

Experiment Number: 03038 - 03

**P18: INCIDENCE RATES OF NON-NEOPLASTIC LESIONS BY ANATOMIC SITE (a) WITH
AVERAGE SEVERITY GRADES[b]**

Date Report Requested: 02/28/2019

Test Type: CHRONIC

Sodium Tungstate Dihydrate

Time Report Requested: 13:33:08

Route: DOSED WATER

CAS Number: 10213-10-2

First Dose M/F: 01/30/12 / 01/31/12

Species/Strain: RATS/HSD

Lab: BAT

Final 1_Rats

NTP Study Number: C03038
Lock Date: 05/25/2016
Cage Range: ALL
Date Range: ALL
Reasons For Removal: ALL
Removal Date Range: ALL
Treatment Groups: Include ALL
Study Gender: Both
TDMSE Version: 3.0.2.3_002
PWG Approval Date: NONE

Test Type: CHRONIC

Sodium Tungstate Dihydrate

Time Report Requested: 13:33:08

Route: DOSED WATER

CAS Number: 10213-10-2

First Dose M/F: 01/30/12 / 01/31/12

Species/Strain: RATS/HSD

Lab: BAT

Harlan Sprague Dawley RATS MALE	0mg/L male	250mg/L male	500mg/L male	1000mg/L male
---------------------------------	------------	--------------	--------------	---------------

Disposition Summary

Animals Initially In Study	50	50	50	50
Early Deaths				
Moribund Sacrifice	17	14	10	8
Natural Death	21	10	16	13
Survivors				
Natural Death			1	
Terminal Sacrifice	12	26	23	29
Animals Examined Microscopically	50	50	50	50

ALIMENTARY SYSTEM

Esophagus	(50)	(50)	(50)	(50)
Adventitia, Polyarteritis Nodosa				1 [2.0]
Muscularis, Atrophy			1 [3.0]	
Intestine Large, Cecum	(50)	(50)	(49)	(50)
Edema		2 [3.0]	2 [1.5]	
Erosion	1 [2.0]			
Inflammation, Suppurative	1 [4.0]	1 [2.0]		
Inflammation, Acute	1 [3.0]	2 [1.5]		
Inflammation, Chronic	4 [1.5]	2 [2.0]	1 [1.0]	
Inflammation, Chronic Active	1 [2.0]	1 [2.0]		
Mineral	4 [2.3]	6 [1.7]		
Lymphoid Tissue, Hyperplasia				1 [3.0]
Intestine Large, Colon	(50)	(50)	(50)	(50)
Cyst, Multiple	1			
Edema		1 [2.0]	1 [2.0]	
Inflammation, Acute	1 [1.0]	1 [1.0]		
Inflammation, Chronic		1 [1.0]		
Inflammation, Chronic Active		1 [1.0]		
Mineral		1 [1.0]		
Parasite Metazoan	2		2	2
Polyarteritis Nodosa				2 [2.0]
Lymphoid Tissue, Hyperplasia			1 [3.0]	

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

b-Average severity grade(1-minimal;2-mild;3-moderate;4-marked)

Test Type: CHRONIC

Sodium Tungstate Dihydrate

Time Report Requested: 13:33:08

Route: DOSED WATER

CAS Number: 10213-10-2

First Dose M/F: 01/30/12 / 01/31/12

Species/Strain: RATS/HSD

Lab: BAT

Harlan Sprague Dawley RATS MALE	0mg/L male	250mg/L male	500mg/L male	1000mg/L male
Lymphoid Tissue, Inflammation, Granulomatous			1 [1.0]	
Intestine Large, Rectum Inflammation, Chronic	(50)	(50)	(50)	(50)
Parasite Metazoan	2	5	6	8
Polyarteritis Nodosa				1 [3.0]
Intestine Small, Duodenum Inflammation, Chronic	(50)	(50)	(50)	(50)
Inflammation, Chronic Active	1 [1.0]	1 [1.0]		1 [1.0]
Polyarteritis Nodosa			1 [1.0]	
Epithelium, Hyperplasia				1 [2.0]
Intestine Small, Ileum Inflammation, Chronic	(50)	(50)	(49)	(50)
Inflammation, Chronic Active	2 [1.0]			
Polyarteritis Nodosa	1 [2.0]	1 [1.0]		
Peyer's Patch, Hyperplasia		1 [3.0]		
Intestine Small, Jejunum Diverticulum	(50)	(50)	(50)	(50)
Peyer's Patch, Hyperplasia		1		
Liver	(50)	(50)	(50)	(50)
Angiectasis			1 [2.0]	
Basophilic Focus	2	2		1
Clear Cell Focus	14	23	21	25
Congestion	1 [3.0]			
Degeneration, Cystic			2 [1.0]	
Eosinophilic Focus	3			
Extramedullary Hematopoiesis		1 [1.0]		2 [1.0]
Fatty Change, Diffuse	1 [2.0]		1 [2.0]	1 [1.0]
Hepatodiaphragmatic Nodule	1	1		
Inclusion Body Intracytoplasmic	1 [1.0]			
Infiltration Cellular, Plasma Cell		1 [1.0]		
Inflammation, Chronic	1 [1.0]		1 [1.0]	2 [1.0]
Inflammation, Chronic Active				2 [1.0]
Mixed Cell Focus	3		4	4
Pigment			2 [1.5]	1 [2.0]
Polyarteritis Nodosa		1 [2.0]		2 [2.0]

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

b-Average severity grade(1-minimal;2-mild;3-moderate;4-marked)

Test Type: CHRONIC

Sodium Tungstate Dihydrate

Time Report Requested: 13:33:08

Route: DOSED WATER

CAS Number: 10213-10-2

First Dose M/F: 01/30/12 / 01/31/12

Species/Strain: RATS/HSD

Lab: BAT

Harlan Sprague Dawley RATS MALE	0mg/L male	250mg/L male	500mg/L male	1000mg/L male
Thrombus	1			
Artery, Hyperplasia		1 [2.0]		
Bile Duct, Cyst	1	1		
Bile Duct, Hyperplasia	42 [1.1]	38 [1.1]	43 [1.0]	41 [1.1]
Centrilobular, Hepatocyte, Degeneration				1 [1.0]
Hepatocyte, Degeneration				1 [1.0]
Hepatocyte, Fatty Change, Focal	4 [1.3]	1 [1.0]		1 [1.0]
Hepatocyte, Fatty Change, Diffuse		1 [2.0]		
Hepatocyte, Hyperplasia			1 [3.0]	
Hepatocyte, Hypertrophy			1 [2.0]	1 [2.0]
Hepatocyte, Karyomegaly				1 [1.0]
Hepatocyte, Necrosis	4 [2.0]	2 [1.5]	1 [3.0]	
Hepatocyte, Vacuolation, Cytoplasmic			2 [2.0]	
Oval Cell, Hyperplasia	1 [1.0]		1 [1.0]	2 [1.5]
Mesentery	(2)	(5)	(2)	(3)
Hemorrhage			1 [4.0]	
Polyarteritis Nodosa	2 [3.0]	3 [3.0]	1 [4.0]	2 [2.5]
Thrombus		1		
Artery, Inflammation		1 [4.0]		
Pancreas	(50)	(50)	(50)	(50)
Basophilic Focus		1		
Cytoplasmic Alteration		1 [2.0]		
Inflammation, Chronic Active		1 [3.0]		
Polyarteritis Nodosa	5 [2.0]	1 [3.0]	4 [2.8]	4 [2.8]
Thrombus	1			1
Acinus, Atrophy	5 [1.6]	1 [2.0]	3 [1.3]	3 [1.3]
Acinus, Hyperplasia	22 [2.5]	19 [2.5]	22 [2.3]	21 [2.9]
Artery, Mineral				1 [2.0]
Duct, Cyst	1		1	
Salivary Glands	(50)	(50)	(50)	(50)
Mineral	1 [1.0]			
Stomach, Forestomach	(50)	(50)	(50)	(50)
Edema		1 [2.0]		1 [2.0]
Inflammation, Acute	2 [1.5]			
Inflammation, Chronic	1 [1.0]	1 [2.0]		1 [1.0]
Inflammation, Chronic Active	1 [1.0]		1 [2.0]	1 [1.0]

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

b-Average severity grade(1-minimal;2-mild;3-moderate;4-marked)

Test Type: CHRONIC

Sodium Tungstate Dihydrate

Time Report Requested: 13:33:08

Route: DOSED WATER

CAS Number: 10213-10-2

First Dose M/F: 01/30/12 / 01/31/12

Species/Strain: RATS/HSD

Lab: BAT

Harlan Sprague Dawley RATS MALE	0mg/L male	250mg/L male	500mg/L male	1000mg/L male
Mineral	2 [2.0]	1 [3.0]		
Ulcer	2 [3.5]	3 [3.3]		
Epithelium, Hyperplasia	3 [2.0]		1 [3.0]	1 [1.0]
Stomach, Glandular	(50)	(50)	(50)	(50)
Mineral	20 [2.1]	21 [1.8]	8 [1.4]	11 [1.3]
Polyarteritis Nodosa	1 [2.0]			1 [2.0]
Glands, Ectasia			1 [1.0]	
Tongue	(0)	(1)	(1)	(0)
Epithelium, Hyperplasia		1 [2.0]		

CARDIOVASCULAR SYSTEM

Blood Vessel	(50)	(50)	(49)	(49)
Inflammation, Chronic Active		1 [2.0]		
Mineral	15 [2.3]	9 [2.7]	1 [1.0]	
Polyarteritis Nodosa	1 [2.0]			
Heart	(50)	(50)	(50)	(50)
Cardiomyopathy	47 [2.1]	45 [2.4]	44 [2.1]	45 [2.1]
Hemorrhage				1 [2.0]
Inflammation, Suppurative		1 [3.0]		
Inflammation, Chronic				1 [1.0]
Inflammation, Chronic Active				1 [3.0]
Mineral	13 [1.4]	6 [1.2]		1 [1.0]
Polyarteritis Nodosa	1 [1.0]			2 [2.0]
Thrombus		2		1

ENDOCRINE SYSTEM

Adrenal Cortex	(50)	(50)	(50)	(50)
Atrophy				2 [2.0]
Degeneration, Cystic	2 [1.0]	1 [1.0]	1 [2.0]	1 [1.0]
Hyperplasia, Focal	21 [1.6]	28 [1.9]	17 [1.5]	27 [1.6]
Hypertrophy, Focal	20 [1.3]	17 [1.4]	21 [1.7]	18 [1.4]
Karyomegaly	2 [1.0]	3 [1.0]	5 [1.0]	
Mineral	1 [1.0]			

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

b-Average severity grade(1-minimal;2-mild;3-moderate;4-marked)

Test Type: CHRONIC

Sodium Tungstate Dihydrate

Time Report Requested: 13:33:08

Route: DOSED WATER

CAS Number: 10213-10-2

First Dose M/F: 01/30/12 / 01/31/12

Species/Strain: RATS/HSD

Lab: BAT

Harlan Sprague Dawley RATS MALE	0mg/L male	250mg/L male	500mg/L male	1000mg/L male
Necrosis	2 [1.5]	4 [1.3]		
Pigment	1 [1.0]	1 [1.0]		1 [2.0]
Thrombus		2	2	1
Vacuolation, Cytoplasmic	1 [3.0]			1 [2.0]
Bilateral, Hyperplasia, Focal	5 [2.2]	3 [2.3]	6 [1.5]	10 [2.6]
Bilateral, Hypertrophy, Focal	1 [1.0]	4 [1.8]	2 [2.0]	5 [2.0]
Adrenal Medulla	(50)	(50)	(50)	(50)
Hyperplasia, Focal	18 [1.9]	11 [2.1]	13 [1.9]	13 [2.5]
Infiltration Cellular, Mononuclear Cell		1 [1.0]		
Necrosis		1 [4.0]		
Thrombus	1	1		
Vacuolation, Cytoplasmic			1 [1.0]	
Bilateral, Hyperplasia, Focal	4 [3.3]	3 [3.0]	5 [1.6]	2 [2.0]
Islets, Pancreatic	(50)	(50)	(50)	(50)
Hyperplasia		1 [2.0]		
Parathyroid Gland	(43)	(45)	(45)	(45)
Hyperplasia, Focal		3 [1.7]		4 [1.5]
Hyperplasia, Diffuse	39 [1.7]	34 [1.4]	34 [1.4]	28 [1.5]
Polyarteritis Nodosa				1 [2.0]
Pituitary Gland	(50)	(50)	(50)	(50)
Pars Distalis, Atrophy				2 [3.5]
Pars Distalis, Cyst	1		1	
Pars Distalis, Hyperplasia	14 [1.7]	18 [2.2]	21 [2.0]	14 [1.9]
Pars Distalis, Hypertrophy		2 [1.0]		
Pars Distalis, Karyomegaly	1 [1.0]			
Pars Distalis, Pigment				1 [3.0]
Pars Intermedia, Hyperplasia			1 [4.0]	
Pars Nervosa, Degeneration		1 [1.0]		
Pars Nervosa, Vacuolation, Cytoplasmic	1 [2.0]			
Rathke's Cleft, Cyst	1			
Thyroid Gland	(50)	(50)	(50)	(50)
Infiltration Cellular, Mononuclear Cell		1 [1.0]		
C-cell, Hyperplasia	5 [2.4]	12 [2.4]	9 [2.8]	7 [2.6]
Epithelium, Follicle, Hyperplasia	1 [1.0]			

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

b-Average severity grade(1-minimal;2-mild;3-moderate;4-marked)

Test Type: CHRONIC

Sodium Tungstate Dihydrate

Time Report Requested: 13:33:08

Route: DOSED WATER

CAS Number: 10213-10-2

First Dose M/F: 01/30/12 / 01/31/12

Species/Strain: RATS/HSD

Lab: BAT

Harlan Sprague Dawley RATS MALE	0mg/L male	250mg/L male	500mg/L male	1000mg/L male
---------------------------------	------------	--------------	--------------	---------------

GENERAL BODY SYSTEM

None

GENITAL SYSTEM

Epididymis	(50)	(50)	(50)	(49)
Granuloma Sperm			1 [3.0]	
Hypospermia	14	14	11	12
Mesothelium, Cyst			1	
Penis	(0)	(0)	(1)	(0)
Congestion			1 [2.0]	
Preputial Gland	(50)	(50)	(50)	(50)
Cyst			1	
Inflammation, Suppurative		1 [4.0]		
Inflammation, Chronic Active	1 [4.0]			
Prostate	(50)	(50)	(50)	(50)
Decreased Secretory Fluid	2			4
Inflammation, Chronic Active		1 [4.0]		1 [4.0]
Epithelium, Hyperplasia	3 [1.7]	4 [1.0]	3 [1.7]	3 [1.0]
Seminal Vesicle	(50)	(50)	(50)	(50)
Decreased Secretory Fluid	9	5	5	7
Inflammation, Chronic		1 [2.0]		
Inflammation, Chronic Active		1 [3.0]	1 [3.0]	2 [3.0]
Testis	(50)	(50)	(50)	(49)
Edema				1 [2.0]
Hemorrhage	1 [3.0]			
Polyarteritis Nodosa	28 [2.2]	31 [2.1]	26 [2.1]	24 [1.8]
Germ Cell, Degeneration	8 [2.1]	6 [2.0]	9 [1.8]	4 [1.8]

HEMATOPOIETIC SYSTEM

Bone Marrow	(50)	(50)	(50)	(50)
Hypercellularity	1 [4.0]			

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

b-Average severity grade(1-minimal;2-mild;3-moderate;4-marked)

Test Type: CHRONIC

Sodium Tungstate Dihydrate

Time Report Requested: 13:33:08

Route: DOSED WATER

CAS Number: 10213-10-2

First Dose M/F: 01/30/12 / 01/31/12

Species/Strain: RATS/HSD

Lab: BAT

Harlan Sprague Dawley RATS MALE	0mg/L male	250mg/L male	500mg/L male	1000mg/L male
Lymph Node	(3)	(5)	(3)	(3)
Bronchial, Hemorrhage		1 [2.0]		
Lumbar, Hemorrhage		2 [2.0]		
Lumbar, Hyperplasia, Plasma Cell		1 [2.0]		
Lumbar, Infiltration Cellular, Histiocyte		1 [2.0]		
Lumbar, Lymphatic Sinus, Dilation				2 [2.5]
Lymphatic Sinus, Mediastinal, Dilation	1 [3.0]			
Mediastinal, Hemorrhage		2 [2.5]	1 [2.0]	
Mediastinal, Pigment			1 [3.0]	
Pancreatic, Hyperplasia, Lymphocyte	1 [2.0]		1 [2.0]	1 [2.0]
Pancreatic, Inflammation, Suppurative	1 [3.0]			
Pancreatic, Necrosis	1 [4.0]			
Renal, Hyperplasia, Plasma Cell		1 [2.0]		
Lymph Node, Mandibular	(50)	(50)	(50)	(50)
Atrophy	1 [2.0]			
Congestion				1 [3.0]
Hyperplasia, Lymphocyte		2 [2.0]		
Hyperplasia, Plasma Cell	24 [2.0]	35 [1.8]	40 [2.0]	40 [2.0]
Infiltration Cellular, Histiocyte				1 [2.0]
Inflammation, Chronic	1 [1.0]			
Inflammation, Chronic Active	1 [2.0]			
Pigment	1 [2.0]	1 [1.0]		
Lymphatic Sinus, Dilation	4 [2.3]	13 [2.2]	8 [2.0]	6 [1.8]
Lymph Node, Mesenteric	(50)	(50)	(50)	(49)
Hemorrhage	1 [3.0]	1 [3.0]	1 [2.0]	1 [3.0]
Hyperplasia, Plasma Cell		1 [2.0]	1 [1.0]	
Infiltration Cellular, Histiocyte	3 [2.3]	3 [1.7]	1 [2.0]	
Inflammation, Suppurative			1 [2.0]	
Pigment			1 [1.0]	1 [1.0]
Lymphatic Sinus, Dilation			1 [1.0]	1 [1.0]
Spleen	(50)	(50)	(50)	(50)
Atrophy	1 [3.0]			
Extramedullary Hematopoiesis	5 [2.4]	9 [2.2]	7 [2.0]	4 [2.0]
Lymphocyte, Hyperplasia	1 [2.0]	7 [1.7]	2 [2.5]	2 [2.0]
White Pulp, Atrophy	2 [2.0]	4 [2.5]	6 [2.5]	2 [3.0]
Thymus	(48)	(48)	(49)	(50)

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

b-Average severity grade(1-minimal;2-mild;3-moderate;4-marked)

Test Type: CHRONIC

Sodium Tungstate Dihydrate

Time Report Requested: 13:33:08

Route: DOSED WATER

CAS Number: 10213-10-2

First Dose M/F: 01/30/12 / 01/31/12

Species/Strain: RATS/HSD

Lab: BAT

Harlan Sprague Dawley RATS MALE	0mg/L male	250mg/L male	500mg/L male	1000mg/L male
---------------------------------	------------	--------------	--------------	---------------

Atrophy	1 [3.0]			
---------	---------	--	--	--

INTEGUMENTARY SYSTEM

Mammary Gland	(48)	(47)	(50)	(49)
Inflammation, Chronic		1 [2.0]		
Mineral	1 [1.0]			
Duct, Dilation	1 [1.0]	1 [2.0]	1 [2.0]	1 [2.0]
Skin	(50)	(50)	(50)	(50)
Congestion			1 [2.0]	
Cyst Epithelial Inclusion	3	2	2	3
Fibrosis	1 [3.0]		1 [3.0]	
Inflammation, Suppurative			1 [4.0]	
Inflammation, Chronic		1 [2.0]	1 [2.0]	1 [4.0]
Inflammation, Chronic Active	1 [4.0]	1 [4.0]	1 [2.0]	1 [3.0]
Ulcer	1 [4.0]		1 [4.0]	2 [4.0]
Epithelium, Hyperkeratosis			1 [4.0]	
Epithelium, Hyperplasia		1 [4.0]	2 [2.5]	
Sebaceous Gland, Cyst			1	

MUSCULOSKELETAL SYSTEM

Bone	(50)	(50)	(50)	(50)
Fibrous Osteodystrophy	1 [2.0]			
Inflammation, Chronic Active			1 [3.0]	
Maxilla, Cyst			1	
Skeletal Muscle	(0)	(1)	(0)	(0)
Inflammation, Chronic		1 [4.0]		

NERVOUS SYSTEM

Brain	(50)	(50)	(50)	(50)
Cyst Epithelial Inclusion	1			
Hemorrhage				1 [4.0]

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

b-Average severity grade(1-minimal;2-mild;3-moderate;4-marked)

Test Type: CHRONIC

Sodium Tungstate Dihydrate

Time Report Requested: 13:33:08

Route: DOSED WATER

CAS Number: 10213-10-2

First Dose M/F: 01/30/12 / 01/31/12

Species/Strain: RATS/HSD

Lab: BAT

Harlan Sprague Dawley RATS MALE	0mg/L male	250mg/L male	500mg/L male	1000mg/L male
Glial Cell, Hyperplasia	1 [2.0]			
Meninges, Fibrosis		1 [1.0]		
Neuron, Degeneration			1 [1.0]	
Peripheral Nerve	(1)	(3)	(0)	(0)
Spinal Cord	(1)	(1)	(0)	(0)
Axon, Degeneration	1 [1.0]			

RESPIRATORY SYSTEM

Lung	(50)	(50)	(50)	(50)
Congestion	2 [2.5]			
Hemorrhage	5 [1.6]	3 [1.3]		1 [3.0]
Infiltration Cellular, Histiocyte	21 [1.6]	23 [1.7]	17 [1.5]	20 [1.5]
Inflammation, Acute			1 [3.0]	
Inflammation, Chronic	12 [1.1]	15 [1.3]	16 [1.1]	8 [1.1]
Inflammation, Chronic Active	2 [1.5]		1 [2.0]	1 [1.0]
Mineral	2 [1.5]	1 [1.0]		1 [1.0]
Polyarteritis Nodosa		1 [2.0]		
Alveolar Epithelium, Hyperplasia	1 [3.0]		2 [2.5]	3 [2.3]
Arteriole, Hyperplasia			1 [1.0]	
Nose	(50)	(50)	(50)	(50)
Edema		1 [1.0]		
Inflammation, Suppurative			1 [3.0]	
Inflammation, Acute		2 [1.5]	1 [4.0]	1 [1.0]
Inflammation, Chronic Active	1 [2.0]			
Metaplasia, Osseous, Focal			1 [1.0]	
Glands, Respiratory Epithelium, Inflammation, Acute			1 [1.0]	
Goblet Cell, Nasopharyngeal Duct, Hyperplasia	4 [1.0]	14 [1.0]	7 [1.0]	10 [1.0]
Goblet Cell, Respiratory Epithelium, Hyperplasia	16 [1.1]	19 [1.0]	14 [1.0]	17 [1.1]
Nasolacrimal Duct, Inflammation, Acute		1 [2.0]		
Olfactory Epithelium, Accumulation, Hyaline Droplet	42 [1.8]	46 [1.8]	46 [1.8]	44 [1.6]
Olfactory Epithelium, Degeneration	1 [1.0]			
Olfactory Epithelium, Inflammation, Acute		2 [1.5]		

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

b-Average severity grade(1-minimal;2-mild;3-moderate;4-marked)

Test Type: CHRONIC

Sodium Tungstate Dihydrate

Time Report Requested: 13:33:08

Route: DOSED WATER

CAS Number: 10213-10-2

First Dose M/F: 01/30/12 / 01/31/12

Species/Strain: RATS/HSD

Lab: BAT

Harlan Sprague Dawley RATS MALE	0mg/L male	250mg/L male	500mg/L male	1000mg/L male
Olfactory Epithelium, Inflammation, Chronic Active		1 [1.0]		
Olfactory Epithelium, Necrosis		1 [3.0]		
Olfactory Epithelium, Vacuolation, Cytoplasmic		3 [1.7]		
Respiratory Epithelium, Accumulation, Hyaline Droplet				1 [1.0]
Respiratory Epithelium, Inflammation, Acute	2 [1.5]	2 [1.0]	1 [1.0]	5 [1.0]
Respiratory Epithelium, Inflammation, Chronic	1 [1.0]	1 [2.0]	1 [1.0]	
Respiratory Epithelium, Inflammation, Chronic Active		2 [2.0]		1 [1.0]
Respiratory Epithelium, Necrosis				1 [2.0]
Respiratory Epithelium, Vacuolation, Cytoplasmic	1 [2.0]			
Septum, Inflammation, Chronic	1 [1.0]			
Trachea	(50)	(50)	(50)	(50)
Inflammation, Acute			1 [1.0]	
Inflammation, Chronic	1 [1.0]	1 [1.0]		1 [1.0]

SPECIAL SENSES SYSTEM

Eye	(50)	(50)	(50)	(50)
Phthisis Bulbi	1			
Cornea, Hyperplasia		1 [1.0]		
Cornea, Inflammation, Acute	4 [2.3]	1 [2.0]	1 [2.0]	
Cornea, Inflammation, Chronic	3 [2.0]	1 [2.0]	3 [1.7]	2 [1.0]
Cornea, Inflammation, Chronic Active	3 [1.7]	2 [2.0]	3 [1.0]	1 [2.0]
Lens, Cataract				2 [2.5]
Retina, Dysplasia	1 [2.0]			
Harderian Gland	(50)	(50)	(50)	(50)
Fibrosis		1 [1.0]		
Hyperplasia	2 [3.0]	1 [2.0]		3 [2.0]
Zymbal's Gland	(1)	(1)	(1)	(0)

URINARY SYSTEM

Kidney	(50)	(50)	(50)	(50)
--------	------	------	------	------

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

b-Average severity grade(1-minimal;2-mild;3-moderate;4-marked)

Test Type: CHRONIC

Sodium Tungstate Dihydrate

Time Report Requested: 13:33:08

Route: DOSED WATER

CAS Number: 10213-10-2

First Dose M/F: 01/30/12 / 01/31/12

Species/Strain: RATS/HSD

Lab: BAT

Harlan Sprague Dawley RATS MALE	0mg/L male	250mg/L male	500mg/L male	1000mg/L male
Inflammation, Chronic		1 [2.0]		
Mineral	13 [1.5]	11 [1.4]	2 [1.0]	4 [1.0]
Nephropathy, Chronic Progressive	50 [3.4]	50 [3.2]	50 [3.2]	49 [2.5]
Thrombus	1			
Capsule, Fibrosis			1 [2.0]	
Epithelium, Renal Tubule, Hyperplasia		1 [4.0]		
Pelvis, Dilation	31 [1.5]	24 [1.2]	16 [1.2]	17 [1.6]
Renal Tubule, Atypical Hyperplasia	1 [2.0]			
Renal Tubule, Dilation		1 [2.0]		
Renal Tubule, Inflammation, Suppurative	25 [1.2]	33 [1.3]	35 [1.3]	41 [1.6]
Renal Tubule, Regeneration		1 [2.0]		
Urothelium, Hyperplasia	1 [3.0]			
Urinary Bladder	(50)	(50)	(50)	(50)
Calculus Gross Observation			1	
Hemorrhage		1 [2.0]		
Inflammation, Acute				1 [3.0]
Inflammation, Chronic	1 [1.0]	1 [1.0]	1 [1.0]	1 [2.0]
Inflammation, Chronic Active		1 [2.0]		
Serosa, Inflammation, Chronic Active	1 [1.0]			
Urothelium, Hyperplasia		1 [4.0]		
Urothelium, Hyperplasia, Atypical			1 [4.0]	

*** END OF MALE ***

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

b-Average severity grade(1-minimal;2-mild;3-moderate;4-marked)

Test Type: CHRONIC

Sodium Tungstate Dihydrate

Time Report Requested: 13:33:08

Route: DOSED WATER

CAS Number: 10213-10-2

First Dose M/F: 01/30/12 / 01/31/12

Species/Strain: RATS/HSD

Lab: BAT

Harlan Sprague Dawley RATS FEMALE	0mg/L female	250mg/L female	500mg/L female	1000mg/L female
-----------------------------------	--------------	----------------	----------------	-----------------

Disposition Summary

Animals Initially In Study	50	50	50	50
Early Deaths				
Moribund Sacrifice	13	10	13	9
Natural Death	7	7	6	10
Survivors				
Moribund Sacrifice				1
Terminal Sacrifice	30	33	31	30
Animals Examined Microscopically	50	50	50	50

ALIMENTARY SYSTEM

Esophagus	(50)	(50)	(49)	(50)
Intestine Large, Cecum	(50)	(50)	(50)	(49)
Edema	1 [2.0]	1 [2.0]		
Epithelium, Hyperplasia			1 [1.0]	2 [1.5]
Intestine Large, Colon	(50)	(50)	(50)	(50)
Parasite Metazoan		1	3	2
Polyarteritis Nodosa			1 [3.0]	
Lymphoid Tissue, Hyperplasia	3 [1.7]	1 [2.0]	1 [3.0]	2 [2.0]
Intestine Large, Rectum	(50)	(50)	(50)	(50)
Parasite Metazoan	5	6	2	8
Lymphoid Tissue, Hyperplasia			1 [2.0]	
Intestine Small	(1)	(0)	(0)	(0)
Intestine Small, Duodenum	(50)	(50)	(50)	(50)
Peyer's Patch, Hyperplasia				1 [2.0]
Intestine Small, Ileum	(50)	(50)	(50)	(49)
Peyer's Patch, Hyperplasia				1 [2.0]
Intestine Small, Jejunum	(50)	(50)	(50)	(50)
Peyer's Patch, Hyperplasia	1 [2.0]	2 [2.0]	2 [1.5]	2 [2.5]
Liver	(50)	(50)	(50)	(50)
Angiectasis	2 [2.5]			
Clear Cell Focus	8	12	3	7
Congestion	1 [2.0]			
Eosinophilic Focus	2			2

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

b-Average severity grade(1-minimal;2-mild;3-moderate;4-marked)

Test Type: CHRONIC

Sodium Tungstate Dihydrate

Time Report Requested: 13:33:08

Route: DOSED WATER

CAS Number: 10213-10-2

First Dose M/F: 01/30/12 / 01/31/12

Species/Strain: RATS/HSD

Lab: BAT

Harlan Sprague Dawley RATS FEMALE	0mg/L female	250mg/L female	500mg/L female	1000mg/L female
Extramedullary Hematopoiesis	1 [1.0]	2 [1.0]		1 [1.0]
Fatty Change, Diffuse	2 [1.5]	1 [2.0]		
Fibrosis			1 [1.0]	
Mixed Cell Focus	2	8	2	1
Pigment				1 [1.0]
Bile Duct, Cholangiofibrosis			1 [2.0]	
Bile Duct, Cyst	2		1	3
Bile Duct, Hyperplasia	1 [1.0]	5 [1.0]	2 [2.0]	4 [1.0]
Centrilobular, Hepatocyte, Degeneration				1 [2.0]
Centrilobular, Hepatocyte, Fatty Change		1 [2.0]		
Centrilobular, Hepatocyte, Hypertrophy				1 [2.0]
Hepatocyte, Fatty Change, Focal	3 [1.0]	1 [1.0]		1 [1.0]
Hepatocyte, Necrosis	1 [2.0]	1 [2.0]	1 [1.0]	
Hepatocyte, Vacuolation, Cytoplasmic	1 [1.0]			
Serosa, Fibrosis	1 [1.0]			
Mesentery	(1)	(0)	(1)	(2)
Polyarteritis Nodosa				1 [3.0]
Fat, Necrosis				1 [3.0]
Pancreas	(50)	(50)	(50)	(50)
Basophilic Focus		1		
Polyarteritis Nodosa	1 [2.0]		1 [4.0]	2 [1.5]
Acinus, Atrophy	1 [1.0]	4 [1.0]		1 [1.0]
Acinus, Hyperplasia	5 [1.4]	5 [1.4]		5 [1.4]
Acinus, Inflammation, Acute		1 [2.0]		
Salivary Glands	(50)	(50)	(49)	(50)
Stomach, Forestomach	(50)	(50)	(50)	(50)
Inflammation, Acute		1 [2.0]	2 [1.0]	
Inflammation, Chronic	1 [2.0]			
Inflammation, Chronic Active	1 [2.0]			
Mineral	1 [1.0]		1 [1.0]	
Ulcer	1 [3.0]	2 [2.5]		
Epithelium, Hyperplasia	3 [1.7]	1 [3.0]	2 [1.5]	
Stomach, Glandular	(50)	(50)	(50)	(50)
Erosion				1 [2.0]
Mineral	3 [1.7]	4 [1.0]		2 [2.0]

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

b-Average severity grade(1-minimal;2-mild;3-moderate;4-marked)

Test Type: CHRONIC

Sodium Tungstate Dihydrate

Time Report Requested: 13:33:08

Route: DOSED WATER

CAS Number: 10213-10-2

First Dose M/F: 01/30/12 / 01/31/12

Species/Strain: RATS/HSD

Lab: BAT

Harlan Sprague Dawley RATS FEMALE	0mg/L female	250mg/L female	500mg/L female	1000mg/L female
-----------------------------------	--------------	----------------	----------------	-----------------

CARDIOVASCULAR SYSTEM

Blood Vessel	(50)	(50)	(50)	(49)
Mineral	1 [1.0]			
Heart	(50)	(50)	(49)	(50)
Cardiomyopathy	29 [1.5]	25 [1.2]	23 [1.5]	23 [1.2]
Mineral	1 [1.0]		1 [3.0]	

ENDOCRINE SYSTEM

Adrenal Cortex	(50)	(50)	(50)	(50)
Angiectasis	7 [1.6]	3 [1.7]	2 [2.5]	
Atrophy		1 [2.0]		
Degeneration, Cystic	2 [1.5]	3 [1.0]	2 [3.0]	2 [2.0]
Extramedullary Hematopoiesis		1 [1.0]	2 [1.0]	
Hemorrhage			1 [3.0]	
Hyperplasia, Focal	7 [1.6]	11 [1.6]	15 [1.5]	9 [1.7]
Hypertrophy, Focal	15 [1.8]	19 [1.6]	14 [1.4]	17 [1.6]
Infiltration Cellular, Mononuclear Cell	1 [1.0]			
Necrosis	1 [1.0]		1 [3.0]	
Pigment	1 [1.0]			
Thrombus	1		1	1
Bilateral, Hyperplasia, Focal	4 [2.3]	6 [2.0]	3 [1.3]	4 [2.0]
Bilateral, Hypertrophy, Focal	3 [1.7]	4 [2.8]	2 [3.0]	4 [2.0]
Adrenal Medulla	(50)	(50)	(50)	(50)
Hyperplasia, Focal	12 [1.2]	11 [1.2]	9 [1.4]	9 [1.1]
Pigment		1 [1.0]		
Thrombus	2			
Bilateral, Hyperplasia, Focal	1 [1.0]	3 [2.7]		2 [2.0]
Islets, Pancreatic	(50)	(50)	(50)	(50)
Parathyroid Gland	(46)	(47)	(44)	(44)
Angiectasis	1 [2.0]			
Hyperplasia, Focal	2 [1.0]	1 [1.0]	4 [1.3]	3 [2.0]
Hyperplasia, Diffuse	3 [1.7]	7 [1.4]	8 [1.4]	8 [1.3]

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

b-Average severity grade(1-minimal;2-mild;3-moderate;4-marked)

Test Type: CHRONIC

Sodium Tungstate Dihydrate

Time Report Requested: 13:33:08

Route: DOSED WATER

CAS Number: 10213-10-2

First Dose M/F: 01/30/12 / 01/31/12

Species/Strain: RATS/HSD

Lab: BAT

Harlan Sprague Dawley RATS FEMALE	0mg/L female	250mg/L female	500mg/L female	1000mg/L female
Pituitary Gland	(50)	(50)	(50)	(50)
Pigment	1 [1.0]			
Pars Distalis, Atrophy			1 [3.0]	
Pars Distalis, Hyperplasia	19 [2.3]	18 [2.3]	17 [2.0]	21 [2.7]
Pars Distalis, Pigment			1 [3.0]	
Pars Distalis, Vacuolation, Cytoplasmic	1 [2.0]			
Pars Intermedia, Angiectasis				1 [2.0]
Pars Intermedia, Hyperplasia				1 [2.0]
Pars Intermedia, Pigment		1 [2.0]		1 [1.0]
Thyroid Gland	(50)	(50)	(49)	(50)
C-cell, Hyperplasia	14 [2.5]	13 [1.8]	9 [2.0]	12 [1.8]

GENERAL BODY SYSTEM

None

GENITAL SYSTEM

Clitoral Gland	(50)	(50)	(50)	(49)
Inflammation, Chronic Active		1 [4.0]		
Duct, Cyst		1		
Ovary	(50)	(50)	(50)	(50)
Cyst	2			3
Inflammation, Chronic Active				1 [1.0]
Bursa, Cyst	1	1	1	3
Follicle, Cyst	5	8	4	7
Paraovarian Tissue, Cyst	1		1	1
Uterus	(50)	(50)	(50)	(50)
Adenomyosis		2 [2.0]		
Atrophy				1 [3.0]
Cyst				2
Cyst, Squamous				1
Dilation	1 [3.0]		2 [4.0]	2 [4.0]
Hemorrhage			2 [2.5]	
Hyperplasia, Atypical	4 [2.3]	7 [1.4]	19 [1.7]	8 [2.3]

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

b-Average severity grade(1-minimal;2-mild;3-moderate;4-marked)

Test Type: CHRONIC

Sodium Tungstate Dihydrate

Time Report Requested: 13:33:08

Route: DOSED WATER

CAS Number: 10213-10-2

First Dose M/F: 01/30/12 / 01/31/12

Species/Strain: RATS/HSD

Lab: BAT

Harlan Sprague Dawley RATS FEMALE	0mg/L female	250mg/L female	500mg/L female	1000mg/L female
Hyperplasia, Stromal	1 [1.0]			
Inflammation, Suppurative				2 [4.0]
Inflammation, Acute				1 [4.0]
Inflammation, Chronic			1 [2.0]	
Inflammation, Chronic Active			3 [2.7]	3 [3.0]
Pigment	1 [1.0]			
Squamous Metaplasia	29 [2.3]	23 [2.0]	32 [2.4]	26 [2.4]
Thrombus	1			1
Cervix, Squamous Metaplasia	1 [3.0]			
Cervix, Epithelium, Hyperplasia	2 [2.0]			
Endometrium, Hyperplasia, Cystic	32 [2.3]	25 [2.1]	34 [2.6]	27 [2.6]
Myometrium, Malformation			1	
Vagina	(49)	(50)	(50)	(50)
Inflammation, Acute		1 [2.0]		
Inflammation, Chronic Active	1 [2.0]			

HEMATOPOIETIC SYSTEM

Bone Marrow	(50)	(50)	(50)	(50)
Lymph Node	(3)	(3)	(1)	(2)
Lumbar, Hemorrhage		1 [3.0]		
Lumbar, Hyperplasia, Lymphocyte	1 [3.0]			
Lumbar, Hyperplasia, Plasma Cell				1 [2.0]
Lumbar, Infiltration Cellular, Neutrophil	1 [2.0]			
Lumbar, Pigment	1 [2.0]			
Lumbar, Lymphatic Sinus, Dilation		1 [2.0]		
Renal, Hyperplasia, Lymphocyte		1 [2.0]		
Lymph Node, Mandibular	(50)	(50)	(49)	(50)
Hemorrhage			1 [3.0]	
Hyperplasia, Lymphocyte	3 [2.0]	1 [3.0]		
Hyperplasia, Plasma Cell	7 [2.0]	8 [1.9]	5 [2.0]	2 [2.0]
Infiltration Cellular, Histiocyte	1 [2.0]			1 [3.0]
Pigment			1 [2.0]	
Lymphatic Sinus, Dilation	1 [1.0]			1 [2.0]
Lymph Node, Mesenteric	(50)	(50)	(50)	(50)

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

b-Average severity grade(1-minimal;2-mild;3-moderate;4-marked)

Test Type: CHRONIC

Sodium Tungstate Dihydrate

Time Report Requested: 13:33:08

Route: DOSED WATER

CAS Number: 10213-10-2

First Dose M/F: 01/30/12 / 01/31/12

Species/Strain: RATS/HSD

Lab: BAT

Harlan Sprague Dawley RATS FEMALE	0mg/L female	250mg/L female	500mg/L female	1000mg/L female
Atrophy		2 [3.5]		
Hemorrhage			1 [2.0]	
Infiltration Cellular, Histiocyte	8 [1.9]	3 [1.7]	1 [2.0]	1 [2.0]
Lymphatic Sinus, Dilation		1 [1.0]		1 [3.0]
Spleen	(50)	(50)	(50)	(50)
Extramedullary Hematopoiesis	18 [1.7]	11 [2.5]	14 [2.6]	14 [2.4]
Fibrosis	1 [3.0]			
Hemorrhage				1 [4.0]
Hyperplasia, Lymphocyte		1 [2.0]		
Infarct	1 [4.0]		1 [3.0]	
Lymphocyte, Hyperplasia	7 [1.6]	1 [2.0]		1 [1.0]
Red Pulp, Atrophy	1 [4.0]			
White Pulp, Atrophy	1 [2.0]	2 [3.0]	3 [2.7]	
Thymus	(47)	(49)	(49)	(50)
Cyst			1	1

INTEGUMENTARY SYSTEM

Mammary Gland	(50)	(50)	(50)	(50)
Hyperplasia	2 [2.5]	2 [1.5]	1 [2.0]	3 [2.3]
Inflammation, Chronic		1 [1.0]	1 [1.0]	1 [2.0]
Duct, Cyst	1			
Duct, Dilation	4 [2.0]	9 [2.1]	2 [2.5]	5 [3.0]
Duct, Inflammation, Chronic				1 [2.0]
Skin	(50)	(50)	(50)	(50)
Cyst Epithelial Inclusion	1			
Inflammation, Chronic		1 [2.0]		

MUSCULOSKELETAL SYSTEM

Bone	(50)	(50)	(50)	(50)
Joint, Inflammation, Chronic			1 [1.0]	
Skeletal Muscle	(0)	(0)	(1)	(0)

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

b-Average severity grade(1-minimal;2-mild;3-moderate;4-marked)

Test Type: CHRONIC

Sodium Tungstate Dihydrate

Time Report Requested: 13:33:08

Route: DOSED WATER

CAS Number: 10213-10-2

First Dose M/F: 01/30/12 / 01/31/12

Species/Strain: RATS/HSD

Lab: BAT

Harlan Sprague Dawley RATS FEMALE	0mg/L female	250mg/L female	500mg/L female	1000mg/L female
NERVOUS SYSTEM				
Brain	(50)	(50)	(50)	(50)
Hemorrhage	1 [4.0]	1 [4.0]		1 [4.0]
Peripheral Nerve	(0)	(1)	(0)	(0)
RESPIRATORY SYSTEM				
Lung	(50)	(50)	(49)	(50)
Infiltration Cellular, Histiocyte	38 [2.0]	36 [2.1]	34 [2.1]	30 [2.2]
Inflammation, Chronic	9 [1.0]	9 [1.0]	5 [1.2]	5 [1.2]
Inflammation, Chronic Active				1 [2.0]
Metaplasia, Squamous	1 [3.0]	1 [2.0]		
Mineral	1 [1.0]			
Thrombus		1		
Alveolar Epithelium, Hyperplasia	1 [1.0]	1 [2.0]	2 [1.5]	
Alveolus, Infiltration Cellular, Histiocyte		1 [1.0]		
Nose	(50)	(50)	(50)	(50)
Inflammation, Acute		1 [1.0]		
Thrombus	1			
Glands, Respiratory Epithelium, Dilation	2 [3.0]		1 [2.0]	
Glands, Respiratory Epithelium, Hyperplasia	1 [2.0]			
Goblet Cell, Nasopharyngeal Duct, Hyperplasia	3 [1.3]	3 [1.0]	1 [2.0]	1 [1.0]
Goblet Cell, Respiratory Epithelium, Hyperplasia	3 [1.3]	6 [1.0]	2 [1.5]	1 [1.0]
Olfactory Epithelium, Accumulation, Hyaline Droplet	50 [2.1]	50 [2.0]	50 [1.8]	50 [2.0]
Olfactory Epithelium, Inflammation, Acute				1 [2.0]
Respiratory Epithelium, Accumulation, Hyaline Droplet	1 [1.0]	12 [1.0]	10 [1.1]	8 [1.0]
Respiratory Epithelium, Hyperplasia		1 [2.0]		
Respiratory Epithelium, Inflammation, Chronic Active		2 [2.0]		
Trachea	(50)	(50)	(49)	(50)

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

b-Average severity grade(1-minimal;2-mild;3-moderate;4-marked)

Test Type: CHRONIC

Sodium Tungstate Dihydrate

Time Report Requested: 13:33:08

Route: DOSED WATER

CAS Number: 10213-10-2

First Dose M/F: 01/30/12 / 01/31/12

Species/Strain: RATS/HSD

Lab: BAT

Harlan Sprague Dawley RATS FEMALE	0mg/L female	250mg/L female	500mg/L female	1000mg/L female
-----------------------------------	--------------	----------------	----------------	-----------------

SPECIAL SENSES SYSTEM

Eye	(50)	(50)	(50)	(50)
Cornea, Inflammation, Chronic Active			1 [2.0]	
Harderian Gland	(50)	(50)	(50)	(50)
Hyperplasia		1 [1.0]	2 [2.0]	1 [1.0]
Inflammation, Acute		1 [2.0]		
Zymbal's Gland	(0)	(0)	(1)	(0)

URINARY SYSTEM

Kidney	(50)	(50)	(50)	(50)
Calculus Micro Observation Only			1	
Infarct				3 [1.0]
Metaplasia, Osseous				1 [1.0]
Mineral	4 [1.3]	4 [1.0]	10 [1.2]	2 [1.0]
Nephropathy, Chronic Progressive	49 [1.8]	49 [1.4]	48 [1.4]	47 [1.7]
Cortex, Cyst	1	1		
Pelvis, Dilation	3 [1.7]	1 [1.0]	9 [1.6]	7 [1.1]
Renal Tubule, Dilation			2 [2.0]	1 [2.0]
Renal Tubule, Hyperplasia, Oncocytic				1 [1.0]
Renal Tubule, Inflammation, Suppurative	8 [1.0]	9 [1.0]	6 [1.0]	19 [1.1]
Renal Tubule, Regeneration				18 [1.8]
Urinary Bladder	(50)	(50)	(50)	(50)

*** END OF REPORT ***

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

b-Average severity grade(1-minimal;2-mild;3-moderate;4-marked)