

Experiment Number: 20614 - 02

**P05: INCIDENCE RATES OF NEOPLASMS BY ANATOMIC SITE (SYSTEMIC LESIONS  
ABRIDGED) (a)**

Date Report Requested: 07/24/2018

Test Type: CHRONIC

Perfluorooctanoic Acid

Time Report Requested: 12:59:13

Route: DOSED FEED

CAS Number: 335-67-1

First Dose M/F: 07/27/09 / NA

Species/Strain: RATS/HSD

Lab: BAT

Final 1\_Core Only

**NTP Study Number:**

C20614B

**Lock Date:**

01/10/2012

**Cage Range:**

ALL

**Date Range:**

ALL

**Reasons For Removal:**

25021 TSAC

25020 NATD

25019 MSAC

**Removal Date Range:**

ALL

**Treatment Groups:**

Include ALL

**Study Gender:**

Male

**TDMSE Version:**

3.0.2.3\_002

**PWG Approval Date:**

07/24/2018

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Time Report Requested: 12:59:13

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CAS Number: 335-67-1

First Dose M/F: 07/27/09 / NA

Species/Strain: RATS/HSD

Lab: BAT

Harlan Sprague Dawley RATS MALE	0/0 ppm	300/0 ppm	0/20 ppm	300/20 ppm	0/40 ppm	300/40 ppm
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**Disposition Summary**

<b>Animals Initially In Study</b>	<b>60</b>	<b>60</b>	<b>60</b>	<b>60</b>	<b>60</b>	<b>60</b>
<b>Early Deaths</b>						
<b>Moribund Sacrifice</b>	<b>7</b>	<b>9</b>	<b>6</b>	<b>8</b>	<b>8</b>	<b>6</b>
<b>Natural Death</b>	<b>7</b>	<b>6</b>	<b>2</b>	<b>4</b>	<b>7</b>	<b>6</b>
<b>Survivors</b>						
<b>Natural Death</b>		<b>1</b>			<b>1</b>	
<b>Terminal Sacrifice</b>	<b>36</b>	<b>34</b>	<b>42</b>	<b>38</b>	<b>34</b>	<b>38</b>
<b>Animals Examined Microscopically</b>	<b>50</b>	<b>50</b>	<b>50</b>	<b>50</b>	<b>50</b>	<b>50</b>

## ALIMENTARY SYSTEM

Esophagus	(50)	(50)	(50)	(50)	(50)	(50)
Intestine Large, Cecum	(49)	(50)	(50)	(50)	(50)	(50)
Intestine Large, Colon	(49)	(50)	(50)	(50)	(50)	(50)
Intestine Large, Rectum	(50)	(50)	(50)	(50)	(50)	(50)
Intestine Small, Duodenum	(50)	(50)	(50)	(50)	(50)	(50)
Intestine Small, Ileum	(49)	(50)	(50)	(50)	(50)	(50)
Intestine Small, Jejunum	(49)	(50)	(50)	(50)	(50)	(50)
Adenocarcinoma	1 (2%)					
Sarcoma, Metastatic, Spleen				1 (2%)		
Liver	(50)	(50)	(50)	(50)	(50)	(50)
Carcinoma, Metastatic, Pancreas						
Cholangiocarcinoma	1 (2%)					
Hemangioma						
Hepatocellular Adenoma				1 (2%)	4 (8%)	5 (10%)
Hepatocellular Adenoma, Multiple					3 (6%)	
Hepatocellular Carcinoma						
Mesentery	(0)	(0)	(1)	(2)	(0)	(0)
Sarcoma, Metastatic, Spleen				1 (50%)		
Pancreas	(50)	(50)	(50)	(50)	(50)	(50)
Sarcoma, Metastatic, Spleen				1 (2%)		
Schwannoma Malignant, Metastatic, Stomach, Forestomach		1 (2%)				
Acinus, Adenoma	1 (2%)	3 (6%)	8 (16%)		4 (8%)	8 (16%)

a - Number of animals examined microscopically at site and number of animals with lesion

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Species/Strain: RATS/HSD

Lab: BAT

Harlan Sprague Dawley RATS MALE	0/0 ppm	300/0 ppm	0/20 ppm	300/20 ppm	0/40 ppm	300/40 ppm
Acinus, Adenoma, Multiple	2 (4%)	4 (8%)	20 (40%)	18 (36%)	22 (44%)	22 (44%)
Acinus, Carcinoma			3 (6%)	2 (4%)	1 (2%)	
Acinus, Carcinoma, Multiple						1 (2%)
Salivary Glands	(49)	(50)	(50)	(50)	(50)	(50)
Myoepithelioma					1 (2%)	
Schwannoma Malignant						1 (2%)
Stomach, Forestomach	(50)	(50)	(50)	(50)	(50)	(50)
Schwannoma Malignant		1 (2%)				
Stomach, Glandular	(50)	(50)	(50)	(50)	(50)	(50)
Carcinoma, Metastatic, Pancreas						
Neuroendocrine Tumor, Malignant						1 (2%)
<b>CARDIOVASCULAR SYSTEM</b>						
Blood Vessel	(50)	(50)	(50)	(50)	(50)	(50)
Heart	(50)	(50)	(50)	(50)	(50)	(50)
Schwannoma Malignant		1 (2%)				
Endocardium, Schwannoma Malignant		1 (2%)				
<b>ENDOCRINE SYSTEM</b>						
Adrenal Cortex	(50)	(50)	(50)	(50)	(50)	(50)
Adenoma						
Schwannoma Malignant, Metastatic, Stomach, Forestomach		1 (2%)				
Adrenal Medulla	(50)	(50)	(50)	(50)	(50)	(50)
Pheochromocytoma Benign	6 (12%)	8 (16%)	3 (6%)	5 (10%)	1 (2%)	3 (6%)
Pheochromocytoma Benign, Multiple	1 (2%)					
Pheochromocytoma Malignant			1 (2%)			
Bilateral, Pheochromocytoma Benign	1 (2%)					
Bilateral, Pheochromocytoma Malignant						
Islets, Pancreatic	(50)	(50)	(50)	(50)	(50)	(50)
Adenoma	5 (10%)	2 (4%)	8 (16%)	8 (16%)	7 (14%)	8 (16%)
Adenoma, Multiple		1 (2%)			1 (2%)	
Carcinoma			1 (2%)			

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Species/Strain: RATS/HSD

Lab: BAT

Harlan Sprague Dawley RATS MALE	0/0 ppm	300/0 ppm	0/20 ppm	300/20 ppm	0/40 ppm	300/40 ppm
Parathyroid Gland Adenoma	(41)	(46)	(44)	(39)	(38)	(40)
Pituitary Gland Pars Distalis, Adenoma	(50) 5 (10%)	(50) 6 (12%)	(50) 6 (12%)	(50) 8 (16%)	(50) 2 (4%)	(50) 9 (18%)
Thyroid Gland Bilateral, C-cell, Adenoma	(49) 1 (2%)	(50) 2 (4%)	(50) 1 (2%)	(50)	(50)	(50) 2 (4%)
Bilateral, C-cell, Carcinoma						
C-cell, Adenoma	10 (20%)	5 (10%)	10 (20%)	11 (22%)	4 (8%)	13 (26%)
C-cell, Carcinoma		3 (6%)	3 (6%)		2 (4%)	

## GENERAL BODY SYSTEM

None

## GENITAL SYSTEM

Epididymis	(50)	(50)	(50)	(50)	(50)	(49)
Preputial Gland	(50)	(50)	(50)	(50)	(50)	(49)
Duct, Papilloma		1 (2%)				
Prostate	(50)	(50)	(50)	(50)	(50)	(50)
Adenoma						1 (2%)
Sarcoma, Metastatic, Spleen				1 (2%)		
Ventral, Adenoma	3 (6%)	1 (2%)	1 (2%)	3 (6%)		
Seminal Vesicle	(50)	(50)	(50)	(50)	(50)	(50)
Testes	(50)	(50)	(50)	(50)	(50)	(49)
Sarcoma, Metastatic, Spleen				1 (2%)		
Interstitial Cell, Adenoma		3 (6%)		1 (2%)	3 (6%)	1 (2%)

## HEMATOPOIETIC SYSTEM

Bone Marrow	(50)	(50)	(50)	(50)	(50)	(50)
Sarcoma, Metastatic, Bone		1 (2%)				
Lymph Node	(3)	(3)	(3)	(3)	(3)	(3)
Mediastinal, Sarcoma, Metastatic, Bone		1 (33%)				

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Harlan Sprague Dawley RATS MALE	0/0 ppm	300/0 ppm	0/20 ppm	300/20 ppm	0/40 ppm	300/40 ppm
Mediastinal, Sarcoma, Metastatic, Spleen				1 (33%)		
Pancreatic, Carcinoma					1 (33%)	
Lymph Node, Mandibular	(49)	(50)	(50)	(50)	(50)	(50)
Lymph Node, Mesenteric	(49)	(50)	(50)	(50)	(50)	(50)
Sarcoma, Metastatic, Spleen				1 (2%)		
Spleen	(50)	(50)	(50)	(50)	(50)	(50)
Sarcoma				1 (2%)		
Schwannoma Malignant, Metastatic, Stomach, Forestomach		1 (2%)				
Thymus	(48)	(48)	(46)	(49)	(48)	(47)
Sarcoma, Metastatic, Bone		1 (2%)				
Thymoma Malignant						

## INTEGUMENTARY SYSTEM

Mammary Gland	(50)	(50)	(49)	(50)	(50)	(50)
Adenoma				1 (2%)		
Fibroadenoma	2 (4%)		2 (4%)		2 (4%)	1 (2%)
Skin	(50)	(50)	(50)	(50)	(50)	(50)
Basal Cell Adenoma	1 (2%)					
Hemangiosarcoma						1 (2%)
Keratoacanthoma	5 (10%)		2 (4%)	3 (6%)	1 (2%)	
Lipoma			2 (4%)			
Pilomatrixoma			1 (2%)			
Squamous Cell Papilloma			1 (2%)			1 (2%)
Trichoepithelioma		1 (2%)				
Pinna, Neural Crest Tumor						
Subcutaneous Tissue, Fibroma	1 (2%)		5 (10%)	3 (6%)	1 (2%)	2 (4%)
Subcutaneous Tissue, Fibrosarcoma	1 (2%)					
Subcutaneous Tissue, Hemangiosarcoma					1 (2%)	
Subcutaneous Tissue, Lipoma, Multiple				1 (2%)		
Subcutaneous Tissue, Schwannoma Malignant						

## MUSCULOSKELETAL SYSTEM

a - Number of animals examined microscopically at site and number of animals with lesion

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Harlan Sprague Dawley RATS MALE	0/0 ppm	300/0 ppm	0/20 ppm	300/20 ppm	0/40 ppm	300/40 ppm
Bone	(50)	(50)	(50)	(50)	(50)	(50)
Sarcoma		1 (2%)				
Periosteum, Sarcoma		1 (2%)				
Skeletal Muscle	(2)	(1)	(1)	(1)	(1)	(0)
Sarcoma, Metastatic, Spleen				1 (100%)		
<b>NERVOUS SYSTEM</b>						
Brain	(50)	(50)	(50)	(50)	(50)	(50)
Glioma Malignant	1 (2%)		1 (2%)			
Meningioma Malignant						
Oligodendroglioma Benign		1 (2%)				
Cerebellum, Granular Cell Tumor Benign	1 (2%)					
Cerebrum, Granular Cell Tumor Benign	1 (2%)					
Meninges, Schwannoma Malignant	1 (2%)					
Peripheral Nerve	(0)	(0)	(0)	(1)	(1)	(0)
Spinal Cord	(0)	(0)	(0)	(1)	(1)	(0)
<b>RESPIRATORY SYSTEM</b>						
Larynx	(1)	(0)	(0)	(0)	(0)	(0)
Lung	(50)	(50)	(50)	(50)	(50)	(50)
Carcinoma, Metastatic, Thyroid Gland			1 (2%)			
Carcinoma, Metastatic, Zymbal'S Gland						
Sarcoma, Metastatic, Bone		1 (2%)				
Schwannoma Malignant, Metastatic, Stomach, Forestomach		1 (2%)				
Squamous Cell Carcinoma	1 (2%)					
Nose	(50)	(50)	(50)	(50)	(50)	(50)
Trachea	(50)	(50)	(50)	(50)	(50)	(50)
<b>SPECIAL SENSES SYSTEM</b>						
Eye	(50)	(50)	(50)	(50)	(50)	(50)

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Species/Strain: RATS/HSD

Lab: BAT

Harlan Sprague Dawley RATS MALE	0/0 ppm	300/0 ppm	0/20 ppm	300/20 ppm	0/40 ppm	300/40 ppm
Retrobulbar, Schwannoma Malignant, Metastatic, Skin						
Harderian Gland	(50)	(50)	(50)	(50)	(50)	(50)
Schwannoma Malignant, Metastatic, Brain	1 (2%)					
Schwannoma Malignant, Metastatic, Skin						
Lacrimal Gland	(1)	(0)	(0)	(0)	(0)	(0)
Zymbal's Gland	(0)	(0)	(0)	(1)	(0)	(0)
Carcinoma				1 (100%)		
<b>URINARY SYSTEM</b>						
Kidney	(50)	(50)	(50)	(50)	(50)	(50)
Liposarcoma	1 (2%)	1 (2%)				
Nephroblastoma	1 (2%)					
Renal Tubule, Adenoma	1 (2%)		1 (2%)			
Urinary Bladder	(49)	(50)	(50)	(50)	(50)	(50)
<b>SYSTEMIC LESIONS</b>						
Multiple Organ	*(50)	*(50)	*(50)	*(50)	*(50)	*(50)
Histiocytic Sarcoma			1 (2%)			
Leukemia Mononuclear	3 (6%)	1 (2%)				1 (2%)
Lymphoma Malignant	1 (2%)	2 (4%)	2 (4%)	1 (2%)	2 (4%)	1 (2%)
Mesothelioma Malignant	1 (2%)	2 (4%)		2 (4%)	1 (2%)	

a - Number of animals examined microscopically at site and number of animals with lesion

\* Number of animals with any tissue examined microscopically

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Lab: BAT

Harlan Sprague Dawley RATS MALE

0/80 ppm

300/80 ppm

**Disposition Summary**

<b>Animals Initially In Study</b>	<b>60</b>	<b>60</b>
<b>Early Deaths</b>		
<b>Moribund Sacrifice</b>	<b>3</b>	<b>4</b>
<b>Natural Death</b>	<b>10</b>	<b>7</b>
<b>Survivors</b>		
<b>Natural Death</b>	<b>1</b>	
<b>Terminal Sacrifice</b>	<b>36</b>	<b>39</b>
<b>Animals Examined Microscopically</b>	<b>50</b>	<b>50</b>

## ALIMENTARY SYSTEM

Esophagus	(50)	(50)
Intestine Large, Cecum	(50)	(50)
Intestine Large, Colon	(50)	(50)
Intestine Large, Rectum	(50)	(50)
Intestine Small, Duodenum	(50)	(50)
Intestine Small, Ileum	(50)	(50)
Intestine Small, Jejunum	(50)	(50)
Adenocarcinoma		
Sarcoma, Metastatic, Spleen		
Liver	(50)	(50)
Carcinoma, Metastatic, Pancreas	1 (2%)	
Cholangiocarcinoma		1 (2%)
Hemangioma		1 (2%)
Hepatocellular Adenoma	8 (16%)	5 (10%)
Hepatocellular Adenoma, Multiple	3 (6%)	5 (10%)
Hepatocellular Carcinoma		4 (8%)
Mesentery	(1)	(1)
Sarcoma, Metastatic, Spleen		
Pancreas	(50)	(50)
Sarcoma, Metastatic, Spleen		
Schwannoma Malignant, Metastatic, Stomach, Forestomach		
Acinus, Adenoma	6 (12%)	3 (6%)

a - Number of animals examined microscopically at site and number of animals with lesion



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Lab: BAT

Harlan Sprague Dawley RATS MALE	0/80 ppm	300/80 ppm
Acinus, Adenoma, Multiple	26 (52%)	27 (54%)
Acinus, Carcinoma	3 (6%)	3 (6%)
Acinus, Carcinoma, Multiple		
Salivary Glands	(49)	(50)
Myoepithelioma		
Schwannoma Malignant		
Stomach, Forestomach	(50)	(50)
Schwannoma Malignant		
Stomach, Glandular	(50)	(50)
Carcinoma, Metastatic, Pancreas		1 (2%)
Neuroendocrine Tumor, Malignant		

## CARDIOVASCULAR SYSTEM

Blood Vessel	(50)	(50)
Heart	(50)	(50)
Schwannoma Malignant	1 (2%)	
Endocardium, Schwannoma Malignant		

## ENDOCRINE SYSTEM

Adrenal Cortex	(50)	(50)
Adenoma	3 (6%)	1 (2%)
Schwannoma Malignant, Metastatic, Stomach, Forestomach		
Adrenal Medulla	(50)	(50)
Pheochromocytoma Benign		
Pheochromocytoma Benign, Multiple		
Pheochromocytoma Malignant		
Bilateral, Pheochromocytoma Benign		
Bilateral, Pheochromocytoma Malignant		1 (2%)
Islets, Pancreatic	(50)	(50)
Adenoma	3 (6%)	5 (10%)
Adenoma, Multiple	1 (2%)	
Carcinoma		

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Lab: BAT

Harlan Sprague Dawley RATS MALE	0/80 ppm	300/80 ppm
Parathyroid Gland	(41)	(42)
Adenoma		1 (2%)
Pituitary Gland	(50)	(50)
Pars Distalis, Adenoma	2 (4%)	5 (10%)
Thyroid Gland	(49)	(50)
Bilateral, C-cell, Adenoma		1 (2%)
Bilateral, C-cell, Carcinoma	1 (2%)	
C-cell, Adenoma	12 (24%)	11 (22%)
C-cell, Carcinoma		2 (4%)

## GENERAL BODY SYSTEM

None

## GENITAL SYSTEM

Epididymis	(50)	(50)
Preputial Gland	(50)	(50)
Duct, Papilloma		
Prostate	(50)	(50)
Adenoma	1 (2%)	
Sarcoma, Metastatic, Spleen		
Ventral, Adenoma	1 (2%)	
Seminal Vesicle	(50)	(50)
Testes	(50)	(50)
Sarcoma, Metastatic, Spleen		
Interstitial Cell, Adenoma		1 (2%)

## HEMATOPOIETIC SYSTEM

Bone Marrow	(50)	(50)
Sarcoma, Metastatic, Bone		
Lymph Node	(0)	(1)
Mediastinal, Sarcoma, Metastatic, Bone		

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Mediastinal, Sarcoma, Metastatic, Spleen		
Pancreatic, Carcinoma		
Lymph Node, Mandibular	(49)	(50)
Lymph Node, Mesenteric	(50)	(50)
Sarcoma, Metastatic, Spleen		
Spleen	(50)	(50)
Sarcoma		
Schwannoma Malignant, Metastatic, Stomach, Forestomach		
Thymus	(49)	(45)
Sarcoma, Metastatic, Bone		
Thymoma Malignant		1 (2%)

## INTEGUMENTARY SYSTEM

Mammary Gland	(50)	(50)
Adenoma		
Fibroadenoma	1 (2%)	1 (2%)
Skin	(50)	(50)
Basal Cell Adenoma		
Hemangiosarcoma		
Keratoacanthoma	1 (2%)	1 (2%)
Lipoma		
Pilomatrixoma		
Squamous Cell Papilloma		
Trichoepithelioma		
Pinna, Neural Crest Tumor		1 (2%)
Subcutaneous Tissue, Fibroma	1 (2%)	1 (2%)
Subcutaneous Tissue, Fibrosarcoma	1 (2%)	
Subcutaneous Tissue, Hemangiosarcoma		
Subcutaneous Tissue, Lipoma, Multiple		
Subcutaneous Tissue, Schwannoma Malignant	1 (2%)	

## MUSCULOSKELETAL SYSTEM

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Harlan Sprague Dawley RATS MALE	0/80 ppm	300/80 ppm
Bone	(50)	(50)
Sarcoma		
Periosteum, Sarcoma		
Skeletal Muscle	(0)	(2)
Sarcoma, Metastatic, Spleen		

## NERVOUS SYSTEM

Brain	(50)	(50)
Glioma Malignant		
Meningioma Malignant	1 (2%)	
Oligodendroglioma Benign		
Cerebellum, Granular Cell Tumor Benign		
Cerebrum, Granular Cell Tumor Benign		1 (2%)
Meninges, Schwannoma Malignant		
Peripheral Nerve	(0)	(0)
Spinal Cord	(0)	(0)

## RESPIRATORY SYSTEM

Larynx	(0)	(0)
Lung	(50)	(50)
Carcinoma, Metastatic, Thyroid Gland		
Carcinoma, Metastatic, Zymbal'S Gland		1 (2%)
Sarcoma, Metastatic, Bone		
Schwannoma Malignant, Metastatic, Stomach, Forestomach		
Squamous Cell Carcinoma		
Nose	(50)	(50)
Trachea	(50)	(50)

## SPECIAL SENSES SYSTEM

Eye	(50)	(50)
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Lab: BAT

Harlan Sprague Dawley RATS MALE	0/80 ppm	300/80 ppm
Retrobulbar, Schwannoma Malignant, Metastatic, Skin	1 (2%)	
Harderian Gland	(49)	(50)
Schwannoma Malignant, Metastatic, Brain		
Schwannoma Malignant, Metastatic, Skin	1 (2%)	
Lacrimal Gland	(0)	(0)
Zymbal's Gland	(0)	(1)
Carcinoma		1 (100%)

## URINARY SYSTEM

Kidney	(50)	(50)
Liposarcoma		
Nephroblastoma		
Renal Tubule, Adenoma	1 (2%)	
Urinary Bladder	(50)	(50)

## SYSTEMIC LESIONS

Multiple Organ	*(50)	*(50)
Histiocytic Sarcoma		
Leukemia Mononuclear	1 (2%)	1 (2%)
Lymphoma Malignant		1 (2%)
Mesothelioma Malignant		1 (2%)

a - Number of animals examined microscopically at site and number of animals with lesion

\* Number of animals with any tissue examined microscopically

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Lab: BAT

Harlan Sprague Dawley RATS MALE	0/0 ppm	300/0 ppm	0/20 ppm	300/20 ppm	0/40 ppm	300/40 ppm
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**Tumor Summary for Males**

Total Animals with Primary Neoplasms (b)	37	28	46	40	35	44
Total Primary Neoplasms	60	52	83	70	64	82
Total Animals with Benign Neoplasms	32	24	40	37	31	43
Total Benign Neoplasms	47	38	70	63	56	76
Total Animals with Malignant Neoplasms	9	11	12	6	8	5
Total Malignant Neoplasms	13	14	12	7	8	5
Total Animals with Metastatic Neoplasms	1	2	1	1		
Total Metastatic Neoplasms	1	8	1	8		
Total Animals with Malignant Neoplasms Uncertain Primary Site						
Total Animals with Neoplasms Uncertain- Benign or Malignant			1			1
Total Uncertain Neoplasms			1			1

a - Number of animals examined microscopically at site and number of animals with lesion

b - Primary tumors: all tumors except metastatic tumors

Experiment Number: 20614 - 02

**P05: INCIDENCE RATES OF NEOPLASMS BY ANATOMIC SITE (SYSTEMIC LESIONS ABRIDGED) (a)**

Date Report Requested: 07/24/2018

Test Type: CHRONIC

Perfluorooctanoic Acid

Time Report Requested: 12:59:13

Route: DOSED FEED

CAS Number: 335-67-1

First Dose M/F: 07/27/09 / NA

Species/Strain: RATS/HSD

Lab: BAT

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Harlan Sprague Dawley RATS MALE	0/80 ppm	300/80 ppm
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**Tumor Summary for Males**

Total Animals with Primary Neoplasms (b)	41	44
Total Primary Neoplasms	79	87
Total Animals with Benign Neoplasms	38	39
Total Benign Neoplasms	70	70
Total Animals with Malignant Neoplasms	8	15
Total Malignant Neoplasms	9	16
Total Animals with Metastatic Neoplasms	2	2
Total Metastatic Neoplasms	3	2
Total Animals with Malignant Neoplasms Uncertain Primary Site		
Total Animals with Neoplasms Uncertain- Benign or Malignant		1
Total Uncertain Neoplasms		1

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\*\*\* END OF REPORT \*\*\*

a - Number of animals examined microscopically at site and number of animals with lesion

b - Primary tumors: all tumors except metastatic tumors