#### Final Status Survey Planning Worksheet

Page	1	of	5
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GENERAL SECTION				
Survey Area #: OOL-06	Survey Unit #: 01			
Survey Unit Name: Yankee Western Access South				
FSSP Number: YNPS-FSSP-OOL06-01-00				
PREPARATION FOR FSS ACTIVITIES				
Check marks in the boxes below signify affirmative respo	onses and completion of the action.			
1.1 Files have been established for survey unit FSS reco	rds. ☑			
1.2 ALARA review has been completed for the survey u	nit. 🗹			
1.3 The survey unit has been turned over for final status	survey. 🗹			
1.4 An initial DP-8854 walkdown has been performed as in the survey area file.	nd a copy of the completed Survey Unit Walkdown Evaluation is			
1.5 Activities conducted within area since turnover for F	SS have been reviewed.			
Based on reviewed information, subsequent walkdow	Based on reviewed information, subsequent walkdown: 🗹 not warranted 🛛 warranted			
If warranted, subsequent walkdown has been perform	ed and documented per DP-8854.			
OR				
The basis has been provided to and accepted by the F subsequent walkdown.	The basis has been provided to and accepted by the FSS Project Manager for not performing a subsequent walkdown.			
1.6 A final classification has been performed.				
Classification: CLASS 1 🗆 CLASS 2 🗆 CLA	.SS 3 ⊠			
DATA QUALITY OBJECTIVES (DQO)				
1.0 Statement of problem:				
Survey Unit OOL-06-01 is the southern most unit of Survey Area OOL-06 and consists of land area west of the industrial area bound by OOL-06-02 on the north and east, OOL-08-01 on the south and non-impacted land on the west. OOL-06-01 is comprised of approximately 10,988 square meters of heavily wooded land area with no structures or systems associated with it. The survey unit, was never part of the RCA and has not been disturbed since plant construction. The problem at hand is to demonstrate that the years of plant operation did not result in an accumulation of plant-related radioactivity that exceeds LTP release criteria.				
The planning team for this effort consists of the FSS Project Manager, FSS Radiological Engineer, FSS Field Supervisor, and FSS Technicians. The FSS Radiological Engineer will make primary decisions with the concurrence of the FSS				

2.0 Identify the decision:

Does residual plant-related radioactivity, if present in the survey unit, exceed LTP release criteria? Alternative actions that may be implemented in this effort are; no action, investigation and reclassification.

3.0 Identify the inputs to the decision:

Sample media: soil

Project Manager.

Types of measurements: soil samples and judgmental scans.

Applicable DCGL: 3.0 pCi Cs-137 per g soil (8.73-mrem/y DCGL).

Radionuclide-of-concern: Cs-137

Thirty samples were collected between October 1994 and September 1998 and used to provide the initial characterization data for OOL-06, one humus, three sediment and twenty-six soil samples. However, the characterization data available in the HSA is insufficient to support FSS planning of Survey Unit OOL-06-01 since none of the samples collected in Survey

Area OOL-06 were from this subdivided Survey Unit.

Because Survey Unit OOL-06-01 is similar in nature and contiguous with Survey Unit OOL-08-01, the radiological characterization data (68 characterization soil, sediment samples) from Survey Unit OOL-08-01 are used to plan the additional characterization data required for Survey Unit OOL-06-01. The design of this plan incorporates the FSS Data Quality Objective (DQO) process in accordance with procedure DP-8856 to facilitate subsequent FSS for Survey Unit OOL-06-01. This approach allows the characterization data collected under this plan to be used as FSS data provided all of the License Termination Plan (LTP) survey design requirements are met and the results of the collected data satisfy all LTP specific release criteria.

Based on a review of Survey Unit OOL-08-01 HSA characterization data, Cesium-137 is the only plant-related radionuclide that was identified consistently (83.8%) in the 68 characterization soil samples analyzed (but its presence in soil also has a non-plant related origin (i.e. fallout from weapons testing). The radionuclide-of-concern for this survey will be Cs-137 however; all LTP radionuclides will be assessed in this survey.

The characterization data did not include analysis for hard-to-detect (HTD) nuclides; however, the gamma analysis performed did not detect Am-241 in any of the samples suggesting that TRUs are not present in Survey Unit OOL-06-01. HTD nuclides and TRUs will be included in the assessment related to this survey plan by complete (HTD nuclides and TRUs) off-site laboratory analysis of at least 5% of the samples taken.

Average Cs-137 concentration: 0.882 pCi/g

Standard deviation (o): 0.616 pCi/g

Surrogate DCGL: N/A

Investigation Level for soil samples: >2.31 pCi Cs-137 per g. This is 50% of the 8.73-mrem/y DCGL (i.e., 1.5 pCi/g) plus the decay-adjusted average Cs-137 background in the reference area (i.e., 0.81 pCi/g). Additionally, any other LTP-listed nuclide identified at a concentration greater than 50% of its 8.73-mrem/y DCGL will be cause for an investigation.

Investigation Level for scan: >background using an audible signal.

Expected background range for SPA-3 scan: 8,000 cpm to 15,000 cpm, depending on the presence of rock and boulders in the immediate vicinity of the measurement location.

Radionuclides for analysis: All LTP-listed nuclides with the focus on Cs-137.

MDCs for gamma analysis of soil sampl	les: 10 - 50% of the 8.73-mrem/y DCGL = $0.3 - 1.5$ pCi Cs137 per g
	= 0.25 - 1.3  pCi Ag-108m per g
	= 0.14 - 0.7 pCi Co-60 per g
	= 0.17 - 0.86 pCi Cs-134 per g
	= 1.1 - 5.5  pCi Sb - 125  per g
	= 1000 - 5200 pCi Fe-55 per g
	= 0.25 - 1.3  pCi Nb-94 per g
	= 0.35 - 1.7 pCi Eu-152 per g
	= 0.33 - 1.7 pCi Eu-154 per g
	= 14 - 70 pCi Eu-155 per g
MDCs for analyses of HTD nuclides:	10 - 50% of the 8.73-mrem/y DCGL = 0.059 - 0.29 pCi Sr-90 per g
	= 13 - 64 pCi H-3 per g
	= 0.19 - 0.96 pCi C-14 per g
	= 28 - 140 pCi Ni-63 per g
	= 0.48 - 2.4 pCi Tc-99 per g
	= 1.1 - 5.7  pCi Pu238 per g
	= 1.0 - 5.2  pCi Pu - 239  per g
	= 34 - 170  pCi Pu-214 per g
	= 1.0 - 5.2  pCi Am - 241  per g
	= 1.1 - 5.5  pCi Cm - 243  per g

Note: The desired MDCs in the laboratory analyses of FSS soil samples will be the 10% DCGL values. If those values

cannot be achieved, the 50% DCGL values <u>must</u> be achieved in the laboratory analyses of the FSS soil samples. The MDC values listed above will also be transmitted to the outside laboratory as an attachment to the chain-of-custody form accompanying the FSS soil samples.

Scan coverage: SPA-3 scans will be performed over an approximate 1m by 1m area surrounding each soil sample. At least two judgmental SPA-3 scans will be performed in Survey Unit OOL-06-01, each of which will cover an area of approximately 10  $m^2$  (1m in width and 10m in length).

- The first scan area will be performed between the southern border of Survey Area OOL-07 and Survey Unit OOL-08-01.
- The second scan area will be performed along the boundary of Survey Unit OOL-05-02.

MDCR for SPA-3: The accompanying Table 1 provides MDCR values by various background levels.

MDC(fDCGL) for SPA-3 scans: The accompanying Table 1 provides MDC values by various background levels.

QC checks and measurements: QC checks for the SPA-3 will be performed in accordance with DP-8540. One QC split sample will be collected.

#### 4.0 Define the boundaries of the survey:

Boundaries of OOL-06-01 are as shown on the attached map. OOL-05-02 and OOL-06-02 form the northern and eastern boundaries while OOL-08-01 forms the southern boundary. The survey unit is bounded on the west by non-impacted land. There are no plant-related structures present in OOL-06-01. The survey will be performed under appropriate weather conditions (as defined by instrumentation limitations and human tolerance) and in daylight hours (allowing adequate daylight time for ingress and egress).

#### 5.0 Develop a decision rule:

- (a) If all the characterization sample data show that the soil concentrations of all plant-related nuclides and the sum of the fraction of these nuclides are below the 8.73-mrem/y DCGLs, accept the data as FSS data and reject the null hypothesis (i.e., Survey Unit OOL-06-01 meets the release criteria).
- (b) If an action level(s) is exceeded, then perform an investigation survey.
- (c) If the average concentration of any LTP-listed nuclide exceeds the DCGL or the sum of the fractions exceeds one, then accept the null hypothesis (i.e., Survey Unit OOL-06-01 fails to meet the release criteria).

Note: Alternate actions beyond investigations are not expected to be necessary within this survey unit.

6.0 Specify tolerable limits on decision errors:

Null hypothesis: Residual plant-related radioactivity in Survey Unit OOL-06-01 exceeds the release criteria.

Probability of type I error: 0.05

Probability of type II error: 0.05

 $LBGR: 3.0 \text{ pCi/g} \div 2 = 1.5 \text{ pCi/g}$ 

7.0 Optimize Design:

Type of statistical test: WRS Test 🗹 🛛 Sign Test 🗔

11 FSS soil samples will be collected in randomly selected locations (refer to accompanying DPF-8853.1). This number has been chosen with the expectation that the characterization data collected, as defined by this survey package, will be useable for the FSS survey.

Cs-137 is present in background due to fallout - Cs-137 in reference area:  $0.82 \text{ pCi/g} \pm 0.404 \text{ pCi/g}$ . Decay-adjustment (9.5 y: 10/96 to 4/06) of the average background Cs-137: 0.66 pCi/g

Basis including background reference location (if WRS test is specified): <u>YA-REPT-00-002-05</u>

Number samples (per DP-8853): 11. Refer to the completed DPF-8853.1 in the survey package file.

Biased samples: N/A

### GENERAL INSTRUCTIONS

1. Collect 11 random soil samples in accordance with DP-8120, using sampling equipment as stated in DP-8120. One of

DPF-8856.1

the 11 soil samples will be a QC split sample. The same QC split sample will also be analyzed for HTD nuclides satisfying section 5.6.2.1 of the LTP as well as DP-8856.

2. Soil sample designation:

(a) Random soil sample designations: OOL-06-01-001-F through OOL-06-01-011-F corresponding to FSS samples collected at locations 001 through 011.

(b) QC split sample designation: OOL-06-01-007-F-S collected at sample location 007. The results will be compared in accordance with DP-8864.

<u>Note</u>: Sample OOL-06-01-007-F-S will be sent to the off-site laboratory as collected from the field (i.e., <u>without</u> drying) for H-3 analysis. The sample will also be analyzed for gamma-emitters, HTD beta-emitters, and TRUs.

<u>Note</u>: Soil sample OOL-06-01-009-F will be a QC recount performed by the YNPS Chemistry Lab and the results will be compared in accordance with DP-8864.

(c) Biased soil sample designation: N/A.

3. All soil samples will be received and prepared in accordance with DP-8813.

4. Chain of Custody form will be used in accordance with DP-8123 for all soil samples sent to an off-site laboratory. The required MDCs for the analyses performed by the off-site laboratory will be communicated to the Lab via an attachment to the Chain-of-Custody form.

5. The measurement locations have been identified using GPS in accordance with DP-8859. Each location will be marked with a flag. The FSS Radiological Engineer or FSS Field Supervisor will guide the FSS Technicians to the sample locations. Any location that is not suitable for soil sampling will be relocated to the nearest suitable location and documented in the field log in accordance with DP-8856.

6. Survey instrument: Operation of the E-600 w/SPA-3 will be in accordance with DP-8535, with QC checks performed in accordance with DP-8540. The instrument response checks shall be performed before issue and after use.

7. The job hazards associated with this survey are addressed in the accompanying JHA for OOL-06-01.

8. All personnel participating in this survey shall be trained in accordance with DP-8868.

### SPECIFIC INSTRUCTIONS

1. FSS Technicians will perform scans by moving the SPA-3 detector at a speed  $\leq 0.5$  m/s, keeping the probe within a distance of approximately 3 inches from the ground surface, and following a serpentine pattern that includes at least 3 passes across each square meter. When scanning and walking, a slow pace (i.e., 1 step per second) shall be used. Scanning will be performed in the rate-meter mode with the audible feature on. Surveyors will listen for upscale readings, to which they will respond by slowing down or stopping the probe to distinguish between random fluctuations in the background and greater than background readings. Location(s) where detectable-above-background scan readings are found will be investigated.

A first level investigation may be done with the SPA-3/E-600 to determine if the observed increase in the scan measurement is due to the presence of rocks and boulders. SPA-3 scans performed in non-impacted areas have shown that rock formations accounted for increased count rates. If it can be demonstrated that the presence of rocks is the cause of an increased count rate during a SPA-3 scan, record that finding form DPF-8856.2. If it is demonstrated that the rocks and boulders do not account for an above background SPA-3 measurement, a soil sample will be collected at the point of the highest SPA-3 reading in the scanned area. Detailed descriptions of investigation actions will be recorded on form DPF-8856.2 and the location of the above background scan and sample will be recorded on the survey map. The location description must include sufficient detail to revisit the spot at a later time. If a soil sample is collected during the first level investigation, the sample designation will consist of the measurement location code plus the letter "I" (for investigation). For example, if a soil sample is collected during a first level investigation at measurement location 001, it will be designated OOL-06-01-001-F-1. If the investigation calls for more than 1 sample, sequentially number the investigation samples as "II", "12", etc.

All designated measurement locations have been already identified by GPS per DP-8859. If a designated sample location is obstructed for any reason, the FSS Engineer or the FSS Field Supervisor will select an alternate location as close as reasonably possible to the designated location. A detailed description of the alternate location will be recorded on form DPF-8856.2, the survey map will be annotated appropriately and the alternate location will be conspicuously marked to facilitate re-visiting to identify and record the coordinates with GPS in accordance with DP-8859.

<u>Note</u>: If scan speeds of < 0.5 m/s are required due to high ambient background count rates, then the FSS Field Supervisor shall monitor and time scan speeds for at least 50% of such scanned areas.

2. YNPS Chemistry will analyze all soil samples for gamma-emitting radionuclides, <u>except</u> sample OOL-06-01-007-F-S. If any of the gamma analyses show that the Cs-137 concentration is greater than 1.5 pCi/g, an investigation survey will be conducted at that sample location.

3. Soil sample OOL-06-01-007-F-S will be sent directly to the off-site laboratory. The sample will be analyzed for H-3, gamma-emitting nuclides, HTD beta-emitting nuclides, and TRUs. Ensure that the lid to the 1-liter marinelli container is secured and sealed with electrical tape to prevent loss of moisture during shipping.

4. On-site and off-site analyses of the FSS samples shall achieve the required MDC values stated in Section 3 of this plan. The required MDCs will be communicated to the laboratory using an attachment to the Chain-of-Custody form.

### NOTIFICATION POINTS

FSI point(s) (y/n) Specify:	
Prepared by Oath C. E.	Date 5/2/06
Reviewed by Inc. FS8 Radiological Engineer	Date 5/2/06
Approved by <u>FSS Project Manager</u>	Date 5/8/06

#### Table 1



Inputs:

Scan speed: 0.5 m/s MDCR = 1.38\*sqrt(b)/sqrt(p)\*t

Where:

b = background counts in time t

p = surveyor efficiency = 0.5

t = time the detector is above localized activity =

1.12 s = 0.0187 min

Assume: Localized contam diam =

56 cm

$$MDC(fDCGL_{EMC}) = MDCR\sum(f^{i} / E_{i}AF^{i}DCGL^{i}) \quad (DP-8853)$$

AF= Area Factor

 $E_i$  = Scanning instrument efficiency (YA-REPT-00-015-04)

f = radionuclide fraction

Cs-137 Co-60

E, =	188	379 cpm/pCi/g	*
DCGL	3	1.4	
f =	1	0	
AF =	1.1	1	

BKG(dpm)	BKG/t	MDCR	$MDC(fDCGL_{emc}(8.73))$
7000	130.7	1195	1.93E+00
8000	149.3	1278	2.06E+00
9000	168.0	1355	2.18E+00
10000	186.7	1428	2.30E+00
11000	205.3	1498	2.41E+00
12000	224.0	1565	2.52E+00
13000	242.7	1629	2.63E+00
14000	261.3	1690	2.72E+00
15000	280.0	1749	2.82E+00
16000	298.7	1807	2.91E+00
17000	317.3	1862	3.00E+00
18000	336.0	1916	3.09E+00
19000	354.7	1969	3.17E+00
20000	373.3	2020	3.26E+00
21000	392.0	2070	3.34E+00
22000	410.7	2119	3.42E+00
23000	429.3	2166	3.49E+00
24000	448.0	2213	3.57E+00

\*E, values from YA-REPT-00=015-04, "Instrument Efficiency Determination for Use in Minimum Detectable Concentration Calculations in Support of Final Status Survey at Yankee Rowe"

GEN	ERAL SECTION			
Surve	y Area No.: OOL-06	Survey Unit No.: 02		
Surve	y Unit Name: Yankee Western Acc	ess		
FSSF	No.:YNPS-FSSP-OOL-06	5-02-00		
PRE	PARATION FOR FSS ACTIVITIE	S		
Chec	k marks in the boxes below signify af	firmative responses and completion of the action.		
1.1	Files have been established for surve	y unit FSS records. $X$		
1.2	ALARA review has been completed	for the survey unit.		
1.3	The survey unit has been turned over	for final status survey.		
1.4	An initial DP-5554 walk down has b	een performed and a copy of the completed Survey Unit		
	Walk down Evaluation is in the surve	ey area file. <u>X</u>		
1.5	Activities conducted within area since	the turnover for FSS have been reviewedX		
	Based on reviewed information, subs	sequent walk down: <u>X</u> not warranted warranted		
	If warranted, subsequent walk down	has been performed and documented per DP-8854.		
	The basis has been provided to and a	ccepted by the FSS Project Manager for not performing a		
ł	subsequent walk down.			
1.6	A final classification has been perfor	medX		
1	Classification: Class 3			
DAT	A QUALITY OBJECTIVES (DQO			
1.0	State the problem:			
}	Define the problem so that the focus	of the survey will be unambiguous.		
	Members of the planning team:	FSS Project manager, Radiological Engineer, Field Supervisor, and Technicians.		
	Primary decision maker/method:	FSS Radiological Engineer with concurrence of the FSS Project Manager.		
}	Available resources/deadlines:	N/A		
	Concise description of problem:	Release of OOL-06-02 to demonstrate compliance with YNPS LTP release criterion.		
2.0	Identify the decision:			
	Define the question that the survey will attempt to resolve and identify alternative actions that may be taken based			
	on the outcome of the survey.	Is the residual redicastivity in OOL 06.02 holes, the 8.72 mm/m relaces evitation?		
1	Principal study question:	Is the residual radioactivity in OOL-06-02 below the 8.73 mr/yr release criterion?		
	Alternative actions: If residual radioactivity in OOL-06-02 exceeds the 8.73 mr/yr release criterion, investigations will be performed, potentially resulting in remediation, reclassification or resurveys			
	Decision statement:	Determine whether or not OOL-06-02 satisfies the 8.73 mr/yr release criterion.		
3.0	Identify the inputs to the decision:			
}	Informational inputs needed to resolv	ve the decision statement and environmental variables that will be measured.		
	Sources of information:	<ul><li>29 samples from historical data was sufficient to develop the DQOs for OOL-06-02.</li><li>20 new data measurements will be acquired to support DQAs.</li></ul>		
	Direct measurement technique:	Soil samples will be collected and analyzed on site for all ETD LTP listed radionucluides, 1 sample will be sent to an independent lab for analyses of all LTP listed radionuclides.		
	Scan measurement technique: Sample matrix	Surfaces will be scanned via a SPA-3 probe. Soil		
	Radionuclide(s) of concern:	Based on a review of YNPS historical data, the following radionuclides are the only facility related radionuclides of concern: Co-60, Cs-137		
}	Sample Quantity	15 (calculated) + 5 (added), for a total of 20 samples. (+1 QC)		
l.	Gridded Sample Area Size	N/A (Class 3)		
li	Sample Grid Spacing:	No Grid		

Surv	ey Area No.:	OOL-06	Survey Unit No.: 02
Surv	ey Unit Name:	Yankee Western Acc	ess
FSSI	P_No.:	YNPS-FSSP-OOL-06	5-02-00
	Detection Li	mits:	For direct measurements and sample analyses, Minimum Detectable Concentrations (MDCs) less than 10% of the DCGL are prefered, while MDCs up to 50% of the DCGL are acceptable. See Attachment 2 for MDC Table.
	MDC (fl	DCGL):	The accompanying MDCR/MDC table in Attachment 1 provides MDC values, as a fraction of DCGL, for various background levels.
	MDCR(s	urveyor):	The accompanying MDCR/MDC table in Attachment 1 provides MDCR values for various background levels.
	Background	Measurements:	No reference area (background) measurements are required, the Sign Test will be used.
	Release crite	eria DCGL based on:	8.73 mr/yr for Soil. See Attachment 2 for radionuclide specific breakdown of DCGLs.
4.0	Define the bou	<u>undaries of the surve</u>	<u>y:</u>
	Define the spa Temporal bo	tial and temporal bour nundaries:	adaries that will be covered by the decision statement so data can be easily interpreted. The data are used to reflect the condition of radionuclides leaching into the ground water over a period of 1,000 years. The survey may be performed under appropriate weather conditions (as defined by instrument tolerance and personnel safety) on any shift of work.
	Spatial Bour	ıdaries:	YNPS has been divided into multiple survey areas and units with relatively homogeneous characteristics based on information collected during the years of facility operation, the HSA, and post remediation activities. The area of interest has been named OOL-06, and the survey unit is 02. The medium of interest is described as Soil. The radiological characteristics of this unit classify it as a Class 3 area. Which has no restrictions as a surface area guidance. The total surface area is 16,918 m2, which is in compliance with the Class 3 guidance. The maximum length is 264.6m, and the maximum width is 101.2m. Soil is surveyed to a depth of 15 cm.
	Detailed des	cription of unit:	See included GPS coordinates and maps that demonstrate the measurement locations, the survey unit boundaries and unit relationship to site. This area consists mainly of woodland's but includes an asphalt covered roadway which lead to the old administration building and mid-level parking lot. OOL-06-02 is bordered by OOL-06-01, OOL-08-01 to the south, OOL-05-01 to the west, OOL-05-04 & 08, OOL-06-03 to the north and OOL-02-03, OOL-08-06, OMB-02 to the east.
5.0	<u>Develop a dec</u>	<u>ision rule:</u>	
1	Define the par	rameter of interest, spe	ccify action levels, and the DCGL.
1	Investigation	1 Levels:	If an investigation level below is exceeded, then perform an investigation survey.
]]	Direct m	neasurements:	> 50% DCGLw
	Scan me Parameter o	asurements: f interest:	If there are no investigation issues, and the the residual radioactivity in OOL-06-02 systematic samples is less than the DCGLw then the survey unit is in compliance with the release criterion (8.73 mr/yr).
	Critical Vali	ие: 	If the average concentration is less than DCGLw, the sum of fractions is less than 1, and less than 6 of the 20 samples are above the DCGLw, the Survey Units passes.

Surve	ey Area No.: OOL-06		Survey Unit No.: 02	-
Surve	ey Unit Name: Yankee Western A	ccess		
FSSF	'No.: YNPS-FSSP-OOL	-06-02-00		_
6.0	Specify limits on decision errors	·		7
r I	Specify the decision maker's limit	s on decision errors, use	ed to establish performance goals for the data collection design.	- {
	Null Hypothesis $(H_{0})$ :	The residual radioac	ctivity in the survey unit data is greater than the DCGLw	
ļ				}
	Tolerance for Error	Type I Error: 0.05 (r	probability of rejecting the null hypothesis when it is true )	
		Type II Error: 0.05 (	(probability of accepting the null hypothesis when it is false)	{
	DCGLw (Unitv):	1	(proceeding of accepting are namely positions (more in its table))	ł
}	LBGR:	0.8702 (Initial LBG	iR: 0.5)	
}	Relative shift ( $\Delta/\sigma$ ):	2		
}	Sigma ( $\sigma$ ):	0.0649		
	Power of survey design:	See attachment for r	prospective power curve.	
7.0	Optimize Design:			
Į	Type of statistical test:	WRS Test	Sign Test X	
}	(background will not be subtracted	(		
	Design optimization is included in	the DQO process, and i	reflected in the data published in this plan.	
{	Number & Location of Samples.	20 Soil samples will	l be collected at locations based on random and judgmental	
		locatons (refer to ac	companying DPF-8853.2). See map for specific locations.	
GEN	ERAL INSTRUCTIONS			
1	Where possible, measurement loc	ations will be identified	using GPS in accordance with DP-8859. Each location will be	
	marked to assist in identifying the	location.		
2	Soil samples will be collected in a	ccordance with DP-8120	0.	
3	Chain of Custody form will be use	ed in accordance with DI	P-8123 for all soil samples sent to an off-site laboratory.	
4	All soil samples will be received and prepared in accordance with DP-8813. Note: Split samples to be sent to an off-site			
	lab will not be dried prior to counting on site or shipping.			- {
5	Survey instrument: Operation of the E-600 w/SPA-3 will be in accordance with DP-8535 with QC checks performed in			}
8	accordance with DP-8504. The in	strument response check	ks shall be performed before issue and after use.	
6	All SPA-3 scans will be performed with the audible feature activated. Listen for upscale readings and respond by slowing			
1	down or stopping the probe to dist	inguish between random	n fluctuations in the background and greater than background	}
ł	readings. Investigate any reprodu	cible upscale readings as	s described in the specific instructions.	
7	The job hazards associated with the survey described in this package are addressed in the accompanying Job Hazard			
	Assessment (JHA) for OOL-06-02	2.		
8	All personnel participating in this	survey shall be trained i	in accordance with DP-8868.	
9	Biased soil samples will be taken	from the "man-made" pi	iles of soil located in the southwest section of this survey unit.	
CDE	The use of a direct-push sampling	machine and/or hand-he	eld sampling equipment may be used to obtain these samples.	_
SPE				_
1	SPA-3 Scans:	1	1 11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
•	• Move the SPA-3 in rate-meter mode at a speed of 0.25m or less per second, keeping the probe at a distance of $\leq 3$ " from			
1	the surface and following a serpentine path that includes at least 3 passes across each square meter.			
•	• Scan the 1m <sup>2</sup> area surrounding each sample point prior to collecting a sample.			
•	• Perform 83 biased scans 1m wide by 10m long.			
2	Scan Investigations:			
1	Note: Detailed descriptions of inv	estigation actions shall	be recorded in the daily survey journal (DPF-8856.2) and	ĺ
	locations marked on a map.			
•	Scan a im radius tootprint around	ine investigation location	on in accordance with the scan requirements above. The area of	
6	scan should be increased as neces	sary to bound any areas	or elevated activity identified. Ferform a sample investigation as	

Survey Area No.:	OOL-06	Survey Unit No.: 02
Survey Unit Name:	Yankee Western Acce	285
FSSP No.:	YNPS-FSSP-OOL-06	-02-00
3 Sample Location All designated and compass a the FSS Field alternate location alternate location accordance with	ons: measurement location s necessary. If a design Supervisor will select a ion will be recorded on ion will be conspicuous th DP-8859 or by meas	s will be identified by GPS per DP-8859 or by use of reference points, tape measure nated sample location is obstructed for any reason, the FSS Radiological Engineer or in alternate location in accordance with DP-8856. A detailed description of the form DPF-8856.2, the survey unit map will be annotated appropriately, and the sly marked to facilitate re-visiting to identify and record the coordinates with GPS in surement from a known reference point when a GPS is not available.
4 Sample Requir	ements:	Collect 20 samples in accordance with DP-8120. 1 of the 20 samples will be analyzed as a QC split sample to fulfill the QC requirement of DP-8852. The same QC split sample will be analyzed for HTD nuclides in accordance with section 5.6.3.2.1 of the LTP and DP-8856.
Biased sample	s:	Collect 5 biased samples in accordance with DP-8120. These samples are to be taken in the "man-made" piles of soil which are located in the southwest section of this survey unit (see attached map). Two individual samples will be a obtained at each sample location, one at the surface (first 6-inches) and the second sample at a depth which is determined to be the original soil elevation underneath the pile. Place a "1" after the sample ID number to represent the surface sample and "2" after the "original soil" elevation sample (i.e. OOL-06-02-21-F-B-1). Place the soil into a 1-liter marinelli or plastic bag. If refusal is met prior to the achieving the original soil depth, then relocate within a 1-meter radius and re-sample.

**NOTE:** Any sample point that falls on the road will be sampled at two levels, the asphalt itself and the soil underlying the asphalt. Asphalt samples will be distinguished from the soil sample by appending the letter "A" to the suffix of the alphanumeric sample ID. Asphalt samples will be analyzed using the same MDCs as soil as specified in the DQO section of this plan.

5	Sample Designation:	
	FSS soil samples:	OOL-06-02-001-F through OOL-06-02-020-F corresponding to FSS sample locations 001 through 020.
	Biased soil samples:	OOL-06-02-021-F-B through OOL-06-02-025-F-B corresponding to biased sample location 021 through 025.
	QC split samples:	OOL-06-02-007-F-S is to be designated as QC split sample. This sample will be sent to the off-site laboratory (do not dry).
	Recount samples:	OOL-06-02-006-F-RC will be counted twice on site. The results will be compared in accordance with DP-8864.

6 Sample Analysis:

• Gamma analysis will be performed on all soil samples. If any of the gamma analyses show that an investigation level has been exceeded an investigation survey will be conducted at that sample location as directed by the radiological engineer.

- YNPS Chemistry will analyze OOL-06-02-001-F through OOL-06-02-020-F and OOL-06-02-021-F-B through OOL-06-02-025-F-B for gamma-emitting nuclides.
- YNPS Chemistry will analyze OOL-06-02-006-F as a sample recount. The recounted sample will possess the naming convention OOL-06-02-006-F-RC.
- YNPS Chemistry will analyze OOL-06-02-007-F-S for gamma-emitting nuclides prior to being sent to the off-site laboratory. These samples will be analyzed for gamma-emitting nuclides and HTD at the off-site laboratory.
- All gamma analysis of the FSS samples shall achieve the MDC values stated in the DQO section of this plan. The MDC's will be communicated to the laboratory using an attachment to the Chain-of- Custody form.



Survey Area No.:	OOL-06	Survey Unit No .:	02
Survey Unit Name:	Yankee Western Access		
FSSP No.:	YNPS-FSSP-OOL-06-02-00		

Prepared by John Grinley FSS Radiological Engineer

Reviewed by Rennhad

FSS Radiological Engineer

Date August 8, 2006

Approved by Martin Erickson Monte C FSS Project Manager

Date <u>8/16/06</u>

YNPS-FSSP-OOL-06-02-00 Attachment 1 SPA-3 Scan Tables

### Max Background

BKG(cpm)	MDCR	MDC(fDCGL)
4,000	639	1.14E+00
5,000	715	1.27E+00
6,000	783	1.39E+00
7,000	845	1.50E+00
8,000	904	1.61E+00
9,000	959	1.70E+00
10,000	1,011	1.80E+00
11,000	1,060	1.88E+00
12,000	1,107	1.97E+00
13,000	1,152	2.05E+00
14,000	1,196	2.13E+00
15,000	1,238	2.20E+00
16,000	1,278	2.27E+00
17,000	1,318	2.34E+00
18,000	1,356	2.41E+00
19,000	1,393	2.48E+00
20,000	1,429	2.54E+00
21,000	<u>1,4</u> 64	2.60E+00
22,000	1,499	2.66E+00
23,000	1,533	2.72E+00
24,000	1,565	2.78E+00
25,000	1,598	2.84E+00
26,000	1,629	2.90E+00
27,000	1,660	2.95E+00
28,000	1,691	3.01E+00
30,000	1,750	3.11E+00
32,000	1,808	3.21E+00
34,000	1,863	3.31E+00
36,000	1,917	3.41E+00
38,000	1,970	3.50E+00
40,000	2,021	3.59E+00

## YNPS-FSSP-OOL-06-02-00 Attachment 2

## DCGL MDC Table

自然是中心的学生。 在1995年中间的主义	Soil	il 10% MDC 5		Easy to
NUCIICE	(pCl/g)	DCGL	DCGL	Detect?
Co-60	1.4E+00	1.4E-01	7.0E-01	ETD
Nb-94	2.5E+00	2.5E-01	1.3E+00	ETD
Ag-108m	2.5E+00	2.5E-01	1.3E+00	ETD
Sb-125	1.1E+01	1.1E+00	5.6E+00	ETD
Cs-134	1.7E+00	1.7E-01	8.7E-01	ETD
Cs-137	3.0E+00	3.0E-01	1.5E+00	ETD
Eu-152	3.6E+00	3.6E-01	1.8E+00	ETD
Eu-154	3.3E+00	3.3E-01	1.7E+00	ETD
Eu-155	1.4E+02	1.4E+01	1.4E+01 6.9E+01	
Am-241	1.0E+01	1.0E+00	5.1E+00	ETD
H-3	1.3E+02	1.3E+01	6.4E+01	HTD
C-14	1.9E+00	1.9E-01	9.7E-01	HTD
Fe-55	1.0E+04	1.0E+03	5.1E+03	HTD
Ni-63	2.8E+02	2.8E+01	1.4E+02	HTD
Sr-90	6.0E-01	6.0E-02	3.0E-01	HTD
Tc-99	5.0E+00	5.0E-01	2.5E+00	HTD
Pu-238	1.2E+01	1.2E+00	5.8E+00	HTD
Pu-239	1.1E+01	1.1E+00	5.3E+00	HTD
Pu-241	3.4E+02	3.4E+01	1.7E+02	HTD
Cm-243	1.1E+01	1.1E+00	5.6E+00	HTD

8/8/64

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GE	NERAL SECTION		
Sur	vey Area No.: OOL-06	Survey Unit No.: 03	
Sur	vey Unit Name: Temporary Trailer a	nd Parking Area	
FSS	SP No.: YNPS-FSSP-OOL-0	6-03-00	
PR	EPARATION FOR FSS ACTIVIT	IES	
Che	ck marks in the boxes below signify	affirmative responses and completion of the action.	
1.1	Files have been established for surv	ey unit FSS records.	<u> </u>
1.2	ALARA review has been completed	for the survey unit.	X
1.3	The survey unit has been turned over	r for final status survey.	X
1.4	An initial DP-5554 walk down has Walk down Evaluation is in the surv	been performed and a copy of the completed Survey Unit vey area file.	x
1.5	Activities conducted within area sin	ce turnover for FSS have been reviewed.	X
	Based on reviewed information, sub	sequent walk down: X not warranted	warranted
	If warranted, subsequent walk dowr	has been performed and documented per DP-8854.	
	The basis has been provided to and	accepted by the FSS Project Manager for not performing a	
	subsequent walk down.		
1.6	A final classification has been performed as a classification: Class 2	rmed.	<u>X</u>
DA	TA QUALITY OBJECTIVES (DO	00)	
1.0	State the problem:		
	Define the problem so that the focus Members of the planning team: Primary decision maker/method: Available resources/deadlines: Concise description of problem:	s of the survey will be unambiguous. FSS Project manager, Radiological Engineer, Field Superviso FSS Radiological Engineer with concurrence of the FSS Proje N/A Release of OOL-06-03 to demonstrate compliance with YNPS	r, and Technicians. ect Manager. S LTP release criterion.
2.0	Identify the decision: Define the question that the survey on the outcome of the survey	will attempt to resolve and identify alternative actions that may l	pe taken based
	Principal study question:	Is the residual radioactivity in $OOI = 0.6 = 0.3$ below the 8.73 mr/	vr release criterion?
	Alternative actions:	If residual radioactivity in OOL-06-03 exceeds the 8.73 mr/yr investigations will be performed, potentially resulting in reme or resurveys.	release criterion, diation, reclassification
	Decision statement:	Determine whether or not OOL-06-03 satisfies the 8.73 mr/yr	release criterion.
3.0	Identify the inputs to the decision	<u>.</u>	
	Informational inputs needed to reso Sources of information:	we the decision statement and environmental variables that will 30 samples from historical data was sufficient to develop the 15 new data measurements will be acquired to support DQAs	be measured. DQOs for OOL-06-03.
	Direct measurement technique:	Soil samples will be collected and analyzed on site for all ETI radionucluides, 1 sample will be sent to an independent lab for listed radionuclides.	D LTP listed or analyses of all LTP
	Scan measurement technique: Sample matrix:	Surfaces will be scanned via a SPA-3 probe. Soil	
	Radionuclide(s) of concern:	Based on a review of YNPS historical data, the following rad facility related radionuclides of concern: Co-60, Cs-137	ionuclides are the only
	Sample Quantity	15 (calculated) + 0 (added), for a total of 15 samples. (+1 QC	)
	Gridded Sample Area Size	268.67 m2 (Survey Unit Area/N)	
	Sample Grid Spacing:	Triangular: 17.6m	

Survey Area No.: OOL-06	Survey Unit No.: 03
Survey Unit Name: Temporary Trailer	and Parking Area
FSSP No.: YNPS-FSSP-OOL	-06-03-00
Detection Limits:	For direct measurements and sample analyses, Minimum Detectable Concentrations (MDCs) less than 10% of the DCGL are prefered, while MDCs up to 50% of the
MDC (fDCGL):	DCGL are acceptable. See Attachment 2 for MDC Table. The accompanying MDCR/MDC table in Attachment 1 provides MDC values, as a
MDCR(surveyor):	fraction of DCGL, for various background levels. The accompanying MDCR/MDC table in Attachment 1 provides MDCR values for various background levels
Background Measurements:	No reference area (background) measurements are required, the Sign Test will be used.
Release criteria DCGL based or	<ul> <li>8.73 mr/yr for Soil. See Attachment 2 for radionuclide specific breakdown of DCGLs.</li> </ul>
4.0 Define the boundaries of the sur	<u>vey:</u>
Define the spatial and temporal bo Temporal boundaries:	The data are used to reflect the condition of radionuclides leaching into the ground water over a period of 1,000 years. The survey may be performed under appropriate weather conditions (as defined by instrument tolerance and personnel safety) on any
Spatial Boundaries:	shift of work. YNPS has been divided into multiple survey areas and units with relatively homogeneous characteristics based on information collected during the years of facility operation, the HSA, and post remediation activities. The area of interest has been named OOL-06, and the survey unit is 03. The medium of interest is described
	as Soil. The radiological characteristics of this unit classify it as a Class 2 area. Which has $> 2,000 \text{ m2}, \le 10,000 \text{ m2}$ as a surface area guidance. The total surface area is 4,030 m2, which is in compliance with the Class 2 guidance. The maximum length is 137m, and the maximum width is 39m. Soil is surveyed to a depth of 15 cm.
Detailed description of unit:	See included GPS coordinates and maps that demonstrate the measurement locations, the survey unit boundaries and unit relationship to site. Survey Unit OOL-06-03 is located on the west side of the site and was never part of the RCA. The survey unit contains the main egress and ingress points for vehicles and personnel as well as a staging area for temporary storage and office trailers. Even though OOL-06-03 was never a site for storing, packaging, or processing Rad Waste, Radwaste shipments traversed the survey unit during the decommissioning. OOL-06-03 is bounded on the north by OOL-05, on the south and west by OOL-06-02, and on the east by OOL-02-03. OOL-06-03 was classified as a Class 3 area in the HSA, however, because of the volume of radwaste shipments and the potential for activity to exist, OOL-06-03 has been reclassified as a MARSSIM Class 2 area. The survey unit is comprised of asphalt
5.0 Develop a decision rule:	
Define the parameter of interest, s	pecify action levels, and the DCGL.
Investigation Levels: Direct measurements:	If an investigation level below is exceeded, then perform an investigation survey. > DCGLw
Scan measurements:	> DCGLw or > MDC
rarameter of interest:	systematic samples is less than the DCGLw then the survey unit is in compliance with the release criterion (8.73 mr/yr).
Critical Value:	If the average concentration is less than DCGLw, the sum of fractions is less than 1, and less than 4 of the 15 samples are above the DCGLw, the Survey Units passes.

Sur	vey Area No.:	OOL-06	Survey Unit No.: 03			
Sur	vey Unit Name	: Temporary Trailer an	nd Parking Area			
FSS	SP No.:	YNPS-FSSP-OOL-0	6-03-00			
6.0	Specify limits	on decision errors:				
	Specify the de	ecision maker's limits of	on decision errors, used to establish performance goals for the data collection design.			
	Null Hypoth	tesis $(H_0)$ :	The residual radioactivity in the survey unit data is greater than the DCGLw			
	Tolerance fe	or Error:	Type I Error: 0.05 (probability of rejecting the null hypothesis when it is true.)			
8			Type II Error: 0.05 (probability of accepting the null hypothesis when it is false.)			
1	DCGLw (U	nity):	1			
8	LBGR:		0.9792 (Initial LBGR: 0.5)			
	Relative shi	fi $(\Delta/\sigma)$ :	2			
	Sigma ( $\sigma$ ):		0.0104			
	Power of su	rvey design:	See attachment for prospective power curve.			
7.0	Optimize Des	sign:				
	Type of statist	tical test:	WRS Test Sign TestX			
	(background v	will not be subtracted)				
	Design optimi	ization is included in the	the DQO process, and reflected in the data published in this plan.			
	Number & I	Location of Samples:	15 Soil samples will be collected at locations based on a random start, systematic			
CE	NEDAL INST	DUCTIONS	Thangular grid (lefer to accompanying DPF-8855.2). See map for specific locations.			
	NERAL INSI					
	Where possib	le, measurement locati	ons will be identified using OPS in accordance with DP-8859. Each location will be			
	Soil complexes	will be callested in each	ocation.			
2	Chain of Cust	will be conected in acc	in accordance with DP-0120.			
	All soil sampl	log will be received and	d prepared in accordance with DP-8813 Note: Split samples to be sent to an off-site			
	lah will not he	dried prior to countin	on site or shinning			
5	Survey instru	ment: Operation of the	e F-600 w/SPA-3 will be in accordance with DP-8535 with OC checks performed in			
	accordance wi	ith DP-8504. The inst	rument response checks shall be performed before issue and after use			
6	All SPA-3 sca	ans will be performed	with the audible feature activated. Listen for unscale readings and respond by slowing			
	down or stop	oing the probe to distin	guish between random fluctuations in the background and greater than background			
	readings. Inv	estigate any reproduci	ble upscale readings as described in the specific instructions.			
7	The job hazar	ds associated with the	survey described in this package are addressed in the accompanying Job Hazard			
	Assessment (J	(HA) for OOL-06-03.				
8	All personnel	participating in this su	arvey shall be trained in accordance with DP-8868.			
ļ						
SPI	ECIFIC INST	RUCTIONS				
1	SPA-3 Scans:					
•	• Move the SPA-3 in rate-meter mode at a speed of 0.25m or less per second, keeping the probe at a distance of $\leq 3$ " from					
	the surface an	d following a serpenti	ne path that includes at least 3 passes across each square meter.			
	• Scan the 1m <sup>2</sup> area surrounding each sample point prior to collecting a sample.					
2	Scan Investig	ations	y toni long.			
1	Note: Detaile	ed descriptions of inve	stigation actions shall be recorded in the daily survey journal (DPF-8856 2) and			
	locations mar	ked on a man.	subarion actions shart be recorded in the damy survey journal (D11-0050.2) and			
	Scan a 1m rad	lius footprint around th	the investigation location in accordance with the scan requirements above. The area of			
	scan should be	e increased as necessa	ry to bound any areas of elevated activity identified. Perform a sample investigation as			
	noted below					

Survey	Area No.: OOL-06	Survey Unit No.: 03			
Survey	Unit Name: Temporary Trailer and	d Parking Area			
FSSP N	No.: YNPS-FSSP-OOL-06	5-03-00			
3 Sa Al and the alt alt ac	In the second se	s will be identified by GPS per DP-8859 or by use of reference points, tape measure nated sample location is obstructed for any reason, the FSS Radiological Engineer or an alternate location in accordance with DP-8856. A detailed description of the form DPF-8856.2, the survey unit map will be annotated appropriately, and the sly marked to facilitate re-visiting to identify and record the coordinates with GPS in surement from a known reference point when a GPS is not available.			
4 Sample Requirements: Collect 15 samples in accordance with DP-8120. 1 of the 15 samples will be analyzed as a QC split sample to fulfill the QC requirement of DP-8852. The same QC split sample will be analyzed for HTD nuclides in accordance with section 5.6.3.2.1 of the LTP and DP-8856.					
Bio	ased samples:	No biased samples will be collected.			
5 Sa FS	mple Designation: SS soil samples:	OOL-06-03-001-F through OOL-06-03-015-F corresponding to FSS sample locations			
Ri.	ased soil samples	No biased samples will be collected			
	asea son samples.	The blased samples will be concered.			
Q	C split samples:	OOL-06-03-005-F-S is to be designated as QC split sample. This sample will be sent to the off-site laboratory (do not dry).			
Re	ecount samples:	OOL-06-03-004-F-RC will be counted twice on site. The results will be compared in accordance with DP-8864.			
6 <i>Sa</i> • Ga be	ample Analysis: amma analysis will be performed o en exceeded an investigation surve	n all soil samples. If any of the gamma analyses show that an investigation level has y will be conducted at that sample location as directed by the radiological engineer.			
• Yî	NPS Chemistry will analyze OOL-	06-03-001-F through OOL-06-03-015-F for gamma-emitting nuclides.			
• Yî co • Yî lat • Al wi	NPS Chemistry will analyze OOL- nvention OOL-06-03-004-F-RC. NPS Chemistry will analyze OOL- boratory. These samples will be an Il gamma analysis of the FSS samp ill be communicated to the laborato	06-03-004-F as a sample recount. The recounted sample will possess the naming 06-03-005-F-S for gamma-emitting nuclides prior to being sent to the off-site lalyzed for gamma-emitting nuclides and HTD at the off-site laboratory. les shall achieve the MDC values stated in the DQO section of this plan. The MDC's ry using an attachment to the Chain-of- Custody form.			
7 As • Ar asp alp	phalt Samples: ny sample point that falls on the asphalt. Asphalt samples will be dist phanumeric sample ID. Asphalt sa	phalt will be sampled at two levels, the asphalt itself and the soil underlying the inguished from the soil sample by appending the letter "A" to the suffix of the mples will be analyzed using the same MDCs as soil as specified in the DQO section			
Pro	epared by <u>Martin Erickson</u>	Date August 31, 2006			

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	FSS Radiological Engineer		
	m		
Reviewed by	Michael D. Rennhack	Date	August 31, 2006
	FSS Radiological Engineer		
Approved by	Martin Erickson On Babineau/ Son Balmac	Date	August 31, 2006
	FSS Project Manager		

	Martin	Erickson			
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#### Sample Number Calculation Worksheet - Data Input

# YNPS-FSSP-OOL-06-03-00

Attachment 1

# **SPA-3 Scan Tables**

### Max Background

BKG(cpm)	MDCR	MDC(fDCGL)
4,000	639	1.16E+00
5,000	715	1.30E+00
6,000	783	1.43E+00
7,000	845	1.54E+00
8,000	904	1.65E+00
9,000	959	1.75E+00
10,000	1,011	1.84E+00
11,000	1,060	1.93E+00
12,000	1,107	2.02E+00
13,000	1,152	2.10E+00
14,000	1,196	2.18E+00
15,000	1,238	2.25E+00
16,000	1,278	2.33E+00
17,000	1,318	2.40E+00
18,000	1,356	2.47E+00
19,000	1,393	2.54E+00
20,000	1,429	2.60E+00
21,000	1,464	2.67E+00
22,000	1,499	2.73E+00
23,000	1,533	2.79E+00
24,000	1,565	2.85E+00
25,000	1,598	2.91E+00
26,000	1,629	2.97E+00
27,000	1,660	3.03E+00
28,000	1,691	3.08E+00
30,000	1,750	3.19E+00
32,000	1,808	3.29E+00
34,000	1,863	3.39E+00
36,000	1,917	3.49E+00
38,000	1,970	3.59E+00
40,000	2,021	3.68E+00

	COL-0 Date C	OOL-06-03-00 Characterization Date     Date Characterization Date     Date Characterization Date     Section 24 (2006)						
	Participation and the	n a god the state of		的资源和分别。	0.0-00	New Crois765	为不少的 <b>的外的</b> 成	A State Sheet State
🖂 Date' 🔅	Co-60	Co-137	·鲁拉尔家小岛。第一次	( A L. Andrew (B) ( S)	5.2714	MAR 30.17-	and the second second	
12/09/97	2.29E-02	-1.33E-02			7.28E-03	-1.09E-02		
12/09/97	3.85E-02	9.03E-03			1.22E-02	7.39E-03		
12/08/97	3.03E-03	1.33E-02			9.63E-04	1.09E-02		[
12/08/97	6.04E-03	5.83E-02			1.92E-03	4.77E-02		
12/09/97	2.76E-02	1.27E-02			8.75E-03	1.04E-02		
12/08/97	-7.32E-03	-1.77E-02			-2.32E-03	-1.45E-02		
12/08/97	1.96E-02	7.52E-03			6.22E-03	6.15E-03		
12/08/97	-3.90E-02	8.95E-03			-1.24E-02	7. <u>3</u> 2E-03		
12/08/97	-1.61E-02	0.00E+00			-5.11E-03	0.00E+00		
11/03/97	2.66E-02	-1.15E-02			8.34E-03	-9.41E-03		
11/03/97	3.88E-03	3.16E-02			1.22E-03	2.58E-02		
11/13/97	-8.74E-04	-2.97E-02			-2.75E-04	-2.43E-02		
11/13/97	-2.53E-03	-2.02E-02			-7.96E-04	-1.65E-02		
12/11/97	2.72E-02	-9.37E-03			8.63E-03	-7.67E-03		
12/11/97	2.00E-02	4.34E-03			6.37E-03	3.55E-03		
12/11/97	4.12E-02	9.24E-02			1.31E-02	7.56E-02		
12/11/97	1.49E-02	1.85E-02			4.72E-03	1.51E-02		
12/11/97	5.50E-02	9.52E-02			1.75E-02	7.79E-02		
12/02/97	3.59E-02	0.00E+00			1.14E-02	0.00E+00		
12/03/97	2.11E-02	1.46E-02			6.68E-03	1.20E-02		
12/02/97	2.08E-04	-3.07E-02			6.59E-05	-2.51E-02		
12/02/97	1.94E-02	1.51E-03			6.14E-03	1.24E-03		
12/03/97	-1.26E-02	-1.08E-02_			-3.98E-03	-8.86E-03		
12/02/97	-6.38E-03	0.00E+00			-2.02E-03	0.00E+00		
12/02/97	-1.63E-02	1.54E-02			-5.16E-03	-1.26E-02		
12/02/97	3.64E-02	-5.31E-03			1.15E-02	-4.34E-03		
08/03/98	8.27E-02	1.65E-02			2.86E-02	1.37E-02		
08/03/98	3.37E-02	-4.83E-03			1.16E-02	-4.01E-03		
08/03/98	5.85E-02	4.04E-02			2.02E-02	3.36E-02		
08/03/98	5.51E-02	2.70E-02	L		1.91E-02	2.24E-02		

MR 8-31-86