERS/YEAR
GROUNDWATER TRAVEL TIME:	400.000	YEARS
PECLET NUMBER:	273194.	

NUCLIDE DATA

TH230

ACTIVITY AT THE TIME OF LEACH INCIDENT (CURIES)	8.89D+03
MASS AT THE TIME OF LEACH INCIDENT (MOLES)	1.990+03
MASS AT THE END OF LEACH INCIDENT (MOLES)	2.61D+01
DECAY NUMBER	3.47D-03
RETENTION COEFFICIENT	2096.

NUCLIDE DATA

BRIEF PEAK INFORMATION

DATA FOR INFLOW

TIME OF INITIAL DISCHARGE	927246.	YEARS AFTER REACTOR DISCHARGE
TIME OF PEAK TAIL	1.44717E+06	YEARS AFTER REACTOR DISCHARGE
TIME OF PEAK MAXIMUM	945463.	YEARS AFTER REACTOR DISCHARGE
MAXIMUM DISCHARGE RATE	1.17E-05	CURIES/YEAR
NUMBER OF TIMESTEPS USED	122	
DISP TO NO-DISP PEAKS	0.96911460	

TIME	DIM.LESS TIME	BAND RELEASE	D:O NO-DISP	LISTING OF INFLOW WITH AND WITHOUT DISPERSION
9.2725E+05	2.0681E+03	4.1544E-12	0.0	
9.3069E+05	2.0767E+03	3.6475E-09	0.0	
9.3414E+05	2.0853E+03	3.5142E-07	0.0	
9.3760E+05	2.0940E+03	4.3570E-06	0.0	
9.3849E+05	2.0962E+03	6.2167E-06	0.0	
9.4197E+05	2.1049E+03	1.1305E-05	1.2064E-05	
9.4546E+05	2.1137E+03	1.1692E-05	1.1705E-05	
9.4897E+05	2.1224E+03	1.1354E-05	1.1354E-05	
9.5249E+05	2.1312E+03	1.1013E-05	1.1013E-05	
9.5602E+05	2.1401E+03	1.0681E-05	1.0681E-05	
9.5957E+05	2.1489E+03	1.0358E-05	1.0358E-05	
9.6313E+05	2.1578E+03	1.0044E-05	1.0044E-05	
9.6670E+05	2.1667E+03	9.7375E-06	9.7375E-06	
9.7028E+05	2.1757E+03	9.4397E-06	9.4397E-06	
9.7388E+05	2.1847E+03	9.1499E-06	9.1499E-06	
9.7749E+05	2.1937E+03	8.8680E-06	8.8680E-06	
9.8112E+05	2.2028E+03	8.5938E-06	8.5938E-06	
9.8476E+05	2.2119E+03	8.3271E-06	8.3271E-06	
9.8841E+05	2.2210E+03	8.0677E-06	8.0677E-06	
9.9208E+05	2.2302E+03	7.8155E-06	7.8155E-06	
9.9576E+05	2.2394E+03	7.5702E-06	7.5702E-06	
9.9945E+05	2.2486E+03	7.3318E-06	7.3318E-06	
1.0032E+06	2.2579E+03	7.1001E-06	7.1001E-06	
1.0069E+06	2.2672E+03	6.8784E-06	6.8784E-06	

NUCLIDE: TH230 FROM U 234

DESCRIPTION OF LEACH SCENARIO:

TIME OF LEACH INCIDENT:	100000.	YEARS AFTER REACTOR DISCHARGE
LEACH DURATION:	500000.	YEARS
MIGRATION PATH LENGTH:	2273.60	METERS
GROUNDWATER VELOCITY:	5.68400	METERS/YEAR
GROUNDWATER TRAVEL TIME:	400.000	YEARS
PECLET NUMBER:	273194.	

NUCLIDE DATA

	U 234	TH230
ACTIVITY AT THE TIME OF LEACH INCIDENT (CURIES)	1.39D+04	8.89D+03
MASS AT THE TIME OF LEACH INCIDENT (MOLES)	9.61D+03	1.99D+03
MASS AT THE END OF LEACH INCIDENT (MOLES)	2.36D+03	1.10D+03
DECAY NUMBER	1.12D-03	3.47D-03
RETENTION COEFFICIENT	1906.	2096.

BRIEF PEAK INFORMATION

TIME OF INITIAL DISCHARGE	849139.	YEARS AFTER REACTOR DISCHARGE
TIME OF PEAK TAIL	1.44674E+06	YEARS AFTER REACTOR DISCHARGE
TIME OF PEAK MAXIMUM	912715.	YEARS AFTER REACTOR DISCHARGE
MAXIMUM DISCHARGE RATE	3.68E-03	CURIES/YEAR
NUMBER OF TIMESTEPS USED	180	
DISP TO NO-DISP PEAKS	0.99964172	

TIME	DIM.LESS TIME	BAND RELEASE	D:O NO-DISP
8.4920E+05	1.8730E+03	6.5722E-15	0.0
8.4985E+05	1.8746E+03	5.4285E-14	0.0
8.5051E+05	1.8763E+03	4.0510E-13	0.0
8.5116E+05	1.8779E+03	2.7337E-12	0.0
8.5182E+05	1.8795E+03	1.6686E-11	0.0
8.5247E+05	1.8812E+03	9.2215E-11	0.0
8.5313E+05	1.8828E+03	4.6185E-10	0.0
8.5378E+05	1.8845E+03	2.0982E-09	0.0
8.5444E+05	1.8861E+03	8.6575E-09	0.0
8.5509E+05	1.8877E+03	3.2469E-08	0.0
8.5575E+05	1.8894E+03	1.1085E-07	0.0
8.5640E+05	1.8910E+03	3.4502E-07	0.0
8.5706E+05	1.8926E+03	9.8068E-07	0.0
8.5771E+05	1.8943E+03	2.5508E-06	0.0
8.5837E+05	1.8959E+03	6.0834E-06	0.0
8.5902E+05	1.8976E+03	1.3338E-05	0.0
8.5968E+05	1.8992E+03	2.6965E-05	0.0
8.6033E+05	1.9008E+03	5.0434E-05	0.0
8.6099E+05	1.9025E+03	8.7622E-05	0.0
8.6164E+05	1.9041E+03	1.4200E-04	0.0
8.6230E+05	1.9057E+03	2.1576E-04	2.7761E-08
8.6264E+05	1.9066E+03	2.6200E-04	9.5846E-05
8.6298E+05	1.9075E+03	3.1333E-04	1.8937E-04
8.6332E+05	1.9083E+03	3.6941E-04	2.8071E-04

NUCLIDE: TH229 FROM NP237 DECAYING VIA U 233

DESCRIPTION OF LEACH SCENARIO:

TIME OF LEACH INCIDENT:	100000.	YEARS AFTER REACTOR DISCHARGE
LEACH DURATION:	500000.	YEARS
MIGRATION PATH LENGTH:	2273.60	METERS
GROUNDWATER VELOCITY:	5.68400	METERS/YEAR
GROUNDWATER TRAVEL TIME:	400.000	YEARS
PECLET NUMBER:	273194.	

NUCLIDE DATA

	NP237	U 233	TH229
ACTIVITY AT THE TIME OF LEACH INCIDENT (CURIES)	1.06D+04	3.75D+03	3.42D+03
MASS AT THE TIME OF LEACH INCIDENT (MOLES)	6.34D+04	1.70D+03	6.98D+01
MASS AT THE END OF LEACH INCIDENT (MOLES)	5.39D+04	4.02D+03	1.81D+02
DECAY NUMBER	1.30D-04	1.71D-03	3.80D-02
RETENTION COEFFICIENT	1887.	1906.	2096.

BRIEF PEAK INFORMATION

TIME OF INITIAL DISCHARGE	841736.	YEARS AFTER REACTOR DISCHARGE
TIME OF PEAK TAIL	1.38915E+06	YEARS AFTER REACTOR DISCHARGE
TIME OF PEAK MAXIMUM	869122.	YEARS AFTER REACTOR DISCHARGE
MAXIMUM DISCHARGE RATE	1.54E-02	CURIES/YEAR
NUMBER OF TIMESTEPS USED	226	
DISP TO NO-DISP PEAKS	0.99968147	

TIME	DIM.LESS TIME	BAND RELEASE	D:O NO-DISP
8.4174E+05	1.8543E+03	3.0999E-14	0.0
8.4211E+05	1.8553E+03	1.0763E-13	0.0
8.4248E+05	1.8562E+03	3.6141E-13	0.0
8.4286E+05	1.8571E+03	1.1738E-12	0.0
8.4323E+05	1.8581E+03	3.6868E-12	0.0
8.4360E+05	1.8590E+03	1.1207E-11	0.0
8.4398E+05	1.8599E+03	3.2964E-11	0.0
8.4435E+05	1.8609E+03	9.3833E-11	0.0
8.4472E+05	1.8618E+03	2.5854E-10	0.0
8.4509E+05	1.8627E+03	6.8942E-10	0.0
8.4547E+05	1.8637E+03	1.7805E-09	0.0
8.4584E+05	1.8646E+03	4.4534E-09	0.0
8.4621E+05	1.8655E+03	1.0789E-08	0.0
8.4659E+05	1.8665E+03	2.5321E-08	0.0
8.4696E+05	1.8674E+03	5.7574E-08	0.0
8.4733E+05	1.8683E+03	1.2691E-07	0.0
8.4771E+05	1.8693E+03	2.7119E-07	0.0
8.4808E+05	1.8702E+03	5.6195E-07	0.0
8.4845E+05	1.8711E+03	1.1295E-06	0.0
8.4883E+05	1.8721E+03	2.2021E-06	0.0
8.4920E+05	1.8730E+03	4.1715E-06	0.0
8.4947E+05	1.8737E+03	6.5393E-06	0.0
8.4975E+05	1.8744E+03	1.0090E-05	0.0
8.5002E+05	1.8751E+03	1.5324E-05	0.0

TIME	BAND-RELEASE
8.5182E+05	1.0264E-15
8.5247E+05	5.6895E-15
8.5313E+05	2.8583E-14
8.5378E+05	1.3028E-13
8.5444E+05	5.3937E-13
8.5509E+05	2.0301E-12
8.5575E+05	6.9570E-12
8.5640E+05	2.1741E-11
8.5706E+05	6.2063E-11
8.5771E+05	1.6218E-10
8.5837E+05	3.8874E-10
8.5902E+05	8.5702E-10
8.5968E+05	1.7431E-09
8.6033E+05	3.2820E-09
8.6099E+05	5.7442E-09
8.6164E+05	9.3857E-09
8.6230E+05	1.4391E-08
8.6281E+05	1.9306E-08
8.6332E+05	2.5067E-08
8.6384E+05	3.1595E-08
8.6435E+05	3.8775E-08
8.6486E+05	4.6475E-08
8.6538E+05	5.4561E-08
8.6589E+05	6.2915E-08
8.6640E+05	7.1437E-08
8.6691E+05	8.0057E-08
8.6743E+05	8.8722E-08
8.6794E+05	9.7400E-08
8.6845E+05	1.0607E-07
8.6896E+05	1.1472E-07
8.6948E+05	1.2334E-07
8.6999E+05	1.3194E-07
8.7050E+05	1.4051E-07
8.7102E+05	1.4905E-07
8.7153E+05	1.5756E-07
8.7204E+05	1.6604E-07
8.7255E+05	1.7449E-07
8.8631E+05	3.9047E-07
9.0006E+05	5.8700E-07
9.1382E+05	7.6575E-07
9.2757E+05	9.2824E-07
9.4133E+05	1.0759E-06
9.5508E+05	1.2100E-06
9.6884E+05	1.3316E-06
9.8259E+05	1.4420E-06
9.9635E+05	1.5420E-06
1.0101E+06	1.6325E-06
1.0239E+06	1.7145E-06
1.0376E+06	1.7885E-06
1.0514E+06	1.8554E-06
1.0651E+06	1.9157E-06
1.0789E+06	1.9700E-06
1.0926E+06	2.0189E-06
1.1064E+06	2.0628E-06

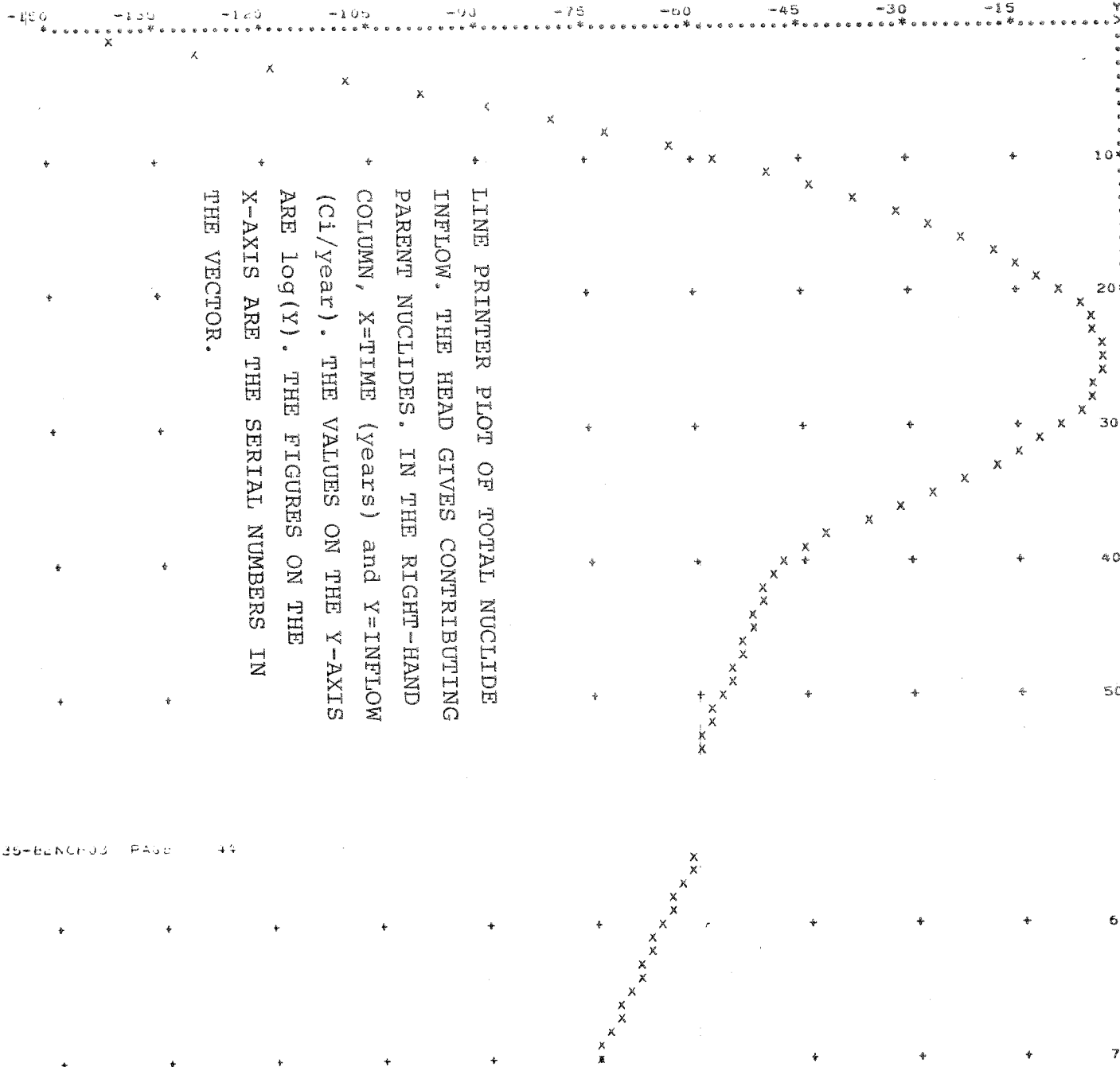
RESULTS FROM CALCULATIONS CARRIED OUT
WITH SHORT-LIVED DAUGHTER APPROXIMATION.

PLET OF THE NUCLIDE CONTRIBUTIONS FROM:

NP237 (X) NP237 AM241 CM243

SCALE: VARIABLE VALUE = Y*10** -1

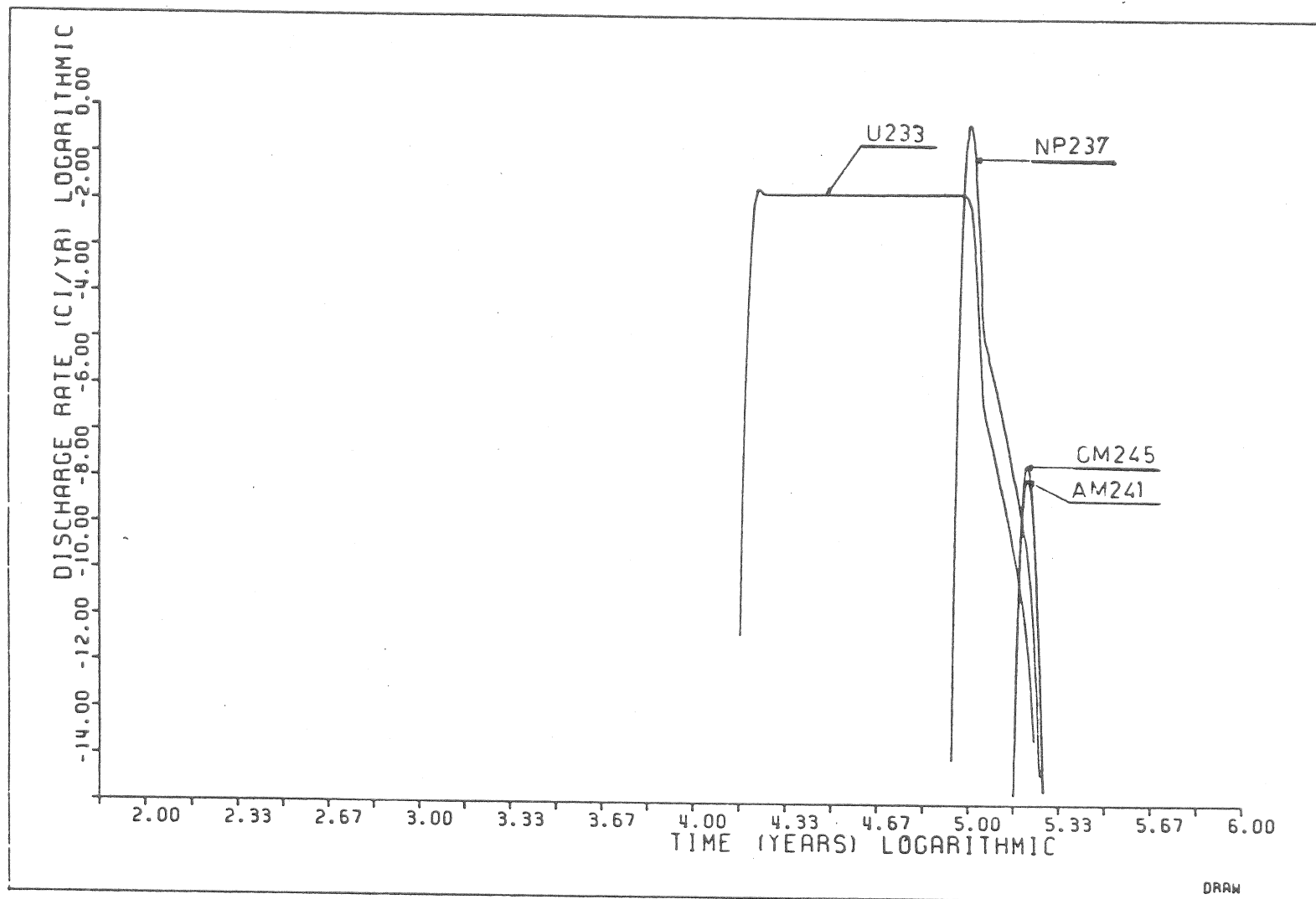
X-VALUE Y-VALUE



X-VALUE	Y-VALUE
8.70E+04	8.87E-15
8.77E+04	1.35E-13
8.83E+04	1.65E-12
8.90E+04	1.70E-11
8.96E+04	1.52E-10
9.03E+04	1.33E-09
9.10E+04	1.06E-08
9.16E+04	7.17E-08
9.23E+04	4.25E-07
9.37E+04	1.16E-05
9.44E+04	5.11E-05
9.51E+04	1.99E-04
9.58E+04	6.87E-04
9.65E+04	2.20E-03
9.72E+04	6.32E-03
9.80E+04	1.58E-02
9.87E+04	3.58E-02
9.94E+04	7.28E-02
1.01E+05	2.18E-01
1.02E+05	3.20E-01
1.02E+05	4.21E-01
1.03E+05	4.95E-01
1.04E+05	5.24E-01
1.05E+05	4.95E-01
1.05E+05	4.20E-01
1.06E+05	3.20E-01
1.07E+05	2.18E-01
1.09E+05	7.33E-02
1.09E+05	3.61E-02
1.10E+05	1.59E-02
1.11E+05	6.22E-03
1.12E+05	2.25E-03
1.13E+05	7.37E-04
1.14E+05	2.24E-04
1.14E+05	6.91E-05
1.15E+05	2.74E-05
1.17E+05	1.14E-05
1.18E+05	9.20E-06
1.19E+05	7.59E-06
1.20E+05	6.28E-06
1.21E+05	5.20E-06
1.21E+05	4.33E-06
1.22E+05	3.57E-06
1.23E+05	2.94E-06
1.24E+05	2.43E-06
1.26E+05	1.63E-06
1.27E+05	1.35E-06
1.28E+05	1.10E-06
1.29E+05	8.97E-07
1.30E+05	7.33E-07
1.31E+05	6.00E-07
1.32E+05	4.88E-07
1.33E+05	3.94E-07
1.34E+05	3.21E-07
1.36E+05	2.11E-07
1.37E+05	1.69E-07
1.38E+05	1.37E-07
1.39E+05	1.11E-07
1.40E+05	8.90E-08
1.41E+05	7.12E-08
1.42E+05	5.68E-08
1.43E+05	4.57E-08
1.44E+05	3.66E-08

BENCH03 1980-03-11

PLOT OF BENCH03 - results.



BENCHMARK RUN WITH GETOUT3. NUCLIDES CM245, AM241, NP237 AND U233.
GROUND WATER TRAVEL TIME: 400 YEARS
DISPERSION: 0.1 SQUARE METERS / YEAR
TIME OF LEACH INCIDENT: 0 YEARS
LEACHING TIME: 100 YEARS