

**Experiment Number:** 60311 - 05  
**Test Type:** CHRONIC  
**Route:** RESPIRATORY EXPOSURE WHOLE BODY  
**Species/Strain:** RATS/F344/N Tac

**P04: NEOPLASMS BY INDIVIDUAL ANIMAL**  
Cobalt  
**CAS Number:** 7440-48-4

**Date Report Requested:** 01/18/2012  
**Time Report Requested:** 14:48:11  
**First Dose M/F:** 05/08/06 / 05/08/06  
**Lab:** BNW

F2\_RD

**NTP Study Number:** C60311  
**Lock Date:** 12/03/2008  
**Cage Range:** ALL  
**Date Range:** ALL  
**Reasons For Removal:** ALL  
**Removal Date Range:** ALL  
**Treatment Groups:** Include ALL  
**Study Gender:** Both  
**TDMSE Version:** 2.6.0.0\_007  
**PWG Approval Date:** NONE

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DAY ON TEST <b>FISCHER 344-TACONIC RATS MALE</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	3	6	6	6	7	6	6	7	6	7	6	5	7	7	5	7	6	7	6	5	7	7	6		6			
<b>Control</b>	8	1	2	9	2	8	1	3	7	2	6	4	3	2	6	2	8	0	3	8	8	0	1	6	8			
	3	1	6	7	9	2	6	0	6	9	3	2	0	9	2	9	8	5	0	3	3	3	2	9	8		8	
ANIMAL ID	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	<b>males (cont...)</b>
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	2	2	2	2	2		

### ALIMENTARY SYSTEM

Esophagus	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Intestine Large, Cecum	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Intestine Large, Colon	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Intestine Large, Rectum	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Intestine Small, Duodenum	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Intestine Small, Ileum	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	A	+	+	+	+	+	+	+
Intestine Small, Jejunum	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	A	+	+	+	+	+	+	+
Liver	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Leukemia Mononuclear				X	X	X			X	X				X					X	X	X	X		
Mesentery	+		+			+			+	+	+		+	+				+				+		
Leukemia Mononuclear																								
Mesothelioma Malignant																								
Pancreas	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Leukemia Mononuclear				X																				
Mixed Tumor Malignant																								
Salivary Glands	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Adenoma, Tubular																								
Stomach, Forestomach	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue

M .. Missing tissue  
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FISCHER 344-TACONIC RATS MALE Control	DAY ON TEST																									males (cont...)
	0383	0668	0668	0668	0768	0768	0768	0768	0768	0768	0768	0768	0768	0768	0768	0768	0768	0768	0768	0768	0768	0768	0768	0768	0768	
ANIMAL ID	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	
	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	

Leukemia Mononuclear

X

Stomach, Glandular

+ +

Leukemia Mononuclear

X

**CARDIOVASCULAR SYSTEM**

Blood Vessel

Heart

+ +

Leukemia Mononuclear

X X

Schwannoma Malignant

X

**ENDOCRINE SYSTEM**

Adrenal Cortex

+ +

Leukemia Mononuclear

X X

Adrenal Medulla

+ +

Leukemia Mononuclear

X X

Pheochromocytoma Benign

X X

Pheochromocytoma Malignant

X

Bilateral, Pheochromocytoma Benign

X X

Islets, Pancreatic

+ +

Carcinoma

X

Parathyroid Gland

+ + + M +

Leukemia Mononuclear

Pituitary Gland

+ +

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| FISCHER 344-TACONIC RATS MALE<br><br>Control  | DAY ON TEST | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | males<br>(cont...) |   |  |
|---|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--------------------|---|--|
|   | ANIMAL ID   | 3 | 6 | 6 | 6 | 7 | 6 | 6 | 7 | 6 | 7 | 6 | 5 | 7 | 7 | 5 | 7 | 6 | 7 | 6 | 5 | 7 | 7 | 6 |                    | 6 |  |
|   |             | 8 | 1 | 2 | 9 | 2 | 8 | 1 | 3 | 7 | 2 | 6 | 4 | 3 | 2 | 6 | 2 | 8 | 0 | 3 | 8 | 8 | 0 | 1 | 6                  | 8 |  |
|   |             | 3 | 1 | 6 | 7 | 9 | 2 | 6 | 0 | 6 | 9 | 3 | 2 | 0 | 9 | 2 | 9 | 8 | 5 | 0 | 3 | 3 | 3 | 2 | 9                  | 8 |  |
|   |             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0                  | 0 |  |
|   |             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0                  | 0 |  |
|   |             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0                  | 0 |  |
|   |             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2                  | 2 |  |
|   |             | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4                  | 5 |  |
| Leukemia Mononuclear<br>Pars Distalis, Adenoma  |             |   | X |   |   | X |   | X | X |   | X | X |   | X | X | X | X | X |   | X | X | X | X | X | X                  |   |  |
| Thyroid Gland<br>Leukemia Mononuclear<br>C-cell, Adenoma<br>C-cell, Carcinoma<br>Follicular Cell, Carcinoma |             | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | +                  |   |  |
|   |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | X |   |                    |   |  |
|   |             |   |   |   |   |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   | X                  |   |  |

GENERAL BODY SYSTEM

NONE

GENITAL SYSTEM

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Epididymis<br>Mesothelioma Malignant                                  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Preputial Gland<br>Adenoma<br>Carcinoma                               | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | X |   |   |   |   |   |   |   |   |
| Prostate<br>Adenoma<br>Leukemia Mononuclear<br>Mesothelioma Malignant | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
|   |   |   |   |   |   |   |   |   | X | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Seminal Vesicle   | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Testes<br>Leukemia Mononuclear  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | X | + |

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| FISCHER 344-TACONIC RATS MALE | DAY ON TEST |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      | males<br>(cont...) |
|-------------------------------|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|--------------------|
|                               | 0383        | 0681 | 0662 | 0669 | 0722 | 0681 | 0663 | 0737 | 0662 | 0726 | 0654 | 0732 | 0722 | 0566 | 0728 | 0678 | 0773 | 0668 | 0578 | 0770 | 0663 | 0578 | 0771 | 0668 | 0668 |                    |
| Control                       | 0000        | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 |                    |
| ANIMAL ID                     | 0000        | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 |                    |
|                               | 1           | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 0    | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 0    | 1    | 2    | 3    | 4    | 5    |                    |

Mesothelioma Malignant  
 Bilateral, Interstitial Cell, Adenoma  
 Interstitial Cell, Adenoma

X X X X X X X X X X X X X X X X X X X X

**HEMATOPOIETIC SYSTEM**

|  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bone Marrow  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Leukemia Mononuclear                                 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Lymph Node   |   |   |   | + |   | + |   |   |   | + |   |   |   |   | + |   |   |   |   |   |   |   | + | + |
| Axillary, Deep Cervical, Renal, Leukemia Mononuclear |   |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Lumbar, Renal, Leukemia Mononuclear                  |   |   |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Pancreatic, Renal, Leukemia Mononuclear              |   |   |   |   |   |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   |   |   | X |   |
| Renal, Leukemia Mononuclear                          |   |   |   |   |   |   |   |   |   |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   |
| Lymph Node, Bronchial                                | M | M | M | + | + | + | M | + | M | + | M | M | + | M | M | + | + | M | + | M | + | M | + | M |
| Leukemia Mononuclear                                 |   |   |   | X |   | X |   |   |   | X |   |   |   |   |   |   |   |   |   |   |   |   | X |   |
| Lymph Node, Mandibular                               | + | + | + | + | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Leukemia Mononuclear                                 |   |   |   | X |   | X |   |   |   | X | X |   |   |   |   |   |   |   |   |   |   |   | X |   |
| Lymph Node, Mediastinal                              | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Leukemia Mononuclear                                 |   |   |   | X |   | X |   |   |   | X | X |   |   |   |   |   |   |   |   |   |   |   | X |   |
| Lymph Node, Mesenteric                               | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Leukemia Mononuclear                                 |   |   |   | X |   |   |   |   |   | X | X |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Spleen   | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Leukemia Mononuclear                                 |   |   |   | X | X | X |   |   |   | X | X |   |   |   |   |   |   |   |   |   |   | X | X | X |

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| DAY ON TEST | FISCHER 344-TACONIC RATS MALE |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | ANIMAL ID             | males<br>(cont...)    |  |
|-------------|-------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|--|
|             | 0<br>3<br>8<br>3              | 0<br>6<br>1<br>1      | 0<br>6<br>2<br>6      | 0<br>6<br>9<br>7      | 0<br>7<br>2<br>9      | 0<br>6<br>8<br>2      | 0<br>6<br>1<br>6      | 0<br>7<br>3<br>0      | 0<br>6<br>7<br>6      | 0<br>7<br>2<br>9      | 0<br>6<br>6<br>3      | 0<br>5<br>4<br>2      | 0<br>7<br>3<br>0      | 0<br>7<br>2<br>9      | 0<br>5<br>6<br>2      | 0<br>7<br>8<br>5      | 0<br>6<br>0<br>0      | 0<br>7<br>3<br>3      | 0<br>6<br>8<br>3      | 0<br>5<br>8<br>3      | 0<br>7<br>0<br>2      | 0<br>7<br>1<br>9      | 0<br>6<br>6<br>8      | 0<br>6<br>8<br>8      |                       |                       |                       |  |
| Control     | 0<br>0<br>0<br>0<br>1         | 0<br>0<br>0<br>0<br>2 | 0<br>0<br>0<br>0<br>3 | 0<br>0<br>0<br>0<br>4 | 0<br>0<br>0<br>0<br>5 | 0<br>0<br>0<br>0<br>6 | 0<br>0<br>0<br>0<br>7 | 0<br>0<br>0<br>0<br>8 | 0<br>0<br>0<br>0<br>9 | 0<br>0<br>0<br>0<br>0 | 0<br>0<br>0<br>0<br>1 | 0<br>0<br>0<br>0<br>1 | 0<br>0<br>0<br>0<br>1 | 0<br>0<br>0<br>0<br>1 | 0<br>0<br>0<br>0<br>1 | 0<br>0<br>0<br>0<br>1 | 0<br>0<br>0<br>0<br>1 | 0<br>0<br>0<br>0<br>1 | 0<br>0<br>0<br>0<br>1 | 0<br>0<br>0<br>0<br>1 | 0<br>0<br>0<br>0<br>2 | 0<br>0<br>0<br>0<br>2 | 0<br>0<br>0<br>0<br>2 | 0<br>0<br>0<br>0<br>2 | 0<br>0<br>0<br>0<br>3 | 0<br>0<br>0<br>0<br>4 | 0<br>0<br>0<br>0<br>5 |  |

Thymus M + + + M M +  
 Leukemia Mononuclear X X X X

**INTEGUMENTARY SYSTEM**

Mammary Gland + M + + + + + + M + + M + M + M + + + M M + M M  
 Carcinoma X  
 Fibroadenoma X  
 Skin +  
 Basal Cell Adenoma X  
 Hamartoma  
 Keratoacanthoma X X  
 Leukemia Mononuclear X  
 Squamous Cell Carcinoma  
 Trichoepithelioma X X  
 Subcutaneous Tissue, Fibroma X  
 Subcutaneous Tissue, Lipoma X

**MUSCULOSKELETAL SYSTEM**

Bone +  
 Skeletal Muscle  
 Mesothelioma Malignant

**NERVOUS SYSTEM**

Brain +  
 Astrocytoma Malignant X

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|-------------------------------|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|--------------------|------|------|------|
|                               | 0383        | 0681 | 0662 | 0669 | 0722 | 0681 | 0663 | 0737 | 0672 | 0664 | 0574 | 0732 | 0726 | 0562 | 0728 | 0678 | 0773 | 0668 | 0575 | 0778 | 0770 | 0663 | 0578 | 0771 | 0668 |                    | 0680 | 0116 | 0688 |
| Control                       | 0000        | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000               | 0000 | 0000 | 0000 |
| ANIMAL ID                     | 0001        | 0002 | 0003 | 0004 | 0005 | 0006 | 0007 | 0008 | 0009 | 0010 | 0011 | 0012 | 0013 | 0014 | 0015 | 0016 | 0017 | 0018 | 0019 | 0020 | 0021 | 0022 | 0023 | 0024 | 0025 | 0026               | 0027 | 0028 | 0029 |

Spinal Cord

+

**RESPIRATORY SYSTEM**

Larynx

+ +

Lung

+ +

Alveolar/Bronchiolar Adenoma

X

Alveolar/Bronchiolar Adenoma, Multiple

X

Leukemia Mononuclear

X X

Pheochromocytoma Malignant, Metastatic, Adrenal Medulla

Squamous Cell Carcinoma, Metastatic, Skin

Nose

+ +

Leukemia Mononuclear

X X

Trachea

+ +

**SPECIAL SENSES SYSTEM**

Ear

+

Eye

+ +

Harderian Gland

+ +

Zymbal's Gland

+ + +

Adenoma

Carcinoma

X X X

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 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: RATS/F344/N Tac

P04: NEOPLASMS BY INDIVIDUAL ANIMAL  
 Cobalt  
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012  
 Time Report Requested: 14:48:11  
 First Dose M/F: 05/08/06 / 05/08/06  
 Lab: BNW

|                                      |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                            |  |
|--------------------------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----------------------------|--|
| <b>FISCHER 344-TACONIC RATS MALE</b> | DAY ON TEST |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                            |  |
|                                      | 0           | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | <b>males<br/>(cont...)</b> |  |
|                                      | 3           | 6 | 6 | 6 | 7 | 6 | 6 | 7 | 6 | 7 | 6 | 5 | 7 | 7 | 5 | 7 | 6 | 7 | 6 | 5 | 7 | 7 | 6 |                            |  |
|                                      | 8           | 1 | 2 | 9 | 2 | 8 | 1 | 3 | 7 | 2 | 6 | 4 | 3 | 2 | 6 | 2 | 8 | 0 | 3 | 8 | 8 | 0 | 1 |                            |  |
| 3                                    | 1           | 6 | 7 | 9 | 2 | 6 | 0 | 6 | 9 | 3 | 2 | 0 | 9 | 2 | 9 | 8 | 5 | 0 | 3 | 3 | 2 | 9 | 8 |                            |  |
| <b>Control</b>                       | ANIMAL ID   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                            |  |
|                                      | 0           | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |                            |  |
|                                      | 0           | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |                            |  |
|                                      | 0           | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |                            |  |
| 0                                    | 0           | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 |                            |  |
| 1                                    | 2           | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5                          |  |

**URINARY SYSTEM**

|                        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Kidney                 | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Leukemia Mononuclear   |   |   |   | X |   | X |   |   | X | X |   |   |   |   |   |   |   |   |   |   |   | X |   |
| Urinary Bladder        | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Leukemia Mononuclear   |   |   |   | X |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Mesothelioma Malignant |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |

**SYSTEMIC LESIONS**

|                        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Multiple Organ         | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Leukemia Mononuclear   |   |   |   | X | X | X |   |   | X | X |   |   |   | X |   |   |   |   | X | X | X | X |   |
| Mesothelioma Malignant |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue

M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically



Experiment Number: 60311 - 05  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: RATS/F344/N Tac

**P04: NEOPLASMS BY INDIVIDUAL ANIMAL**  
 Cobalt  
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012  
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 First Dose M/F: 05/08/06 / 05/08/06  
 Lab: BNW

| FISCHER 344-TACONIC RATS MALE | DAY ON TEST |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      | * TOTALS |      |      |      |
|-------------------------------|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|----------|------|------|------|
|                               | 0730        | 0722 | 0722 | 0722 | 0722 | 0713 | 0708 | 0706 | 0706 | 0706 | 0702 | 0702 | 0701 | 0701 | 0701 | 0701 | 0701 | 0701 | 0701 | 0701 | 0701 |          | 0701 |      |      |
| Control                       | 0026        | 0027 | 0028 | 0029 | 0030 | 0031 | 0032 | 0033 | 0034 | 0035 | 0036 | 0037 | 0038 | 0039 | 0040 | 0041 | 0042 | 0043 | 0044 | 0045 | 0046 | 0047     | 0048 | 0049 | 0050 |

**ALIMENTARY SYSTEM**

|                           |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |
|---------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|
| Esophagus                 | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Intestine Large, Cecum    | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | A | + | + | + | + | + | + | + | 49 |
| Intestine Large, Colon    | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Intestine Large, Rectum   | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Intestine Small, Duodenum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Intestine Small, Ileum    | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | A | + | + | + | + | + | + | + | 48 |
| Intestine Small, Jejunum  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | A | + | + | + | + | + | + | + | 48 |
| Liver                     | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Leukemia Mononuclear      |   | X |   | X |   | X | X | X | X | X |   |   |   |   |   |   | X |   | X | X |   |   |   |   | 21 |
| Mesentery                 | + |   | + |   |   |   |   |   |   | + | + |   |   |   | + |   | + | + |   | + |   |   |   |   | 18 |
| Leukemia Mononuclear      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | X |   |   |   |   |   |   |   | 1  |
| Mesothelioma Malignant    |   |   |   |   |   |   |   |   | X |   |   |   |   |   | X |   |   |   |   |   |   |   |   |   | 2  |
| Pancreas                  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Leukemia Mononuclear      |   |   |   |   |   |   |   |   |   |   |   |   | X |   |   |   |   | X |   |   |   |   |   |   | 3  |
| Mixed Tumor Malignant     |   |   |   |   |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1  |
| Salivary Glands           | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Adenoma, Tubular          |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | X |   |   |   |   |   |   |   | 1  |
| Stomach, Forestomach      | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
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 Lab: BNW

| FISCHER 344-TACONIC RATS MALE<br>Control   | DAY ON TEST |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |         | * TOTALS                |  |
|--|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|---------|-------------------------|--|
|  | 0730        | 0732  | 0739  | 0739  | 0739  | 0739  | 0739  | 0739  | 0739  | 0739  | 0739  | 0739  | 0739  | 0739  | 0739  | 0739  | 0739  | 0739  | 0739  | 0739  | 0739  | 0739  | 0739  | 0739    |                         |  |
| ANIMAL ID  | 00026       | 00027 | 00028 | 00029 | 00030 | 00031 | 00032 | 00033 | 00034 | 00035 | 00036 | 00037 | 00038 | 00039 | 00040 | 00041 | 00042 | 00043 | 00044 | 00045 | 00046 | 00047 | 00048 | 00049   | 00050                   |  |
| Leukemia Mononuclear   |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |         | 1                       |  |
| Stomach, Glandular<br>Leukemia Mononuclear   | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +       | 50<br>1                 |  |
| <b>CARDIOVASCULAR SYSTEM</b>   |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |         |                         |  |
| Blood Vessel   |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |         | 1                       |  |
| Heart<br>Leukemia Mononuclear<br>Schwannoma Malignant  | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +       | 50<br>6<br>1            |  |
|  |             |       |       |       |       | X     |       |       |       |       |       |       | X     |       |       |       |       |       |       |       |       |       |       |         |                         |  |
| <b>ENDOCRINE SYSTEM</b>  |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |         |                         |  |
| Adrenal Cortex<br>Leukemia Mononuclear   | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +       | 50<br>8                 |  |
| Adrenal Medulla<br>Leukemia Mononuclear<br>Pheochromocytoma Benign<br>Pheochromocytoma Malignant<br>Bilateral, Pheochromocytoma Benign | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +       | 50<br>8<br>11<br>2<br>4 |  |
|  |             |       |       |       |       | X     |       |       |       |       |       |       | X     | X     |       |       |       |       |       |       | X     |       |       |         |                         |  |
| Islets, Pancreatic<br>Carcinoma  | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | 50<br>2 |                         |  |
|  |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | X     |       |         |                         |  |
| Parathyroid Gland<br>Leukemia Mononuclear  | +           | +     | +     | +     | +     | M     | +     | +     | +     | +     | +     | M     | M     | +     | +     | +     | +     | +     | +     | +     | M     | +     | +     | 45<br>1 |                         |  |
|  |             |       |       |       |       |       |       |       |       |       |       | X     |       |       |       |       |       |       |       |       |       |       |       |         |                         |  |
| Pituitary Gland  | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | 50      |                         |  |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
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M .. Missing tissue  
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 Cobalt  
 CAS Number: 7440-48-4

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| FISCHER 344-TACONIC RATS MALE | DAY ON TEST |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | * TOTALS |
|-------------------------------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|
|                               | 0730        | 0722  | 0722  | 0722  | 0722  | 0713  | 0708  | 0706  | 0706  | 0706  | 0706  | 0706  | 0706  | 0706  | 0706  | 0706  | 0706  | 0706  | 0706  | 0706  | 0706  | 0706  | 0706  | 0706  |          |
| Control                       | 00026       | 00027 | 00028 | 00029 | 00030 | 00031 | 00032 | 00033 | 00034 | 00035 | 00036 | 00037 | 00038 | 00039 | 00040 | 00041 | 00042 | 00043 | 00044 | 00045 | 00046 | 00047 | 00048 | 00049 | 00050    |

|                                       |   |   |   |   |   |   |   |   |   |   |  |   |  |  |  |   |   |   |  |  |   |  |   |  |    |
|---------------------------------------|---|---|---|---|---|---|---|---|---|---|--|---|--|--|--|---|---|---|--|--|---|--|---|--|----|
| Mesothelioma Malignant                |   |   |   |   |   |   |   |   | X |   |  |   |  |  |  | X |   |   |  |  |   |  |   |  | 2  |
| Bilateral, Interstitial Cell, Adenoma | X |   | X | X | X |   |   |   | X | X |  | X |  |  |  | X | X | X |  |  | X |  | X |  | 23 |
| Interstitial Cell, Adenoma            |   | X |   |   |   | X | X | X |   |   |  | X |  |  |  |   |   |   |  |  | X |  | X |  | 12 |

**HEMATOPOIETIC SYSTEM**

|  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |    |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|----|
| Bone Marrow  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |    |
| Leukemia Mononuclear                                 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1  |    |
| Lymph Node   |   | + |   |   |   |   |   |   | + |   |   |   |   |   |   |   |   |   |   |   | + |   | + | + | 12 |    |
| Axillary, Deep Cervical, Renal, Leukemia Mononuclear |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1  |    |
| Lumbar, Renal, Leukemia Mononuclear                  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1  |    |
| Pancreatic, Renal, Leukemia Mononuclear              |   |   |   |   |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 3  |    |
| Renal, Leukemia Mononuclear                          |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | X |   |   |   | 3  |    |
| Lymph Node, Bronchial                                | M | + | M | M | + | + | + | + | M | M | + | + | + | + | + | + | + | + | + | + | M | M | + | M | +  | 27 |
| Leukemia Mononuclear                                 |   |   |   |   |   | X |   | X |   |   |   |   |   |   |   |   |   |   |   |   | X |   |   |   | 7  |    |
| Lymph Node, Mandibular                               | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 48 |    |
| Leukemia Mononuclear                                 |   | X |   |   |   |   |   | X |   | X |   |   |   |   |   |   |   |   |   |   | X |   |   |   | 9  |    |
| Lymph Node, Mediastinal                              | + | + | + | + | M | + | + | + | + | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | 46 |    |
| Leukemia Mononuclear                                 |   |   |   |   |   |   |   | X |   | X |   |   |   |   | X |   |   |   |   |   | X |   |   |   | 8  |    |
| Lymph Node, Mesenteric                               | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M | + | +  | 49 |
| Leukemia Mononuclear                                 |   |   |   |   |   | X |   | X |   | X |   |   |   |   |   |   |   |   |   |   | X |   |   |   | 7  |    |
| Spleen   | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |    |
| Leukemia Mononuclear                                 |   | X |   | X |   | X | X | X | X | X | X |   |   |   |   |   |   |   |   |   | X |   | X | X | 21 |    |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
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| FISCHER 344-TACONIC RATS MALE<br>Control  | DAY ON TEST           |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |   |                       |                       |                       |                       |                       |                       |                       |                       | * TOTALS              |                       |                       |  |  |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|--|--|
|   | 0<br>7<br>3<br>0      | 0<br>7<br>2<br>9      | 0<br>7<br>2<br>9      | 0<br>7<br>2<br>9      | 0<br>7<br>2<br>9      | 0<br>6<br>1<br>3      | 0<br>6<br>8<br>2      | 0<br>6<br>6<br>3      | 0<br>7<br>2<br>9      | 0<br>6<br>9<br>1      | 0<br>5<br>2<br>9      | 0<br>7<br>2<br>7      | 0<br>7<br>2<br>7      | 0<br>5<br>1<br>4  | 0<br>4<br>2<br>1      | 0<br>7<br>9<br>6      | 0<br>6<br>7<br>5      | 0<br>7<br>3<br>0      | 0<br>7<br>2<br>9      | 0<br>6<br>7<br>4      | 0<br>5<br>9<br>8      | 0<br>6<br>7<br>8      |                       | 0<br>3<br>7<br>6      |                       |  |  |
| ANIMAL ID   | 0<br>0<br>0<br>2<br>6 | 0<br>0<br>0<br>2<br>7 | 0<br>0<br>0<br>2<br>8 | 0<br>0<br>0<br>2<br>9 | 0<br>0<br>0<br>3<br>0 | 0<br>0<br>0<br>3<br>1 | 0<br>0<br>0<br>3<br>2 | 0<br>0<br>0<br>3<br>3 | 0<br>0<br>0<br>3<br>3 | 0<br>0<br>0<br>3<br>3 | 0<br>0<br>0<br>3<br>3 | 0<br>0<br>0<br>3<br>3 | 0<br>0<br>0<br>3<br>3 | 0<br>0<br>0<br>3<br>3   | 0<br>0<br>0<br>4<br>0 | 0<br>0<br>0<br>4<br>1 | 0<br>0<br>0<br>4<br>2 | 0<br>0<br>0<br>4<br>3 | 0<br>0<br>0<br>4<br>4 | 0<br>0<br>0<br>4<br>4 | 0<br>0<br>0<br>4<br>4 | 0<br>0<br>0<br>4<br>4 | 0<br>0<br>0<br>4<br>4 | 0<br>0<br>0<br>5<br>9 | 0<br>0<br>0<br>5<br>0 |  |  |
| Thymus<br>Leukemia Mononuclear  | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +   | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | M                     | +                     | 46<br>4                                    |  |
| <b>INTEGUMENTARY SYSTEM</b>   |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |   |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |  |  |
| Mammary Gland<br>Carcinoma<br>Fibroadenoma  | +                     | M                     | M                     | +                     | +                     | M                     | M                     | M                     | M                     | +                     | M                     | +                     | M                     | +   | +                     | +                     | M                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | M                     | 31<br>1<br>1                               |  |
| Skin<br>Basal Cell Adenoma<br>Hamartoma<br>Keratoacanthoma<br>Leukemia Mononuclear<br>Squamous Cell Carcinoma<br>Trichoepithelioma<br>Subcutaneous Tissue, Fibroma<br>Subcutaneous Tissue, Lipoma | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +   | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | 50<br>2<br>1<br>4<br>1<br>1<br>2<br>2<br>2 |  |
| <b>MUSCULOSKELETAL SYSTEM</b>   |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |   |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |  |  |
| Bone<br>Skeletal Muscle<br>Mesothelioma Malignant   | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +   | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | 50<br>1<br>1                               |  |
| <b>NERVOUS SYSTEM</b>   |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |   |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |  |  |
| Brain<br>Astrocytoma Malignant  | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +   | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | 50<br>1                                    |  |
| * .. Total animals with tissue examined microscopically; Total animals with tumor<br>+ .. Tissue examined microscopically<br>X .. Lesion present<br>I .. Insufficient tissue                      |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | M .. Missing tissue<br>A .. Autolysis precludes evaluation<br>BLANK .. Not examined microscopically |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |  |  |

Experiment Number: 60311 - 05  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: RATS/F344/N Tac

P04: NEOPLASMS BY INDIVIDUAL ANIMAL  
 Cobalt  
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012  
 Time Report Requested: 14:48:11  
 First Dose M/F: 05/08/06 / 05/08/06  
 Lab: BNW

| FISCHER 344-TACONIC RATS MALE                           | DAY ON TEST |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      | * TOTALS |
|---|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|----------|
|   | 0730        | 0732 | 0739 | 0739 | 0739 | 0739 | 0739 | 0739 | 0739 | 0739 | 0739 | 0739 | 0739 | 0739 | 0739 | 0739 | 0739 | 0739 | 0739 | 0739 | 0739 | 0739 | 0739 |          |
| Control   | 0026        | 0027 | 0028 | 0029 | 0030 | 0031 | 0032 | 0033 | 0033 | 0033 | 0033 | 0033 | 0033 | 0033 | 0033 | 0033 | 0033 | 0033 | 0033 | 0033 | 0033 | 0033 | 0033 |          |
|   |             |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |          |
| Spinal Cord   |             |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      | 1    |          |
| <b>RESPIRATORY SYSTEM</b>                               |             |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |          |
| Larynx  | +           | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | 50   |          |
| Lung  | +           | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | 50   |          |
| Alveolar/Bronchiolar Adenoma                            |             |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      | 1    |          |
| Alveolar/Bronchiolar Adenoma, Multiple                  |             |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      | 1    |          |
| Leukemia Mononuclear                                    |             | X    |      |      | X    | X    | X    | X    | X    | X    |      |      |      |      |      |      | X    |      |      | X    |      |      | 18   |          |
| Pheochromocytoma Malignant, Metastatic, Adrenal Medulla |             |      |      |      |      |      |      |      |      |      |      |      |      |      |      | X    |      |      |      |      |      |      | 1    |          |
| Squamous Cell Carcinoma, Metastatic, Skin               |             |      |      |      |      |      |      |      |      |      |      | X    |      |      |      |      |      |      |      |      |      |      | 1    |          |
| Nose  | +           | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | A    | +    | +    | +    | +    | +    | 48   |          |
| Leukemia Mononuclear                                    |             |      |      |      | X    |      | X    |      |      | X    |      |      |      |      |      |      |      |      |      |      |      |      | 6    |          |
| Trachea   | +           | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | 50   |          |
| <b>SPECIAL SENSES SYSTEM</b>                            |             |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |          |
| Ear   |             |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      | 1    |          |
| Eye   | +           | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | 50   |          |
| Harderian Gland   | +           | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | 50   |          |
| Zymbal's Gland  |             |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      | 4    |          |
| Adenoma   |             |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      | X    |      | 1    |          |
| Carcinoma   |             |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      | 3    |          |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue

M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically

Experiment Number: 60311 - 05

P04: NEOPLASMS BY INDIVIDUAL ANIMAL

Date Report Requested: 01/18/2012

Test Type: CHRONIC

Cobalt

Time Report Requested: 14:48:11

Route: RESPIRATORY EXPOSURE WHOLE BODY

CAS Number: 7440-48-4

First Dose M/F: 05/08/06 / 05/08/06

Species/Strain: RATS/F344/N Tac

Lab: BNW

|                                      |           |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                 |
|--------------------------------------|-----------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------------|
|                                      |           | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |   |                 |
| DAY ON TEST                          |           | 7 | 7 | 7 | 7 | 7 | 6 | 6 | 6 | 7 | 6 | 5 | 7 | 7 | 5 | 4 | 7 | 6 | 6 | 7 | 7 | 6 | 7 | 5 | 6 | 3 |                 |
| <b>FISCHER 344-TACONIC RATS MALE</b> |           | 3 | 2 | 2 | 2 | 2 | 1 | 8 | 6 | 2 | 9 | 1 | 2 | 2 | 1 | 4 | 2 | 9 | 7 | 3 | 2 | 7 | 2 | 9 | 7 | 6 |                 |
|                                      |           | 0 | 9 | 9 | 9 | 9 | 3 | 2 | 3 | 9 | 1 | 9 | 9 | 7 | 4 | 1 | 9 | 6 | 5 | 0 | 9 | 0 | 4 | 8 | 7 | 6 |                 |
| <b>Control</b>                       | ANIMAL ID | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |                 |
|                                      |           | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |                 |
|                                      |           | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |                 |
|                                      |           | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 |                 |
|                                      |           | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | <b>* TOTALS</b> |

**URINARY SYSTEM**

|                        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |           |
|------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------|
| Kidney                 | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | <b>50</b> |
| Leukemia Mononuclear   |   |   |   |   |   |   |   |   |   |   | X |   |   |   |   |   |   | X |   |   |   |   |   |   |   | <b>7</b>  |
| Urinary Bladder        | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | <b>50</b> |
| Leukemia Mononuclear   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | <b>2</b>  |
| Mesothelioma Malignant |   |   |   |   |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | <b>1</b>  |

**SYSTEMIC LESIONS**

|                        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |           |
|------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------|
| Multiple Organ         | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | <b>50</b> |
| Leukemia Mononuclear   |   | X |   | X |   | X | X | X | X | X |   |   |   |   |   |   |   | X |   | X | X |   |   |   |   | <b>21</b> |
| Mesothelioma Malignant |   |   |   |   |   |   |   | X |   |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   |   | <b>2</b>  |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue

M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically

Experiment Number: 60311 - 05  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: RATS/F344/N Tac

P04: NEOPLASMS BY INDIVIDUAL ANIMAL  
 Cobalt  
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012  
 Time Report Requested: 14:48:11  
 First Dose M/F: 05/08/06 / 05/08/06  
 Lab: BNW

|   |             |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                    |                       |                       |                       |
|---|-------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|--------------------|-----------------------|-----------------------|-----------------------|
| FISCHER 344-TACONIC RATS MALE<br><br>1.25 mg/m3 | DAY ON TEST | 0<br>5<br>4<br>0      | 0<br>7<br>3<br>0      | 0<br>7<br>2<br>0      | 0<br>6<br>2<br>4      | 0<br>7<br>0<br>8      | 0<br>6<br>2<br>3      | 0<br>7<br>2<br>5      | 0<br>6<br>2<br>7      | 0<br>7<br>2<br>9      | 0<br>7<br>2<br>9      | 0<br>6<br>2<br>4      | 0<br>7<br>2<br>0      | 0<br>6<br>3<br>9      | 0<br>6<br>3<br>4      | 0<br>5<br>3<br>0      | 0<br>7<br>3<br>7      | 0<br>6<br>6<br>4      | 0<br>6<br>6<br>7      | 0<br>6<br>6<br>3      | 0<br>5<br>7<br>7      | 0<br>6<br>8<br>4      | 0<br>6<br>8<br>2      | 0<br>7<br>9<br>5      | males<br>(cont...) |                       |                       |                       |
|   | ANIMAL ID   | 0<br>0<br>2<br>0<br>1 | 0<br>0<br>0<br>0<br>2 | 0<br>0<br>2<br>0<br>3 | 0<br>0<br>2<br>0<br>4 | 0<br>0<br>2<br>0<br>5 | 0<br>0<br>2<br>0<br>6 | 0<br>0<br>2<br>0<br>7 | 0<br>0<br>2<br>0<br>8 | 0<br>0<br>2<br>0<br>9 | 0<br>0<br>2<br>1<br>0 | 0<br>0<br>2<br>1<br>1 | 0<br>0<br>2<br>1<br>1 | 0<br>0<br>2<br>1<br>1 | 0<br>0<br>2<br>1<br>1 | 0<br>0<br>2<br>1<br>1 | 0<br>0<br>2<br>1<br>1 | 0<br>0<br>2<br>1<br>1 | 0<br>0<br>2<br>2<br>0 | 0<br>0<br>2<br>2<br>1 | 0<br>0<br>2<br>2<br>2 | 0<br>0<br>2<br>2<br>2 | 0<br>0<br>2<br>2<br>2 | 0<br>0<br>2<br>2<br>2 |                    | 0<br>0<br>2<br>2<br>3 | 0<br>0<br>2<br>2<br>4 | 0<br>0<br>2<br>2<br>5 |
|   |             |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                    |                       |                       |                       |

**ALIMENTARY SYSTEM**

|                           |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Esophagus                 | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Large, Cecum    | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Large, Colon    | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Large, Rectum   | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Small, Duodenum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Small, Ileum    | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Small, Jejunum  | + | + | + | + | + | + | + | + | + | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + |   |
| Liver                     | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |   |
| Hepatocellular Adenoma    | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Leukemia Mononuclear      | X | X | X |   |   | X | X |   |   | X | X | X | X | X |   |   |   |   | X | X | X |   |   |   |   |
| Mesentery                 |   | + |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | + |   |   |   |   |   | + |   |
| Pancreas                  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |   |
| Leukemia Mononuclear      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Acinus, Adenoma           |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Salivary Glands           | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |   |
| Stomach, Forestomach      | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |   |
| Squamous Cell Papilloma   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
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M .. Missing tissue  
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Experiment Number: 60311 - 05  
 Test Type: CHRONIC  
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P04: NEOPLASMS BY INDIVIDUAL ANIMAL  
 Cobalt  
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012  
 Time Report Requested: 14:48:11  
 First Dose M/F: 05/08/06 / 05/08/06  
 Lab: BNW

| DAY ON TEST | FISCHER 344-TACONIC RATS MALE |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | ANIMAL ID | males<br>(cont...) |   |   |   |  |
|-------------|-------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------|--------------------|---|---|---|--|
|             | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |           |                    | 0 | 0 |   |  |
| 5           | 7                             | 7 | 6 | 7 | 6 | 7 | 6 | 7 | 7 | 7 | 6 | 7 | 7 | 6 | 6 | 5 | 7 | 6 | 6 | 6 | 6         | 5                  | 6 | 7 | 0 |  |
| 4           | 3                             | 2 | 2 | 0 | 8 | 2 | 2 | 2 | 2 | 2 | 8 | 3 | 2 | 9 | 3 | 8 | 3 | 7 | 6 | 6 | 6         | 7                  | 8 | 2 | 0 |  |
| 0           | 0                             | 0 | 9 | 4 | 8 | 3 | 9 | 5 | 9 | 9 | 4 | 0 | 9 | 9 | 4 | 3 | 0 | 4 | 7 | 7 | 3         | 7                  | 4 | 9 | 0 |  |
| 0           | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0         | 0                  | 0 | 0 | 0 |  |
| 2           | 2                             | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2         | 2                  | 2 | 2 | 0 |  |
| 0           | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2         | 2                  | 2 | 2 | 0 |  |
| 1           | 2                             | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2         | 3                  | 4 | 5 | 1 |  |

Stomach, Glandular

+ +

Tooth

+

**CARDIOVASCULAR SYSTEM**

Blood Vessel

+

Heart

+ +

Alveolar/Bronchiolar Carcinoma, Metastatic, Lung

Leukemia Mononuclear  
Schwannoma Malignant

X X X X X X X

**ENDOCRINE SYSTEM**

Adrenal Cortex

+ +

Leukemia Mononuclear

X X X X X X X X

Adrenal Medulla

+ +

Leukemia Mononuclear

X X X X X X X X

Pheochromocytoma Benign

X X X X X X X X

Pheochromocytoma Malignant

X

Bilateral, Pheochromocytoma Benign

X X X X X X X X X

Islets, Pancreatic

+ +

Adenoma

X

Carcinoma

X

Parathyroid Gland

+ + + + + + + + + + + + + M + + + + + + + + + M

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue

M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically

Experiment Number: 60311 - 05  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: RATS/F344/N Tac

P04: NEOPLASMS BY INDIVIDUAL ANIMAL  
 Cobalt  
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012  
 Time Report Requested: 14:48:11  
 First Dose M/F: 05/08/06 / 05/08/06  
 Lab: BNW

| FISCHER 344-TACONIC RATS MALE | DAY ON TEST |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      | males<br>(cont...) |
|-------------------------------|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|--------------------|
|                               | 0540        | 0730 | 0772 | 0622 | 0708 | 0678 | 0772 | 0672 | 0772 | 0772 | 0667 | 0772 | 0772 | 0666 | 0666 | 0557 | 0776 | 0666 | 0666 | 0666 | 0557 | 0667 | 0688 | 0729 |      |                    |
| 1.25 mg/m3                    | ANIMAL ID   |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |                    |
|                               | 0000        | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 |      |                    |
|                               | 2200        | 2200 | 2200 | 2200 | 2200 | 2200 | 2200 | 2200 | 2200 | 2200 | 2200 | 2200 | 2200 | 2200 | 2200 | 2200 | 2200 | 2200 | 2200 | 2200 | 2200 | 2200 | 2200 | 2200 |      |                    |
|                               | 0001        | 0002 | 0003 | 0004 | 0005 | 0006 | 0007 | 0008 | 0009 | 0010 | 0011 | 0012 | 0013 | 0014 | 0015 | 0016 | 0017 | 0018 | 0019 | 0020 | 0021 | 0022 | 0023 | 0024 | 0025 |                    |

|                            |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|----------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Pituitary Gland            | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |   |
| Leukemia Mononuclear       |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Pars Distalis, Adenoma     |   |   |   | X | X |   | X | X | X | X |   |   |   |   | X | X | X | X |   | X |   |   | X | X | X |
| Pars Intermedia, Adenoma   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Thyroid Gland              | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |   |
| C-cell, Adenoma            |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| C-cell, Carcinoma          |   |   |   |   |   |   |   |   | X | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Follicular Cell, Carcinoma |   |   |   |   |   |   |   |   |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   | X |   |

**GENERAL BODY SYSTEM**

NONE

**GENITAL SYSTEM**

|                        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Epididymis             | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Mesothelioma Malignant |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | X | X |
| Penis                  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Preputial Gland        | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Adenoma                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | X |
| Prostate               | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Leukemia Mononuclear   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Seminal Vesicle        | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Leukemia Mononuclear   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Testes                 | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue  
 M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically

Experiment Number: 60311 - 05  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: RATS/F344/N Tac

P04: NEOPLASMS BY INDIVIDUAL ANIMAL  
 Cobalt  
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012  
 Time Report Requested: 14:48:11  
 First Dose M/F: 05/08/06 / 05/08/06  
 Lab: BNW

| FISCHER 344-TACONIC RATS MALE | DAY ON TEST |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      | ANIMAL ID                | males<br>(cont...) |
|-------------------------------|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|--------------------------|--------------------|
|                               | 0540        | 0730 | 0772 | 0622 | 0700 | 0668 | 0722 | 0675 | 0772 | 0772 | 0662 | 0772 | 0772 | 0662 | 0772 | 0662 | 0772 | 0662 | 0772 | 0662 | 0772 | 0662 | 0772 | 0662 |                          |                    |
| 1.25 mg/m3                    | 0           | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 000000000000000000000000 |                    |

Mesothelioma Malignant  
 Bilateral, Interstitial Cell, Adenoma  
 Interstitial Cell, Adenoma

|   |  |   |   |  |   |  |  |   |   |   |   |  |  |  |  |  |  |   |  |   |  |  |   |   |
|---|--|---|---|--|---|--|--|---|---|---|---|--|--|--|--|--|--|---|--|---|--|--|---|---|
| X |  | X | X |  | X |  |  | X | X | X | X |  |  |  |  |  |  | X |  | X |  |  | X | X |
|---|--|---|---|--|---|--|--|---|---|---|---|--|--|--|--|--|--|---|--|---|--|--|---|---|

**HEMATOPOIETIC SYSTEM**

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bone Marrow                             | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |   |   |
| Leukemia Mononuclear                    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | X |   |   |   |
| Lymph Node                              |   |   |   |   |   |   | + | + |   |   |   |   |   |   |   |   |   |   | + |   |   |   |   | + |   |   |
| Lumbar, Leukemia Mononuclear            |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | X |   |   |
| Pancreatic, Leukemia Mononuclear        |   |   |   |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | X |   |   |
| Pancreatic, Renal, Leukemia Mononuclear |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Renal, Leukemia Mononuclear             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | X |   |   |
| Lymph Node, Bronchial                   | + | + | + | + | M | M | + | M | + | M | M | + | M | M | M | M | + | M | + | M | M | + | + | M | M |   |
| Leukemia Mononuclear                    |   |   |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | X |   |   |   |
| Lymph Node, Mandibular                  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M | + | + |
| Carcinoma, Metastatic, Zymbal'S Gland   |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Leukemia Mononuclear                    |   |   |   |   |   |   | X | X |   |   |   |   |   |   |   |   |   |   |   |   |   | X | X |   |   |   |
| Lymph Node, Mediastinal                 | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + |   |
| Leukemia Mononuclear                    |   |   |   |   |   |   | X |   |   |   |   | X |   |   |   |   |   |   |   |   |   | X | X |   |   |   |
| Lymph Node, Mesenteric                  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |   |
| Leukemia Mononuclear                    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | X | X |   |   |   |
| Spleen                                  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |   |
| Leukemia Mononuclear                    | X | X | X | X |   | X | X | X |   | X | X | X | X | X |   |   |   | X |   | X | X | X |   |   |   |   |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue

M .. Missing tissue  
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**Experiment Number:** 60311 - 05  
**Test Type:** CHRONIC  
**Route:** RESPIRATORY EXPOSURE WHOLE BODY  
**Species/Strain:** RATS/F344/N Tac

**P04: NEOPLASMS BY INDIVIDUAL ANIMAL**  
 Cobalt  
**CAS Number:** 7440-48-4

**Date Report Requested:** 01/18/2012  
**Time Report Requested:** 14:48:11  
**First Dose M/F:** 05/08/06 / 05/08/06  
**Lab:** BNW

|                               |  | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |   |   |   |
|-------------------------------|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DAY ON TEST                   |  | 5 | 7 | 7 | 6 | 7 | 6 | 7 | 6 | 7 | 7 | 6 | 7 | 7 | 6 | 6 | 5 | 7 | 6 | 6 | 6 | 6 | 5 | 6 | 7 |   |
| FISCHER 344-TACONIC RATS MALE |  | 4 | 3 | 2 | 2 | 0 | 8 | 2 | 7 | 2 | 2 | 8 | 3 | 2 | 9 | 3 | 8 | 3 | 7 | 6 | 6 | 6 | 7 | 8 | 2 |   |
| 1.25 mg/m3                    |  | 0 | 0 | 0 | 4 | 8 | 3 | 5 | 7 | 9 | 9 | 4 | 0 | 9 | 4 | 3 | 0 | 4 | 7 | 7 | 3 | 7 | 4 | 9 |   |   |
| ANIMAL ID                     |  | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |   |
|                               |  | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |   |
|                               |  | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |   |
|                               |  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 |

males  
(cont...)

|                      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|----------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Thymus               | + | + | + | + | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |   |
| Leukemia Mononuclear |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | X |

**INTEGUMENTARY SYSTEM**

|                              |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mammary Gland                | + | + | + | + | M | M | + | + | M | M | M | + | + | + | + | + | + | + | + | M | + | + | + | + | + | M |   |   |
| Fibroadenoma                 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Skin                         | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |   |
| Keratoacanthoma              |   |   |   |   |   |   |   |   |   |   |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   |   |   | X |
| Squamous Cell Papilloma      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Lip, Squamous Cell Papilloma |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Pinna, Neural Crest Tumor    |   |   |   |   |   |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Subcutaneous Tissue, Fibroma |   |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | X |
| Subcutaneous Tissue, Lipoma  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |

**MUSCULOSKELETAL SYSTEM**

|      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bone | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
|------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

**NERVOUS SYSTEM**

|                                       |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Brain                                 | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |   |
| Carcinoma, Metastatic, Zymbal'S Gland |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Leukemia Mononuclear                  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | X |
| Oligodendroglioma Malignant           |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |

**RESPIRATORY SYSTEM**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Larynx | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
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Experiment Number: 60311 - 05  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: RATS/F344/N Tac

P04: NEOPLASMS BY INDIVIDUAL ANIMAL  
 Cobalt  
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012  
 Time Report Requested: 14:48:11  
 First Dose M/F: 05/08/06 / 05/08/06  
 Lab: BNW

| FISCHER 344-TACONIC RATS MALE<br>1.25 mg/m3                   | DAY ON TEST |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        | males<br>(cont...) |        |        |        |        |
|---|-------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------------------|--------|--------|--------|--------|
|   | 0540        | 0730   | 0772   | 0622   | 0708   | 0663   | 0778   | 0672   | 0776   | 0777   | 0667   | 0776   | 0777   | 0666   | 0666   | 0557   | 0776   | 0666   | 0666   | 0557   |                    | 0666   | 0777   | 0667   | 0678   |
| ANIMAL ID   | 002011      | 000022 | 000033 | 000044 | 000055 | 000066 | 000077 | 000088 | 000099 | 000000 | 000011 | 000022 | 000033 | 000044 | 000055 | 000066 | 000077 | 000088 | 000099 | 000000 | 000011             | 000022 | 000033 | 000044 | 000055 |
| Lung  | +           | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +                  | +      | +      | +      |        |
| Alveolar/Bronchiolar Adenoma                                  |             |        |        |        |        |        | X      |        |        |        |        |        |        | X      | X      |        |        |        |        |        |                    |        | X      |        |        |
| Alveolar/Bronchiolar Adenoma, Multiple                        |             |        |        |        |        |        |        |        |        |        | X      |        |        |        |        |        |        |        |        |        |                    |        |        | X      |        |
| Alveolar/Bronchiolar Carcinoma                                |             |        |        |        | X      |        |        |        |        |        |        |        |        | X      |        |        |        |        |        |        |                    |        |        |        |        |
| Alveolar/Bronchiolar Carcinoma, Multiple                      |             | X      |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |                    |        |        |        |        |
| Carcinoma, Metastatic, Zymbal'S Gland                         |             |        |        |        | X      |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |                    |        |        |        |        |
| Cystic Keratinizing Epithelioma                               |             |        |        |        | X      |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |                    |        |        |        |        |
| Leukemia Mononuclear  | X           | X      |        |        |        | X      | X      |        |        | X      | X      | X      | X      | X      |        |        |        | X      |        | X      | X                  | X      |        |        |        |
| Mediastinum, Alveolar/Bronchiolar Carcinoma, Metastatic, Lung |             |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |                    |        |        |        |        |
| Nose  | +           | +      | +      | +      | +      | +      | +      | I      | +      | +      | +      | A      | +      | +      | +      | +      | +      | +      | +      | +      | +                  | +      | +      |        |        |
| Leukemia Mononuclear  | X           |        |        |        |        | X      |        |        |        |        |        |        |        |        |        |        |        |        |        |        |                    |        |        |        |        |
| Trachea   | +           | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +                  | +      | +      | +      |        |
| <b>SPECIAL SENSES SYSTEM</b>                                  |             |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |                    |        |        |        |        |
| Ear   |             |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |                    |        |        | +      |        |
| Eye   | +           | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +                  | +      | +      | +      |        |
| Harderian Gland   | +           | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +                  | +      | +      | +      |        |
| Zymbal's Gland Carcinoma                                      |             |        |        |        |        | +      |        |        |        |        |        |        |        |        | +      |        |        |        |        |        |                    |        |        | X      |        |
| <b>URINARY SYSTEM</b>   |             |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |                    |        |        |        |        |
| Kidney  | +           | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +                  | +      | +      | +      |        |
| Leukemia Mononuclear  |             |        |        |        |        |        |        |        |        |        |        |        | X      |        |        |        |        |        |        |        |                    |        |        |        |        |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
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Experiment Number: 60311 - 05  
 Test Type: CHRONIC  
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 Species/Strain: RATS/F344/N Tac

P04: NEOPLASMS BY INDIVIDUAL ANIMAL  
 Cobalt  
 CAS Number: 7440-48-4

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 Lab: BNW

|                               |             |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                    |
|-------------------------------|-------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|--------------------|
| FISCHER 344-TACONIC RATS MALE | DAY ON TEST | 05 | 07 | 07 | 06 | 07 | 06 | 07 | 06 | 07 | 07 | 06 | 07 | 07 | 06 | 06 | 05 | 07 | 06 | 06 | 06 | 06 | 05 | 06 | 07 | males<br>(cont...) |
|                               | ANIMAL ID   | 40 | 30 | 29 | 24 | 08 | 83 | 27 | 75 | 29 | 29 | 24 | 03 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 |                    |

Renal Tubule, Adenoma

Urinary Bladder

+ +

**SYSTEMIC LESIONS**

Multiple Organ

Leukemia Mononuclear

Mesothelioma Malignant

+  
 X  
 X

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
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 Lab: BNW

| DAY ON TEST | FISCHER 344-TACONIC RATS MALE |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        | * TOTALS |        |
|-------------|-------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|--------|
|             | 0729                          | 0729   | 0729   | 0730   | 0730   | 0731   | 0731   | 0731   | 0731   | 0731   | 0731   | 0731   | 0731   | 0731   | 0731   | 0731   | 0731   | 0731   | 0731   | 0731   | 0731   | 0731   | 0731   | 0731   |          | 0731   |
| 1.25 mg/m3  | 002226                        | 000222 | 000222 | 000222 | 000222 | 000222 | 000222 | 000222 | 000222 | 000222 | 000222 | 000222 | 000222 | 000222 | 000222 | 000222 | 000222 | 000222 | 000222 | 000222 | 000222 | 000222 | 000222 | 000222 | 000222   | 000222 |
| ANIMAL ID   | 002226                        | 000222 | 000222 | 000222 | 000222 | 000222 | 000222 | 000222 | 000222 | 000222 | 000222 | 000222 | 000222 | 000222 | 000222 | 000222 | 000222 | 000222 | 000222 | 000222 | 000222 | 000222 | 000222 | 000222 | 000222   | 000222 |

**ALIMENTARY SYSTEM**

|                           |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |
|---------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|
| Esophagus                 | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Intestine Large, Cecum    | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Intestine Large, Colon    | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Intestine Large, Rectum   | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |
| Intestine Small, Duodenum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Intestine Small, Ileum    | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Intestine Small, Jejunum  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |
| Liver                     | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Hepatocellular Adenoma    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1  |
| Leukemia Mononuclear      |   | X |   | X |   |   |   | X |   |   |   |   |   |   |   |   |   | X |   | X |   |   |   | X |   | 19 |
| Mesentery                 |   |   |   |   |   |   | + |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 4  |
| Pancreas                  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Leukemia Mononuclear      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | X | 1  |
| Acinus, Adenoma           |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | X |   | 1  |
| Salivary Glands           | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Stomach, Forestomach      | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Squamous Cell Papilloma   |   |   |   |   |   |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1  |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue

M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically

Experiment Number: 60311 - 05

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: RATS/F344/N Tac

P04: NEOPLASMS BY INDIVIDUAL ANIMAL

Cobalt

CAS Number: 7440-48-4

Date Report Requested: 01/18/2012

Time Report Requested: 14:48:11

First Dose M/F: 05/08/06 / 05/08/06

Lab: BNW

| FISCHER 344-TACONIC RATS MALE<br>1.25 mg/m3 | DAY ON TEST |      | ANIMAL ID |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      | * TOTALS |      |      |      |      |      |
|---|-------------|------|-----------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|----------|------|------|------|------|------|
|   | 0729        | 0729 | 0729      | 0730 | 0731 | 0735 | 0736 | 0739 | 0740 | 0743 | 0746 | 0749 | 0750 | 0753 | 0756 | 0759 | 0760 | 0763 | 0766 | 0769 | 0770 | 0773 |          | 0776 | 0779 | 0780 | 0783 | 0786 |

Stomach, Glandular + 50

Tooth + 2

**CARDIOVASCULAR SYSTEM**

Blood Vessel 1

Heart + 50

Alveolar/Bronchiolar Carcinoma, Metastatic, Lung X X 2

Leukemia Mononuclear X 5

Schwannoma Malignant X 1

**ENDOCRINE SYSTEM**

Adrenal Cortex + 50

Leukemia Mononuclear X X X 10

Adrenal Medulla + 50

Leukemia Mononuclear X 10

Pheochromocytoma Benign X X X X 10

Pheochromocytoma Malignant X 2

Bilateral, Pheochromocytoma Benign X X X X 13

Islets, Pancreatic + 50

Adenoma 1

Carcinoma 1

Parathyroid Gland + + + + + M + + + + + + + + + + + M M + + + + + 45

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|---|-------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|--|
|   | 0729        | 0729   | 0729   | 0730   | 0730   | 0731   | 0731   | 0731   | 0731   | 0731   | 0731   | 0731   | 0731   | 0731   | 0731   | 0731   | 0731   | 0731   | 0731   | 0731   | 0731   | 0731   | 0731   | 0731   |          |  |
| ANIMAL ID                                   | 002266      | 002267 | 002268 | 002269 | 002270 | 002271 | 002272 | 002273 | 002274 | 002275 | 002276 | 002277 | 002278 | 002279 | 002280 | 002281 | 002282 | 002283 | 002284 | 002285 | 002286 | 002287 | 002288 | 002289 | 002290   |  |
| Pituitary Gland                             | +           | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | 50       |  |
| Leukemia Mononuclear                        |             |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        | 4        |  |
| Pars Distalis, Adenoma                      |             |        | X      | X      |        | X      | X      | X      |        | X      | X      |        | X      | X      | X      | X      | X      | X      | X      |        | X      | X      |        |        | 32       |  |
| Pars Intermedia, Adenoma                    |             |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        | 1        |  |
| Thyroid Gland                               | +           | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | 50       |  |
| C-cell, Adenoma                             |             | X      | X      | X      |        |        |        |        |        |        |        | X      |        |        |        |        | X      |        |        |        |        |        |        |        | 8        |  |
| C-cell, Carcinoma                           | X           |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        | 2        |  |
| Follicular Cell, Carcinoma                  |             |        |        |        |        |        |        |        |        | X      |        |        |        |        |        |        |        |        |        |        | X      |        |        |        | 2        |  |
| <b>GENERAL BODY SYSTEM</b>                  |             |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |          |  |
| NONE  |             |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |          |  |
| <b>GENITAL SYSTEM</b>                       |             |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |          |  |
| Epididymis                                  | +           | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | 50       |  |
| Mesothelioma Malignant                      |             |        |        |        |        |        |        |        |        |        |        |        | X      |        |        |        |        |        |        |        |        |        |        |        | 3        |  |
| Penis                                       |             |        |        |        |        |        |        |        |        |        |        |        | +      |        |        |        |        |        |        |        |        |        |        |        | 1        |  |
| Preputial Gland                             | +           | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | 50       |  |
| Adenoma                                     |             |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        | 1        |  |
| Prostate                                    | +           | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | 50       |  |
| Leukemia Mononuclear                        |             | X      |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        | 1        |  |
| Seminal Vesicle                             | +           | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | 50       |  |
| Leukemia Mononuclear                        |             | X      |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        | 1        |  |
| Testes                                      | +           | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | 50       |  |

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|---|-------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---|----------|
|   | 0729        | 0729   | 0729   | 0730   | 0730   | 0731   | 0731   | 0732   | 0732   | 0733   | 0733   | 0734   | 0734   | 0735   | 0735   | 0736   | 0736   | 0737   | 0737   | 0738   | 0738   | 0739   | 0739   |   |          |
| ANIMAL ID                                   | 002226      | 000022 | 000022 | 000022 | 000022 | 000022 | 000022 | 000022 | 000022 | 000022 | 000022 | 000022 | 000022 | 000022 | 000022 | 000022 | 000022 | 000022 | 000022 | 000022 | 000022 | 000022 | 000022 |   |          |
|   | 6           | 7      | 8      | 9      | 0      | 1      | 2      | 3      | 4      | 5      | 6      | 7      | 8      | 9      | 0      | 1      | 2      | 3      | 4      | 5      | 6      | 7      | 8      | 9 | 0        |

|                                       |   |   |   |   |   |   |  |   |   |  |  |   |   |   |   |  |   |   |  |   |   |   |  |  |  |    |
|---------------------------------------|---|---|---|---|---|---|--|---|---|--|--|---|---|---|---|--|---|---|--|---|---|---|--|--|--|----|
| Mesothelioma Malignant                |   |   |   |   |   |   |  |   |   |  |  |   | X |   |   |  |   |   |  |   |   |   |  |  |  | 3  |
| Bilateral, Interstitial Cell, Adenoma |   | X | X |   | X | X |  |   |   |  |  | X | X | X | X |  | X |   |  | X |   |   |  |  |  | 21 |
| Interstitial Cell, Adenoma            | X |   |   | X |   |   |  | X | X |  |  |   |   | X |   |  |   | X |  |   | X | X |  |  |  | 18 |

### HEMATOPOIETIC SYSTEM

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |    |   |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|----|---|
| Bone Marrow                             | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | +  | 50 |   |
| Leukemia Mononuclear                    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | X  | 2  |   |
| Lymph Node                              |   |   |   |   | + | + |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | + | +  | +  | 9 |
| Lumbar, Leukemia Mononuclear            |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    | 1  |   |
| Pancreatic, Leukemia Mononuclear        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    | 2  |   |
| Pancreatic, Renal, Leukemia Mononuclear |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | X |    | 1  |   |
| Renal, Leukemia Mononuclear             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    | 1  |   |
| Lymph Node, Bronchial                   | + | M | + | M | M | + | M | + | + | + | M | M | M | + | + | M | M | + | M | + | M | + | + | + | +  | 25 |   |
| Leukemia Mononuclear                    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | X  | 3  |   |
| Lymph Node, Mandibular                  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | +  | 49 |   |
| Carcinoma, Metastatic, Zymbal'S Gland   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    | 1  |   |
| Leukemia Mononuclear                    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | X |   | X |   |   |   | X | 7  |    |   |
| Lymph Node, Mediastinal                 | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M | + | + | + | + | 48 |    |   |
| Leukemia Mononuclear                    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | X |   |   |   |   | X | 6  |    |   |
| Lymph Node, Mesenteric                  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |    |   |
| Leukemia Mononuclear                    |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | X |   | 4  |    |   |
| Spleen                                  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |    |   |
| Leukemia Mononuclear                    | X | X |   | X |   |   |   | X |   |   |   |   | X |   |   |   |   | X |   | X |   | X |   | X | 25 |    |   |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue

M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically

Experiment Number: 60311 - 05  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: RATS/F344/N Tac

P04: NEOPLASMS BY INDIVIDUAL ANIMAL  
 Cobalt  
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012  
 Time Report Requested: 14:48:11  
 First Dose M/F: 05/08/06 / 05/08/06  
 Lab: BNW

| FISCHER 344-TACONIC RATS MALE | DAY ON TEST |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        | * TOTALS |
|-------------------------------|-------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|
|                               | 07          | 07     | 07     | 07     | 07     | 07     | 07     | 07     | 07     | 07     | 07     | 07     | 07     | 07     | 07     | 07     | 07     | 07     | 07     | 07     | 07     | 07     | 07     | 07     |          |
| 1.25 mg/m3                    | 29          | 29     | 29     | 29     | 29     | 29     | 29     | 29     | 29     | 29     | 29     | 29     | 29     | 29     | 29     | 29     | 29     | 29     | 29     | 29     | 29     | 29     | 29     | 29     | 29       |
| ANIMAL ID                     | 002226      | 000022 | 000022 | 000022 | 000022 | 000022 | 000022 | 000022 | 000022 | 000022 | 000022 | 000022 | 000022 | 000022 | 000022 | 000022 | 000022 | 000022 | 000022 | 000022 | 000022 | 000022 | 000022 | 000022 | 000022   |

|                      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |
|----------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|
| Thymus               | + | + | + | + | M | + | + | M | + | + | M | + | + | + | + | + | + | + | + | M | + | + | + | + | M | + | 44 |
| Leukemia Mononuclear |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 2  |

**INTEGUMENTARY SYSTEM**

|                              |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |    |
|------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|----|
| Mammary Gland                | + | M | M | + | M | + | + | + | + | M | + | + | + | + | M | + | M | M | M | M | M | + | + | M | + | 32 |    |
| Fibroadenoma                 |   |   |   |   |   |   |   |   |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   |   |   |    | 1  |
| Skin                         | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | +  | 50 |
| Keratoacanthoma              | X |   |   |   |   | X |   |   |   | X |   |   |   |   |   |   |   |   |   |   | X |   |   |   |   |    | 6  |
| Squamous Cell Papilloma      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    | 1  |
| Lip, Squamous Cell Papilloma |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    | 1  |
| Pinna, Neural Crest Tumor    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    | 1  |
| Subcutaneous Tissue, Fibroma |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    | 3  |
| Subcutaneous Tissue, Lipoma  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    | 1  |

**MUSCULOSKELETAL SYSTEM**

|      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |
|------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|
| Bone | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
|------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|

**NERVOUS SYSTEM**

|                                       |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |
|---------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|
| Brain                                 | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Carcinoma, Metastatic, Zymbal'S Gland |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1  |
| Leukemia Mononuclear                  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1  |
| Oligodendroglioma Malignant           |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 2  |

**RESPIRATORY SYSTEM**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|
| Larynx | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue

M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically

Experiment Number: 60311 - 05  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: RATS/F344/N Tac

P04: NEOPLASMS BY INDIVIDUAL ANIMAL  
 Cobalt  
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012  
 Time Report Requested: 14:48:11  
 First Dose M/F: 05/08/06 / 05/08/06  
 Lab: BNW

| FISCHER 344-TACONIC RATS MALE<br>1.25 mg/m3                   | DAY ON TEST |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        | * TOTALS |
|---|-------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|
|   | 0729        | 0729   | 0729   | 0730   | 0730   | 0731   | 0731   | 0732   | 0732   | 0733   | 0733   | 0734   | 0734   | 0735   | 0735   | 0736   | 0736   | 0737   | 0737   | 0738   | 0738   | 0739   | 0739   |        |          |
| ANIMAL ID   | 002226      | 002227 | 002228 | 002229 | 002230 | 002231 | 002232 | 002233 | 002234 | 002235 | 002236 | 002237 | 002238 | 002239 | 002240 | 002241 | 002242 | 002243 | 002244 | 002245 | 002246 | 002247 | 002248 | 002249 |          |
| Lung  | +           | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | 50     |          |
| Alveolar/Bronchiolar Adenoma                                  |             |        |        |        |        |        |        |        |        |        |        | X      |        |        |        |        |        | X      | X      |        |        |        |        | 7      |          |
| Alveolar/Bronchiolar Adenoma, Multiple                        |             |        |        | X      |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        | 3      |          |
| Alveolar/Bronchiolar Carcinoma                                |             |        | X      |        | X      | X      |        |        | X      | X      |        |        | X      | X      |        |        |        |        |        |        |        | X      |        | 10     |          |
| Alveolar/Bronchiolar Carcinoma, Multiple                      | X           |        |        |        |        |        |        | X      |        |        |        |        |        | X      |        |        |        |        |        | X      | X      |        |        | 6      |          |
| Carcinoma, Metastatic, Zymbal'S Gland                         |             |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        | 1      |          |
| Cystic Keratinizing Epithelioma                               | X           |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        | 1      |          |
| Leukemia Mononuclear  |             | X      |        | X      |        |        |        |        |        |        |        |        |        |        |        |        | X      | X      |        |        |        |        | X      | 18     |          |
| Mediastinum, Alveolar/Bronchiolar Carcinoma, Metastatic, Lung |             |        |        |        |        |        |        |        |        |        |        |        |        | X      |        |        |        |        |        |        | X      |        |        | 2      |          |
| Nose  | +           | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | 47     |          |
| Leukemia Mononuclear  |             |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        | X      | 3      |          |
| Trachea   | +           | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | 50     |          |
| <b>SPECIAL SENSES SYSTEM</b>                                  |             |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |          |
| Ear   |             |        |        |        | +      |        |        |        |        |        |        | +      |        |        |        |        |        |        | +      |        |        |        | +      | 5      |          |
| Eye   | +           | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | 50     |          |
| Harderian Gland   | +           | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | 50     |          |
| Zymbal's Gland  |             |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        | 3      |          |
| Carcinoma   |             |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        | X      | 3      |          |
| <b>URINARY SYSTEM</b>   |             |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |          |
| Kidney  | +           | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | +      | 50     |          |
| Leukemia Mononuclear  |             |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        | X      | 2      |          |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue

M .. Missing tissue  
 A .. Autolysis precludes evaluation  
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Experiment Number: 60311 - 05  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: RATS/F344/N Tac

**P04: NEOPLASMS BY INDIVIDUAL ANIMAL**  
 Cobalt  
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012  
 Time Report Requested: 14:48:11  
 First Dose M/F: 05/08/06 / 05/08/06  
 Lab: BNW

| FISCHER 344-TACONIC RATS MALE<br>1.25 mg/m3 | DAY ON TEST          |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      | * TOTALS |
|---|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------|
|   | 07<br>29             | 07<br>29             | 07<br>29             | 07<br>30             | 07<br>30             | 07<br>31             | 07<br>01             | 07<br>02             | 07<br>03             | 07<br>04             | 07<br>05             | 07<br>06             | 07<br>07             | 07<br>08             | 07<br>09             | 07<br>10             | 07<br>11             | 07<br>12             | 07<br>13             | 07<br>14             | 07<br>15             | 07<br>16             | 07<br>17             | 07<br>18             | 07<br>19             |          |
| ANIMAL ID                                   | 00<br>22<br>22<br>67 | 00<br>22<br>22<br>78 | 00<br>22<br>22<br>89 | 00<br>22<br>22<br>90 | 00<br>22<br>22<br>01 | 00<br>22<br>22<br>12 | 00<br>22<br>22<br>23 | 00<br>22<br>22<br>34 | 00<br>22<br>22<br>45 | 00<br>22<br>22<br>56 | 00<br>22<br>22<br>67 | 00<br>22<br>22<br>78 | 00<br>22<br>22<br>89 | 00<br>22<br>22<br>90 | 00<br>22<br>22<br>01 | 00<br>22<br>22<br>12 | 00<br>22<br>22<br>23 | 00<br>22<br>22<br>34 | 00<br>22<br>22<br>45 | 00<br>22<br>22<br>56 | 00<br>22<br>22<br>67 | 00<br>22<br>22<br>78 | 00<br>22<br>22<br>89 | 00<br>22<br>22<br>90 | 00<br>22<br>22<br>01 |          |
| Renal Tubule, Adenoma                       | X                    |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      | 1                    |                      |          |
| Urinary Bladder                             | +                    |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      | 50                   |                      |          |
| <b>SYSTEMIC LESIONS</b>                     |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |          |
| Multiple Organ                              | +                    |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      | 50                   |                      |          |
| Leukemia Mononuclear                        | X                    | X                    |                      | X                    |                      |                      |                      | X                    |                      |                      |                      |                      |                      | X                    |                      |                      |                      | X                    |                      | X                    |                      | X                    |                      | X                    |                      | 25       |
| Mesothelioma Malignant                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      | X                    |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      | 3        |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
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Experiment Number: 60311 - 05  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: RATS/F344/N Tac

P04: NEOPLASMS BY INDIVIDUAL ANIMAL

Cobalt

CAS Number: 7440-48-4

Date Report Requested: 01/18/2012

Time Report Requested: 14:48:11

First Dose M/F: 05/08/06 / 05/08/06

Lab: BNW

|                                      | DAY ON TEST |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | males<br>(cont...) |   |
|--------------------------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--------------------|---|
| <b>FISCHER 344-TACONIC RATS MALE</b> | 0           | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |                    |   |
|                                      | 7           | 7 | 6 | 7 | 7 | 6 | 7 | 6 | 7 | 6 | 7 | 6 | 7 | 6 | 6 | 7 | 7 | 6 | 7 | 6 | 7 | 6 | 5 | 5 |                    | 6 |
| <b>2.5 mg/m3</b>                     | 1           | 0 | 6 | 2 | 2 | 8 | 2 | 5 | 2 | 8 | 3 | 0 | 0 | 2 | 4 | 2 | 3 | 8 | 3 | 8 | 3 | 2 | 1 | 2 | 8                  |   |
|                                      | 9           | 5 | 7 | 9 | 9 | 3 | 9 | 2 | 1 | 8 | 0 | 9 | 3 | 8 | 6 | 9 | 0 | 8 | 0 | 5 | 8 | 5 | 2 | 8 | 4                  |   |
|                                      | 0           | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0                  |   |
|                                      | 0           | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0                  |   |
|                                      | 4           | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4                  |   |
|                                      | 0           | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2                  |   |
|                                      | 1           | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5                  |   |

**ALIMENTARY SYSTEM**

|                                     |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|-------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Esophagus                           | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Large, Cecum              | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Large, Colon<br>Carcinoma | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Large, Rectum             | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Small, Duodenum           | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Small, Ileum              | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Small, Jejunum            | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Liver                               | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Leukemia Mononuclear                |   |   |   |   |   | X |   |   | X |   |   |   |   |   |   |   |   | X | X | X | X |   | X |   |
| Mesentery                           |   |   |   |   |   | + |   |   | + |   |   |   |   | + |   |   |   |   |   |   |   |   | + |   |
| Lipoma                              |   |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Pancreas                            | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Leukemia Mononuclear                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | X |   |
| Salivary Glands                     | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Schwannoma Malignant                |   |   |   |   |   |   |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Stomach, Forestomach                | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
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P04: NEOPLASMS BY INDIVIDUAL ANIMAL  
 Cobalt  
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 Lab: BNW

|                               | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
|-------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DAY ON TEST                   | 7 | 7 | 6 | 7 | 7 | 6 | 7 | 6 | 7 | 6 | 7 | 6 | 7 | 6 | 6 | 7 | 6 | 7 | 7 | 6 | 6 | 5 | 5 | 6 |   |   |
| FISCHER 344-TACONIC RATS MALE | 1 | 0 | 6 | 2 | 2 | 8 | 2 | 5 | 2 | 8 | 3 | 0 | 0 | 2 | 4 | 2 | 3 | 8 | 3 | 2 | 1 | 2 | 8 | 4 | 5 |   |
| 2.5 mg/m3                     | 9 | 5 | 7 | 9 | 9 | 3 | 9 | 2 | 1 | 8 | 0 | 9 | 3 | 8 | 6 | 9 | 0 | 8 | 0 | 5 | 8 | 2 | 8 | 4 |   |   |
| ANIMAL ID                     | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |   |
|                               | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |   |
|                               | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 |   |
|                               | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 |   |

males  
(cont...)

Stomach, Glandular +

### CARDIOVASCULAR SYSTEM

Heart +  
 Alveolar/Bronchiolar Carcinoma, Metastatic X  
 Leukemia Mononuclear X X  
 Schwannoma Malignant X

### ENDOCRINE SYSTEM

Adrenal Cortex +  
 Leukemia Mononuclear X X X  
 Adrenal Medulla +  
 Leukemia Mononuclear X X  
 Pheochromocytoma Benign X X X X  
 Pheochromocytoma Malignant X X  
 Bilateral, Pheochromocytoma Benign X X X X X  
 Islets, Pancreatic + + + + + + + + + + + + + + + + M + + + + + +  
 Adenoma X X X X  
 Carcinoma X X X  
 Parathyroid Gland + + + + + + + + + + + + + + + M + M + + + + + +  
 Pituitary Gland +  
 Pars Distalis, Adenoma X  
 Thyroid Gland +  
 C-cell, Adenoma X X X X X X X X X

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue

M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically

Experiment Number: 60311 - 05  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: RATS/F344/N Tac

P04: NEOPLASMS BY INDIVIDUAL ANIMAL  
 Cobalt  
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012  
 Time Report Requested: 14:48:11  
 First Dose M/F: 05/08/06 / 05/08/06  
 Lab: BNW

|                                      |                  | DAY ON TEST |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                                  |  |
|--------------------------------------|------------------|-------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------------------------|--|
|                                      |                  | 07<br>19    | 07<br>10<br>05 | 06<br>06<br>07 | 07<br>02<br>09 | 07<br>02<br>09 | 06<br>08<br>03 | 07<br>02<br>09 | 06<br>05<br>02 | 07<br>02<br>01 | 06<br>08<br>08 | 07<br>03<br>00 | 06<br>02<br>03 | 07<br>04<br>02 | 06<br>07<br>06 | 07<br>03<br>08 | 06<br>08<br>05 | 07<br>07<br>05 | 06<br>06<br>08 | 05<br>08<br>02 | 05<br>04<br>08 | 06<br>05<br>04 | 07<br>06<br>05 |                                  |  |
| <b>FISCHER 344-TACONIC RATS MALE</b> |                  | 0           | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | <b>males</b><br><b>(cont...)</b> |  |
|                                      | <b>2.5 mg/m3</b> | 0           | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              |                                  |  |
|                                      | <b>ANIMAL ID</b> | 0           | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              |                                  |  |
|                                      |                  | 4           | 4              | 4              | 4              | 4              | 4              | 4              | 4              | 4              | 4              | 4              | 4              | 4              | 4              | 4              | 4              | 4              | 4              | 4              | 4              | 4              | 4              |                                  |  |

C-cell, Carcinoma

X

X

**GENERAL BODY SYSTEM**

NONE

**GENITAL SYSTEM**

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Epididymis  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Preputial Gland<br>Carcinoma  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Prostate<br>Pheochromocytoma Malignant, Metastatic,<br>Adrenal Medulla        | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Seminal Vesicle   | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Testes<br>Bilateral, Interstitial Cell, Adenoma<br>Interstitial Cell, Adenoma | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
|   | X |   |   | X |   |   | X |   |   | X |   | X |   | X |   | X |   | X |   | X |   | X | X |
|   |   | X | X |   |   |   |   |   | X |   | X |   |   | X |   | X | X | X |   |   |   |   |   |

**HEMATOPOIETIC SYSTEM**

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bone Marrow<br>Leukemia Mononuclear   | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
|   |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Lymph Node<br>Iliac, Leukemia Mononuclear<br>Pancreatic, Leukemia Mononuclear |   |   |   |   |   |   |   |   |   | + | + |   |   | + |   |   |   | + |   |   |   |   |   |
|   |   |   |   |   |   |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | X |   |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue

M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically



Experiment Number: 60311 - 05  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: RATS/F344/N Tac

**P04: NEOPLASMS BY INDIVIDUAL ANIMAL**

Cobalt

CAS Number: 7440-48-4

Date Report Requested: 01/18/2012

Time Report Requested: 14:48:11

First Dose M/F: 05/08/06 / 05/08/06

Lab: BNW

| FISCHER 344-TACONIC RATS MALE | DAY ON TEST          |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      | males<br>(cont...)   |                      |                      |                      |                      |                      |
|-------------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
|                               | 07<br>19             | 07<br>05             | 06<br>07             | 07<br>06             | 07<br>09             | 07<br>03             | 06<br>02             | 07<br>05             | 07<br>02             | 06<br>01             | 07<br>08             | 06<br>03             | 07<br>00             | 06<br>03             | 06<br>08             | 07<br>03             | 06<br>08             | 07<br>05             | 06<br>08             | 05<br>02             |                      | 05<br>08             | 06<br>04             | 06<br>05             |                      |                      |
| 2.5 mg/m3                     | 00<br>44<br>00<br>11 | 00<br>04<br>00<br>02 | 00<br>04<br>00<br>03 | 00<br>04<br>00<br>04 | 00<br>04<br>00<br>05 | 00<br>04<br>00<br>06 | 00<br>04<br>00<br>07 | 00<br>04<br>00<br>08 | 00<br>04<br>00<br>09 | 00<br>04<br>00<br>00 | 00<br>04<br>00<br>01 | 00<br>04<br>00<br>01 | 00<br>04<br>00<br>02 | 00<br>04<br>00<br>03 | 00<br>04<br>00<br>04 | 00<br>04<br>00<br>05 | 00<br>04<br>00<br>06 | 00<br>04<br>00<br>07 | 00<br>04<br>00<br>08 | 00<br>04<br>00<br>09 | 00<br>04<br>00<br>00 | 00<br>04<br>00<br>01 | 00<br>04<br>00<br>02 | 00<br>04<br>00<br>03 | 00<br>04<br>00<br>04 | 00<br>04<br>00<br>05 |

Pancreatic, Renal, Leukemia Mononuclear

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lymph Node, Bronchial Histiocytic Sarcoma                           | M | M | M | + | M | M | M | M | + | M | + | M | + | + | M | M | M | M | + | M | + | M | M | + | M |
| Lymph Node, Mandibular Leukemia Mononuclear                         | + | + | + | + | + | + | + | + | + | X | + | + | + | + | + | + | + | + | + | + | + | X | + | + | + |
| Lymph Node, Mediastinal Histiocytic Sarcoma<br>Leukemia Mononuclear | + | M | M | + | + | + | + | + | + | + | + | M | + | + | + | M | + | + | + | + | X | + | + | + | + |
| Lymph Node, Mesenteric Leukemia Mononuclear                         | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M | + | + | + | + | + | + |
| Spleen Leukemia Mononuclear   | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Thymus  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M | + | + | M | + | + | + | + |

**INTEGUMENTARY SYSTEM**

|                                   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|-----------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mammary Gland                     | + | M | + | M | M | + | M | + | M | + | + | M | M | M | M | + | + | + | + | M | + | + | M | + | + |
| Skin Basal Cell Adenoma           | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Skin Basal Cell Carcinoma         |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Skin Keratoacanthoma              |   |   | X |   |   |   |   | X |   |   |   |   | X |   |   |   |   |   |   |   |   |   | X |   |   |
| Skin Sebaceous Gland, Adenoma     |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Skin Subcutaneous Tissue, Fibroma |   |   |   |   |   |   |   |   |   |   |   |   |   | X |   |   | X | X |   |   |   |   |   |   |   |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue

M .. Missing tissue  
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Experiment Number: 60311 - 05

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: RATS/F344/N Tac

P04: NEOPLASMS BY INDIVIDUAL ANIMAL

Cobalt

CAS Number: 7440-48-4

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Lab: BNW

|                                      |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                            |
|--------------------------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----------------------------|
|                                      | DAY ON TEST | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |                            |
|                                      |             | 7 | 7 | 6 | 7 | 7 | 6 | 7 | 6 | 7 | 6 | 7 | 6 | 7 | 6 | 6 | 7 | 7 | 6 | 7 | 7 | 6 | 6 | 5 | 5 | 6 |                            |
| <b>FISCHER 344-TACONIC RATS MALE</b> |             | 1 | 0 | 6 | 2 | 2 | 8 | 2 | 5 | 2 | 8 | 3 | 0 | 0 | 2 | 4 | 2 | 3 | 8 | 3 | 2 | 1 | 2 | 8 | 4 | 5 |                            |
|                                      |             | 9 | 5 | 7 | 9 | 9 | 3 | 9 | 2 | 1 | 8 | 0 | 9 | 3 | 8 | 6 | 9 | 0 | 8 | 0 | 5 | 8 | 2 | 8 | 4 | 4 |                            |
| <b>2.5 mg/m3</b>                     |             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |                            |
|                                      | ANIMAL ID   | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |                            |
|                                      |             | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |                            |
|                                      |             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 |                            |
|                                      |             | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | <b>males<br/>(cont...)</b> |

**MUSCULOSKELETAL SYSTEM**

|      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bone | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
|------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

**NERVOUS SYSTEM**

|                      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|----------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Brain                | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Leukemia Mononuclear |   |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | X |   |   |

**RESPIRATORY SYSTEM**

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Larynx  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Lung  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Alveolar/Bronchiolar Adenoma                                  |   |   | X |   |   |   |   |   |   |   |   |   |   | X | X |   |   |   |   |   |   |   |   |   |   |
| Alveolar/Bronchiolar Adenoma, Multiple                        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | X |   |   | X |   |   |   |   |
| Alveolar/Bronchiolar Carcinoma                                |   |   |   |   |   |   | X | X | X | X | X |   | X |   |   | X |   |   |   | X | X |   |   |   | X |
| Alveolar/Bronchiolar Carcinoma, Multiple                      | X |   |   |   | X | X |   |   |   |   | X |   |   |   |   |   |   |   |   | X | X |   |   |   |   |
| Leukemia Mononuclear  |   |   |   |   |   |   | X |   |   | X |   |   |   |   |   |   |   |   |   | X | X | X |   |   | X |
| Mediastinum, Alveolar/Bronchiolar Carcinoma, Metastatic, Lung |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | X |   |   |   |   |   |   |   |
| Nose  | + | + | + | + | + | + | + | + | + | + | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Leukemia Mononuclear  |   |   |   |   |   |   | X |   |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   | X |   |
| Trachea   | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |

**SPECIAL SENSES SYSTEM**

|     |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|-----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Eye | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
|-----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
+ .. Tissue examined microscopically  
X .. Lesion present  
I .. Insufficient tissue

M .. Missing tissue  
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BLANK .. Not examined microscopically

Experiment Number: 60311 - 05  
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Route: RESPIRATORY EXPOSURE WHOLE BODY  
Species/Strain: RATS/F344/N Tac

P04: NEOPLASMS BY INDIVIDUAL ANIMAL  
Cobalt  
CAS Number: 7440-48-4

Date Report Requested: 01/18/2012  
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Lab: BNW

|  |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                            |
|--|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----------------------------|
|  | DAY ON TEST |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                            |
| <b>FISCHER 344-TACONIC RATS MALE</b><br><br><b>2.5 mg/m3</b> | 0           | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |   |                            |
|  | 7           | 7 | 6 | 7 | 7 | 6 | 7 | 6 | 7 | 6 | 7 | 6 | 7 | 6 | 6 | 7 | 7 | 6 | 7 | 6 | 7 | 6 | 5 | 5 |   | 6                          |
|  | 1           | 0 | 6 | 2 | 2 | 8 | 2 | 5 | 2 | 8 | 3 | 0 | 0 | 2 | 4 | 2 | 3 | 8 | 3 | 2 | 1 | 2 | 8 | 4 |   | 5                          |
|  | ANIMAL ID   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                            |
|  | 0           | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | <b>males<br/>(cont...)</b> |
|  | 0           | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |                            |
|  | 4           | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |                            |
|  | 0           | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |                            |
|  | 1           | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 5 |                            |

Harderian Gland

+ +

**URINARY SYSTEM**

Kidney  
Alveolar/Bronchiolar Carcinoma, Metastatic, Lung  
Leukemia Mononuclear

+  
  
X  
  
X

Urinary Bladder

+ +

**SYSTEMIC LESIONS**

Multiple Organ  
Histiocytic Sarcoma  
Leukemia Mononuclear

+  
  
X  
X X X X X X X

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
+ .. Tissue examined microscopically  
X .. Lesion present  
I .. Insufficient tissue  
M .. Missing tissue  
A .. Autolysis precludes evaluation  
BLANK .. Not examined microscopically

**Experiment Number:** 60311 - 05  
**Test Type:** CHRONIC  
**Route:** RESPIRATORY EXPOSURE WHOLE BODY  
**Species/Strain:** RATS/F344/N Tac

**P04: NEOPLASMS BY INDIVIDUAL ANIMAL**  
**Cobalt**  
**CAS Number:** 7440-48-4

**Date Report Requested:** 01/18/2012  
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**First Dose M/F:** 05/08/06 / 05/08/06  
**Lab:** BNW

| FISCHER 344-TACONIC RATS MALE | DAY ON TEST    |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                | * TOTALS       |
|-------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
|                               | 06<br>98       | 05<br>83       | 07<br>29       | 06<br>89       | 07<br>29       | 05<br>98       | 07<br>16       | 07<br>29       | 07<br>30       | 07<br>30       | 06<br>80       | 06<br>00       | 06<br>22       | 04<br>22       | 05<br>35       | 07<br>29       | 06<br>54       | 07<br>31       | 07<br>76       | 06<br>61       | 07<br>04       | 07<br>29       | 07<br>05       | 07<br>30       |                |
| 2.5 mg/m3                     | 00<br>42<br>67 | 00<br>42<br>67 | 00<br>42<br>67 | 00<br>42<br>67 | 00<br>42<br>67 | 00<br>42<br>67 | 00<br>42<br>67 | 00<br>42<br>67 | 00<br>42<br>67 | 00<br>42<br>67 | 00<br>42<br>67 | 00<br>42<br>67 | 00<br>42<br>67 | 00<br>42<br>67 | 00<br>42<br>67 | 00<br>42<br>67 | 00<br>42<br>67 | 00<br>42<br>67 | 00<br>42<br>67 | 00<br>42<br>67 | 00<br>42<br>67 | 00<br>42<br>67 | 00<br>42<br>67 | 00<br>42<br>67 | 00<br>42<br>67 |
| ANIMAL ID                     | 04<br>26       | 04<br>26       | 04<br>26       | 04<br>26       | 04<br>26       | 04<br>26       | 04<br>26       | 04<br>26       | 04<br>26       | 04<br>26       | 04<br>26       | 04<br>26       | 04<br>26       | 04<br>26       | 04<br>26       | 04<br>26       | 04<br>26       | 04<br>26       | 04<br>26       | 04<br>26       | 04<br>26       | 04<br>26       | 04<br>26       | 04<br>26       | 04<br>26       |

**ALIMENTARY SYSTEM**

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |          |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----------|
| Esophagus                               | + | + | + | + | + | + | + | + | M | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + | + | 48       |
| Intestine Large, Cecum                  | + | + | + | + | + | + | + | + | + | + | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | 49       |
| Intestine Large, Colon<br>Carcinoma     | + | + | + | + | + | + | + | + | + | + | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | 49<br>1  |
| Intestine Large, Rectum                 | + | + | + | + | + | + | + | + | + | + | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | 49       |
| Intestine Small, Duodenum               | + | + | + | + | + | + | + | + | + | + | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | 49       |
| Intestine Small, Ileum                  | + | + | + | A | + | + | + | + | + | + | + | A | + | + | + | + | + | + | + | A | + | + | + | + | + | 47       |
| Intestine Small, Jejunum                | + | + | + | + | + | + | + | + | + | + | + | A | + | + | + | + | + | + | + | A | + | + | + | + | + | 48       |
| Liver<br>Leukemia Mononuclear           | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50<br>18 |
| Mesentery<br>Lipoma                     | + |   |   |   |   |   |   |   |   | + |   |   |   |   |   | + | + |   |   |   |   |   |   |   |   | 9<br>1   |
| Pancreas<br>Leukemia Mononuclear        | + | + | + | + | + | + | + | + | + | + | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | 49<br>1  |
| Salivary Glands<br>Schwannoma Malignant | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50<br>1  |
| Stomach, Forestomach                    | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50       |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
+ .. Tissue examined microscopically  
X .. Lesion present  
I .. Insufficient tissue

M .. Missing tissue  
A .. Autolysis precludes evaluation  
BLANK .. Not examined microscopically

Experiment Number: 60311 - 05  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: RATS/F344/N Tac

**P04: NEOPLASMS BY INDIVIDUAL ANIMAL**

Cobalt

CAS Number: 7440-48-4

Date Report Requested: 01/18/2012

Time Report Requested: 14:48:11

First Dose M/F: 05/08/06 / 05/08/06

Lab: BNW

| FISCHER 344-TACONIC RATS MALE<br>2.5 mg/m3 | DAY ON TEST |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |    | * TOTALS |
|--|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----|----------|
|  | 0698        | 0583  | 0729  | 0689  | 0729  | 0598  | 0776  | 0779  | 0770  | 0680  | 0668  | 0662  | 0457  | 0532  | 0759  | 0664  | 0771  | 0661  | 0774  | 0677  | 0775  | 0770  | 0773  |    |          |
| ANIMAL ID                                  | 00426       | 00447 | 00408 | 00444 | 00444 | 00000 | 00000 | 00000 | 00000 | 00000 | 00000 | 00000 | 00000 | 00000 | 00000 | 00000 | 00000 | 00000 | 00000 | 00000 | 00000 | 00000 | 00000 |    |          |
| Stomach, Glandular                         | +           | +     | M     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | 49 |          |
| <b>CARDIOVASCULAR SYSTEM</b>               |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |    |          |
| Heart                                      | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | 50 |          |
| Alveolar/Bronchiolar Carcinoma, Metastatic |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 1  |          |
| Leukemia Mononuclear                       |             |       |       |       |       |       |       |       |       | X     |       | X     |       |       |       |       |       |       |       | X     |       |       |       | 6  |          |
| Schwannoma Malignant                       | X           |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 1  |          |
| <b>ENDOCRINE SYSTEM</b>                    |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |    |          |
| Adrenal Cortex                             | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | 50 |          |
| Leukemia Mononuclear                       |             |       |       | X     |       |       |       |       |       | X     |       | X     |       |       |       | X     |       |       | X     | X     | X     |       |       | 10 |          |
| Adrenal Medulla                            | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | 50 |          |
| Leukemia Mononuclear                       |             |       |       | X     |       |       |       |       |       | X     |       | X     |       |       |       | X     |       |       | X     | X     | X     |       |       | 11 |          |
| Pheochromocytoma Benign                    | X           |       |       | X     |       |       |       | X     | X     |       |       | X     |       |       |       |       |       |       |       |       |       | X     | X     | 15 |          |
| Pheochromocytoma Malignant                 | X           |       |       | X     |       |       | X     | X     |       |       | X     |       |       |       |       |       |       |       |       |       |       | X     | X     | 9  |          |
| Bilateral, Pheochromocytoma Benign         |             |       | X     |       | X     | X     | X     |       |       | X     | X     |       | X     |       |       | X     | X     | X     |       | X     |       |       |       | 22 |          |
| Islets, Pancreatic                         | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | A     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | 48    |    |          |
| Adenoma                                    | X           |       |       |       |       |       |       |       |       | X     |       |       |       |       |       |       |       |       |       |       |       | X     |       | 6  |          |
| Carcinoma                                  |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | X     |       | 5  |          |
| Parathyroid Gland                          | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | M     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | 47    |    |          |
| Pituitary Gland                            | +           | +     | M     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | 49    |    |          |
| Pars Distalis, Adenoma                     | X           | X     |       | X     |       | X     |       |       |       | X     |       | X     | X     | X     | X     | X     |       |       |       | X     | X     | X     | 31    |    |          |
| Thyroid Gland                              | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | 50    |    |          |
| C-cell, Adenoma                            | X           |       | X     |       |       | X     |       |       | X     |       |       |       |       |       |       |       |       |       |       |       |       |       | 8     |    |          |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue

M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically

Experiment Number: 60311 - 05  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: RATS/F344/N Tac

P04: NEOPLASMS BY INDIVIDUAL ANIMAL  
 Cobalt  
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012  
 Time Report Requested: 14:48:11  
 First Dose M/F: 05/08/06 / 05/08/06  
 Lab: BNW

| DAY ON TEST                   |   | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0               |          |
|-------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------------|----------|
| FISCHER 344-TACONIC RATS MALE | 6 | 5 | 7 | 6 | 7 | 5 | 7 | 7 | 7 | 7 | 6 | 6 | 6 | 4 | 5 | 7 | 6 | 7 | 7 | 6 | 6 | 7 | 7 | 7               |          |
|                               | 9 | 8 | 2 | 8 | 2 | 9 | 1 | 2 | 3 | 3 | 1 | 8 | 5 | 7 | 3 | 2 | 5 | 3 | 1 | 7 | 1 | 0 | 2 | 0               |          |
|                               | 8 | 3 | 9 | 9 | 9 | 8 | 6 | 0 | 0 | 0 | 0 | 8 | 0 | 2 | 5 | 9 | 4 | 0 | 6 | 8 | 1 | 4 | 9 | 3               |          |
| 2.5 mg/m3                     | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0               |          |
|                               | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0               |          |
|                               | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4               |          |
|                               | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5               |          |
|                               | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9               |          |
|                               |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | <b>* TOTALS</b> |          |
| C-cell, Carcinoma             |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                 | <b>3</b> |

**GENERAL BODY SYSTEM**

NONE

**GENITAL SYSTEM**

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |           |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------|
| Epididymis  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | <b>50</b> |
| Preputial Gland   | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | <b>49</b> |
| Carcinoma   |   |   |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | <b>1</b>  |
| Prostate  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | <b>50</b> |
| Pheochromocytoma Malignant, Metastatic, Adrenal Medulla |   |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | <b>1</b>  |
| Seminal Vesicle   | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | <b>50</b> |
| Testes  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | <b>50</b> |
| Bilateral, Interstitial Cell, Adenoma                   | X |   | X |   |   | X | X |   | X |   |   |   |   |   | X |   |   |   |   |   | X | X | X |   | <b>17</b> |
| Interstitial Cell, Adenoma                              |   |   |   | X | X |   |   |   | X |   |   | X |   |   |   |   | X | X | X | X |   |   |   | X | <b>17</b> |

**HEMATOPOIETIC SYSTEM**

|                                  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |           |
|----------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------|
| Bone Marrow                      | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | <b>50</b> |
| Leukemia Mononuclear             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | X | <b>2</b>  |
| Lymph Node                       |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | + | <b>5</b>  |
| Iliac, Leukemia Mononuclear      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | <b>1</b>  |
| Pancreatic, Leukemia Mononuclear |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | <b>1</b>  |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue

M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically

Experiment Number: 60311 - 05  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: RATS/F344/N Tac

**P04: NEOPLASMS BY INDIVIDUAL ANIMAL**

Cobalt

CAS Number: 7440-48-4

Date Report Requested: 01/18/2012

Time Report Requested: 14:48:11

First Dose M/F: 05/08/06 / 05/08/06

Lab: BNW

| FISCHER 344-TACONIC RATS MALE<br>2.5 mg/m3  | DAY ON TEST |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | * TOTALS |   |    |    |
|---|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|---|----|----|
|   | 0698        | 0583  | 0729  | 0689  | 0729  | 0598  | 0716  | 0779  | 0770  | 0770  | 0668  | 0662  | 0457  | 0532  | 0759  | 0664  | 0771  | 0661  | 0770  | 0770  | 0770  | 0770  |          |   |    |    |
| ANIMAL ID                                   | 00426       | 00442 | 00442 | 00444 | 00444 | 00444 | 00444 | 00444 | 00444 | 00444 | 00444 | 00444 | 00444 | 00444 | 00444 | 00444 | 00444 | 00444 | 00444 | 00444 | 00444 | 00444 |          |   |    |    |
| Pancreatic, Renal, Leukemia Mononuclear     |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | X        | 1 |    |    |
| Lymph Node, Bronchial Histiocytic Sarcoma   | +           | M     | M     | +     | M     | M     | +     | +     | M     | M     | +     | +     | +     | M     | +     | +     | M     | M     | M     | +     | +     | +     | M        | + | M  | 21 |
|   |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |   |    | 1  |
| Lymph Node, Mandibular Leukemia Mononuclear | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | + | 50 |    |
|   |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | X        |   | 6  |    |
| Lymph Node, Mediastinal Histiocytic Sarcoma | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | + | 46 |    |
| Leukemia Mononuclear                        |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |   | 1  |    |
|   |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | X        |   | 2  |    |
| Lymph Node, Mesenteric Leukemia Mononuclear | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | + | 49 |    |
|   |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |   | 3  |    |
| Spleen Leukemia Mononuclear                 | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | + | 50 |    |
|   | X           |       | X     | X     | X     |       |       |       |       | X     | X     |       |       |       |       | X     | X     | X     | X     | X     | X     |       |          | X | 22 |    |
| Thymus                                      | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | + | 47 |    |
|   |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |   |    |    |
| <b>INTEGUMENTARY SYSTEM</b>                 |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |   |    |    |
| Mammary Gland                               | M           | +     | M     | +     | M     | +     | +     | +     | M     | +     | +     | +     | M     | +     | +     | +     | +     | M     | +     | +     | M     | +     | M        | + | M  | 30 |
| Skin  | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | + | 50 |    |
| Basal Cell Adenoma                          |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |   | 1  |    |
| Basal Cell Carcinoma                        |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |   | 1  |    |
| Keratoacanthoma                             |             |       | X     |       |       |       | X     |       |       |       |       |       |       |       |       |       |       |       | X     |       |       |       |          |   | 7  |    |
| Sebaceous Gland, Adenoma                    |             |       |       |       |       |       |       |       |       | X     |       |       |       |       |       |       |       |       |       |       |       |       |          |   | 1  |    |
| Subcutaneous Tissue, Fibroma                |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |   | 3  |    |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue

M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically

| DAY ON TEST                          | 0               | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
|--------------------------------------|-----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| <b>FISCHER 344-TACONIC RATS MALE</b> | 6               | 5 | 7 | 6 | 7 | 5 | 7 | 7 | 7 | 7 | 6 | 6 | 6 | 4 | 5 | 7 | 6 | 7 | 7 | 6 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
| <b>2.5 mg/m3</b>                     | 9               | 8 | 2 | 8 | 2 | 9 | 1 | 2 | 3 | 3 | 1 | 8 | 5 | 7 | 3 | 2 | 5 | 3 | 1 | 7 | 1 | 0 | 2 | 0 | 0 | 3 | 0 |   |
| ANIMAL ID                            | 8               | 3 | 9 | 9 | 9 | 8 | 6 | 9 | 0 | 0 | 8 | 0 | 2 | 2 | 5 | 9 | 4 | 0 | 6 | 8 | 1 | 4 | 9 | 5 | 0 | 3 | 0 |   |
|                                      | 0               | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
|                                      | 4               | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
|                                      | 2               | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 0 |
|                                      | 6               | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 0 | 0 | 0 |
|                                      | <b>* TOTALS</b> |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |

**MUSCULOSKELETAL SYSTEM**

Bone + **50**

**NERVOUS SYSTEM**

Brain + **50**  
 Leukemia Mononuclear X **3**

**RESPIRATORY SYSTEM**

Larynx + **50**

Lung + **50**  
 Alveolar/Bronchiolar Adenoma X X X **8**  
 Alveolar/Bronchiolar Adenoma, Multiple X X X X X X X X **2**  
 Alveolar/Bronchiolar Carcinoma X X X X X X X X X X X **20**  
 Alveolar/Bronchiolar Carcinoma, Multiple X X X X X X X X X X X X X X X X X **14**  
 Leukemia Mononuclear X **13**  
 Mediastinum, Alveolar/Bronchiolar Carcinoma, Metastatic, Lung X **5**

Nose + + + | + + + + + + + + + + A + A + + + + + + + + | + + + + + + + **45**  
 Leukemia Mononuclear X **4**

Trachea + **50**

**SPECIAL SENSES SYSTEM**

Eye + **50**

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue

M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically



Experiment Number: 60311 - 05  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: RATS/F344/N Tac

**P04: NEOPLASMS BY INDIVIDUAL ANIMAL**

Cobalt

CAS Number: 7440-48-4

Date Report Requested: 01/18/2012

Time Report Requested: 14:48:11

First Dose M/F: 05/08/06 / 05/08/06

Lab: BNW

| DAY ON TEST                                      | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | * TOTALS |          |  |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----------|----------|--|
|  | 6 | 5 | 7 | 6 | 7 | 5 | 7 | 7 | 7 | 7 | 6 | 6 | 6 | 4 | 5 | 7 | 6 | 7 | 7 | 6 | 6 | 7 | 7 | 7 |          |          |  |
| FISCHER 344-TACONIC RATS MALE                    | 9 | 8 | 2 | 8 | 2 | 9 | 1 | 2 | 3 | 3 | 1 | 8 | 5 | 7 | 3 | 2 | 5 | 3 | 1 | 7 | 1 | 0 | 2 | 0 | 3        | * TOTALS |  |
| 2.5 mg/m3  | 8 | 3 | 9 | 9 | 9 | 8 | 6 | 9 | 0 | 0 | 8 | 0 | 2 | 2 | 5 | 9 | 4 | 0 | 6 | 8 | 1 | 4 | 9 | 5 | 0        |          |  |
| ANIMAL ID  | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0        | * TOTALS |  |
|  | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4        |          |  |
|  | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5        | * TOTALS |  |
|  | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0        |          |  |
| Harderian Gland                                  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50       |          |  |
| <b>URINARY SYSTEM</b>                            |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |          |          |  |
| Kidney   | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50       |          |  |
| Alveolar/Bronchiolar Carcinoma, Metastatic, Lung |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | X |   |   |   |   |   | 1        |          |  |
| Leukemia Mononuclear                             |   |   |   |   |   |   |   |   |   |   |   | X |   |   |   |   |   |   |   | X |   |   |   |   | 4        |          |  |
| Urinary Bladder                                  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50       |          |  |
| <b>SYSTEMIC LESIONS</b>                          |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |          |          |  |
| Multiple Organ                                   | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50       |          |  |
| Histiocytic Sarcoma                              |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1        |          |  |
| Leukemia Mononuclear                             | X |   | X | X | X |   |   |   |   | X | X |   |   |   |   |   | X | X | X | X | X | X |   | X | 22       |          |  |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue

M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically

Experiment Number: 60311 - 05  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: RATS/F344/N Tac

**P04: NEOPLASMS BY INDIVIDUAL ANIMAL**

Cobalt

CAS Number: 7440-48-4

Date Report Requested: 01/18/2012

Time Report Requested: 14:48:11

First Dose M/F: 05/08/06 / 05/08/06

Lab: BNW

|                               |  | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | males<br>(cont...) |                    |
|-------------------------------|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--------------------|--------------------|
| DAY ON TEST                   |  | 7 | 6 | 6 | 5 | 5 | 6 | 7 | 7 | 6 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 5 | 6 | 7 | 6 | 6 | 7 | 7 | 4 |                    | 7                  |
| FISCHER 344-TACONIC RATS MALE |  | 3 | 9 | 2 | 1 | 5 | 4 | 3 | 1 | 7 | 9 | 2 | 1 | 2 | 2 | 2 | 2 | 7 | 8 | 1 | 9 | 1 | 2 | 2 | 7 |                    | 2                  |
| 5.0 mg/m3                     |  | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0                  | males<br>(cont...) |
| ANIMAL ID                     |  | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0                  |                    |
|                               |  | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6                  |                    |
|                               |  | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2                  |                    |

**ALIMENTARY SYSTEM**

|  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Esophagus  | + | + | + | + | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + |   |
| Intestine Large, Cecum                           | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Large, Colon                           | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Large, Rectum                          | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Small, Duodenum                        | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Small, Ileum<br>Leukemia Mononuclear   | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
|  |   |   |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Intestine Small, Jejunum                         | + | + | + | + | + | + | + | + | + | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Liver  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Alveolar/Bronchiolar Carcinoma, Metastatic, Lung |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | X |   |   |   |
| Carcinoma, Metastatic, Kidney<br>Hemangiosarcoma |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Hepatocellular Adenoma                           |   |   |   |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Leukemia Mononuclear                             |   |   |   | X | X | X |   | X |   |   | X |   |   |   |   |   |   |   |   |   | X |   |   |   | X |   |
| Mesentery  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Leukemia Mononuclear                             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Pancreas   | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Carcinoma, Metastatic, Kidney                    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |

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 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue

M .. Missing tissue  
 A .. Autolysis precludes evaluation  
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Experiment Number: 60311 - 05

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: RATS/F344/N Tac

P04: NEOPLASMS BY INDIVIDUAL ANIMAL

Cobalt

CAS Number: 7440-48-4

Date Report Requested: 01/18/2012

Time Report Requested: 14:48:11

First Dose M/F: 05/08/06 / 05/08/06

Lab: BNW

| FISCHER 344-TACONIC RATS MALE<br><br>5.0 mg/m3 | DAY ON TEST |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        | males<br>(cont...) |
|--|-------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------------------|
|  | 07          | 06     | 06     | 05     | 05     | 06     | 07     | 07     | 06     | 06     | 07     | 07     | 07     | 07     | 07     | 07     | 07     | 05     | 06     | 07     | 06     | 06     | 07     | 07     | 04     | 07     |                    |
|  | 30          | 91     | 28     | 16     | 52     | 46     | 33     | 17     | 79     | 88     | 33     | 33     | 22     | 22     | 22     | 22     | 22     | 72     | 89     | 17     | 91     | 19     | 12     | 29     | 72     | 42     |                    |
| ANIMAL ID                                      | 006001      | 006002 | 006003 | 006004 | 006005 | 006006 | 006007 | 006008 | 006009 | 006010 | 006011 | 006012 | 006013 | 006014 | 006015 | 006016 | 006017 | 006018 | 006019 | 006020 | 006021 | 006022 | 006023 | 006024 | 006025 | 006026 |                    |

Leukemia Mononuclear

X

Salivary Glands

+ +

Stomach, Forestomach

+ +

Stomach, Glandular

+ +

CARDIOVASCULAR SYSTEM

Heart

+ +

Alveolar/Bronchiolar Carcinoma, Metastatic  
Alveolar/Bronchiolar Carcinoma, Metastatic,  
Lung

X

Leukemia Mononuclear

X X

Pheochromocytoma Malignant, Metastatic,  
Adrenal Medulla

X

Schwannoma Malignant

ENDOCRINE SYSTEM

Adrenal Cortex

+ +

Leukemia Mononuclear

X

X

Mesothelioma Malignant

X

Adrenal Medulla

+ +

Leukemia Mononuclear

X

X

Pheochromocytoma Benign

X

X X X X

Pheochromocytoma Malignant

X X X

Bilateral, Pheochromocytoma Benign

X X

X X X

X X

X X X

X

Bilateral, Pheochromocytoma Malignant

X

X

X

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
+ .. Tissue examined microscopically  
X .. Lesion present  
I .. Insufficient tissue

M .. Missing tissue  
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Experiment Number: 60311 - 05  
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 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: RATS/F344/N Tac

P04: NEOPLASMS BY INDIVIDUAL ANIMAL  
 Cobalt  
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012  
 Time Report Requested: 14:48:11  
 First Dose M/F: 05/08/06 / 05/08/06  
 Lab: BNW

| FISCHER 344-TACONIC RATS MALE<br><br>5.0 mg/m3 | DAY ON TEST |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | ANIMAL ID | males<br>(cont...) |       |
|--|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-----------|--------------------|-------|
|  | 07030       | 06911 | 06288 | 05516 | 05544 | 06731 | 07717 | 06699 | 06683 | 06779 | 06698 | 06673 | 06722 | 06722 | 06722 | 05799 | 06678 | 06719 | 06691 | 06729 |           |                    | 06729 |
| Islets, Pancreatic Adenoma                     | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +         | +                  | +     |
| Islets, Pancreatic Carcinoma                   | X           |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |           | X                  |       |
| Parathyroid Gland                              | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | M     | +     | +     | M     | +     | M     | +     | +     | +     | +     | +         | +                  | +     |
| Pituitary Gland                                | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +         | +                  | +     |
| Leukemia Mononuclear Pars Distalis, Adenoma    |             | X     |       |       |       |       | X     | X     | X     |       | X     |       | X     |       | X     |       |       | X     | X     |       | X         | X                  | X     |
| Thyroid Gland                                  | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +         | +                  | +     |
| Bilateral, C-cell, Adenoma                     |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |           |                    |       |
| C-cell, Adenoma                                |             |       |       |       |       |       |       | X     |       |       |       |       |       |       |       |       |       |       |       |       |           | X                  |       |
| C-cell, Carcinoma                              |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | X     |       |       |           |                    |       |
| <b>GENERAL BODY SYSTEM</b>                     |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |           |                    |       |
| Peritoneum                                     |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |           |                    | +     |
| <b>GENITAL SYSTEM</b>                          |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |           |                    |       |
| Epididymis                                     | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +         | +                  | +     |
| Mesothelioma Malignant                         |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |           |                    | X     |
| Preputial Gland                                | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +         | M                  | +     |
| Carcinoma                                      |             |       |       |       |       |       |       |       |       |       |       | X     |       |       |       |       |       | X     |       |       |           |                    |       |
| Prostate                                       | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +         | +                  | +     |
| Leukemia Mononuclear                           |             |       | X     |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |           |                    |       |
| Seminal Vesicle                                | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +         | +                  | +     |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
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**Experiment Number:** 60311 - 05  
**Test Type:** CHRONIC  
**Route:** RESPIRATORY EXPOSURE WHOLE BODY  
**Species/Strain:** RATS/F344/N Tac

**P04: NEOPLASMS BY INDIVIDUAL ANIMAL**  
 Cobalt  
**CAS Number:** 7440-48-4

**Date Report Requested:** 01/18/2012  
**Time Report Requested:** 14:48:11  
**First Dose M/F:** 05/08/06 / 05/08/06  
**Lab:** BNW

| FISCHER 344-TACONIC RATS MALE | DAY ON TEST      |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  | males<br>(cont...) |                  |                  |                  |                  |
|-------------------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|--------------------|------------------|------------------|------------------|------------------|
|                               | 0<br>7<br>3<br>0 | 0<br>6<br>9<br>1 | 0<br>6<br>2<br>8 | 0<br>5<br>1<br>6 | 0<br>5<br>5<br>2 | 0<br>6<br>4<br>6 | 0<br>7<br>3<br>0 | 0<br>7<br>1<br>7 | 0<br>6<br>7<br>9 | 0<br>6<br>9<br>8 | 0<br>7<br>2<br>3 | 0<br>7<br>1<br>3 | 0<br>7<br>2<br>2 | 0<br>7<br>2<br>9 | 0<br>7<br>2<br>9 | 0<br>5<br>7<br>2 | 0<br>6<br>8<br>9 | 0<br>7<br>1<br>7 | 0<br>6<br>9<br>1 | 0<br>6<br>1<br>9 |                    | 0<br>7<br>2<br>9 | 0<br>7<br>7<br>9 | 0<br>4<br>7<br>0 | 0<br>7<br>2<br>9 |
| 5.0 mg/m3                     | 0<br>0<br>6<br>0 | 0<br>0<br>6<br>0 | 0<br>0<br>6<br>0 | 0<br>0<br>6<br>0 | 0<br>0<br>6<br>0 | 0<br>0<br>6<br>0 | 0<br>0<br>6<br>0 | 0<br>0<br>6<br>0 | 0<br>0<br>6<br>0 | 0<br>0<br>6<br>0 | 0<br>0<br>6<br>1 | 0<br>0<br>6<br>1 | 0<br>0<br>6<br>1 | 0<br>0<br>6<br>1 | 0<br>0<br>6<br>1 | 0<br>0<br>6<br>1 | 0<br>0<br>6<br>1 | 0<br>0<br>6<br>2 | 0<br>0<br>6<br>1 | 0<br>0<br>6<br>2 | 0<br>0<br>6<br>2   | 0<br>0<br>6<br>3 | 0<br>0<br>6<br>4 | 0<br>0<br>6<br>5 |                  |
| ANIMAL ID                     | 1                | 2                | 3                | 4                | 5                | 6                | 7                | 8                | 9                | 0                | 1                | 2                | 3                | 4                | 5                | 6                | 7                | 8                | 9                | 0                | 1                  | 2                | 3                | 4                | 5                |

Carcinoma, Metastatic, Kidney

X

Testes

+ +

Mesothelioma Malignant

X

Bilateral, Interstitial Cell, Adenoma

X X

Interstitial Cell, Adenoma

X X

### HEMATOPOIETIC SYSTEM

Bone Marrow

+ +

Lymph Node

+ + + + + + + + + + + + + + + + +

Iliac, Renal, Leukemia Mononuclear

X

Pancreatic, Leukemia Mononuclear

X

Pancreatic, Renal, Leukemia Mononuclear

X

Renal, Leukemia Mononuclear

X

Renal, Pheochromocytoma Malignant,  
Metastatic, Adrenal Medulla

Lymph Node, Bronchial

+ M + M M M M M + + M M M M M + + + M + + M M M

Leukemia Mononuclear

X

Lymph Node, Mandibular

+ + + + + + + + M + + + + + + + + + + + + + +

Leukemia Mononuclear

X

Lymph Node, Mediastinal

+ + + + + M + + + + + + + + + + + + + + + +

Alveolar/Bronchiolar Carcinoma, Metastatic,  
Lung

X

Leukemia Mononuclear

X

Lymph Node, Mesenteric

+ +

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue

M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically

Experiment Number: 60311 - 05  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: RATS/F344/N Tac

P04: NEOPLASMS BY INDIVIDUAL ANIMAL  
 Cobalt  
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012  
 Time Report Requested: 14:48:11  
 First Dose M/F: 05/08/06 / 05/08/06  
 Lab: BNW

| FISCHER 344-TACONIC RATS MALE | DAY ON TEST |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | males<br>(cont...) |
|-------------------------------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------------------|
|                               | 0730        | 0691  | 0628  | 0561  | 0554  | 0664  | 0773  | 0777  | 0666  | 0666  | 0777  | 0777  | 0777  | 0777  | 0777  | 0777  | 0777  | 0555  | 0666  | 0777  | 0666  | 0666  | 0777  | 0777  | 0447  |                    |
| 5.0 mg/m3                     | 0060        | 0066  | 0066  | 0066  | 0066  | 0066  | 0066  | 0066  | 0066  | 0066  | 0066  | 0066  | 0066  | 0066  | 0066  | 0066  | 0066  | 0066  | 0066  | 0066  | 0066  | 0066  | 0066  | 0066  | 0066  | 0066               |
| ANIMAL ID                     | 00601       | 00662 | 00663 | 00664 | 00665 | 00666 | 00667 | 00668 | 00669 | 00660 | 00661 | 00662 | 00663 | 00664 | 00665 | 00666 | 00667 | 00668 | 00669 | 00660 | 00661 | 00662 | 00663 | 00664 | 00665 | 00666              |

|  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Leukemia Mononuclear                             |   |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Spleen   | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Leukemia Mononuclear                             |   |   | X | X | X | X |   | X | X |   | X |   |   |   |   | X |   |   |   |   | X |   |   | X |   |   |
| Thymus   | + | + | + | + | + | M | + | + | + | M | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + | + |
| Alveolar/Bronchiolar Carcinoma, Metastatic, Lung |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Leukemia Mononuclear                             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |

**INTEGUMENTARY SYSTEM**

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mammary Gland                             | + | + | + | + | M | + | + | + | + | M | + | + | M | + | M | M | M | + | M | M | + | + | + | + | + | + |
| Fibroadenoma                              |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | X |
| Skin                                      | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Basal Cell Adenoma                        |   |   |   |   |   |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Keratoacanthoma                           | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Trichoepithelioma                         |   |   |   |   |   |   |   |   |   |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   |   |   |
| Subcutaneous Tissue, Fibrous Histiocytoma |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |

**MUSCULOSKELETAL SYSTEM**

|  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bone   | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Alveolar/Bronchiolar Carcinoma, Metastatic, Lung |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Skeletal Muscle                                  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | + |   |   |   |   |   |   |   |   |   | + |
| Alveolar/Bronchiolar Carcinoma, Metastatic, Lung |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | X |
| Carcinoma, Metastatic, Kidney                    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue

M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically

Experiment Number: 60311 - 05

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: RATS/F344/N Tac

P04: NEOPLASMS BY INDIVIDUAL ANIMAL

Cobalt

CAS Number: 7440-48-4

Date Report Requested: 01/18/2012

Time Report Requested: 14:48:11

First Dose M/F: 05/08/06 / 05/08/06

Lab: BNW

| DAY ON TEST                          |   | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
|--------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| <b>FISCHER 344-TACONIC RATS MALE</b> | 7 | 6 | 6 | 5 | 5 | 6 | 7 | 7 | 6 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 5 | 6 | 7 | 6 | 6 | 7 | 7 | 4 | 7 | 7 |   |
|                                      | 3 | 9 | 2 | 1 | 5 | 4 | 3 | 1 | 7 | 9 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 7 | 8 | 1 | 9 | 1 | 2 | 2 | 7 | 2 | 9 |   |
| <b>5.0 mg/m3</b>                     | 0 | 1 | 8 | 6 | 2 | 6 | 0 | 7 | 9 | 8 | 3 | 3 | 2 | 9 | 9 | 9 | 2 | 9 | 7 | 1 | 9 | 9 | 9 | 0 | 0 | 0 | 0 |   |
|                                      | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |   |
| ANIMAL ID                            |   | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |   |
|                                      |   | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |   |
|                                      |   | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 |   |   |

males  
(cont...)

Fibrous Histiocytoma, Metastatic, Skin

### NERVOUS SYSTEM

|       |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|-------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Brain | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
|-------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

### RESPIRATORY SYSTEM

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Larynx | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

|      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lung | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
|------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

|                              |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |   |  |   |  |  |  |  |  |  |  |
|------------------------------|---|--|--|--|--|--|--|--|--|---|--|--|--|--|--|--|---|--|---|--|--|--|--|--|--|--|
| Alveolar/Bronchiolar Adenoma | X |  |  |  |  |  |  |  |  | X |  |  |  |  |  |  | X |  | X |  |  |  |  |  |  |  |
|------------------------------|---|--|--|--|--|--|--|--|--|---|--|--|--|--|--|--|---|--|---|--|--|--|--|--|--|--|

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| Alveolar/Bronchiolar Adenoma, Multiple |  |  |  |  |  |  | X |  | X |  |  | X |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|---|--|---|--|--|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|

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|--------------------------------|---|---|--|--|--|--|--|--|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| Alveolar/Bronchiolar Carcinoma | X | X |  |  |  |  |  |  | X |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|--------------------------------|---|---|--|--|--|--|--|--|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|

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|--|--|--|--|--|---|---|--|---|--|---|---|---|--|---|---|---|--|---|--|---|---|---|---|--|---|--|
| Alveolar/Bronchiolar Carcinoma, Multiple |  |  |  |  | X | X |  | X |  | X | X | X |  | X | X | X |  | X |  | X | X | X | X |  | X |  |
|--|--|--|--|--|---|---|--|---|--|---|---|---|--|---|---|---|--|---|--|---|---|---|---|--|---|--|

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|-------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|---|--|--|--|--|--|--|--|--|--|--|--|--|
| Carcinoma, Metastatic, Kidney |  |  |  |  |  |  |  |  |  |  |  |  |  | X |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|---|--|--|--|--|--|--|--|--|--|--|--|--|

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|---------------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|---|--|--|--|--|--|--|--|
| Carcinoma, Metastatic, Zymbal'S Gland |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | X |  |  |  |  |  |  |  |
|---------------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|---|--|--|--|--|--|--|--|

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| Cystic Keratinizing Epithelioma |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|---------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|

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|----------------------|--|--|---|--|---|--|--|---|---|--|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| Leukemia Mononuclear |  |  | X |  | X |  |  | X | X |  | X |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|----------------------|--|--|---|--|---|--|--|---|---|--|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|

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|---|--|--|--|--|--|--|--|--|--|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| Pheochromocytoma Malignant, Metastatic, Adrenal Medulla |  |  |  |  |  |  |  |  |  | X |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|---|--|--|--|--|--|--|--|--|--|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|

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|---|--|--|--|--|--|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| Mediastinum, Alveolar/Bronchiolar Carcinoma, Metastatic, Lung |  |  |  |  |  | X |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|---|--|--|--|--|--|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|

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|--|--|--|--|--|--|--|--|--|--|--|--|--|--|---|--|--|--|--|--|--|--|--|--|--|--|--|
| Mediastinum, Carcinoma, Metastatic, Kidney |  |  |  |  |  |  |  |  |  |  |  |  |  | X |  |  |  |  |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|---|--|--|--|--|--|--|--|--|--|--|--|--|

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|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| Mediastinum, Carcinoma, Metastatic, Uncertain Primary Site |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|

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|-----------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| Mediastinum, Leukemia Mononuclear |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|

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|------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Nose | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
|------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

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|----------------------|--|--|---|--|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| Leukemia Mononuclear |  |  | X |  | X |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|----------------------|--|--|---|--|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
+ .. Tissue examined microscopically  
X .. Lesion present  
I .. Insufficient tissue

M .. Missing tissue  
A .. Autolysis precludes evaluation  
BLANK .. Not examined microscopically

Experiment Number: 60311 - 05

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: RATS/F344/N Tac

P04: NEOPLASMS BY INDIVIDUAL ANIMAL

Cobalt

CAS Number: 7440-48-4

Date Report Requested: 01/18/2012

Time Report Requested: 14:48:11

First Dose M/F: 05/08/06 / 05/08/06

Lab: BNW

| FISCHER 344-TACONIC RATS MALE                       | DAY ON TEST |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | males<br>(cont...) |
|---|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--------------------|
|   | ANIMAL ID   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                    |
|   | 0           | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |                    |
|   | 7           | 6 | 6 | 5 | 5 | 6 | 7 | 7 | 6 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 5 | 6 | 7 | 6 | 6 | 7 | 4 |                    |
| 5.0 mg/m <sup>3</sup>                               | 3           | 9 | 2 | 1 | 5 | 4 | 3 | 1 | 7 | 9 | 8 | 3 | 3 | 2 | 2 | 2 | 2 | 7 | 8 | 1 | 9 | 1 | 2 | 2 | 9                  |
|   | 0           | 1 | 8 | 6 | 2 | 6 | 0 | 7 | 9 | 8 | 3 | 3 | 2 | 9 | 9 | 9 | 2 | 9 | 7 | 1 | 9 | 1 | 9 | 0 | 9                  |
|   | 0           | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0                  |
|   | 0           | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0                  |
|   | 6           | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6                  |
|   | 0           | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2                  |
|   | 1           | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5                  |
| Trachea   | +           | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | +                  |
| <b>SPECIAL SENSES SYSTEM</b>                        |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                    |
| Eye   | +           | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | +                  |
| Harderian Gland                                     | +           | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | +                  |
| Zymbal's Gland<br>Carcinoma                         |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | + |   |   |   | X                  |
| <b>URINARY SYSTEM</b>                               |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                    |
| Kidney  | +           | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | +                  |
| Alveolar/Bronchiolar Carcinoma, Metastatic,<br>Lung |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | X |   |   |                    |
| Leukemia Mononuclear                                |             |   | X |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                    |
| Renal Tubule, Adenoma                               |             |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                    |
| Renal Tubule, Adenoma, Multiple                     |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                    |
| Renal Tubule, Carcinoma                             |             |   |   |   |   |   |   |   |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   |   |                    |
| Urinary Bladder                                     | +           | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | +                  |
| <b>SYSTEMIC LESIONS</b>                             |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                    |
| Multiple Organ                                      | +           | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | +                  |
| Leukemia Mononuclear                                |             |   | X | X | X | X |   | X | X |   | X |   |   |   |   | X |   |   |   | X |   |   | X |   |                    |
| Mesothelioma Malignant                              |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | X                  |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
+ .. Tissue examined microscopically  
X .. Lesion present  
I .. Insufficient tissue

M .. Missing tissue  
A .. Autolysis precludes evaluation  
BLANK .. Not examined microscopically



Experiment Number: 60311 - 05  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: RATS/F344/N Tac

P04: NEOPLASMS BY INDIVIDUAL ANIMAL  
 Cobalt  
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012  
 Time Report Requested: 14:48:11  
 First Dose M/F: 05/08/06 / 05/08/06  
 Lab: BNW

| FISCHER 344-TACONIC RATS MALE<br>5.0 mg/m3 |  | DAY ON TEST |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | * TOTALS |       |       |       |
|--|--|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|-------|-------|-------|
|  |  | 0689        | 0729  | 0729  | 0715  | 0670  | 0468  | 0672  | 0772  | 0772  | 0772  | 0772  | 0566  | 0666  | 0644  | 0772  | 0668  | 0722  | 0722  | 0669  | 0668  | 0750  | 0665  |          | 0767  | 0565  | 0667  |
| ANIMAL ID                                  |  | 00626       | 00662 | 00662 | 00662 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666    | 00666 | 00666 | 00666 |
|  |  |             |       | 0667  | 0678  | 0679  | 0679  | 0600  | 0601  | 0602  | 0603  | 0604  | 0605  | 0606  | 0607  | 0608  | 0609  | 0610  | 0611  | 0612  | 0613  | 0614  | 0615  | 0616     | 0617  | 0618  | 0619  |

**ALIMENTARY SYSTEM**

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |         |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---------|
| Esophagus   | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 48      |
| Intestine Large, Cecum                              | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50      |
| Intestine Large, Colon                              | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50      |
| Intestine Large, Rectum                             | + | + | + | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49      |
| Intestine Small, Duodenum                           | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50      |
| Intestine Small, Ileum<br>Leukemia Mononuclear      | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50<br>1 |
| Intestine Small, Jejunum                            | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49      |
| Liver   | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50      |
| Alveolar/Bronchiolar Carcinoma, Metastatic,<br>Lung |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1       |
| Carcinoma, Metastatic, Kidney                       |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1       |
| Hemangiosarcoma                                     |   |   |   |   |   |   |   |   |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   | 1       |
| Hepatocellular Adenoma                              |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1       |
| Leukemia Mononuclear                                |   |   | X |   | X | X |   |   |   |   |   |   | X | X |   | X | X | X |   |   | X |   |   |   | X | X | 18      |
| Mesentery   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | + |   | 3       |
| Leukemia Mononuclear                                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | X |   |   | 1       |
| Pancreas  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50      |
| Carcinoma, Metastatic, Kidney                       |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1       |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue

M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically

Experiment Number: 60311 - 05  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: RATS/F344/N Tac

P04: NEOPLASMS BY INDIVIDUAL ANIMAL  
 Cobalt  
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012  
 Time Report Requested: 14:48:11  
 First Dose M/F: 05/08/06 / 05/08/06  
 Lab: BNW

| FISCHER 344-TACONIC RATS MALE<br>5.0 mg/m3              | DAY ON TEST |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | * TOTALS |
|---|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|
|   | 0689        | 0729  | 0779  | 0775  | 0648  | 0662  | 0772  | 0772  | 0770  | 0770  | 0566  | 0666  | 0641  | 0770  | 0668  | 0722  | 0722  | 0669  | 0668  | 0770  | 0566  | 0667  | 0565  | 0667  |          |
| ANIMAL ID   | 00626       | 00662 | 00668 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 |          |
| Leukemia Mononuclear                                    |             |       |       |       | X     |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 2     |          |
| Salivary Glands   | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | 50    |          |
| Stomach, Forestomach                                    | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | 50    |          |
| Stomach, Glandular                                      | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | 50    |          |
| <b>CARDIOVASCULAR SYSTEM</b>                            |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |
| Heart   | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | 50    |       |          |
| Alveolar/Bronchiolar Carcinoma, Metastatic              |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | X     |       |       | 2     |          |
| Alveolar/Bronchiolar Carcinoma, Metastatic, Lung        |             |       |       |       |       |       |       |       |       |       |       |       | X     |       |       |       |       |       |       |       |       |       |       | 1     |          |
| Leukemia Mononuclear                                    |             |       |       |       | X     |       |       |       |       |       |       | X     | X     |       | X     |       |       |       |       |       |       | X     |       | 7     |          |
| Pheochromocytoma Malignant, Metastatic, Adrenal Medulla |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 1     |          |
| Schwannoma Malignant                                    |             |       | X     |       |       |       |       |       |       |       | X     |       |       |       |       |       |       |       |       |       |       |       |       | 2     |          |
| <b>ENDOCRINE SYSTEM</b>                                 |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |
| Adrenal Cortex  | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | 50    |       |          |
| Leukemia Mononuclear                                    |             |       |       |       | X     |       |       |       |       |       |       | X     | X     |       | X     | X     |       |       |       |       |       | X     | X     | 9     |          |
| Mesothelioma Malignant                                  |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 1     |          |
| Adrenal Medulla   | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | 50    |       |          |
| Leukemia Mononuclear                                    |             |       |       |       | X     |       |       |       |       |       |       | X     | X     |       | X     | X     |       |       |       |       |       | X     | X     | 9     |          |
| Pheochromocytoma Benign                                 | X           | X     | X     |       |       |       |       |       | X     | X     |       |       |       |       | X     |       |       |       | X     |       |       |       | X     | 13    |          |
| Pheochromocytoma Malignant                              | X           | X     | X     |       |       |       |       | X     | X     |       |       |       |       |       | X     |       |       |       |       |       |       |       |       | 9     |          |
| Bilateral, Pheochromocytoma Benign                      |             |       |       | X     |       |       | X     | X     |       | X     |       |       | X     | X     |       |       |       |       |       | X     |       | X     |       | 21    |          |
| Bilateral, Pheochromocytoma Malignant                   |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | X     | X     | X     | X     |       |       |       | 7     |          |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue

M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically

Experiment Number: 60311 - 05  
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 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: RATS/F344/N Tac

P04: NEOPLASMS BY INDIVIDUAL ANIMAL  
 Cobalt  
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012  
 Time Report Requested: 14:48:11  
 First Dose M/F: 05/08/06 / 05/08/06  
 Lab: BNW

| FISCHER 344-TACONIC RATS MALE<br>5.0 mg/m3 | DAY ON TEST |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | * TOTALS |       |      |
|--|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|-------|------|
|  | 0689        | 0799  | 0799  | 0799  | 0678  | 0468  | 0672  | 0772  | 0772  | 0772  | 0566  | 0666  | 0477  | 0677  | 0777  | 0777  | 0666  | 0777  | 0666  | 0577  |          | 0666  | 0577 |
| ANIMAL ID                                  | 00626       | 00662 | 00662 | 00662 | 00663 | 00663 | 00663 | 00663 | 00663 | 00663 | 00663 | 00663 | 00663 | 00663 | 00663 | 00663 | 00663 | 00663 | 00663 | 00663 | 00663    | 00663 |      |
| Islets, Pancreatic Adenoma Carcinoma       | +           | +     | +     | +     | M     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | +     | 49   |
|  |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | X     |       |       | X        | X     | 3    |
|  |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       | 6    |
| Parathyroid Gland                          | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | +     | 46   |
| Pituitary Gland                            | +           | +     | M     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | +     | 49   |
| Leukemia Mononuclear                       |             |       |       |       | X     |       |       |       |       |       |       |       | X     | X     |       |       | X     |       |       |       |          |       | 4    |
| Pars Distalis, Adenoma                     |             |       |       | X     | X     | X     | X     | X     |       |       |       |       | X     | X     |       |       |       |       | X     |       | X        | X     | 24   |
| Thyroid Gland                              | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | +     | 49   |
| Bilateral, C-cell, Adenoma                 |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | X        |       | 1    |
| C-cell, Adenoma                            |             |       |       |       |       |       |       | X     |       |       | X     |       |       |       |       | X     |       |       |       | X     |          |       | 6    |
| C-cell, Carcinoma                          |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       | 1    |
| <b>GENERAL BODY SYSTEM</b>                 |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       |      |
| Peritoneum                                 |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       | 1    |
| <b>GENITAL SYSTEM</b>                      |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       |      |
| Epididymis                                 | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | +     | 50   |
| Mesothelioma Malignant                     |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       | 1    |
| Preputial Gland                            | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | M     | +        | +     | 48   |
| Carcinoma                                  |             | X     |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       | 3    |
| Prostate                                   | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | +     | 50   |
| Leukemia Mononuclear                       |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       | 1    |
| Seminal Vesicle                            | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | +     | 50   |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
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 Lab: BNW

| FISCHER 344-TACONIC RATS MALE                                  | DAY ON TEST |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | * TOTALS |       |       |       |
|--|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|-------|-------|-------|
|  | 0689        | 0729  | 0779  | 0775  | 0668  | 0478  | 0652  | 0729  | 0779  | 0770  | 0770  | 0561  | 0661  | 0441  | 0762  | 0688  | 0722  | 0779  | 0666  | 0678  |          | 0560  | 0665  | 0572  |
| 5.0 mg/m3  | ANIMAL ID   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | * TOTALS |       |       |       |
|  | 00626       | 00662 | 00662 | 00662 | 00663 | 00663 | 00663 | 00663 | 00663 | 00663 | 00663 | 00663 | 00663 | 00663 | 00663 | 00663 | 00663 | 00663 | 00663 | 00663 |          | 00663 | 00663 | 00663 |
| Carcinoma, Metastatic, Kidney                                  |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       |       | 1     |
| Testes   | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | +     | +     | 50    |
| Mesothelioma Malignant   |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       |       | 1     |
| Bilateral, Interstitial Cell, Adenoma                          |             |       |       |       |       |       |       | X     | X     | X     |       | X     |       |       |       |       |       |       | X     |       | X        |       |       | 12    |
| Interstitial Cell, Adenoma                                     | X           | X     | X     | X     | X     |       |       |       |       |       |       |       | X     |       |       | X     |       | X     |       | X     |          |       |       | 17    |
| <b>HEMATOPOIETIC SYSTEM</b>                                    |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       |       |       |
| Bone Marrow  | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | +     | +     | 50    |
| Lymph Node   |             | +     |       |       | +     |       |       |       |       |       |       | +     | +     |       |       |       |       |       |       |       |          |       |       | 9     |
| Iliac, Renal, Leukemia Mononuclear                             |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       |       | 1     |
| Pancreatic, Leukemia Mononuclear                               |             |       |       |       | X     |       |       |       |       |       |       | X     |       |       |       |       |       |       |       |       |          |       |       | 2     |
| Pancreatic, Renal, Leukemia Mononuclear                        |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       |       | 1     |
| Renal, Leukemia Mononuclear                                    |             |       |       |       |       |       |       |       |       |       |       |       | X     |       |       |       |       |       |       |       |          |       |       | 1     |
| Renal, Pheochromocytoma Malignant, Metastatic, Adrenal Medulla |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       |       | 1     |
| Lymph Node, Bronchial  | M           | +     | +     | M     | +     | M     | M     | +     | +     | +     | +     | +     | M     | M     | M     | +     | +     | M     | +     | M     | M        | M     | M     | 20    |
| Leukemia Mononuclear   |             |       | X     |       | X     |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       |       | 4     |
| Lymph Node, Mandibular   | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | +     | M     | 48    |
| Leukemia Mononuclear   |             |       | X     |       |       |       |       |       |       |       |       |       |       |       |       | X     | X     |       |       |       |          |       |       | 6     |
| Lymph Node, Mediastinal  | +           | +     | +     | +     | +     | M     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | +     | +     | 48    |
| Alveolar/Bronchiolar Carcinoma, Metastatic, Lung               |             |       |       |       |       |       |       |       |       |       |       |       |       | X     |       |       |       |       |       |       | X        |       |       | 3     |
| Leukemia Mononuclear   |             |       |       | X     | X     |       |       |       |       |       |       | X     |       |       |       |       |       |       |       |       |          |       |       | 5     |
| Lymph Node, Mesenteric   | +           | +     | +     | +     | +     | +     | M     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | +     | +     | 49    |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue

M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically

Experiment Number: 60311 - 05  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: RATS/F344/N Tac

P04: NEOPLASMS BY INDIVIDUAL ANIMAL  
 Cobalt  
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012  
 Time Report Requested: 14:48:11  
 First Dose M/F: 05/08/06 / 05/08/06  
 Lab: BNW

| FISCHER 344-TACONIC RATS MALE<br>5.0 mg/m3       | DAY ON TEST |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | * TOTALS |      |  |
|--|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|------|--|
|  | 0689        | 0729  | 0779  | 0779  | 0779  | 0779  | 0779  | 0779  | 0779  | 0779  | 0779  | 0779  | 0779  | 0779  | 0779  | 0779  | 0779  | 0779  | 0779  | 0779  | 0779  | 0779  | 0779  | 0779  |          | 0779 |  |
| ANIMAL ID  | 00626       | 00662 | 00662 | 00662 | 00662 | 00662 | 00662 | 00662 | 00662 | 00662 | 00662 | 00662 | 00662 | 00662 | 00662 | 00662 | 00662 | 00662 | 00662 | 00662 | 00662 | 00662 | 00662 | 00662 | 00662    |      |  |
| Leukemia Mononuclear                             |             |       | X     |       | X     |       |       |       |       |       |       | X     | X     |       |       |       |       |       |       |       |       |       |       |       |          | 5    |  |
| Spleen   | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | 50       |      |  |
| Leukemia Mononuclear                             |             |       | X     |       | X     | X     |       |       |       | X     |       | X     | X     |       | X     | X     | X     |       |       | X     |       |       | X     | X     | 22       |      |  |
| Thymus   | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | M     | +     | +     | +     | 46       |      |  |
| Alveolar/Bronchiolar Carcinoma, Metastatic, Lung |             |       |       |       |       |       |       |       |       |       |       |       |       | X     |       |       |       |       |       | X     |       |       |       |       | 2        |      |  |
| Leukemia Mononuclear                             |             |       |       |       |       |       |       |       |       |       |       | X     |       |       | X     |       |       |       |       |       |       |       |       |       | 2        |      |  |
| <b>INTEGUMENTARY SYSTEM</b>                      |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |      |  |
| Mammary Gland                                    | +           | +     | M     | M     | +     | +     | M     | +     | +     | +     | M     | +     | M     | +     | M     | +     | M     | +     | +     | M     | M     | +     | M     | +     | M        | 31   |  |
| Fibroadenoma                                     |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          | 1    |  |
| Skin   | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | 50       |      |  |
| Basal Cell Adenoma                               | X           |       | X     |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 3        |      |  |
| Keratoacanthoma                                  |             |       |       |       |       |       | X     |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 2        |      |  |
| Trichoepithelioma                                |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 1        |      |  |
| Subcutaneous Tissue, Fibrous Histiocytoma        |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | X     |       | 2        |      |  |
| <b>MUSCULOSKELETAL SYSTEM</b>                    |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |      |  |
| Bone   | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | 50       |      |  |
| Alveolar/Bronchiolar Carcinoma, Metastatic, Lung |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | X     |       |       | 1        |      |  |
| Skeletal Muscle                                  |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | +     | +     |       | 4        |      |  |
| Alveolar/Bronchiolar Carcinoma, Metastatic, Lung |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | X     |       |       | 2        |      |  |
| Carcinoma, Metastatic, Kidney                    |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 1        |      |  |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue

M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically

Experiment Number: 60311 - 05  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: RATS/F344/N Tac

P04: NEOPLASMS BY INDIVIDUAL ANIMAL  
 Cobalt  
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012  
 Time Report Requested: 14:48:11  
 First Dose M/F: 05/08/06 / 05/08/06  
 Lab: BNW

| FISCHER 344-TACONIC RATS MALE | DAY ON TEST |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | * TOTALS |   |
|-------------------------------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|---|
|                               | 0689        | 0729  | 0729  | 0729  | 0729  | 0729  | 0729  | 0729  | 0729  | 0729  | 0729  | 0729  | 0729  | 0729  | 0729  | 0729  | 0729  | 0729  | 0729  | 0729  | 0729  | 0729  |          |   |
| 5.0 mg/m3                     | 0           | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0        | 0 |
| ANIMAL ID                     | 00626       | 00626 | 00626 | 00626 | 00626 | 00626 | 00626 | 00626 | 00626 | 00626 | 00626 | 00626 | 00626 | 00626 | 00626 | 00626 | 00626 | 00626 | 00626 | 00626 | 00626 | 00626 | 00626    | 0 |

Fibrous Histiocytoma, Metastatic, Skin

X 1

**NERVOUS SYSTEM**

Brain + 50

**RESPIRATORY SYSTEM**

Larynx + 50

Lung + 50

Alveolar/Bronchiolar Adenoma X 8

Alveolar/Bronchiolar Adenoma, Multiple X 6

Alveolar/Bronchiolar Carcinoma X 6

Alveolar/Bronchiolar Carcinoma, Multiple X 30

Carcinoma, Metastatic, Kidney X 1

Carcinoma, Metastatic, Zymbal'S Gland X 1

Cystic Keratinizing Epithelioma X 1

Leukemia Mononuclear X 13

Pheochromocytoma Malignant, Metastatic, Adrenal Medulla X 1

Mediastinum, Alveolar/Bronchiolar Carcinoma, Metastatic, Lung X 3

Mediastinum, Carcinoma, Metastatic, Kidney X 1

Mediastinum, Carcinoma, Metastatic, Uncertain Primary Site X 1

Mediastinum, Leukemia Mononuclear X 1

Nose + 50

Leukemia Mononuclear X 6

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
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| FISCHER 344-TACONIC RATS MALE<br>5.0 mg/m3       | DAY ON TEST |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |    | * TOTALS |
|--|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----|----------|
|  | 0689        | 0729  | 0779  | 0775  | 0648  | 0667  | 0772  | 0772  | 0773  | 0773  | 0566  | 0666  | 0661  | 0479  | 0678  | 0772  | 0779  | 0666  | 0668  | 0772  | 0566  | 0667  | 0665  |    |          |
| ANIMAL ID  | 00626       | 00662 | 00662 | 00662 | 00663 | 00663 | 00663 | 00663 | 00663 | 00664 | 00665 | 00666 | 00667 | 00668 | 00669 | 00670 | 00671 | 00672 | 00673 | 00674 | 00675 | 00676 | 00677 |    |          |
| Trachea  | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | 50 |          |
| <b>SPECIAL SENSES SYSTEM</b>                     |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |    |          |
| Eye  | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | 50 |          |
| Harderian Gland                                  | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | 50 |          |
| Zymbal's Gland                                   |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 1  |          |
| Carcinoma  |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 1  |          |
| <b>URINARY SYSTEM</b>                            |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |    |          |
| Kidney   | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | 50 |          |
| Alveolar/Bronchiolar Carcinoma, Metastatic, Lung |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 1  |          |
| Leukemia Mononuclear                             |             |       |       |       |       |       |       |       |       |       |       |       | X     | X     |       |       |       |       |       |       |       |       |       | 4  |          |
| Renal Tubule, Adenoma                            |             |       |       |       |       |       |       |       |       | X     |       |       |       |       |       |       |       |       |       |       |       |       |       | 2  |          |
| Renal Tubule, Adenoma, Multiple                  |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | X     |       |       | 1  |          |
| Renal Tubule, Carcinoma                          |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | X     |       |       | 2  |          |
| Urinary Bladder                                  | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | 50 |          |
| <b>SYSTEMIC LESIONS</b>                          |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |    |          |
| Multiple Organ                                   | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | 50 |          |
| Leukemia Mononuclear                             |             |       | X     |       | X     | X     |       |       |       | X     |       | X     | X     |       | X     | X     | X     |       |       | X     |       |       | X     | 22 |          |
| Mesothelioma Malignant                           |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 1  |          |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue

M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically

**Experiment Number:** 60311 - 05  
**Test Type:** CHRONIC  
**Route:** RESPIRATORY EXPOSURE WHOLE BODY  
**Species/Strain:** RATS/F344/N Tac

**P04: NEOPLASMS BY INDIVIDUAL ANIMAL**  
Cobalt  
**CAS Number:** 7440-48-4

**Date Report Requested:** 01/18/2012  
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**Lab:** BNW

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\*\*\* END OF MALE DATA \*\*\*

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\* .. Total animals with tissue examined microscopically; Total animals with tumor  
+ .. Tissue examined microscopically  
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 Lab: BNW

| DAY ON TEST | FISCHER 344-TACONIC RATS FEMALE |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      | females (cont...) |
|-------------|---------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-------------------|
|             | 0732                            | 0733 | 0730 | 0731 | 0674 | 0772 | 0773 | 0773 | 0533 | 0751 | 0773 | 0676 | 0773 | 0773 | 0773 | 0234 | 0730 | 0575 | 0773 | 0676 | 0773 | 0676 | 0677 | 0673 |                   |
| Control     | 0010                            | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011              |
| ANIMAL ID   | 1                               | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 0    | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 0    | 1    | 2    | 3    | 4    | 5                 |

### ALIMENTARY SYSTEM

|  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Esophagus  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Large, Cecum<br>Carcinoma, Metastatic, Islets, Pancreatic  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | X | + | + | + | + | + | + | + | + |
| Intestine Large, Colon<br>Carcinoma, Metastatic, Islets, Pancreatic  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | X | + | + | + | + | + | + | + | + |
| Intestine Large, Rectum  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Small, Duodenum  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | M |
| Intestine Small, Ileum<br>Carcinoma<br>Carcinoma, Metastatic, Islets, Pancreatic<br>Fibrous Histiocytoma, Metastatic, Skin | + | + | + | + | + | + | + | + | + | + | + | A | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Small, Jejunum<br>Carcinoma<br>Carcinoma, Metastatic, Islets, Pancreatic   | + | + | + | + | + | X | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Liver<br>Carcinoma, Metastatic, Islets, Pancreatic<br>Fibrous Histiocytoma, Metastatic, Skin<br>Leukemia Mononuclear       | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Mesentery<br>Carcinoma, Metastatic, Islets, Pancreatic   | + |   |   |   |   |   |   | + |   |   |   |   |   |   | + | + |   |   |   | + |   |   |   | + |

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 + .. Tissue examined microscopically  
 X .. Lesion present  
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 Lab: BNW

| FISCHER 344-TACONIC RATS<br>FEMALE<br>Control | DAY ON TEST      |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  | ANIMAL ID | females<br>(cont...) |                  |                       |                  |
|---|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|-----------|----------------------|------------------|-----------------------|------------------|
|   | 0<br>7<br>3<br>2 | 0<br>7<br>3<br>1 | 0<br>7<br>3<br>0 | 0<br>7<br>3<br>1 | 0<br>6<br>5<br>4 | 0<br>7<br>3<br>2 | 0<br>7<br>3<br>0 | 0<br>7<br>3<br>1 | 0<br>5<br>1<br>1 | 0<br>7<br>3<br>0 | 0<br>7<br>3<br>1 | 0<br>6<br>3<br>1 | 0<br>7<br>3<br>1 | 0<br>7<br>3<br>2 | 0<br>2<br>3<br>4 | 0<br>7<br>3<br>0 | 0<br>5<br>3<br>0 | 0<br>7<br>3<br>1 | 0<br>6<br>8<br>3 | 0<br>7<br>3<br>1 |           |                      | 0<br>6<br>3<br>1 | 0<br>6<br>7<br>4      | 0<br>6<br>4<br>6 |
|   | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0         | 0                    | 0                | 0<br>0<br>1<br>0<br>1 |                  |

|  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|
| Pancreas<br>Acinus, Carcinoma, Metastatic, Islets,<br>Pancreatic | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |  |
| Salivary Glands<br>Fibrous Histiocytoma, Metastatic, Skin        | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |  |
| Stomach, Forestomach<br>Squamous Cell Papilloma                  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |  |
| Stomach, Glandular   | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |  |
| Tongue<br>Squamous Cell Papilloma                                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |
| Tooth  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |

**CARDIOVASCULAR SYSTEM**

|  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|
| Heart<br>Carcinoma, Metastatic, Islets, Pancreatic<br>Fibrous Histiocytoma, Metastatic, Skin<br>Leukemia Mononuclear | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |  |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|

**ENDOCRINE SYSTEM**

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|
| Adrenal Cortex<br>Carcinoma, Metastatic, Islets, Pancreatic<br>Leukemia Mononuclear | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue

M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically

Experiment Number: 60311 - 05  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: RATS/F344/N Tac

P04: NEOPLASMS BY INDIVIDUAL ANIMAL  
 Cobalt  
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012  
 Time Report Requested: 14:48:11  
 First Dose M/F: 05/08/06 / 05/08/06  
 Lab: BNW

| FISCHER 344-TACONIC RATS<br>FEMALE<br>Control     | DAY ON TEST      |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |  | ANIMAL ID | females<br>(cont...) |
|---|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|--|-----------|----------------------|
|   | 0<br>7<br>3<br>2 | 0<br>7<br>3<br>1 | 0<br>7<br>3<br>0 | 0<br>7<br>3<br>1 | 0<br>6<br>5<br>4 | 0<br>7<br>3<br>2 | 0<br>7<br>3<br>0 | 0<br>7<br>3<br>1 | 0<br>5<br>1<br>1 | 0<br>7<br>3<br>0 | 0<br>7<br>3<br>1 | 0<br>6<br>3<br>1 | 0<br>7<br>3<br>1 | 0<br>7<br>3<br>2 | 0<br>7<br>3<br>2 | 0<br>2<br>3<br>4 | 0<br>7<br>5<br>0 | 0<br>7<br>3<br>1 | 0<br>6<br>8<br>3 | 0<br>7<br>3<br>1 | 0<br>6<br>7<br>1 | 0<br>6<br>4<br>4 | 0<br>6<br>6<br>6 | 0<br>7<br>3<br>0 |  |           |                      |
| Adrenal Medulla                                   | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                |  |           |                      |
| Leukemia Mononuclear                              |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  | X                |                  |                  |                  |                  |  |           |                      |
| Pheochromocytoma Benign                           |                  |                  | X                |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  | X                |                  |                  |                  |  |           |                      |
| Bilateral, Fibrous Histiocytoma, Metastatic, Skin |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |  |           |                      |
| Bilateral, Pheochromocytoma Benign                |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |  |           |                      |
| Islets, Pancreatic                                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                |  |           |                      |
| Carcinoma   |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  | X                |                  |                  |                  |                  |                  |                  |                  |                  |  |           |                      |
| Parathyroid Gland                                 | +                | +                | +                | +                | +                | +                | +                | +                | M                | M                | M                | +                | +                | +                | +                | +                | +                | +                | +                | +                | M                | +                | +                | M                |  |           |                      |
| Pituitary Gland                                   | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                |  |           |                      |
| Pars Distalis, Adenoma                            | X                |                  | X                |                  | X                | X                |                  |                  | X                |                  | X                | X                |                  | X                | X                |                  | X                | X                | X                |                  | X                | X                | X                |                  |  |           |                      |
| Thyroid Gland                                     | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                |  |           |                      |
| Bilateral, C-cell, Adenoma                        |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |  |           |                      |
| C-cell, Adenoma                                   |                  |                  | X                |                  |                  | X                |                  |                  |                  | X                | X                |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |  |           |                      |
| C-cell, Carcinoma                                 | X                |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |  |           |                      |
| Follicular Cell, Carcinoma                        |                  |                  |                  |                  |                  |                  |                  |                  |                  | X                |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |  |           |                      |
| <b>GENERAL BODY SYSTEM</b>                        |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |  |           |                      |
| Peritoneum  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  | +                |  |           |                      |
| Carcinoma, Metastatic, Islets, Pancreatic         |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  | X                |  |           |                      |
| <b>GENITAL SYSTEM</b>                             |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |  |           |                      |
| Clitoral Gland                                    | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                |  |           |                      |
| Adenoma   |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  | M                | +                | +                | +                | +                | +                | +                | +                |  |           |                      |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue

M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically

Experiment Number: 60311 - 05  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: RATS/F344/N Tac

P04: NEOPLASMS BY INDIVIDUAL ANIMAL  
 Cobalt  
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012  
 Time Report Requested: 14:48:11  
 First Dose M/F: 05/08/06 / 05/08/06  
 Lab: BNW

| FISCHER 344-TACONIC RATS<br>FEMALE<br>Control            | DAY ON TEST           |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | females<br>(cont...) |  |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------------|--|
|  | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>1      | 0<br>7<br>3<br>0      | 0<br>7<br>3<br>1      | 0<br>6<br>5<br>4      | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>0      | 0<br>7<br>3<br>1      | 0<br>5<br>1<br>1      | 0<br>7<br>3<br>0      | 0<br>7<br>3<br>1      | 0<br>6<br>3<br>1      | 0<br>7<br>3<br>1      | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>2      | 0<br>2<br>3<br>4      | 0<br>7<br>3<br>0      | 0<br>5<br>3<br>0      | 0<br>7<br>3<br>1      | 0<br>6<br>3<br>3      | 0<br>7<br>3<br>1      | 0<br>6<br>7<br>4      | 0<br>6<br>4<br>6      | 0<br>7<br>3<br>0      |                       |                      |  |
| ANIMAL ID  | 0<br>0<br>1<br>0<br>1 | 0<br>0<br>1<br>0<br>2 | 0<br>0<br>1<br>0<br>3 | 0<br>0<br>1<br>0<br>4 | 0<br>0<br>1<br>0<br>5 | 0<br>0<br>1<br>0<br>6 | 0<br>0<br>1<br>0<br>7 | 0<br>0<br>1<br>0<br>8 | 0<br>0<br>1<br>0<br>9 | 0<br>0<br>1<br>0<br>0 | 0<br>0<br>1<br>0<br>1 | 0<br>0<br>1<br>0<br>2 | 0<br>0<br>1<br>0<br>3 | 0<br>0<br>1<br>0<br>4 | 0<br>0<br>1<br>0<br>5 | 0<br>0<br>1<br>0<br>6 | 0<br>0<br>1<br>0<br>7 | 0<br>0<br>1<br>0<br>8 | 0<br>0<br>1<br>0<br>9 | 0<br>0<br>1<br>0<br>0 | 0<br>0<br>1<br>0<br>1 | 0<br>0<br>1<br>0<br>2 | 0<br>0<br>1<br>0<br>3 | 0<br>0<br>1<br>0<br>4 | 0<br>0<br>1<br>0<br>5 |                      |  |
| Carcinoma  | X                     |                       |                       | X                     |                       |                       |                       |                       |                       |                       |                       |                       | X                     |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                      |  |
| Ovary  | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     |                      |  |
| Carcinoma, Metastatic, Islets, Pancreatic                |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                      |  |
| Leukemia Mononuclear                                     |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                      |  |
| Uterus   | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     |                      |  |
| Carcinoma, Metastatic, Islets, Pancreatic                |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                      |  |
| Hemangiosarcoma  |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                      |  |
| Leiomyoma  |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                      |  |
| Leukemia Mononuclear                                     |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                      |  |
| Polyp Stromal  |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                      |  |
| <b>HEMATOPOIETIC SYSTEM</b>                              |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                      |  |
| Bone Marrow  | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     |                      |  |
| Lymph Node   |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                      |  |
| Deep Cervical, Fibrous Histiocytoma, Metastatic, Skin    |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                      |  |
| Lumbar, Renal, Carcinoma, Metastatic, Islets, Pancreatic |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                      |  |
| Pancreatic, Renal, Leukemia Mononuclear                  |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                      |  |
| Lymph Node, Bronchial                                    | M                     | M                     | +                     | +                     | M                     | +                     | +                     | +                     | M                     | M                     | +                     | M                     | +                     | +                     | M                     | M                     | M                     | M                     | +                     | +                     | +                     | +                     | M                     | M                     | +                     |                      |  |
| Fibrous Histiocytoma, Metastatic, Skin                   |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                      |  |
| Leukemia Mononuclear                                     |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                      |  |
| Lymph Node, Mandibular                                   | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     |                      |  |
| Fibrous Histiocytoma, Metastatic, Skin                   |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                      |  |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
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|   |  | DAY ON TEST           |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |  | females<br>(cont...) |
|---|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|--|----------------------|
| FISCHER 344-TACONIC RATS<br>FEMALE  |  | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>1      | 0<br>7<br>3<br>0      | 0<br>7<br>3<br>1      | 0<br>6<br>5<br>4      | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>0      | 0<br>5<br>3<br>1      | 0<br>7<br>3<br>1      | 0<br>7<br>3<br>1      | 0<br>6<br>3<br>1      | 0<br>7<br>3<br>1      | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>2      | 0<br>2<br>3<br>4      | 0<br>7<br>3<br>0      | 0<br>5<br>3<br>0      | 0<br>7<br>3<br>1      | 0<br>6<br>8<br>3      | 0<br>7<br>3<br>1      | 0<br>7<br>3<br>1      | 0<br>6<br>7<br>4      | 0<br>6<br>4<br>6      | 0<br>7<br>3<br>0      |                       |  |                      |
| Control   |  | 0<br>0<br>1<br>0<br>1 | 0<br>0<br>1<br>0<br>2 | 0<br>0<br>1<br>0<br>3 | 0<br>0<br>1<br>0<br>4 | 0<br>0<br>1<br>0<br>5 | 0<br>0<br>1<br>0<br>6 | 0<br>0<br>1<br>0<br>7 | 0<br>0<br>1<br>0<br>8 | 0<br>0<br>1<br>0<br>9 | 0<br>0<br>1<br>1<br>0 | 0<br>0<br>1<br>1<br>1 | 0<br>0<br>1<br>1<br>2 | 0<br>0<br>1<br>1<br>3 | 0<br>0<br>1<br>1<br>4 | 0<br>0<br>1<br>1<br>5 | 0<br>0<br>1<br>1<br>6 | 0<br>0<br>1<br>1<br>7 | 0<br>0<br>1<br>1<br>8 | 0<br>0<br>1<br>1<br>9 | 0<br>0<br>1<br>2<br>0 | 0<br>0<br>1<br>2<br>1 | 0<br>0<br>1<br>2<br>2 | 0<br>0<br>1<br>2<br>3 | 0<br>0<br>1<br>2<br>4 | 0<br>0<br>1<br>2<br>5 |  |                      |
| Leukemia Mononuclear  |  |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | X                     |  |                      |
| Lymph Node, Mediastinal<br>Carcinoma, Metastatic, Islets, Pancreatic<br>Leukemia Mononuclear                          |  | +                     | M                     | M                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | M                     | +                     | +                     | +                     | +                     | +                     | M                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     |  |                      |
| Lymph Node, Mesenteric<br>Carcinoma, Metastatic, Islets, Pancreatic<br>Leukemia Mononuclear                           |  |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | X                     |  |                      |
| Spleen<br>Carcinoma, Metastatic, Islets, Pancreatic<br>Fibrous Histiocytoma, Metastatic, Skin<br>Leukemia Mononuclear |  | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     |  |                      |
| Thymus<br>Leukemia Mononuclear  |  |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | X                     |  |                      |
| <b>INTEGUMENTARY SYSTEM</b>   |  |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |  |                      |
| Mammary Gland<br>Adenoma<br>Carcinoma<br>Fibroadenoma<br>Fibroadenoma, Multiple                                       |  | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     |  |                      |
| Skin<br>Basal Cell Adenoma<br>Squamous Cell Papilloma<br>Subcutaneous Tissue, Fibroma                                 |  | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     |  |                      |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue

M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically

Experiment Number: 60311 - 05  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: RATS/F344/N Tac

P04: NEOPLASMS BY INDIVIDUAL ANIMAL  
 Cobalt  
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012  
 Time Report Requested: 14:48:11  
 First Dose M/F: 05/08/06 / 05/08/06  
 Lab: BNW

|                                    |  | DAY ON TEST |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | females<br>(cont...) |   |
|------------------------------------|--|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----------------------|---|
| FISCHER 344-TACONIC RATS<br>FEMALE |  | 0           | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |                      | 0 |
| Control                            |  | 7           | 7 | 7 | 7 | 6 | 7 | 7 | 7 | 5 | 7 | 7 | 6 | 7 | 7 | 7 | 2 | 7 | 5 | 7 | 6 | 7 | 7 | 6 | 6 |                      | 7 |
| ANIMAL ID                          |  | 3           | 3 | 3 | 3 | 5 | 3 | 3 | 3 | 1 | 3 | 3 | 1 | 3 | 3 | 3 | 3 | 3 | 5 | 3 | 8 | 3 | 3 | 7 | 4 | 3                    |   |
|                                    |  | 2           | 1 | 0 | 1 | 4 | 2 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 2 | 2 | 4 | 0 | 0 | 1 | 3 | 1 | 1 | 4 | 6 | 0                    |   |
|                                    |  | 0           | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0                    |   |
|                                    |  | 0           | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0                    |   |
|                                    |  | 1           | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1                    |   |
|                                    |  | 0           | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0                    |   |
|                                    |  | 1           | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5                    |   |

Subcutaneous Tissue, Fibrous Histiocytoma  
 Subcutaneous Tissue, Lipoma X  
 Subcutaneous Tissue, Schwannoma Malignant

**MUSCULOSKELETAL SYSTEM**

Bone +  
 Skeletal Muscle +  
 Carcinoma, Metastatic, Islets, Pancreatic X

**NERVOUS SYSTEM**

Brain +

**RESPIRATORY SYSTEM**

Larynx +  
 Lung +  
 Alveolar/Bronchiolar Adenoma X  
 Carcinoma, Metastatic, Islets, Pancreatic X  
 Fibrous Histiocytoma, Metastatic, Skin  
 Leukemia Mononuclear X X X  
 Mediastinum, Fibrous Histiocytoma, Metastatic, Skin  
 Nose +  
 Leukemia Mononuclear X

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue  
 M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically

Experiment Number: 60311 - 05  
 Test Type: CHRONIC  
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P04: NEOPLASMS BY INDIVIDUAL ANIMAL  
 Cobalt  
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012  
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 First Dose M/F: 05/08/06 / 05/08/06  
 Lab: BNW

| FISCHER 344-TACONIC RATS<br>FEMALE<br>Control | DAY ON TEST           |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | females<br>(cont...) |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------------|
|   | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>1      | 0<br>7<br>3<br>0      | 0<br>7<br>3<br>1      | 0<br>6<br>5<br>4      | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>0      | 0<br>7<br>3<br>1      | 0<br>5<br>1<br>1      | 0<br>7<br>3<br>0      | 0<br>7<br>3<br>1      | 0<br>6<br>3<br>1      | 0<br>7<br>3<br>1      | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>2      | 0<br>2<br>3<br>4      | 0<br>7<br>3<br>0      | 0<br>5<br>3<br>0      | 0<br>7<br>3<br>1      | 0<br>6<br>8<br>3      | 0<br>7<br>3<br>1      | 0<br>7<br>3<br>1      | 0<br>6<br>7<br>4      | 0<br>6<br>4<br>6      | 0<br>7<br>3<br>0      |                      |
| ANIMAL ID                                     | 0<br>0<br>1<br>0<br>1 | 0<br>0<br>1<br>0<br>2 | 0<br>0<br>1<br>0<br>3 | 0<br>0<br>1<br>0<br>4 | 0<br>0<br>1<br>0<br>5 | 0<br>0<br>1<br>0<br>6 | 0<br>0<br>1<br>0<br>7 | 0<br>0<br>1<br>0<br>8 | 0<br>0<br>1<br>0<br>9 | 0<br>0<br>1<br>0<br>0 | 0<br>0<br>1<br>0<br>1 | 0<br>0<br>1<br>0<br>2 | 0<br>0<br>1<br>0<br>3 | 0<br>0<br>1<br>0<br>4 | 0<br>0<br>1<br>0<br>5 | 0<br>0<br>1<br>0<br>6 | 0<br>0<br>1<br>0<br>7 | 0<br>0<br>1<br>0<br>8 | 0<br>0<br>1<br>0<br>9 | 0<br>0<br>1<br>2<br>0 | 0<br>0<br>1<br>2<br>1 | 0<br>0<br>1<br>2<br>2 | 0<br>0<br>1<br>2<br>3 | 0<br>0<br>1<br>2<br>4 | 0<br>0<br>1<br>2<br>5 |                      |
| Trachea                                       | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     |                      |
| <b>SPECIAL SENSES SYSTEM</b>                  |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                      |
| Ear   |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                      |
| Eye   | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                    |
| Harderian Gland                               | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                    |
| <b>URINARY SYSTEM</b>                         |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                      |
| Kidney  | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                    |
| Leukemia Mononuclear                          |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                      |
| Urinary Bladder                               | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                    |
| Carcinoma, Metastatic, Islets, Pancreatic     |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                      |
| <b>SYSTEMIC LESIONS</b>                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                      |
| Multiple Organ                                | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                    |
| Leukemia Mononuclear                          |                       |                       |                       | X                     |                       |                       |                       |                       |                       |                       |                       |                       | X                     | X                     |                       |                       |                       |                       |                       | X                     | X                     |                       |                       |                       |                       | X                    |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
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M .. Missing tissue  
 A .. Autolysis precludes evaluation  
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Experiment Number: 60311 - 05  
 Test Type: CHRONIC  
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 Species/Strain: RATS/F344/N Tac

P04: NEOPLASMS BY INDIVIDUAL ANIMAL  
 Cobalt  
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012  
 Time Report Requested: 14:48:11  
 First Dose M/F: 05/08/06 / 05/08/06  
 Lab: BNW

| DAY ON TEST                     |  | 0               | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |   |
|---------------------------------|--|-----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|                                 |  | 7               | 7 | 6 | 7 | 7 | 7 | 7 | 7 | 3 | 5 | 7 | 7 | 7 | 7 | 7 | 7 | 6 | 7 | 7 | 6 | 6 | 7 | 6 | 6 | 7 | 6 |   |
|                                 |  | 3               | 3 | 9 | 3 | 3 | 3 | 2 | 3 | 3 | 1 | 3 | 3 | 3 | 3 | 3 | 7 | 3 | 3 | 3 | 6 | 9 | 3 | 9 | 3 | 3 | 1 |   |
|                                 |  | 1               | 1 | 1 | 2 | 2 | 1 | 2 | 2 | 2 | 6 | 0 | 1 | 2 | 0 | 2 | 1 | 4 | 0 | 1 | 1 | 3 | 8 | 1 | 1 | 1 | 1 |   |
| FISCHER 344-TACONIC RATS FEMALE |  |                 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Control                         |  |                 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| ANIMAL ID                       |  | 0               | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
|                                 |  | 0               | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
|                                 |  | 1               | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
|                                 |  | 2               | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
|                                 |  | 6               | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 0 |   |
|                                 |  | <b>* TOTALS</b> |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |

**ALIMENTARY SYSTEM**

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|
| Esophagus                                 | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Intestine Large, Cecum                    | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Carcinoma, Metastatic, Islets, Pancreatic |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1  |
| Intestine Large, Colon                    | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Carcinoma, Metastatic, Islets, Pancreatic |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1  |
| Intestine Large, Rectum                   | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Intestine Small, Duodenum                 | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 48 |
| Intestine Small, Ileum                    | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |
| Carcinoma                                 |   |   |   |   |   |   |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1  |
| Carcinoma, Metastatic, Islets, Pancreatic |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1  |
| Fibrous Histiocytoma, Metastatic, Skin    |   |   |   |   |   |   |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1  |
| Intestine Small, Jejunum                  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Carcinoma                                 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1  |
| Carcinoma, Metastatic, Islets, Pancreatic |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1  |
| Liver                                     | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Carcinoma, Metastatic, Islets, Pancreatic |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1  |
| Fibrous Histiocytoma, Metastatic, Skin    |   |   |   |   |   |   |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1  |
| Leukemia Mononuclear                      |   |   | X | X |   |   | X |   |   |   |   |   |   |   | X |   |   | X |   |   |   |   | X | X |   |   |   | 12 |
| Mesentery                                 | + |   |   | + |   |   |   |   |   |   |   |   | + |   |   |   |   | + | + |   |   | + | + |   |   |   |   | 13 |
| Carcinoma, Metastatic, Islets, Pancreatic |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1  |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
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 Cobalt  
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| FISCHER 344-TACONIC RATS<br>FEMALE<br>Control  | DAY ON TEST           |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | * TOTALS              |                       |                       |                       |                       |  |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|--|
|  | 0<br>7<br>3<br>1      | 0<br>7<br>3<br>1      | 0<br>6<br>9<br>1      | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>1      | 0<br>7<br>2<br>2      | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>2      | 0<br>3<br>1<br>6      | 0<br>5<br>3<br>0      | 0<br>7<br>3<br>1      | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>0      | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>1      | 0<br>6<br>7<br>4      | 0<br>7<br>3<br>0      | 0<br>7<br>3<br>1      | 0<br>6<br>6<br>3      |                       | 0<br>6<br>9<br>8      | 0<br>7<br>3<br>1      |                       |                       |  |
| ANIMAL ID  | 0<br>0<br>1<br>2<br>6 | 0<br>0<br>1<br>2<br>7 | 0<br>0<br>1<br>2<br>8 | 0<br>0<br>1<br>3<br>9 | 0<br>0<br>1<br>3<br>0 | 0<br>0<br>1<br>3<br>1 | 0<br>0<br>1<br>3<br>2 | 0<br>0<br>1<br>3<br>3 | 0<br>0<br>1<br>3<br>3 | 0<br>0<br>1<br>3<br>4 | 0<br>0<br>1<br>3<br>5 | 0<br>0<br>1<br>3<br>6 | 0<br>0<br>1<br>3<br>7 | 0<br>0<br>1<br>3<br>8 | 0<br>0<br>1<br>4<br>9 | 0<br>0<br>1<br>4<br>0 | 0<br>0<br>1<br>4<br>1 | 0<br>0<br>1<br>4<br>2 | 0<br>0<br>1<br>4<br>3 | 0<br>0<br>1<br>4<br>4 | 0<br>0<br>1<br>4<br>5 | 0<br>0<br>1<br>4<br>6 | 0<br>0<br>1<br>4<br>7 | 0<br>0<br>1<br>4<br>8 | 0<br>0<br>1<br>4<br>9 |  |
| Pancreas<br>Acinus, Carcinoma, Metastatic, Islets,<br>Pancreatic   | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | 50<br>1               |  |
| Salivary Glands<br>Fibrous Histiocytoma, Metastatic, Skin  | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | X                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | 50<br>1               |                       |  |
| Stomach, Forestomach<br>Squamous Cell Papilloma  | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | 50<br>1               |                       |  |
| Stomach, Glandular   | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | 50                    |                       |  |
| Tongue<br>Squamous Cell Papilloma  |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | 1<br>1                |                       |  |
| Tooth  |                       |                       |                       |                       |                       |                       |                       |                       | +                     |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | 1                     |                       |  |
| <b>CARDIOVASCULAR SYSTEM</b>   |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |  |
| Heart<br>Carcinoma, Metastatic, Islets, Pancreatic<br>Fibrous Histiocytoma, Metastatic, Skin<br>Leukemia Mononuclear | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | 50<br>1<br>1<br>1     |                       |  |
| <b>ENDOCRINE SYSTEM</b>  |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |  |
| Adrenal Cortex<br>Carcinoma, Metastatic, Islets, Pancreatic<br>Leukemia Mononuclear                                  | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | 50<br>1<br>5          |                       |  |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue

M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically

Experiment Number: 60311 - 05  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: RATS/F344/N Tac

P04: NEOPLASMS BY INDIVIDUAL ANIMAL  
 Cobalt  
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012  
 Time Report Requested: 14:48:11  
 First Dose M/F: 05/08/06 / 05/08/06  
 Lab: BNW

| FISCHER 344-TACONIC RATS<br>FEMALE<br>Control     | DAY ON TEST           |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | * TOTALS              |                       |                       |                       |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
|   | 0<br>7<br>3<br>1      | 0<br>7<br>3<br>1      | 0<br>6<br>9<br>1      | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>1      | 0<br>7<br>2<br>2      | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>2      | 0<br>3<br>1<br>6      | 0<br>5<br>3<br>0      | 0<br>7<br>3<br>1      | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>3      | 0<br>7<br>3<br>3      | 0<br>7<br>3<br>3      | 0<br>7<br>3<br>3      | 0<br>6<br>7<br>4      | 0<br>7<br>3<br>0      | 0<br>7<br>3<br>1      | 0<br>7<br>3<br>1      | 0<br>6<br>6<br>3      | 0<br>6<br>9<br>8      |                       | 0<br>7<br>3<br>1      |                       |                       |
| ANIMAL ID   | 0<br>0<br>1<br>2<br>6 | 0<br>0<br>1<br>2<br>7 | 0<br>0<br>1<br>2<br>8 | 0<br>0<br>1<br>2<br>9 | 0<br>0<br>1<br>3<br>0 | 0<br>0<br>1<br>3<br>1 | 0<br>0<br>1<br>3<br>2 | 0<br>0<br>1<br>3<br>3 | 0<br>0<br>1<br>3<br>3 | 0<br>0<br>1<br>3<br>3 | 0<br>0<br>1<br>3<br>4 | 0<br>0<br>1<br>3<br>5 | 0<br>0<br>1<br>3<br>6 | 0<br>0<br>1<br>3<br>7 | 0<br>0<br>1<br>3<br>8 | 0<br>0<br>1<br>3<br>9 | 0<br>0<br>1<br>4<br>0 | 0<br>0<br>1<br>4<br>1 | 0<br>0<br>1<br>4<br>2 | 0<br>0<br>1<br>4<br>3 | 0<br>0<br>1<br>4<br>4 | 0<br>0<br>1<br>4<br>4 | 0<br>0<br>1<br>4<br>5 | 0<br>0<br>1<br>4<br>6 | 0<br>0<br>1<br>4<br>7 | 0<br>0<br>1<br>4<br>8 | 0<br>0<br>1<br>4<br>9 | 0<br>0<br>1<br>5<br>0 |
| Adrenal Medulla                                   | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | 50                    |                       |                       |
| Leukemia Mononuclear                              |                       |                       | X                     |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | X                     |                       |                       |                       | X                     | X                     |                       | 5                     |                       |                       |
| Pheochromocytoma Benign                           |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | X                     | X                     |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | 4                     |                       |                       |
| Bilateral, Fibrous Histiocytoma, Metastatic, Skin |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | X                     |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | 1                     |                       |                       |
| Bilateral, Pheochromocytoma Benign                |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | X                     |                       |                       |                       |                       |                       |                       |                       | X                     |                       |                       |                       |                       |                       |                       | 2                     |                       |                       |
| Islets, Pancreatic Carcinoma                      | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | 50<br>1               |                       |                       |
| Parathyroid Gland                                 | +                     | +                     | +                     | +                     | M                     | +                     | +                     | +                     | +                     | +                     | M                     | M                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | 42                    |                       |                       |
| Pituitary Gland Pars Distalis, Adenoma            | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | 50<br>29              |                       |                       |
| Thyroid Gland                                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | 50                    |                       |                       |
| Bilateral, C-cell, Adenoma                        |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | X                     |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | 1                     |                       |                       |                       |
| C-cell, Adenoma                                   |                       | X                     |                       |                       | X                     |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | X                     |                       |                       |                       |                       |                       | 7                     |                       |                       |                       |
| C-cell, Carcinoma                                 |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | 1                     |                       |                       |                       |
| Follicular Cell, Carcinoma                        |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | 1                     |                       |                       |                       |
| <b>GENERAL BODY SYSTEM</b>                        |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |
| Peritoneum  |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | 1                     |                       |                       |
| Carcinoma, Metastatic, Islets, Pancreatic         |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | 1                     |                       |                       |
| <b>GENITAL SYSTEM</b>                             |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |
| Clitoral Gland                                    | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | 49                    |                       |                       |
| Adenoma   |                       |                       |                       |                       |                       |                       |                       |                       |                       | X                     |                       |                       |                       |                       |                       |                       |                       |                       |                       | X                     |                       |                       |                       |                       |                       | 2                     |                       |                       |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue

M .. Missing tissue  
 A .. Autolysis precludes evaluation  
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Experiment Number: 60311 - 05  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: RATS/F344/N Tac

P04: NEOPLASMS BY INDIVIDUAL ANIMAL  
 Cobalt  
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012  
 Time Report Requested: 14:48:11  
 First Dose M/F: 05/08/06 / 05/08/06  
 Lab: BNW

| FISCHER 344-TACONIC RATS<br>FEMALE<br>Control            | DAY ON TEST                                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | * TOTALS              |
|--|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
|  | 0<br>7<br>3<br>1                                  | 0<br>7<br>3<br>1      | 0<br>6<br>9<br>1      | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>1      | 0<br>7<br>2<br>2      | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>2      | 0<br>3<br>1<br>6      | 0<br>5<br>3<br>0      | 0<br>7<br>3<br>1      | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>0      | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>1      | 0<br>7<br>3<br>1      | 0<br>6<br>7<br>4      | 0<br>7<br>3<br>0      | 0<br>7<br>3<br>1      | 0<br>7<br>3<br>3      | 0<br>6<br>6<br>8      | 0<br>6<br>9<br>3      | 0<br>7<br>3<br>1      |                       |
| ANIMAL ID  | 0<br>0<br>1<br>2<br>6                             | 0<br>0<br>1<br>2<br>7 | 0<br>0<br>1<br>2<br>8 | 0<br>0<br>1<br>3<br>9 | 0<br>0<br>1<br>3<br>0 | 0<br>0<br>1<br>3<br>1 | 0<br>0<br>1<br>3<br>2 | 0<br>0<br>1<br>3<br>3 | 0<br>0<br>1<br>3<br>3 | 0<br>0<br>1<br>3<br>4 | 0<br>0<br>1<br>3<br>5 | 0<br>0<br>1<br>3<br>6 | 0<br>0<br>1<br>3<br>7 | 0<br>0<br>1<br>3<br>8 | 0<br>0<br>1<br>4<br>9 | 0<br>0<br>1<br>4<br>0 | 0<br>0<br>1<br>4<br>1 | 0<br>0<br>1<br>4<br>2 | 0<br>0<br>1<br>4<br>3 | 0<br>0<br>1<br>4<br>4 | 0<br>0<br>1<br>4<br>5 | 0<br>0<br>1<br>4<br>6 | 0<br>0<br>1<br>4<br>7 | 0<br>0<br>1<br>4<br>8 | 0<br>0<br>1<br>4<br>9 |
| Carcinoma  | X   |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | 4                     |
| Ovary  | +   |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | 50                    |
| Carcinoma, Metastatic, Islets, Pancreatic                |   |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | 1                     |
| Leukemia Mononuclear                                     |   |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | 1                     |
| Uterus   | +   |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | 50                    |
| Carcinoma, Metastatic, Islets, Pancreatic                |   |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | 1                     |
| Hemangiosarcoma  |   |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | 1                     |
| Leiomyoma  | X   |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | 1                     |
| Leukemia Mononuclear                                     |   |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | 1                     |
| Polyp Stromal  | X X X X X   |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | 10                    |
| <b>HEMATOPOIETIC SYSTEM</b>                              |   |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |
| Bone Marrow  | +   |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | 50                    |
| Lymph Node   |   |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | 4                     |
| Deep Cervical, Fibrous Histiocytoma, Metastatic, Skin    | X   |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | 1                     |
| Lumbar, Renal, Carcinoma, Metastatic, Islets, Pancreatic |   |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | 1                     |
| Pancreatic, Renal, Leukemia Mononuclear                  |   |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | 1                     |
| Lymph Node, Bronchial                                    | + + M + + M M M + + + M M M + + + M + + M M M + M |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | 26                    |
| Fibrous Histiocytoma, Metastatic, Skin                   | X   |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | 1                     |
| Leukemia Mononuclear                                     |   |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | 1                     |
| Lymph Node, Mandibular                                   | + + + + + M + + + + + + + + + + + + + + + + + +   |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | 48                    |
| Fibrous Histiocytoma, Metastatic, Skin                   | X   |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | 1                     |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
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M .. Missing tissue  
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Experiment Number: 60311 - 05  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
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P04: NEOPLASMS BY INDIVIDUAL ANIMAL  
 Cobalt  
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012  
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 Lab: BNW

| FISCHER 344-TACONIC RATS<br>FEMALE<br>Control   | DAY ON TEST           |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | * TOTALS                |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-------------------------|
|   | 0<br>7<br>3<br>1      | 0<br>7<br>3<br>1      | 0<br>6<br>9<br>1      | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>1      | 0<br>7<br>2<br>2      | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>2      | 0<br>3<br>1<br>6      | 0<br>5<br>3<br>0      | 0<br>7<br>3<br>1      | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>3      | 0<br>7<br>3<br>3      | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>3      | 0<br>6<br>7<br>4      | 0<br>7<br>3<br>0      | 0<br>7<br>3<br>1      | 0<br>7<br>3<br>1      | 0<br>6<br>6<br>3      | 0<br>6<br>9<br>8      | 0<br>7<br>3<br>1      |                       |                         |
| ANIMAL ID   | 0<br>0<br>1<br>2<br>6 | 0<br>0<br>1<br>2<br>7 | 0<br>0<br>1<br>2<br>8 | 0<br>0<br>1<br>2<br>9 | 0<br>0<br>1<br>3<br>0 | 0<br>0<br>1<br>3<br>1 | 0<br>0<br>1<br>3<br>2 | 0<br>0<br>1<br>3<br>3 | 0<br>0<br>1<br>3<br>3 | 0<br>0<br>1<br>3<br>4 | 0<br>0<br>1<br>3<br>5 | 0<br>0<br>1<br>3<br>6 | 0<br>0<br>1<br>3<br>7 | 0<br>0<br>1<br>3<br>8 | 0<br>0<br>1<br>3<br>9 | 0<br>0<br>1<br>4<br>0 | 0<br>0<br>1<br>4<br>1 | 0<br>0<br>1<br>4<br>2 | 0<br>0<br>1<br>4<br>3 | 0<br>0<br>1<br>4<br>4 | 0<br>0<br>1<br>4<br>5 | 0<br>0<br>1<br>4<br>6 | 0<br>0<br>1<br>4<br>7 | 0<br>0<br>1<br>4<br>8 | 0<br>0<br>1<br>4<br>9 | 0<br>0<br>1<br>5<br>0   |
| Leukemia Mononuclear  | X                     |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | 2                     |                         |
| Lymph Node, Mediastinal<br>Carcinoma, Metastatic, Islets, Pancreatic<br>Leukemia Mononuclear                          | +                     | +                     | M                     | M                     | +                     | M                     | +                     | +                     | +                     | +                     | +                     | M                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | 42<br>1<br>1            |
| Lymph Node, Mesenteric<br>Carcinoma, Metastatic, Islets, Pancreatic<br>Leukemia Mononuclear                           | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | 50<br>1<br>2            |
| Spleen<br>Carcinoma, Metastatic, Islets, Pancreatic<br>Fibrous Histiocytoma, Metastatic, Skin<br>Leukemia Mononuclear | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | 50<br>1<br>1<br>16      |
| Thymus<br>Leukemia Mononuclear  | +                     | M                     | +                     | +                     | +                     | M                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | 47<br>1                 |
| <b>INTEGUMENTARY SYSTEM</b>   |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                         |
| Mammary Gland<br>Adenoma<br>Carcinoma<br>Fibroadenoma<br>Fibroadenoma, Multiple                                       | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | 50<br>1<br>2<br>17<br>1 |
| Skin<br>Basal Cell Adenoma<br>Squamous Cell Papilloma<br>Subcutaneous Tissue, Fibroma                                 | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | 50<br>1<br>1<br>2       |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
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 Cobalt  
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 Lab: BNW

| FISCHER 344-TACONIC RATS<br>FEMALE<br>Control | DAY ON TEST           |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | * TOTALS |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------|
|   | 0<br>7<br>3<br>1      | 0<br>7<br>3<br>1      | 0<br>6<br>9<br>1      | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>1      | 0<br>7<br>2<br>2      | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>2      |          |
| ANIMAL ID                                     | 0<br>0<br>1<br>2<br>6 | 0<br>0<br>1<br>2<br>7 | 0<br>0<br>1<br>2<br>8 | 0<br>0<br>1<br>2<br>9 | 0<br>0<br>1<br>3<br>0 | 0<br>0<br>1<br>3<br>1 | 0<br>0<br>1<br>3<br>2 | 0<br>0<br>1<br>3<br>3 | 0<br>0<br>1<br>3<br>4 | 0<br>0<br>1<br>3<br>5 | 0<br>0<br>1<br>3<br>6 | 0<br>0<br>1<br>3<br>7 | 0<br>0<br>1<br>3<br>8 | 0<br>0<br>1<br>3<br>9 | 0<br>0<br>1<br>4<br>0 | 0<br>0<br>1<br>4<br>1 | 0<br>0<br>1<br>4<br>2 | 0<br>0<br>1<br>4<br>3 | 0<br>0<br>1<br>4<br>4 | 0<br>0<br>1<br>4<br>5 | 0<br>0<br>1<br>4<br>6 | 0<br>0<br>1<br>4<br>7 | 0<br>0<br>1<br>4<br>8 | 0<br>0<br>1<br>4<br>9 |          |

|   |   |   |
|---|---|---|
| Subcutaneous Tissue, Fibrous Histiocytoma | X | 1 |
| Subcutaneous Tissue, Lipoma               |   | 1 |
| Subcutaneous Tissue, Schwannoma Malignant | X | 1 |

### MUSCULOSKELETAL SYSTEM

|   |   |    |
|---|---|----|
| Bone                                      | + | 50 |
| Skeletal Muscle                           |   | 1  |
| Carcinoma, Metastatic, Islets, Pancreatic |   | 1  |

### NERVOUS SYSTEM

|       |   |    |
|-------|---|----|
| Brain | + | 50 |
|-------|---|----|

### RESPIRATORY SYSTEM

|   |   |    |
|---|---|----|
| Larynx  | + | 50 |
| Lung  | + | 50 |
| Alveolar/Bronchiolar Adenoma                        |   | 2  |
| Carcinoma, Metastatic, Islets, Pancreatic           | X   | 1  |
| Fibrous Histiocytoma, Metastatic, Skin              | X   | 1  |
| Leukemia Mononuclear                                | X X   | 10 |
| Mediastinum, Fibrous Histiocytoma, Metastatic, Skin | X   | 1  |
| Nose  | + | 50 |
| Leukemia Mononuclear                                |   | 1  |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue

M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically

Experiment Number: 60311 - 05  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: RATS/F344/N Tac

P04: NEOPLASMS BY INDIVIDUAL ANIMAL  
 Cobalt  
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012  
 Time Report Requested: 14:48:11  
 First Dose M/F: 05/08/06 / 05/08/06  
 Lab: BNW

| FISCHER 344-TACONIC RATS<br>FEMALE<br>Control | DAY ON TEST      |                  | ANIMAL ID        |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  | * TOTALS |                  |                  |                  |    |
|---|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|----------|------------------|------------------|------------------|----|
|   | 0<br>7<br>3<br>1 | 0<br>7<br>3<br>1 | 0<br>6<br>9<br>1 | 0<br>7<br>3<br>2 | 0<br>7<br>3<br>2 | 0<br>7<br>3<br>1 | 0<br>7<br>2<br>2 | 0<br>7<br>3<br>2 | 0<br>7<br>3<br>2 | 0<br>3<br>1<br>6 | 0<br>5<br>3<br>0 | 0<br>7<br>3<br>1 | 0<br>7<br>3<br>2 | 0<br>7<br>3<br>3 | 0<br>7<br>3<br>3 | 0<br>7<br>3<br>3 | 0<br>7<br>3<br>2 | 0<br>7<br>3<br>1 | 0<br>6<br>7<br>4 | 0<br>7<br>3<br>0 | 0<br>7<br>3<br>1 | 0<br>7<br>3<br>1 |          | 0<br>6<br>6<br>3 | 0<br>6<br>9<br>8 | 0<br>7<br>3<br>1 |    |
| Trachea                                       | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +        | +                | +                | +                | 50 |
| <b>SPECIAL SENSES SYSTEM</b>                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |          |                  |                  |                  |    |
| Ear   |                  |                  |                  | +                |                  |                  |                  |                  |                  | +                |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |          |                  |                  |                  | 4  |
| Eye   | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +        | +                | +                | +                | 50 |
| Harderian Gland                               | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +        | +                | +                | +                | 50 |
| <b>URINARY SYSTEM</b>                         |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |          |                  |                  |                  |    |
| Kidney  | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +        | +                | +                | +                | 50 |
| Leukemia Mononuclear                          |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |          |                  |                  |                  | 1  |
| Urinary Bladder                               | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +        | +                | +                | +                | 50 |
| Carcinoma, Metastatic, Islets, Pancreatic     |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |          |                  |                  |                  | 1  |
| <b>SYSTEMIC LESIONS</b>                       |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |          |                  |                  |                  |    |
| Multiple Organ                                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +        | +                | +                | +                | 50 |
| Leukemia Mononuclear                          |                  | X                | X                |                  |                  | X                |                  |                  |                  |                  |                  |                  |                  |                  |                  | X                |                  | X                | X                |                  | X                |                  |          | X                | X                | X                | 16 |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue

M .. Missing tissue  
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Experiment Number: 60311 - 05  
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P04: NEOPLASMS BY INDIVIDUAL ANIMAL  
 Cobalt  
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012  
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 Lab: BNW

| FISCHER 344-TACONIC RATS<br>FEMALE<br>1.25 mg/m3 | DAY ON TEST |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      | females<br>(cont...) |
|--|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|----------------------|
|  | 0691        | 0692 | 0693 | 0694 | 0695 | 0696 | 0697 | 0698 | 0699 | 0690 | 0691 | 0692 | 0693 | 0694 | 0695 | 0696 | 0697 | 0698 | 0699 | 0690 | 0691 | 0692 | 0693 | 0694 |                      |
| ANIMAL ID  | 0030        | 0031 | 0032 | 0033 | 0034 | 0035 | 0036 | 0037 | 0038 | 0039 | 0040 | 0041 | 0042 | 0043 | 0044 | 0045 | 0046 | 0047 | 0048 | 0049 | 0050 | 0051 | 0052 | 0053 | 0054                 |

**ALIMENTARY SYSTEM**

|  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Esophagus                              | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Large, Cecum                 | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Large, Colon                 | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Large, Rectum                | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Small, Duodenum              | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Small, Ileum                 | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Small, Jejunum               | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Liver                                  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Fibrous Histiocytoma, Metastatic, Skin |   |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Hepatocellular Adenoma                 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Hepatocellular Carcinoma               |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | X |
| Leukemia Mononuclear                   | X |   |   |   | X | X | X |   |   |   |   |   | X | X |   | X |   | X |   | X | X |   |   |   | X |
| Mesentery                              | + | + | + |   |   |   | + | + | + |   |   |   |   |   |   |   | + |   | + |   |   |   |   |   |   |
| Pancreas                               | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Leukemia Mononuclear                   |   |   |   |   |   | X | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   | X |   |   |   |
| Salivary Glands                        | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Stomach, Forestomach                   | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
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M .. Missing tissue  
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Experiment Number: 60311 - 05  
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 Cobalt  
 CAS Number: 7440-48-4

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 Lab: BNW

|  |             |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                      |                       |
|--|-------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------------|-----------------------|
| FISCHER 344-TACONIC RATS<br>FEMALE<br>1.25 mg/m3 | DAY ON TEST | 0<br>6<br>9<br>1      | 0<br>6<br>2<br>4      | 0<br>7<br>1<br>6      | 0<br>5<br>9<br>0      | 0<br>7<br>3<br>1      | 0<br>7<br>3<br>0      | 0<br>6<br>4<br>6      | 0<br>6<br>4<br>1      | 0<br>6<br>8<br>1      | 0<br>7<br>3<br>1      | 0<br>7<br>3<br>1      | 0<br>7<br>3<br>1      | 0<br>7<br>3<br>2      | 0<br>5<br>9<br>3      | 0<br>5<br>1<br>6      | 0<br>7<br>3<br>2      | 0<br>6<br>8<br>6      | 0<br>7<br>3<br>0      | 0<br>6<br>7<br>0      | 0<br>7<br>3<br>2      | 0<br>6<br>1<br>1      | 0<br>7<br>3<br>1      | 0<br>7<br>3<br>1      | 0<br>6<br>4<br>6      | females<br>(cont...) |                       |
|  | ANIMAL ID   | 0<br>0<br>3<br>0<br>1 | 0<br>0<br>3<br>0<br>2 | 0<br>0<br>3<br>0<br>3 | 0<br>0<br>3<br>0<br>4 | 0<br>0<br>3<br>0<br>5 | 0<br>0<br>3<br>0<br>6 | 0<br>0<br>3<br>0<br>7 | 0<br>0<br>3<br>0<br>8 | 0<br>0<br>3<br>0<br>9 | 0<br>0<br>3<br>1<br>0 | 0<br>0<br>3<br>1<br>1 | 0<br>0<br>3<br>1<br>2 | 0<br>0<br>3<br>1<br>3 | 0<br>0<br>3<br>1<br>4 | 0<br>0<br>3<br>1<br>5 | 0<br>0<br>3<br>1<br>6 | 0<br>0<br>3<br>1<br>7 | 0<br>0<br>3<br>1<br>8 | 0<br>0<br>3<br>2<br>9 | 0<br>0<br>3<br>2<br>0 | 0<br>0<br>3<br>2<br>1 | 0<br>0<br>3<br>2<br>2 | 0<br>0<br>3<br>2<br>3 | 0<br>0<br>3<br>2<br>4 |                      | 0<br>0<br>3<br>2<br>5 |
|  |             |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                      |                       |

Leukemia Mononuclear

Stomach, Glandular

+ +

**CARDIOVASCULAR SYSTEM**

Blood Vessel

Alveolar/Bronchiolar Carcinoma, Metastatic, Lung

Aorta, Alveolar/Bronchiolar Carcinoma, Metastatic, Lung

Heart

Leukemia Mononuclear

+  
 X

**ENDOCRINE SYSTEM**

Adrenal Cortex

Leukemia Mononuclear

+  
 X

Adrenal Medulla

Leukemia Mononuclear

Pheochromocytoma Benign

Pheochromocytoma Malignant

Bilateral, Pheochromocytoma Benign

Bilateral, Pheochromocytoma Malignant

+  
 X  
 X  
 X  
 X

Islets, Pancreatic

+ +

Parathyroid Gland

+ + + + + + + + + + + + M + + + + + + + + + + + +

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
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 Cobalt  
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|  |           | DAY ON TEST |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                      |  |
|--|-----------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----------------------|--|
|  |           | 0           | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |   |                      |  |
|  |           | 6           | 6 | 7 | 5 | 7 | 7 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 7 | 5 | 5 | 7 | 6 | 7 | 6 | 7 | 6 |   |                      |  |
|  |           | 9           | 2 | 1 | 9 | 3 | 3 | 4 | 4 | 8 | 3 | 3 | 3 | 3 | 3 | 9 | 1 | 3 | 8 | 3 | 7 | 3 | 1 |   |                      |  |
|  |           | 1           | 4 | 6 | 0 | 1 | 0 | 6 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 3 | 6 | 2 | 6 | 0 | 0 | 2 | 1 |   |                      |  |
| FISCHER 344-TACONIC RATS<br>FEMALE<br>1.25 mg/m3 | ANIMAL ID |             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |   |                      |  |
|  |           |             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |                      |  |
|  |           |             | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |                      |  |
|  |           |             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 |                      |  |
|  |           | 1           | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 0 | females<br>(cont...) |  |
| Pituitary Gland                                  |           | +           | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |   |                      |  |
| Leukemia Mononuclear                             |           |             |   |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   | X |   |   |                      |  |
| Pars Distalis, Adenoma                           |           |             | X |   |   |   |   |   |   | X | X |   |   | X |   | X |   | X |   |   |   |   | X | X |                      |  |
| Pars Distalis, Carcinoma                         |           |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                      |  |
| Thyroid Gland                                    |           | +           | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |   |                      |  |
| C-cell, Adenoma                                  |           |             |   |   |   |   | X |   |   |   |   | X |   |   |   |   |   |   | X |   |   | X |   |   |                      |  |
| C-cell, Carcinoma                                |           |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                      |  |
| <b>GENERAL BODY SYSTEM</b>                       |           |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                      |  |
| Peritoneum                                       |           |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                      |  |
| Fibrous Histiocytoma, Metastatic, Skin           |           |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                      |  |
| <b>GENITAL SYSTEM</b>                            |           |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                      |  |
| Clitoral Gland                                   |           | +           | + | + | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |   |                      |  |
| Adenoma  |           |             |   |   |   |   |   |   |   |   |   |   |   |   | X |   |   |   |   |   | X | X |   |   |                      |  |
| Carcinoma  |           |             |   |   | X |   |   |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   |   |   |                      |  |
| Bilateral, Adenoma                               |           |             | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | X |   |   |   |   | X |                      |  |
| Ovary  |           | +           | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |   |                      |  |
| Cystadenocarcinoma                               |           |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                      |  |
| Leukemia Mononuclear                             |           |             |   |   |   |   |   |   |   |   |   |   |   |   | X |   |   |   |   |   |   | X | X |   |                      |  |
| Uterus   |           | +           | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |   |                      |  |
| Carcinoma  |           |             |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                      |  |
| Leiomyoma  |           |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                      |  |
| Leukemia Mononuclear                             |           |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | X |   |   |                      |  |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue

M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically

**Experiment Number:** 60311 - 05  
**Test Type:** CHRONIC  
**Route:** RESPIRATORY EXPOSURE WHOLE BODY  
**Species/Strain:** RATS/F344/N Tac

**P04: NEOPLASMS BY INDIVIDUAL ANIMAL**  
 Cobalt  
**CAS Number:** 7440-48-4

**Date Report Requested:** 01/18/2012  
**Time Report Requested:** 14:48:11  
**First Dose M/F:** 05/08/06 / 05/08/06  
**Lab:** BNW

| DAY ON TEST                     | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0                 | 0 |
|---------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-------------------|---|
| FISCHER 344-TACONIC RATS FEMALE | 6 | 6 | 7 | 5 | 7 | 7 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 7 | 5 | 5 | 7 | 6 | 7 | 6 | 7 | 6 | 7 | 7                 | 6 |
| 1.25 mg/m3                      | 9 | 2 | 1 | 9 | 3 | 3 | 4 | 4 | 8 | 3 | 3 | 3 | 3 | 3 | 9 | 1 | 3 | 8 | 3 | 7 | 3 | 1 | 3 | 3                 | 4 |
|                                 | 1 | 4 | 6 | 0 | 1 | 0 | 6 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 3 | 6 | 2 | 6 | 0 | 0 | 2 | 1 | 1 | 1                 | 6 |
| ANIMAL ID                       | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0                 | 0 |
|                                 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0                 | 0 |
|                                 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3                 | 3 |
|                                 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2                 | 5 |
|                                 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4                 | 5 |
|                                 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | females (cont...) |   |

Polyp Stromal X

**HEMATOPOIETIC SYSTEM**

|  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bone Marrow                                  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Lymph Node Renal, Leukemia Mononuclear       | + |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | + | X |   |   |   |
| Lymph Node, Bronchial Leukemia Mononuclear   | M | + | + | + | M | + | + | M | M | M | M | M | M | M | + | + | + | M | M | + | M | + | M | M | + |
| Lymph Node, Mandibular Leukemia Mononuclear  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Lymph Node, Mediastinal Leukemia Mononuclear | + | + | + | + | + | M | + | M | + | + | + | + | + | + | + | + | M | + | M | + | + | + | + | + | + |
| Lymph Node, Mesenteric Leukemia Mononuclear  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Spleen Leukemia Mononuclear                  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
|  | X |   | X | X | X | X | X | X |   |   |   |   | X | X | X |   | X | X | X | X | X | X | X | X | X |
| Thymus Leukemia Mononuclear                  | + | + | + | + | + | M | + | + | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
|  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | X |   |

**INTEGUMENTARY SYSTEM**

|                       |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|-----------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mammary Gland Adenoma | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
|-----------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue  
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Experiment Number: 60311 - 05  
Test Type: CHRONIC  
Route: RESPIRATORY EXPOSURE WHOLE BODY  
Species/Strain: RATS/F344/N Tac

P04: NEOPLASMS BY INDIVIDUAL ANIMAL

Cobalt

CAS Number: 7440-48-4

Date Report Requested: 01/18/2012  
Time Report Requested: 14:48:11  
First Dose M/F: 05/08/06 / 05/08/06  
Lab: BNW

| FISCHER 344-TACONIC RATS<br>FEMALE<br>1.25 mg/m3 | DAY ON TEST           |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | females<br>(cont...)  |                       |                       |                       |                       |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
|  | 0<br>6<br>9<br>1      | 0<br>6<br>2<br>4      | 0<br>7<br>1<br>6      | 0<br>5<br>9<br>0      | 0<br>7<br>3<br>1      | 0<br>7<br>3<br>0      | 0<br>6<br>4<br>6      | 0<br>6<br>4<br>1      | 0<br>6<br>8<br>1      | 0<br>7<br>3<br>1      | 0<br>7<br>3<br>1      | 0<br>7<br>3<br>1      | 0<br>7<br>3<br>2      | 0<br>5<br>9<br>3      | 0<br>5<br>1<br>6      | 0<br>7<br>3<br>2      | 0<br>6<br>8<br>6      | 0<br>7<br>3<br>0      | 0<br>6<br>7<br>0      | 0<br>6<br>3<br>2      | 0<br>7<br>1<br>1      |                       | 0<br>7<br>3<br>1      | 0<br>6<br>3<br>1      | 0<br>7<br>3<br>4      |                       |
| ANIMAL ID  | 0<br>0<br>3<br>0<br>1 | 0<br>0<br>3<br>0<br>2 | 0<br>0<br>3<br>0<br>3 | 0<br>0<br>3<br>0<br>4 | 0<br>0<br>3<br>0<br>5 | 0<br>0<br>3<br>0<br>6 | 0<br>0<br>3<br>0<br>7 | 0<br>0<br>3<br>0<br>8 | 0<br>0<br>3<br>0<br>9 | 0<br>0<br>3<br>0<br>0 | 0<br>0<br>3<br>0<br>1 | 0<br>0<br>3<br>0<br>1 | 0<br>0<br>3<br>0<br>2 | 0<br>0<br>3<br>0<br>3 | 0<br>0<br>3<br>0<br>4 | 0<br>0<br>3<br>0<br>5 | 0<br>0<br>3<br>0<br>6 | 0<br>0<br>3<br>0<br>7 | 0<br>0<br>3<br>0<br>8 | 0<br>0<br>3<br>0<br>9 | 0<br>0<br>3<br>0<br>0 | 0<br>0<br>3<br>0<br>1 | 0<br>0<br>3<br>0<br>2 | 0<br>0<br>3<br>0<br>3 | 0<br>0<br>3<br>0<br>4 | 0<br>0<br>3<br>0<br>5 |

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carcinoma                                 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | X |   | X | X |   |   |   |
| Fibroadenoma                              |   |   | X | X | X | X |   | X |   | X | X |   |   |   |   |   |   |   | X | X |   | X |   | X |   |   |
| Fibroadenoma, Multiple                    |   |   |   |   |   |   |   |   |   |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   |   |   |
| Leukemia Mononuclear                      |   |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Skin                                      | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Papilloma                                 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Subcutaneous Tissue, Fibroma              |   |   |   |   |   |   |   |   |   |   |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   |   |
| Subcutaneous Tissue, Fibrous Histiocytoma |   |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |

MUSCULOSKELETAL SYSTEM

|                 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|-----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bone            | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Skeletal Muscle |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Lipoma          |   |   |   |   |   |   |   |   |   |   |   |   |   | + |   |   |   |   |   |   |   |   |   |   |   | X |

NERVOUS SYSTEM

|  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Brain                                  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Carcinoma, Metastatic, Pituitary Gland |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |

RESPIRATORY SYSTEM

|  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Larynx                                   | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Lung                                     | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Alveolar/Bronchiolar Adenoma             |   | X |   | X |   | X |   |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Alveolar/Bronchiolar Adenoma, Multiple   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Alveolar/Bronchiolar Carcinoma           |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   |
| Alveolar/Bronchiolar Carcinoma, Multiple |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | X |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
+ .. Tissue examined microscopically  
X .. Lesion present  
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Experiment Number: 60311 - 05  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: RATS/F344/N Tac

P04: NEOPLASMS BY INDIVIDUAL ANIMAL  
 Cobalt  
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012  
 Time Report Requested: 14:48:11  
 First Dose M/F: 05/08/06 / 05/08/06  
 Lab: BNW

| FISCHER 344-TACONIC RATS<br>FEMALE<br>1.25 mg/m3              | DAY ON TEST |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      | ANIMAL ID | females<br>(cont...) |      |      |      |      |      |
|---|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----------|----------------------|------|------|------|------|------|
|   | 0691        | 0694 | 0776 | 0590 | 0771 | 0770 | 0666 | 0666 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 | 0553 | 0553 | 0773 | 0668 | 0773 | 0667 |           |                      | 0773 | 0661 | 0773 | 0773 | 0664 |
|   | 0           | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0         | 0                    | 0    | 0    | 0    |      |      |
|   | 0           | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0         | 0                    | 0    | 0    | 0    |      |      |
|   | 3           | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3         | 3                    | 3    | 3    | 3    |      |      |
|   | 0           | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0         | 0                    | 0    | 0    | 0    |      |      |
|   | 1           | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 0    | 1    | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 0         | 1                    | 2    | 3    | 4    |      |      |
| Cystic Keratinizing Epithelioma                               |             |      |      |      | X    |      |      |      |      |      |      |      |      |      |      |      | X    |      |      |      |           |                      |      |      |      |      |      |
| Leukemia Mononuclear  |             |      |      |      |      |      |      | X    |      |      |      |      |      | X    |      |      |      |      | X    |      | X         | X                    |      |      | X    |      |      |
| Mediastinum, Alveolar/Bronchiolar Carcinoma, Metastatic, Lung |             |      |      |      | X    |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |           |                      |      |      |      |      |      |
| Nose  | +           | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +         | +                    | +    | +    | +    |      |      |
| Trachea   | +           | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +         | +                    | +    | +    | +    |      |      |
| <b>SPECIAL SENSES SYSTEM</b>                                  |             |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |           |                      |      |      |      |      |      |
| Ear   |             |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |           |                      |      |      |      | +    |      |
| Eye   | +           | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +         | +                    | +    | +    | +    |      |      |
| Harderian Gland   | +           | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +         | +                    | +    | +    | +    |      |      |
| Zymbal's Gland  |             |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |           |                      |      |      |      | +    |      |
| Adenoma   |             |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |           |                      |      |      |      | X    |      |
| <b>URINARY SYSTEM</b>   |             |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |           |                      |      |      |      |      |      |
| Kidney  | +           | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +         | +                    | +    | +    | +    |      |      |
| Transitional Epithelium, Papilloma                            |             |      |      | X    |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |           |                      |      |      |      |      |      |
| Urinary Bladder   | +           | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +         | +                    | +    | +    | +    |      |      |
| Leukemia Mononuclear  |             |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |           |                      |      |      |      | X    |      |
| <b>SYSTEMIC LESIONS</b>                                       |             |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |           |                      |      |      |      |      |      |
| Multiple Organ  | +           | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +         | +                    | +    | +    | +    |      |      |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue

M .. Missing tissue  
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 BLANK .. Not examined microscopically

Experiment Number: 60311 - 05  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: RATS/F344/N Tac

P04: NEOPLASMS BY INDIVIDUAL ANIMAL  
 Cobalt  
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012  
 Time Report Requested: 14:48:11  
 First Dose M/F: 05/08/06 / 05/08/06  
 Lab: BNW

| FISCHER 344-TACONIC RATS<br>FEMALE<br>1.25 mg/m3 | DAY ON TEST |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      | females<br>(cont...) |      |      |      |
|--|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|----------------------|------|------|------|
|  | 0691        | 0692 | 0693 | 0694 | 0695 | 0696 | 0697 | 0698 | 0699 | 0690 | 0691 | 0692 | 0693 | 0694 | 0695 | 0696 | 0697 | 0698 | 0699 | 0690 | 0691 | 0692 | 0693 | 0694 | 0695 | 0696 |                      | 0697 | 0698 | 0699 |
|  | 0030        | 0031 | 0032 | 0033 | 0034 | 0035 | 0036 | 0037 | 0038 | 0039 | 0030 | 0031 | 0032 | 0033 | 0034 | 0035 | 0036 | 0037 | 0038 | 0039 | 0030 | 0031 | 0032 | 0033 | 0034 | 0035 |                      | 0036 | 0037 | 0038 |
| Leukemia Mononuclear                             | X           |      | X    | X    | X    | X    | X    | X    |      |      |      | X    | X    | X    |      |      | X    | X    | X    | X    | X    | X    | X    | X    | X    | X    | X                    | X    | X    |      |

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|                                 |  | 0708  | 0598  | 0697  | 0732  | 0763  | 0770  | 0773  | 0773  | 0773  | 0773  | 0593  | 0733  | 0733  | 0733  | 0432  | 0733  | 0631  | 0733  | 0733  | 0578  | 0730  | 0738  | 0683  | 0730  | * TOTALS |
|---------------------------------|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|
| DAY ON TEST                     |  | 08    | 8     | 7     | 2     | 4     | 2     | 2     | 2     | 0     | 1     | 8     | 1     | 0     | 2     | 2     | 2     | 0     | 8     | 1     | 1     | 8     | 9     | 0     | 4     |          |
| FISCHER 344-TACONIC RATS FEMALE |  | 00326 | 00332 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 |          |
| 1.25 mg/m3                      |  | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     |          |
| ANIMAL ID                       |  | 3     | 2     | 7     | 8     | 9     | 0     | 1     | 2     | 3     | 4     | 5     | 6     | 7     | 8     | 9     | 0     | 1     | 2     | 3     | 4     | 5     | 6     | 7     | 8     |          |

**ALIMENTARY SYSTEM**

|  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|
| Esophagus                              | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Intestine Large, Cecum                 | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Intestine Large, Colon                 | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Intestine Large, Rectum                | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Intestine Small, Duodenum              | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Intestine Small, Ileum                 | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Intestine Small, Jejunum               | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Liver                                  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Fibrous Histiocytoma, Metastatic, Skin |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1  |
| Hepatocellular Adenoma                 |   |   |   |   |   |   |   |   |   |   |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   | 1  |
| Hepatocellular Carcinoma               |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1  |
| Leukemia Mononuclear                   |   | X | X |   | X |   |   | X | X |   |   | X | X | X |   |   | X | X |   |   |   |   |   | X |   | 22 |
| Mesentery                              |   | + |   |   |   |   |   |   | + | + |   |   |   |   |   |   |   |   | + | + |   |   |   |   |   | 15 |
| Pancreas                               | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Leukemia Mononuclear                   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 3  |
| Salivary Glands                        | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Stomach, Forestomach                   | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue

M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically

Experiment Number: 60311 - 05  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: RATS/F344/N Tac

P04: NEOPLASMS BY INDIVIDUAL ANIMAL  
 Cobalt  
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012  
 Time Report Requested: 14:48:11  
 First Dose M/F: 05/08/06 / 05/08/06  
 Lab: BNW

| FISCHER 344-TACONIC RATS<br>FEMALE<br>1.25 mg/m3        | DAY ON TEST |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | * TOTALS |       |       |      |
|---|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|-------|-------|------|
|   | 0708        | 0598  | 0697  | 0732  | 0674  | 0772  | 0772  | 0772  | 0772  | 0772  | 0593  | 0733  | 0733  | 0733  | 0733  | 0422  | 0731  | 0678  | 0733  | 0770  |          | 0738  | 0674  | 0730 |
| ANIMAL ID   | 00326       | 00337 | 00338 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333    | 00333 | 00333 |      |
| Leukemia Mononuclear                                    |             |       | X     |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       |       | 1    |
| Stomach, Glandular                                      | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | +     | +     | 50   |
| <b>CARDIOVASCULAR SYSTEM</b>                            |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       |       |      |
| Blood Vessel  |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       |       | 1    |
| Alveolar/Bronchiolar Carcinoma, Metastatic, Lung        |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       |       | 1    |
| Aorta, Alveolar/Bronchiolar Carcinoma, Metastatic, Lung |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       |       | 1    |
| Heart   | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | +     | +     | 50   |
| Leukemia Mononuclear                                    |             |       |       |       |       |       |       |       |       | X     |       |       |       |       |       |       |       |       |       |       |          |       |       | 4    |
| <b>ENDOCRINE SYSTEM</b>                                 |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       |       |      |
| Adrenal Cortex  | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | +     | +     | 50   |
| Leukemia Mononuclear                                    |             |       | X     |       | X     |       |       |       |       | X     |       |       |       |       | X     |       |       |       | X     |       |          |       | X     | 11   |
| Adrenal Medulla   | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | +     | +     | 50   |
| Leukemia Mononuclear                                    |             |       | X     |       | X     |       |       |       |       | X     |       |       |       |       | X     |       |       |       | X     |       |          |       | X     | 11   |
| Pheochromocytoma Benign                                 | X           |       |       |       |       |       | X     |       |       |       | X     |       |       |       | X     |       |       |       |       |       |          |       |       | 8    |
| Pheochromocytoma Malignant                              |             |       |       |       |       |       |       |       |       |       |       |       |       |       | X     |       |       |       |       |       |          |       |       | 1    |
| Bilateral, Pheochromocytoma Benign                      |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | X     |       |          |       |       | 4    |
| Bilateral, Pheochromocytoma Malignant                   |             |       |       |       |       |       |       |       |       | X     |       |       |       |       |       |       |       |       |       |       |          |       |       | 1    |
| Islets, Pancreatic                                      | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | +     | +     | 50   |
| Parathyroid Gland                                       | M           | +     | +     | +     | +     | +     | M     | +     | +     | +     | +     | M     | +     | +     | M     | +     | +     | +     | +     | +     | +        | +     | +     | 45   |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue

M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically

Experiment Number: 60311 - 05  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: RATS/F344/N Tac

P04: NEOPLASMS BY INDIVIDUAL ANIMAL  
 Cobalt  
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012  
 Time Report Requested: 14:48:11  
 First Dose M/F: 05/08/06 / 05/08/06  
 Lab: BNW

| FISCHER 344-TACONIC RATS<br>FEMALE<br>1.25 mg/m3 | DAY ON TEST |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | * TOTALS |      |  |
|--|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|------|--|
|  | 0708        | 0588  | 0697  | 0732  | 0624  | 0772  | 0772  | 0772  | 0772  | 0772  | 0593  | 0733  | 0773  | 0773  | 0773  | 0422  | 0733  | 0618  | 0733  | 0773  | 0578  | 0770  | 0773  | 0683  |          | 0773 |  |
| ANIMAL ID  | 00326       | 00337 | 00338 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333    |      |  |
| Pituitary Gland                                  | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | 50       |      |  |
| Leukemia Mononuclear                             |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | X     | 3        |      |  |
| Pars Distalis, Adenoma                           | X           | X     |       | X     |       | X     | X     | X     |       |       |       |       | X     | X     |       |       | X     |       |       |       | X     | X     | X     | X     | 23       |      |  |
| Pars Distalis, Carcinoma                         |             |       |       |       |       |       |       |       |       |       |       | X     |       |       | X     |       |       |       |       | X     |       |       |       |       | 3        |      |  |
| Thyroid Gland                                    | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | M     | +     | +     | +     | +     | +     | +     | +     | +     | +     | 49       |      |  |
| C-cell, Adenoma                                  |             |       |       |       |       |       |       |       |       |       |       | X     |       |       |       |       |       |       |       |       |       |       | X     |       | 6        |      |  |
| C-cell, Carcinoma                                |             |       |       | X     |       |       |       | X     |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 2        |      |  |
| <b>GENERAL BODY SYSTEM</b>                       |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |      |  |
| Peritoneum                                       |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          | 1    |  |
| Fibrous Histiocytoma, Metastatic, Skin           |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          | 1    |  |
| <b>GENITAL SYSTEM</b>                            |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |      |  |
| Clitoral Gland                                   | +           | +     | +     | +     | +     | M     | +     | +     | +     | M     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | 47   |  |
| Adenoma  |             |       | X     |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          | 4    |  |
| Carcinoma  |             |       |       |       |       |       | X     |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          | 5    |  |
| Bilateral, Adenoma                               |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          | 1    |  |
| Ovary  | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | 50   |  |
| Cystadenocarcinoma                               |             |       |       |       |       |       |       |       |       |       |       |       |       |       | X     |       |       |       |       |       |       |       |       |       |          | 1    |  |
| Leukemia Mononuclear                             |             |       |       |       |       |       |       |       |       | X     |       |       |       |       |       |       |       | X     |       |       |       |       |       | X     |          | 6    |  |
| Uterus   | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | 50   |  |
| Carcinoma  |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          | 1    |  |
| Leiomyoma  |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          | 1    |  |
| Leukemia Mononuclear                             |             |       | X     |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | X     |       |          | 2    |  |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue

M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically



Experiment Number: 60311 - 05  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: RATS/F344/N Tac

P04: NEOPLASMS BY INDIVIDUAL ANIMAL  
 Cobalt  
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012  
 Time Report Requested: 14:48:11  
 First Dose M/F: 05/08/06 / 05/08/06  
 Lab: BNW

| FISCHER 344-TACONIC RATS<br>FEMALE<br>1.25 mg/m3 | DAY ON TEST |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | * TOTALS |      |
|--|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|------|
|  | 0708        | 0709  | 0709  | 0709  | 0709  | 0709  | 0709  | 0709  | 0709  | 0709  | 0709  | 0709  | 0709  | 0709  | 0709  | 0709  | 0709  | 0709  | 0709  | 0709  | 0709  | 0709  | 0709  | 0709  |          | 0709 |
| ANIMAL ID  | 00326       | 00327 | 00328 | 00329 | 00330 | 00331 | 00332 | 00333 | 00334 | 00335 | 00336 | 00337 | 00338 | 00339 | 00340 | 00341 | 00342 | 00343 | 00344 | 00345 | 00346 | 00347 | 00348 | 00349 | 00350    |      |
| Polyp Stromal                                    | X           |       |       | X     | X     |       |       |       |       |       |       |       |       | X     |       |       | X     |       |       |       |       |       |       |       | X        | 7    |

**HEMATOPOIETIC SYSTEM**

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |          |         |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----------|---------|
| Bone Marrow                                     | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50       |         |
| Lymph Node<br>Renal, Leukemia Mononuclear       |   |   |   |   |   |   |   |   |   |   |   |   |   | + |   |   |   |   |   |   |   |   |   |   |   | 3<br>1   |         |
| Lymph Node, Bronchial<br>Leukemia Mononuclear   | + | + | + | M | M | M | M | M | + | M | + | M | + | M | M | M | M | + | M | M | M | M | M | M | M | 18<br>2  |         |
| Lymph Node, Mandibular<br>Leukemia Mononuclear  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M | M | + | + | +        | 48<br>6 |
| Lymph Node, Mediastinal<br>Leukemia Mononuclear | + | + | + | + | + | + | + | + | M | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | M | 43<br>4  |         |
| Lymph Node, Mesenteric<br>Leukemia Mononuclear  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50<br>3  |         |
| Spleen<br>Leukemia Mononuclear                  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50<br>29 |         |
| Thymus<br>Leukemia Mononuclear                  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M | M | + | + | + | + | + | + | + | + | 46<br>1  |         |

**INTEGUMENTARY SYSTEM**

|                          |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |         |
|--------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---------|
| Mammary Gland<br>Adenoma | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50<br>2 |
|--------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---------|

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue

M .. Missing tissue  
 A .. Autolysis precludes evaluation  
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Experiment Number: 60311 - 05  
 Test Type: CHRONIC  
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 Cobalt  
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 Lab: BNW

| FISCHER 344-TACONIC RATS<br>FEMALE<br>1.25 mg/m3 | DAY ON TEST |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | * TOTALS |       |       |       |
|--|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|-------|-------|-------|
|  | 0708        | 0598  | 0697  | 0732  | 0674  | 0772  | 0772  | 0772  | 0772  | 0772  | 0578  | 0771  | 0773  | 0773  | 0422  | 0733  | 0678  | 0773  | 0773  | 0578  |          | 0770  | 0773  | 0684  |
| ANIMAL ID  | 00326       | 00337 | 00338 | 00339 | 00340 | 00341 | 00342 | 00343 | 00344 | 00345 | 00346 | 00347 | 00348 | 00349 | 00350 | 00351 | 00352 | 00353 | 00354 | 00355 | 00356    | 00357 | 00358 | 00359 |
| Carcinoma  |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | X        | X     |       | 5     |
| Fibroadenoma                                     |             |       |       | X     |       |       |       |       |       | X     | X     | X     |       | X     | X     |       | X     |       |       |       | X        |       |       | 21    |
| Fibroadenoma, Multiple                           |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       |       | 1     |
| Leukemia Mononuclear                             |             |       |       |       |       |       |       |       |       |       | X     |       |       |       |       |       |       |       |       |       |          |       |       | 2     |
| Skin   | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | +     | +     | 50    |
| Papilloma  |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | X        |       |       | 1     |
| Subcutaneous Tissue, Fibroma                     |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       |       | 1     |
| Subcutaneous Tissue, Fibrous Histiocytoma        |             |       |       |       |       |       |       |       |       |       |       |       |       |       | X     |       |       |       |       |       |          |       |       | 2     |
| <b>MUSCULOSKELETAL SYSTEM</b>                    |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       |       |       |
| Bone   | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | +     | +     | 50    |
| Skeletal Muscle                                  |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       |       | 1     |
| Lipoma   |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       |       | 1     |
| <b>NERVOUS SYSTEM</b>                            |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       |       |       |
| Brain  | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | +     | +     | 50    |
| Carcinoma, Metastatic, Pituitary Gland           |             |       |       |       |       |       |       |       |       |       | X     |       |       |       | X     |       |       |       |       | X     |          |       |       | 3     |
| <b>RESPIRATORY SYSTEM</b>                        |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       |       |       |
| Larynx   | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | +     | +     | 50    |
| Lung   | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | +     | +     | 50    |
| Alveolar/Bronchiolar Adenoma                     |             |       |       | X     |       |       |       |       |       |       |       |       | X     |       |       |       |       |       |       |       |          |       |       | 6     |
| Alveolar/Bronchiolar Adenoma, Multiple           |             |       |       |       |       |       |       |       |       |       |       |       |       | X     |       |       |       |       |       |       |          |       |       | 1     |
| Alveolar/Bronchiolar Carcinoma                   |             |       |       |       |       |       |       |       |       |       |       | X     | X     |       |       | X     |       |       |       |       |          | X     |       | 5     |
| Alveolar/Bronchiolar Carcinoma, Multiple         |             |       |       |       |       |       |       |       | X     |       |       |       |       |       | X     |       | X     |       |       |       |          |       |       | 4     |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue

M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically

Experiment Number: 60311 - 05  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: RATS/F344/N Tac

P04: NEOPLASMS BY INDIVIDUAL ANIMAL  
 Cobalt  
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012  
 Time Report Requested: 14:48:11  
 First Dose M/F: 05/08/06 / 05/08/06  
 Lab: BNW

| FISCHER 344-TACONIC RATS<br>FEMALE<br>1.25 mg/m3              | DAY ON TEST |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | * TOTALS |       |       |       |      |  |
|---|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|-------|-------|-------|------|--|
|   | 0708        | 0598  | 0697  | 0732  | 0624  | 0772  | 0772  | 0772  | 0772  | 0772  | 0578  | 0771  | 0773  | 0773  | 0773  | 0422  | 0733  | 0671  | 0773  | 0578  |          | 0770  | 0773  | 0684  | 0773 |  |
| ANIMAL ID   | 00326       | 00337 | 00338 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333    | 00333 | 00333 | 00333 |      |  |
| Cystic Keratinizing Epithelioma                               |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       |       |       | 4    |  |
| Leukemia Mononuclear  |             | X     | X     |       | X     |       |       |       |       | X     |       |       |       |       |       |       | X     |       | X     |       |          |       |       | X     | 14   |  |
| Mediastinum, Alveolar/Bronchiolar Carcinoma, Metastatic, Lung |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       | X     |       |       |       |       |          |       |       |       | 2    |  |
| Nose  | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | +     | +     | +     | 50   |  |
| Trachea   | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | +     | +     | +     | 50   |  |
| <b>SPECIAL SENSES SYSTEM</b>                                  |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       |       |       |      |  |
| Ear   |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       |       |       | 4    |  |
| Eye   | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | +     | +     | +     | 50   |  |
| Harderian Gland   | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | +     | +     | +     | 50   |  |
| Zymbal's Gland  |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       |       |       | 1    |  |
| Adenoma   |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       |       |       | 1    |  |
| <b>URINARY SYSTEM</b>   |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       |       |       |      |  |
| Kidney  | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | +     | +     | +     | 50   |  |
| Transitional Epithelium, Papilloma                            |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       |       |       | 1    |  |
| Urinary Bladder   | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | +     | +     | +     | 50   |  |
| Leukemia Mononuclear  |             |       | X     |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       |       | X     | 4    |  |
| <b>SYSTEMIC LESIONS</b>                                       |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       |       |       |      |  |
| Multiple Organ  | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | +     | +     | +     | 50   |  |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue

M .. Missing tissue  
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Experiment Number: 60311 - 05  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: RATS/F344/N Tac

P04: NEOPLASMS BY INDIVIDUAL ANIMAL  
 Cobalt  
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012  
 Time Report Requested: 14:48:11  
 First Dose M/F: 05/08/06 / 05/08/06  
 Lab: BNW

| FISCHER 344-TACONIC RATS<br>FEMALE<br>1.25 mg/m3 | DAY ON TEST |  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | * TOTALS |   |   |    |  |
|--|-------------|--|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----------|---|---|----|--|
|  | ANIMAL ID   |  | 07 | 05 | 06 | 07 | 06 | 07 | 07 | 07 | 07 | 07 | 07 | 05 | 07 | 07 | 07 | 07 | 04 | 07 | 06 | 07 | 07 | 05 | 07 | 07 | 06 | 07 |          |   |   |    |  |
|  |             |  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0        |   |   |    |  |
|  |             |  | 8  | 8  | 7  | 2  | 4  | 2  | 2  | 2  | 0  | 3  | 3  | 3  | 1  | 8  | 1  | 0  | 2  | 2  | 2  | 3  | 1  | 3  | 3  | 1  | 8  | 9  | 0        | 3 | 8 | 3  |  |
|  |             |  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0        | 0 | 0 | 0  |  |
|  |             |  | 3  | 3  | 3  | 3  | 3  | 3  | 3  | 3  | 3  | 3  | 3  | 3  | 3  | 3  | 3  | 3  | 3  | 3  | 3  | 3  | 3  | 3  | 3  | 3  | 3  | 3  | 3        | 3 | 3 |    |  |
|  |             |  | 2  | 2  | 2  | 2  | 3  | 3  | 3  | 3  | 3  | 3  | 3  | 3  | 3  | 4  | 4  | 4  | 4  | 4  | 4  | 4  | 4  | 4  | 4  | 4  | 4  | 4  | 4        | 4 | 5 |    |  |
|  |             |  | 6  | 7  | 8  | 9  | 0  | 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 0  | 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 0  | 1  | 2        | 3 | 4 |    |  |
| Leukemia Mononuclear                             |             |  |    | X  | X  |    | X  |    |    | X  | X  |    |    | X  | X  | X  |    |    | X  | X  | X  |    | X  | X  | X  |    | X  |    |          |   |   | 29 |  |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
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M .. Missing tissue  
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Experiment Number: 60311 - 05  
 Test Type: CHRONIC  
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 Cobalt  
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Date Report Requested: 01/18/2012  
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 Lab: BNW

| FISCHER 344-TACONIC RATS<br>FEMALE<br>2.5 mg/m3 | DAY ON TEST |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      | ANIMAL ID | females<br>(cont...) |      |      |
|---|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----------|----------------------|------|------|
|   | 0730        | 0732 | 0737 | 0731 | 0769 | 0768 | 0773 | 0771 | 0766 | 0766 | 0721 | 0758 | 0773 | 0773 | 0773 | 0773 | 0766 | 0755 | 0773 | 0773 |           |                      | 0773 | 0766 |
|   | 0000        | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000      | 0000                 | 0000 | 0000 |
|   | 51          | 52   | 53   | 54   | 55   | 55   | 55   | 55   | 55   | 55   | 55   | 55   | 55   | 55   | 55   | 55   | 55   | 55   | 55   | 55   | 55        | 55                   | 55   | 55   |

**ALIMENTARY SYSTEM**

|                           |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Esophagus                 | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Large, Cecum    | + | + | + | + | + | + | + | + | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Large, Colon    | + | + | + | + | + | + | + | + | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Large, Rectum   | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Small, Duodenum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Small, Ileum    | + | + | + | + | A | + | + | + | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Small, Jejunum  | + | + | + | + | A | + | + | A | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Liver                     | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Leukemia Mononuclear      |   |   |   |   |   |   |   | X | X |   |   |   | X |   | X | X | X |   | X | X |   | X | X |   |
| Mesentery                 |   |   |   | + |   |   |   |   |   |   | + |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Pancreas                  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Leukemia Mononuclear      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | X |   |
| Salivary Glands           | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Stomach, Forestomach      | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Stomach, Glandular        | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
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Date Report Requested: 01/18/2012  
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 Lab: BNW

| FISCHER 344-TACONIC RATS<br>FEMALE<br>2.5 mg/m3 | DAY ON TEST |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      | ANIMAL ID                | females<br>(cont...) |
|---|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|--------------------------|----------------------|
|   | 0730        | 0732 | 0737 | 0731 | 0739 | 0768 | 0773 | 0766 | 0777 | 0761 | 0766 | 0722 | 0755 | 0777 | 0777 | 0777 | 0777 | 0766 | 0755 | 0777 | 0777 | 0777 | 0766 | 0766 |                          |                      |
|   | 0000        | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 000000000000000000000000 |                      |

Pars Distalis, Carcinoma

Thyroid Gland  
 Bilateral, C-cell, Adenoma  
 C-cell, Adenoma  
 C-cell, Carcinoma  
 Follicular Cell, Adenoma

+  
 X  
 X

**GENERAL BODY SYSTEM**

NONE

**GENITAL SYSTEM**

Clitoral Gland  
 Adenoma  
 Carcinoma  
 Ovary  
 Granulosa Cell Tumor Malignant  
 Leukemia Mononuclear  
 Uterus  
 Carcinoma  
 Leukemia Mononuclear  
 Polyp Stromal

+  
 X X X  
 X  
 +  
 X X X  
 X

**HEMATOPOIETIC SYSTEM**

Bone Marrow

+ +

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
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|---|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------------------|
|   | ANIMAL ID   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |                      |
|   | 00501       | 00502 | 00503 | 00504 | 00505 | 00506 | 00507 | 00508 | 00509 | 00510 | 00511 | 00512 | 00513 | 00514 | 00515 | 00516 | 00517 | 00518 | 00519 | 00520 | 00521 | 00522 |                      |

|  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lymph Node<br>Deep Cervical, Lumbar, Leukemia<br>Mononuclear     |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Lymph Node<br>Iliac, Pancreatic, Renal, Leukemia<br>Mononuclear  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Lymph Node<br>Lumbar, Pancreatic, Renal, Leukemia<br>Mononuclear |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | X |   |   |   |
| Lymph Node<br>Renal, Leukemia Mononuclear                        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | X |   |   |   |   |
| Lymph Node, Bronchial<br>Leukemia Mononuclear                    | M | + | + | + | M | + | M | M | + | M | + | M | + | + | + | + | + | + | + | + | + | + | M | M | M |
| Lymph Node, Mandibular<br>Leukemia Mononuclear                   | M | + | + | + | + | + | + | X | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Lymph Node, Mediastinal<br>Leukemia Mononuclear                  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M |   |
| Lymph Node, Mesenteric<br>Leukemia Mononuclear                   | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | X | + | + |
| Spleen<br>Leukemia Mononuclear                                   | + | + | + | + | + | + | + | X | X | X | + | + | X | + | + | X | + | + | X | X | X | + | X | X | + |
| Thymus<br>Leukemia Mononuclear                                   | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |

| INTEGUMENTARY SYSTEM |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|----------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mammary Gland        | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue

M .. Missing tissue  
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| FISCHER 344-TACONIC RATS<br>FEMALE<br>2.5 mg/m3 | DAY ON TEST |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      | ANIMAL ID | females<br>(cont...) |
|---|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----------|----------------------|
|   | 0730        | 0732 | 0737 | 0739 | 0768 | 0767 | 0773 | 0771 | 0766 | 0766 | 0722 | 0755 | 0777 | 0777 | 0777 | 0766 | 0755 | 0777 | 0777 | 0777 | 0766 | 0766 | 0777 | 0766 | 0777 |           |                      |
|   | 0           | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0005001   |                      |
|   | 0           | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0005002   |                      |
|   | 5           | 5    | 5    | 5    | 5    | 5    | 5    | 5    | 5    | 5    | 5    | 5    | 5    | 5    | 5    | 5    | 5    | 5    | 5    | 5    | 5    | 5    | 5    | 5    | 5    | 0005003   |                      |
|   | 0           | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0005004   |                      |
|   | 1           | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 0    | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 0    | 1    | 2    | 3    | 4    | 5    | 0005005   |                      |

Adenocarcinoma

Adenoma

Fibroadenoma

X

X

X

X

X

X

X

Skin

Keratoacanthoma

Squamous Cell Papilloma

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MUSCULOSKELETAL SYSTEM

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NERVOUS SYSTEM

Brain

Carcinoma, Metastatic, Pituitary Gland

Glioma Malignant

Leukemia Mononuclear

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X

RESPIRATORY SYSTEM

Larynx

Leukemia Mononuclear

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Lung

Alveolar/Bronchiolar Adenoma

Alveolar/Bronchiolar Adenoma, Multiple

Alveolar/Bronchiolar Carcinoma

Alveolar/Bronchiolar Carcinoma, Multiple

Cystic Keratinizing Epithelioma

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X

\* .. Total animals with tissue examined microscopically; Total animals with tumor

+ .. Tissue examined microscopically

X .. Lesion present

I .. Insufficient tissue

M .. Missing tissue

A .. Autolysis precludes evaluation

BLANK .. Not examined microscopically

Experiment Number: 60311 - 05  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: RATS/F344/N Tac

P04: NEOPLASMS BY INDIVIDUAL ANIMAL  
 Cobalt  
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012  
 Time Report Requested: 14:48:11  
 First Dose M/F: 05/08/06 / 05/08/06  
 Lab: BNW

| FISCHER 344-TACONIC RATS<br>FEMALE<br>2.5 mg/m3 | DAY ON TEST |      | ANIMAL ID |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      | females<br>(cont...) |      |      |  |
|---|-------------|------|-----------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|----------------------|------|------|--|
|   | 0730        | 0732 | 0737      | 0739 | 0768 | 0768 | 0773 | 0773 | 0766 | 0766 | 0721 | 0725 | 0773 | 0773 | 0773 | 0773 | 0773 | 0766 | 0766 | 0773 | 0773 | 0766 |                      | 0766 | 0773 |  |
| Leukemia Mononuclear                            |             |      |           |      |      |      |      |      |      | X    | X    |      |      |      |      |      |      |      |      | X    | X    | X    |                      | X    | X    |  |
| Nose<br>Leukemia Mononuclear                    | +           | +    | +         | +    | I    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +                    | +    | +    |  |
| Trachea   | +           | +    | +         | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +                    | +    | +    |  |
| <b>SPECIAL SENSES SYSTEM</b>                    |             |      |           |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |                      |      |      |  |
| Eye   | +           | +    | +         | +    | +    | +    | +    | +    | +    | A    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +                    | +    | +    |  |
| Harderian Gland<br>Leukemia Mononuclear         | +           | +    | +         | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +                    | +    | +    |  |
| <b>URINARY SYSTEM</b>                           |             |      |           |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |                      |      |      |  |
| Kidney<br>Leukemia Mononuclear                  | +           | +    | +         | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +                    | +    | +    |  |
| Urinary Bladder<br>Leukemia Mononuclear         | +           | +    | +         | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +                    | +    | +    |  |
| <b>SYSTEMIC LESIONS</b>                         |             |      |           |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |                      |      |      |  |
| Multiple Organ<br>Leukemia Mononuclear          | +           | +    | +         | +    | +    | +    | +    | +    | +    | X    | X    | X    |      | +    | +    | X    |      | +    | +    | X    | X    | X    |                      | X    | X    |  |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue

M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically

Experiment Number: 60311 - 05  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: RATS/F344/N Tac

P04: NEOPLASMS BY INDIVIDUAL ANIMAL

Cobalt

CAS Number: 7440-48-4

Date Report Requested: 01/18/2012

Time Report Requested: 14:48:11

First Dose M/F: 05/08/06 / 05/08/06

Lab: BNW

|  |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |          |
|--|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----------|
| <b>FISCHER 344-TACONIC RATS<br/>FEMALE<br/>2.5 mg/m3</b> | DAY ON TEST | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | * TOTALS |
|  | ANIMAL ID   | 5 | 5 | 7 | 5 | 5 | 6 | 1 | 7 | 7 | 5 | 6 | 7 | 7 | 7 | 7 | 6 | 7 | 7 | 7 | 5 | 6 | 7 | 7 | 6 | 7 | 5 |          |
|  |             | 9 | 9 | 3 | 4 | 8 | 5 | 1 | 3 | 3 | 9 | 0 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 9 | 1 | 3 | 3 | 9 | 3 | 2 |   |          |
|  |             | 1 | 0 | 1 | 1 | 9 | 4 | 7 | 1 | 1 | 3 | 5 | 2 | 1 | 2 | 2 | 8 | 2 | 1 | 2 | 0 | 8 | 1 | 1 | 5 | 2 |   |          |
|  |             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |   |          |
|  |             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |   |          |
|  |             | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |   |          |
|  |             | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 |   |          |
|  |             | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 4 | 5 | 6 | 7 | 8 |   |          |

ALIMENTARY SYSTEM

|                           |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |
|---------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|
| Esophagus                 | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + | 49 |
| Intestine Large, Cecum    | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |
| Intestine Large, Colon    | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |
| Intestine Large, Rectum   | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Intestine Small, Duodenum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Intestine Small, Ileum    | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 48 |
| Intestine Small, Jejunum  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 47 |
| Liver                     | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Leukemia Mononuclear      | X | X |   |   | X | X | X |   |   | X | X | X | X |   |   | X |   |   |   |   |   | X |   |   |   | X |   |   | 23 |
| Mesentery                 | + | + |   |   |   |   |   |   |   |   |   |   | + |   |   |   |   |   |   |   |   | + | + | + |   |   |   |   | 8  |
| Pancreas                  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Leukemia Mononuclear      |   |   |   |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 2  |
| Salivary Glands           | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Stomach, Forestomach      | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Stomach, Glandular        | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue

M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically

Experiment Number: 60311 - 05  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: RATS/F344/N Tac

P04: NEOPLASMS BY INDIVIDUAL ANIMAL  
 Cobalt  
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012  
 Time Report Requested: 14:48:11  
 First Dose M/F: 05/08/06 / 05/08/06  
 Lab: BNW

| FISCHER 344-TACONIC RATS<br>FEMALE<br>2.5 mg/m3 | DAY ON TEST      |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  | * TOTALS         |                  |                  |                  |
|---|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
|   | 0<br>5<br>9<br>1 | 0<br>5<br>9<br>0 | 0<br>7<br>3<br>1 | 0<br>5<br>4<br>1 | 0<br>5<br>8<br>9 | 0<br>6<br>5<br>4 | 0<br>1<br>1<br>7 | 0<br>7<br>3<br>1 | 0<br>7<br>3<br>1 | 0<br>5<br>9<br>3 | 0<br>6<br>0<br>5 | 0<br>7<br>3<br>2 | 0<br>7<br>3<br>1 | 0<br>7<br>3<br>2 | 0<br>6<br>2<br>8 | 0<br>7<br>3<br>2 | 0<br>7<br>3<br>3 | 0<br>5<br>9<br>0 | 0<br>6<br>1<br>8 | 0<br>7<br>3<br>1 |                  | 0<br>7<br>3<br>1 | 0<br>6<br>9<br>5 | 0<br>7<br>3<br>2 |
| ANIMAL ID                                       | 0<br>5<br>2<br>6 | 0<br>0<br>5<br>7 | 0<br>0<br>5<br>2 | 0<br>0<br>5<br>2 | 0<br>0<br>5<br>3 | 0<br>0<br>5<br>3 | 0<br>0<br>5<br>3 | 0<br>0<br>5<br>3 | 0<br>0<br>5<br>3 | 0<br>0<br>5<br>3 | 0<br>0<br>5<br>3 | 0<br>0<br>5<br>3 | 0<br>0<br>5<br>3 | 0<br>0<br>5<br>3 | 0<br>0<br>5<br>4 | 0<br>0<br>5<br>4 | 0<br>0<br>5<br>4 | 0<br>0<br>5<br>4 | 0<br>0<br>5<br>4 | 0<br>0<br>5<br>4 | 0<br>0<br>5<br>5 | 0<br>0<br>5<br>5 | 0<br>0<br>5<br>4 | 0<br>0<br>5<br>9 |

|                                   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |   |
|-----------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--------|---|
| Tongue<br>Squamous Cell Carcinoma |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 1<br>1 |   |
| Tooth                             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        | 2 |

**CARDIOVASCULAR SYSTEM**

|                      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |
|----------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|
| Heart                | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Leukemia Mononuclear |   |   |   |   | X |   |   |   |   | X |   |   |   |   | X |   |   |   |   | X |   |   | X |   | 7  |
| Schwannoma Malignant |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1  |

**ENDOCRINE SYSTEM**

|                                       |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |
|---------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|
| Adrenal Cortex                        | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Leukemia Mononuclear                  |   |   | X |   | X |   |   |   |   | X |   | X |   |   | X |   |   |   | X |   | X |   |   |   | 12 |
| Adrenal Medulla                       | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Leukemia Mononuclear                  |   |   | X |   | X |   |   |   |   | X |   | X |   |   | X |   |   |   | X |   | X |   |   |   | 12 |
| Pheochromocytoma Benign               | X | X |   |   |   |   |   | X |   |   | X |   | X |   |   |   |   | X |   |   |   |   |   |   | 14 |
| Pheochromocytoma Malignant            |   |   |   |   |   |   |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   | 2  |
| Bilateral, Pheochromocytoma Benign    |   |   |   |   |   |   |   |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   |   |   | 8  |
| Bilateral, Pheochromocytoma Malignant |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | X | 1  |
| Islets, Pancreatic                    | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Parathyroid Gland                     | + | + | + | + | M | M | + | + | + | + | M | + | + | + | + | + | + | M | + | + | M | + | + | + | 38 |
| Pituitary Gland                       | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |
| Leukemia Mononuclear                  |   |   |   |   | X | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   | X |   |   |   | 4  |
| Pars Distalis, Adenoma                | X |   | X |   |   | X |   | X | X | X |   |   |   | X | X |   |   |   | X |   | X |   |   | X | 26 |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue  
 M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically

Experiment Number: 60311 - 05  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: RATS/F344/N Tac

P04: NEOPLASMS BY INDIVIDUAL ANIMAL  
 Cobalt  
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012  
 Time Report Requested: 14:48:11  
 First Dose M/F: 05/08/06 / 05/08/06  
 Lab: BNW

| FISCHER 344-TACONIC RATS<br>FEMALE<br>2.5 mg/m3 | DAY ON TEST |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | * TOTALS |      |    |    |
|---|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|------|----|----|
|   | 0591        | 0590  | 0731  | 0754  | 0558  | 0614  | 0717  | 0773  | 0593  | 0665  | 0772  | 0773  | 0773  | 0773  | 0672  | 0773  | 0773  | 0590  | 0668  | 0771  | 0773  | 0665  | 0773  | 0672  |          | 0773 |    |    |
| ANIMAL ID                                       | 00526       | 00527 | 00528 | 00529 | 00530 | 00531 | 00532 | 00533 | 00534 | 00535 | 00536 | 00537 | 00538 | 00539 | 00540 | 00541 | 00542 | 00543 | 00544 | 00545 | 00546 | 00547 | 00548 | 00549 | 00550    |      |    |    |
| Pars Distalis, Carcinoma                        |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          | X    | 1  |    |
| Thyroid Gland                                   | +           | +     | +     | +     | +     | M     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | +    | +  | 49 |
| Bilateral, C-cell, Adenoma                      |             |       |       |       |       |       |       |       |       |       | X     |       |       |       |       |       |       |       |       |       |       |       |       |       |          |      |    | 2  |
| C-cell, Adenoma                                 |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          | X    |    | 2  |
| C-cell, Carcinoma                               |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |      | X  | 1  |
| Follicular Cell, Adenoma                        |             |       |       |       |       |       |       |       |       |       | X     |       |       |       |       |       |       |       |       |       |       |       |       |       |          |      |    | 1  |
| <b>GENERAL BODY SYSTEM</b>                      |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |      |    |    |
| NONE  |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |      |    |    |
| <b>GENITAL SYSTEM</b>                           |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |      |    |    |
| Clitoral Gland                                  | +           | +     | +     | +     | +     | +     | +     | +     | M     | +     | +     | +     | +     | +     | M     | +     | +     | +     | +     | +     | +     | +     | +     | +     | M        | +    | 47 |    |
| Adenoma   |             |       |       |       |       |       |       |       |       |       |       |       |       |       | X     |       |       |       |       |       |       |       |       |       |          | X    |    | 6  |
| Carcinoma                                       |             |       |       |       |       |       |       |       |       | X     |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |      |    | 3  |
| Ovary   | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | +    | +  | 50 |
| Granulosa Cell Tumor Malignant                  |             |       |       |       |       |       |       |       |       |       |       | X     |       |       |       |       |       |       |       |       |       |       |       |       |          |      |    | 1  |
| Leukemia Mononuclear                            |             |       |       |       | X     | X     | X     |       |       |       |       |       | X     | X     |       |       |       |       |       |       |       |       |       | X     |          | X    |    | 8  |
| Uterus  | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | +    | +  | 50 |
| Carcinoma                                       | X           |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |      |    | 1  |
| Leukemia Mononuclear                            |             |       |       |       |       | X     |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |      |    | 2  |
| Polyp Stromal                                   |             |       |       |       | X     |       |       |       |       |       |       |       |       |       |       | X     | X     |       |       |       |       |       |       |       |          |      |    | 6  |
| <b>HEMATOPOIETIC SYSTEM</b>                     |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |      |    |    |
| Bone Marrow                                     | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | +    | +  | 50 |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue

M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically

Experiment Number: 60311 - 05

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: RATS/F344/N Tac

P04: NEOPLASMS BY INDIVIDUAL ANIMAL

Cobalt

CAS Number: 7440-48-4

Date Report Requested: 01/18/2012

Time Report Requested: 14:48:11

First Dose M/F: 05/08/06 / 05/08/06

Lab: BNW

| FISCHER 344-TACONIC RATS<br>FEMALE<br>2.5 mg/m3 | DAY ON TEST |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | * TOTALS |   |   |   |    |    |  |
|---|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----------|---|---|---|----|----|--|
|   | 0           | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |          | 0 |   |   |    |    |  |
|   | 5           | 5 | 7 | 5 | 5 | 6 | 1 | 7 | 7 | 5 | 6 | 7 | 7 | 7 | 7 | 6 | 7 | 7 | 7 | 5 |          | 6 | 7 | 7 | 6  | 7  |  |
| ANIMAL ID                                       | 9           | 9 | 3 | 4 | 8 | 5 | 1 | 3 | 3 | 9 | 0 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 9 | 1 | 3        | 3 | 9 | 3 |    |    |  |
| ANIMAL ID                                       | 1           | 0 | 1 | 1 | 9 | 4 | 7 | 1 | 1 | 3 | 5 | 2 | 1 | 2 | 2 | 8 | 2 | 1 | 2 | 0 | 8        | 1 | 1 | 5 | 2  |    |  |
| ANIMAL ID                                       | 0           | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0        | 0 | 0 | 0 | 0  |    |  |
| ANIMAL ID                                       | 5           | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5        | 5 | 5 | 5 | 5  |    |  |
| ANIMAL ID                                       | 2           | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4        | 4 | 4 | 4 | 4  |    |  |
| ANIMAL ID                                       | 6           | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5        | 6 | 7 | 8 | 9  |    |  |
| Lymph Node                                      |             |   |   | + | + |   |   | + |   |   |   |   |   |   |   |   |   |   |   |   |          |   |   |   |    | 7  |  |
| Deep Cervical, Lumbar, Leukemia Mononuclear     |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |          |   |   |   |    | 1  |  |
| Iliac, Pancreatic, Renal, Leukemia Mononuclear  |             |   |   |   |   |   |   | X |   | X |   |   |   |   |   |   |   |   |   |   |          |   |   |   |    | 2  |  |
| Lumbar, Pancreatic, Renal, Leukemia Mononuclear |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |          |   |   |   |    | 1  |  |
| Renal, Leukemia Mononuclear                     |             |   |   |   |   |   |   |   |   |   |   |   | X |   |   |   |   |   |   |   |          |   |   |   |    | 2  |  |
| Lymph Node, Bronchial Leukemia Mononuclear      | +           | M | M | + | + | M | M | M | M | M | + | M | + | + | M | M | M | M | M | M | M        | M | M | M | M  | 22 |  |
|   |             |   |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   |          |   |   |   | 2  |    |  |
| Lymph Node, Mandibular Leukemia Mononuclear     | +           | + | + | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | M | + | +        | + | + | + | 47 |    |  |
|   |             |   |   |   |   |   | X |   | X |   | X |   |   |   |   |   |   |   |   |   |          |   |   |   | 6  |    |  |
| Lymph Node, Mediastinal Leukemia Mononuclear    | +           | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M | + | + | + | +        | + | + | + | 48 |    |  |
|   |             |   |   |   |   |   | X |   | X |   | X |   |   |   |   |   |   |   |   |   |          |   |   |   | 4  |    |  |
| Lymph Node, Mesenteric Leukemia Mononuclear     | +           | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | +        | + | + | + | 50 |    |  |
|   |             |   |   |   |   |   |   |   | X |   | X |   |   |   |   | X |   |   |   |   |          |   |   |   | 5  |    |  |
| Spleen Leukemia Mononuclear                     | +           | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | +        | + | + | + | 50 |    |  |
|   | X           | X | X | X | X | X | X |   |   | X | X | X | X |   |   | X | X | X | X |   |          | X |   | X | 28 |    |  |
| Thymus Leukemia Mononuclear                     | +           | + | + | + | + | + | + | + | + | + | + | + | + | M | + | + | + | + | + | + | +        | M | M | + | M  | 46 |  |
|   |             |   |   |   |   |   | X |   | X |   | X |   |   |   |   |   |   |   |   |   |          |   |   |   | 4  |    |  |
| <b>INTEGUMENTARY SYSTEM</b>                     |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |          |   |   |   |    |    |  |
| Mammary Gland                                   | +           | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | +        | + | + | + | +  | 50 |  |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue

M .. Missing tissue  
 A .. Autolysis precludes evaluation  
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Experiment Number: 60311 - 05  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: RATS/F344/N Tac

P04: NEOPLASMS BY INDIVIDUAL ANIMAL  
 Cobalt  
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012  
 Time Report Requested: 14:48:11  
 First Dose M/F: 05/08/06 / 05/08/06  
 Lab: BNW

| FISCHER 344-TACONIC RATS<br>FEMALE<br>2.5 mg/m3 | DAY ON TEST |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | * TOTALS |  |
|---|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|--|
|   | 0591        | 0590  | 0731  | 0541  | 0559  | 0664  | 0177  | 0773  | 0771  | 0553  | 0665  | 0772  | 0771  | 0772  | 0772  | 0668  | 0772  | 0773  | 0559  | 0661  | 0773  | 0771  | 0665  | 0772  |          |  |
| ANIMAL ID                                       | 00526       | 00527 | 00528 | 00529 | 00530 | 00531 | 00532 | 00533 | 00534 | 00535 | 00536 | 00537 | 00538 | 00539 | 00540 | 00541 | 00542 | 00543 | 00544 | 00545 | 00546 | 00547 | 00548 | 00549 |          |  |
| Adenocarcinoma                                  |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 1        |  |
| Adenoma   |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 1        |  |
| Fibroadenoma                                    |             |       |       |       |       |       | X     | X     | X     |       | X     | X     |       |       |       | X     | X     |       | X     | X     | X     |       |       | 15    |          |  |
| Skin  | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | 50       |  |
| Keratoacanthoma                                 |             |       |       |       |       |       |       |       |       |       |       |       |       | X     |       |       |       |       |       |       |       |       |       |       | 2        |  |
| Squamous Cell Papilloma                         |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | X     |       |       | 1        |  |
| <b>MUSCULOSKELETAL SYSTEM</b>                   |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |  |
| Bone  | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | 50       |  |
| <b>NERVOUS SYSTEM</b>                           |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |  |
| Brain   | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | 50       |  |
| Carcinoma, Metastatic, Pituitary Gland          |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | X     |       |       |       |       |       |       |       | 1        |  |
| Glioma Malignant                                |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 1        |  |
| Leukemia Mononuclear                            |             |       |       |       |       |       | X     |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 1        |  |
| <b>RESPIRATORY SYSTEM</b>                       |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |  |
| Larynx  | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | 50       |  |
| Leukemia Mononuclear                            |             |       |       |       |       | X     | X     |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 2        |  |
| Lung  | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | 50       |  |
| Alveolar/Bronchiolar Adenoma                    |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | X     |       |       |       | X     |       |       | 6        |  |
| Alveolar/Bronchiolar Adenoma, Multiple          |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 3        |  |
| Alveolar/Bronchiolar Carcinoma                  |             |       |       |       |       |       |       |       |       |       | X     | X     |       |       |       | X     | X     |       |       |       | X     | X     |       |       | 14       |  |
| Alveolar/Bronchiolar Carcinoma, Multiple        |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 3        |  |
| Cystic Keratinizing Epithelioma                 |             |       |       |       |       |       |       |       |       |       |       | X     |       |       |       |       |       |       |       |       |       |       |       |       | 1        |  |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue

M .. Missing tissue  
 A .. Autolysis precludes evaluation  
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Experiment Number: 60311 - 05  
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 Species/Strain: RATS/F344/N Tac

P04: NEOPLASMS BY INDIVIDUAL ANIMAL  
 Cobalt  
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012  
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 First Dose M/F: 05/08/06 / 05/08/06  
 Lab: BNW

| FISCHER 344-TACONIC RATS<br>FEMALE<br>2.5 mg/m3 | DAY ON TEST |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  | * TOTALS |
|---|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--|----------|
|   | 0591        | 0590  | 0731  | 0734  | 0589  | 0654  | 0177  | 0773  | 0771  | 0593  | 0665  | 0772  | 0773  | 0773  | 0773  | 0672  | 0773  | 0599  | 0668  | 0771  | 0771  | 0665  | 0773  |  |          |
| ANIMAL ID                                       | 00526       | 00527 | 00528 | 00529 | 00530 | 00531 | 00532 | 00533 | 00534 | 00535 | 00536 | 00537 | 00538 | 00539 | 00540 | 00541 | 00542 | 00543 | 00544 | 00545 | 00546 | 00547 | 00548 |  |          |
| Leukemia Mononuclear                            | X           | X     |       |       | X     | X     |       |       | X     | X     |       | X     |       |       | X     |       |       |       |       | X     |       | X     |       |  |          |
| Nose  | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     |  |          |
| Leukemia Mononuclear                            |             |       |       |       | X     | X     |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | X     |       |  |          |
| Trachea   | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     |  |          |
| <b>SPECIAL SENSES SYSTEM</b>                    |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |          |
| Eye   | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     |  |          |
| Harderian Gland                                 | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     |  |          |
| Leukemia Mononuclear                            |             |       |       |       |       | X     |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |          |
| <b>URINARY SYSTEM</b>                           |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |          |
| Kidney  | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     |  |          |
| Leukemia Mononuclear                            |             |       |       | X     | X     |       |       |       | X     |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |          |
| Urinary Bladder                                 | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     |  |          |
| Leukemia Mononuclear                            |             |       |       | X     |       |       |       |       |       |       |       |       |       | X     |       |       |       |       |       |       |       |       |       |  |          |
| <b>SYSTEMIC LESIONS</b>                         |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |          |
| Multiple Organ                                  | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     |  |          |
| Leukemia Mononuclear                            | X           | X     | X     | X     | X     | X     | X     |       |       | X     | X     | X     | X     |       |       | X     | X     | X     | X     |       |       | X     |       |  |          |

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 Cobalt  
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 Lab: BNW

| FISCHER 344-TACONIC RATS<br>FEMALE<br>5.0 mg/m3 | DAY ON TEST           |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | ANIMAL ID             | females<br>(cont...) |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------------|
|   | 0<br>7<br>3<br>1      | 0<br>7<br>3<br>0      | 0<br>7<br>3<br>1      | 0<br>4<br>7<br>8      | 0<br>7<br>3<br>0      | 0<br>4<br>7<br>3      | 0<br>6<br>0<br>0      | 0<br>7<br>2<br>5      | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>1      | 0<br>7<br>3<br>1      | 0<br>7<br>3<br>1      | 0<br>6<br>9<br>1      | 0<br>7<br>1<br>2      | 0<br>5<br>3<br>0      | 0<br>5<br>0<br>6      | 0<br>7<br>3<br>2      | 0<br>6<br>4<br>6      | 0<br>7<br>3<br>2      | 0<br>4<br>8<br>9      | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>1      | 0<br>7<br>3<br>1      | 0<br>7<br>3<br>2      |                       |                      |
|   | 0<br>0<br>7<br>0<br>1 | 0<br>0<br>7<br>0<br>2 | 0<br>0<br>7<br>0<br>3 | 0<br>0<br>7<br>0<br>4 | 0<br>0<br>7<br>0<br>5 | 0<br>0<br>7<br>0<br>6 | 0<br>0<br>7<br>0<br>7 | 0<br>0<br>7<br>0<br>8 | 0<br>0<br>7<br>0<br>9 | 0<br>0<br>7<br>1<br>0 | 0<br>0<br>7<br>1<br>1 | 0<br>0<br>7<br>1<br>2 | 0<br>0<br>7<br>1<br>3 | 0<br>0<br>7<br>1<br>4 | 0<br>0<br>7<br>1<br>5 | 0<br>0<br>7<br>1<br>6 | 0<br>0<br>7<br>1<br>7 | 0<br>0<br>7<br>1<br>8 | 0<br>0<br>7<br>1<br>9 | 0<br>0<br>7<br>2<br>0 | 0<br>0<br>7<br>2<br>1 | 0<br>0<br>7<br>2<br>2 | 0<br>0<br>7<br>2<br>3 | 0<br>0<br>7<br>2<br>4 | 0<br>0<br>7<br>2<br>5 |                      |

**ALIMENTARY SYSTEM**

|                           |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Esophagus                 | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Large, Cecum    | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Large, Colon    | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Large, Rectum   | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Small, Duodenum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Small, Ileum    | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Small, Jejunum  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Liver                     | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Leukemia Mononuclear      |   |   |   | X | X |   | X |   | X |   |   |   | X | X |   |   |   | X | X | X |   |   |   |   |   |
| Mesentery                 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Leukemia Mononuclear      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Pancreas                  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Salivary Glands           | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Stomach, Forestomach      | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Squamous Cell Papilloma   |   |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Stomach, Glandular        | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue

M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically

**Experiment Number:** 60311 - 05  
**Test Type:** CHRONIC  
**Route:** RESPIRATORY EXPOSURE WHOLE BODY  
**Species/Strain:** RATS/F344/N Tac

**P04: NEOPLASMS BY INDIVIDUAL ANIMAL**  
 Cobalt  
**CAS Number:** 7440-48-4

**Date Report Requested:** 01/18/2012  
**Time Report Requested:** 14:48:11  
**First Dose M/F:** 05/08/06 / 05/08/06  
**Lab:** BNW

| DAY ON TEST  |           |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  | females<br>(cont...) |                  |                  |                  |                  |                  |                  |
|--|-----------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|----------------------|------------------|------------------|------------------|------------------|------------------|------------------|
|  |           | 0<br>7<br>3<br>1 | 0<br>7<br>3<br>0 | 0<br>7<br>3<br>1 | 0<br>4<br>7<br>8 | 0<br>7<br>3<br>0 | 0<br>4<br>7<br>3 | 0<br>6<br>7<br>0 | 0<br>7<br>2<br>5 | 0<br>7<br>3<br>2 | 0<br>7<br>3<br>1 | 0<br>7<br>3<br>1 | 0<br>7<br>3<br>1 | 0<br>6<br>9<br>1 | 0<br>7<br>1<br>2 | 0<br>5<br>3<br>0 | 0<br>5<br>7<br>6 | 0<br>7<br>4<br>2 | 0<br>4<br>3<br>9 | 0<br>7<br>8<br>2 | 0<br>7<br>3<br>1 |                      | 0<br>7<br>3<br>1 | 0<br>7<br>3<br>2 |                  |                  |                  |                  |
| <b>FISCHER 344-TACONIC RATS</b><br><b>FEMALE</b><br><br><b>5.0 mg/m3</b> | ANIMAL ID | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                    | 0                |                  |                  |                  |                  |                  |
|  |           | 0<br>7<br>0<br>1 | 0<br>7<br>0<br>2 | 0<br>7<br>0<br>3 | 0<br>7<br>0<br>4 | 0<br>7<br>0<br>5 | 0<br>7<br>0<br>6 | 0<br>7<br>0<br>7 | 0<br>7<br>0<br>8 | 0<br>7<br>0<br>9 | 0<br>7<br>0<br>0 | 0<br>7<br>0<br>1 | 0<br>7<br>0<br>2 | 0<br>7<br>0<br>3 | 0<br>7<br>0<br>4 | 0<br>7<br>0<br>5 | 0<br>7<br>0<br>6 | 0<br>7<br>0<br>7 | 0<br>7<br>0<br>8 | 0<br>7<br>0<br>9 | 0<br>7<br>0<br>0 | 0<br>7<br>0<br>1     | 0<br>7<br>0<br>2 | 0<br>7<br>0<br>3 | 0<br>7<br>0<br>4 | 0<br>7<br>0<br>5 | 0<br>7<br>0<br>6 | 0<br>7<br>0<br>7 |

Tooth

**CARDIOVASCULAR SYSTEM**

|   |   |   |   |   |   |  |  |   |  |  |  |  |  |  |  |   |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|--|--|---|--|--|--|--|--|--|--|---|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| Heart   | + | + | + | + | + |  |  |   |  |  |  |  |  |  |  |   |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Leukemia Mononuclear  |   |   |   |   |   |  |  | X |  |  |  |  |  |  |  | X |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Pheochromocytoma Malignant, Metastatic, Adrenal Medulla           |   |   |   |   |   |  |  |   |  |  |  |  |  |  |  |   |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Pericardium, Rhabdomyosarcoma, Metastatic, Uncertain Primary Site |   |   |   |   |   |  |  |   |  |  |  |  |  |  |  |   | X |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

**ENDOCRINE SYSTEM**

|                                       |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Adrenal Cortex                        | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Leukemia Mononuclear                  |   |   |   |   | X | X |   |   |   |   | X |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Adrenal Medulla                       | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |   |
| Leukemia Mononuclear                  |   |   |   |   | X | X |   |   |   |   | X |   |   |   |   | X |   |   |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Pheochromocytoma Benign               | X | X |   |   | X |   |   |   |   |   |   |   |   | X | X |   |   |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Pheochromocytoma Malignant            | X |   |   |   | X |   |   |   |   |   |   |   |   |   |   | X |   |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Bilateral, Pheochromocytoma Benign    |   |   | X |   |   |   |   |   | X | X |   | X | X |   |   |   |   |   |   |   |   |   | X | X |   | X | X | X | X |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Bilateral, Pheochromocytoma Malignant |   |   |   |   |   |   |   |   |   |   | X |   |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Islets, Pancreatic                    | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |   |
| Adenoma                               |   |   |   |   |   |   |   |   |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Carcinoma                             |   |   |   |   |   |   |   |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Parathyroid Gland                     | + | M | + | + | + | + | + | + | + | + | + |   | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |   |
| Pituitary Gland                       | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
+ .. Tissue examined microscopically  
X .. Lesion present  
I .. Insufficient tissue  
M .. Missing tissue  
A .. Autolysis precludes evaluation  
BLANK .. Not examined microscopically

Experiment Number: 60311 - 05  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: RATS/F344/N Tac

P04: NEOPLASMS BY INDIVIDUAL ANIMAL  
 Cobalt  
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012  
 Time Report Requested: 14:48:11  
 First Dose M/F: 05/08/06 / 05/08/06  
 Lab: BNW

| FISCHER 344-TACONIC RATS<br>FEMALE<br>5.0 mg/m3                                   | DAY ON TEST           |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | females<br>(cont...) |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------------|
|   | 0<br>7<br>3<br>1      | 0<br>7<br>3<br>0      | 0<br>7<br>3<br>1      | 0<br>4<br>7<br>8      | 0<br>7<br>3<br>0      | 0<br>4<br>7<br>3      | 0<br>6<br>0<br>0      | 0<br>7<br>2<br>5      | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>1      | 0<br>7<br>3<br>1      | 0<br>7<br>3<br>1      | 0<br>6<br>9<br>1      | 0<br>7<br>1<br>2      | 0<br>5<br>3<br>0      | 0<br>5<br>0<br>6      | 0<br>7<br>3<br>2      | 0<br>6<br>4<br>6      | 0<br>7<br>3<br>2      | 0<br>4<br>8<br>9      | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>1      | 0<br>7<br>3<br>1      | 0<br>7<br>3<br>1      |                       |                      |
| ANIMAL ID   | 0<br>0<br>7<br>0<br>1 | 0<br>0<br>7<br>0<br>2 | 0<br>0<br>7<br>0<br>3 | 0<br>0<br>7<br>0<br>4 | 0<br>0<br>7<br>0<br>5 | 0<br>0<br>7<br>0<br>6 | 0<br>0<br>7<br>0<br>7 | 0<br>0<br>7<br>0<br>8 | 0<br>0<br>7<br>0<br>9 | 0<br>0<br>7<br>1<br>0 | 0<br>0<br>7<br>1<br>1 | 0<br>0<br>7<br>1<br>2 | 0<br>0<br>7<br>1<br>3 | 0<br>0<br>7<br>1<br>4 | 0<br>0<br>7<br>1<br>5 | 0<br>0<br>7<br>1<br>6 | 0<br>0<br>7<br>1<br>7 | 0<br>0<br>7<br>1<br>8 | 0<br>0<br>7<br>1<br>9 | 0<br>0<br>7<br>2<br>0 | 0<br>0<br>7<br>2<br>1 | 0<br>0<br>7<br>2<br>2 | 0<br>0<br>7<br>2<br>3 | 0<br>0<br>7<br>2<br>4 | 0<br>0<br>7<br>2<br>5 |                      |
| Leukemia Mononuclear<br>Pars Distalis, Adenoma<br>Pars Distalis, Carcinoma        | X                     | X                     |                       |                       |                       |                       | X                     |                       | X                     | X                     | X                     | X                     |                       |                       | X                     | X                     | X                     | X                     |                       |                       |                       |                       |                       |                       | X                     |                      |
| Thyroid Gland<br>C-cell, Adenoma<br>C-cell, Carcinoma<br>Follicular Cell, Adenoma | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     |                      |
| <b>GENERAL BODY SYSTEM</b>  |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                      |
| NONE  |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                      |
| <b>GENITAL SYSTEM</b>   |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                      |
| Clitoral Gland<br>Adenoma<br>Carcinoma  | +                     | M                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | M                     | +                     | +                     | +                     |                       |                      |
| Ovary<br>Leukemia Mononuclear<br>Thecoma Benign                                   | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     |                      |
| Uterus<br>Leukemia Mononuclear<br>Polyp Stromal                                   | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     |                      |
| <b>HEMATOPOIETIC SYSTEM</b>   |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                      |
| Bone Marrow   | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     |                      |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue

M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically

Experiment Number: 60311 - 05

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: RATS/F344/N Tac

P04: NEOPLASMS BY INDIVIDUAL ANIMAL

Cobalt

CAS Number: 7440-48-4

Date Report Requested: 01/18/2012

Time Report Requested: 14:48:11

First Dose M/F: 05/08/06 / 05/08/06

Lab: BNW

|  |  | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | females<br>(cont...) |
|--|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----------------------|
| DAY ON TEST                                      |  | 7 | 7 | 7 | 4 | 7 | 4 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 6 | 7 | 5 | 5 | 7 | 6 | 7 | 4 | 7 | 7 | 7 | 7 |                      |
| FISCHER 344-TACONIC RATS<br>FEMALE<br>5.0 mg/m3  |  | 3 | 3 | 3 | 7 | 3 | 7 | 0 | 2 | 3 | 3 | 3 | 3 | 3 | 9 | 1 | 3 | 0 | 3 | 4 | 3 | 8 | 3 | 3 | 3 | 3 |                      |
| ANIMAL ID  |  | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |                      |
| Leukemia Mononuclear                             |  |   |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                      |
| Lymph Node                                       |  |   |   |   | + |   |   | + |   |   |   |   |   |   |   |   |   |   |   |   |   | + |   |   |   |   |                      |
| Lumbar, Pancreatic, Renal, Leukemia Mononuclear  |  |   |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                      |
| Pancreatic, Leukemia Mononuclear                 |  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                      |
| Renal, Leukemia Mononuclear                      |  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | X |   |   |   |   |                      |
| Lymph Node, Bronchial                            |  | + | M | + | M | M | M | + | M | M | + | + | M | M | M | + | + | M | + | + | M | + | + | + | + | M |                      |
| Alveolar/Bronchiolar Carcinoma, Metastatic, Lung |  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                      |
| Leukemia Mononuclear                             |  |   |   |   |   |   |   |   |   |   |   |   |   |   | X |   |   |   |   |   |   | X |   |   |   |   |                      |
| Lymph Node, Mandibular                           |  | + | + | + | + | + | + | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + | + | + |   |                      |
| Leukemia Mononuclear                             |  |   |   |   |   | X | X |   |   |   | X |   |   |   | X |   |   |   |   | X | X |   |   |   |   |   |                      |
| Lymph Node, Mediastinal                          |  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |   |                      |
| Leukemia Mononuclear                             |  |   |   |   |   | X |   |   |   | X |   |   |   |   | X |   |   |   |   |   | X |   |   |   |   |   |                      |
| Lymph Node, Mesenteric                           |  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |   |                      |
| Leukemia Mononuclear                             |  |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | X |   |   |   |   |                      |
| Spleen   |  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |   |                      |
| Leukemia Mononuclear                             |  | X |   | X |   | X | X |   | X |   | X |   |   | X | X |   |   |   |   | X | X | X |   |   |   |   |                      |
| Thymus   |  | + | + | + | + | + | + | M | + | + | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + |   |                      |
| Alveolar/Bronchiolar Carcinoma, Metastatic, Lung |  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                      |
| Leukemia Mononuclear                             |  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | X |   |   |   |   |                      |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
+ .. Tissue examined microscopically  
X .. Lesion present  
I .. Insufficient tissue

M .. Missing tissue  
A .. Autolysis precludes evaluation  
BLANK .. Not examined microscopically

Experiment Number: 60311 - 05  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: RATS/F344/N Tac

P04: NEOPLASMS BY INDIVIDUAL ANIMAL  
 Cobalt  
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012  
 Time Report Requested: 14:48:11  
 First Dose M/F: 05/08/06 / 05/08/06  
 Lab: BNW

| FISCHER 344-TACONIC RATS<br>FEMALE<br>5.0 mg/m3 | DAY ON TEST           |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | females<br>(cont...)  |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
|   | 0<br>7<br>3<br>1      | 0<br>7<br>3<br>0      | 0<br>7<br>3<br>1      | 0<br>4<br>7<br>8      | 0<br>7<br>3<br>0      | 0<br>4<br>7<br>3      | 0<br>6<br>0<br>0      | 0<br>7<br>2<br>5      | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>1      | 0<br>7<br>3<br>1      | 0<br>7<br>3<br>1      | 0<br>6<br>9<br>1      | 0<br>7<br>1<br>2      | 0<br>5<br>3<br>0      | 0<br>5<br>0<br>6      | 0<br>7<br>3<br>2      | 0<br>6<br>4<br>6      | 0<br>7<br>3<br>2      | 0<br>4<br>8<br>9      | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>1      | 0<br>7<br>3<br>1      | 0<br>7<br>3<br>2      |                       |
| ANIMAL ID                                       | 0<br>0<br>7<br>0<br>1 | 0<br>0<br>7<br>0<br>2 | 0<br>0<br>7<br>0<br>3 | 0<br>0<br>7<br>0<br>4 | 0<br>0<br>7<br>0<br>5 | 0<br>0<br>7<br>0<br>6 | 0<br>0<br>7<br>0<br>7 | 0<br>0<br>7<br>0<br>8 | 0<br>0<br>7<br>0<br>9 | 0<br>0<br>7<br>1<br>0 | 0<br>0<br>7<br>1<br>1 | 0<br>0<br>7<br>1<br>2 | 0<br>0<br>7<br>1<br>3 | 0<br>0<br>7<br>1<br>4 | 0<br>0<br>7<br>1<br>5 | 0<br>0<br>7<br>1<br>6 | 0<br>0<br>7<br>1<br>7 | 0<br>0<br>7<br>1<br>8 | 0<br>0<br>7<br>1<br>9 | 0<br>0<br>7<br>2<br>0 | 0<br>0<br>7<br>2<br>1 | 0<br>0<br>7<br>2<br>2 | 0<br>0<br>7<br>2<br>3 | 0<br>0<br>7<br>2<br>4 | 0<br>0<br>7<br>2<br>5 |

**INTEGUMENTARY SYSTEM**

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mammary Gland                             | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Adenoma                                   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Carcinoma                                 |   |   |   |   |   |   |   |   |   |   |   | X | X |   |   |   |   |   |   |   |   | X |   |   |   |
| Fibroadenoma                              |   | X | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | X |   |   |
| Skin                                      | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Keratoacanthoma                           |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | X |   |   |
| Subcutaneous Tissue, Fibroma              |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Subcutaneous Tissue, Schwannoma Malignant |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |

**MUSCULOSKELETAL SYSTEM**

|  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bone                                   | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Skeletal Muscle                        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Schwannoma Malignant, Metastatic, Skin |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |

**NERVOUS SYSTEM**

|  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Brain                                  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Carcinoma, Metastatic, Pituitary Gland |   |   |   |   |   |   |   |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Leukemia Mononuclear                   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |

**RESPIRATORY SYSTEM**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Larynx | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Lung   | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue

M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically

Experiment Number: 60311 - 05  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: RATS/F344/N Tac

P04: NEOPLASMS BY INDIVIDUAL ANIMAL  
 Cobalt  
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012  
 Time Report Requested: 14:48:11  
 First Dose M/F: 05/08/06 / 05/08/06  
 Lab: BNW

| FISCHER 344-TACONIC RATS<br>FEMALE<br>5.0 mg/m3               | DAY ON TEST |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      | ANIMAL ID | females<br>(cont...) |      |
|---|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----------|----------------------|------|
|   | 0731        | 0730 | 0731 | 0738 | 0730 | 0746 | 0767 | 0772 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 |           |                      | 0777 |
| Alveolar/Bronchiolar Adenoma                                  |             |      |      |      |      |      | X    | X    |      |      |      |      | X    | X    |      |      |      |      | X    |      |      |      |      |      |           |                      |      |
| Alveolar/Bronchiolar Adenoma, Multiple                        |             | X    |      | X    |      |      |      |      |      |      |      |      |      |      |      |      |      |      | X    |      |      |      |      |      |           |                      |      |
| Alveolar/Bronchiolar Carcinoma                                |             | X    |      |      |      |      | X    |      | X    |      |      |      | X    |      |      |      |      |      |      |      | X    |      |      |      |           |                      |      |
| Alveolar/Bronchiolar Carcinoma, Multiple                      | X           |      | X    |      |      |      |      |      | X    | X    | X    |      |      | X    |      | X    |      |      | X    |      | X    |      | X    | X    |           |                      |      |
| Cystic Keratinizing Epithelioma                               | X           |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |           |                      |      |
| Leukemia Mononuclear  |             |      |      | X    | X    |      |      |      | X    |      |      |      |      | X    |      |      |      |      |      | X    |      |      |      |      |           |                      |      |
| Pheochromocytoma Malignant, Metastatic, Adrenal Medulla       |             |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |           |                      |      |
| Squamous Cell Carcinoma                                       |             |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |           |                      |      |
| Mediastinum, Alveolar/Bronchiolar Carcinoma, Metastatic, Lung |             |      |      |      |      |      |      |      |      |      |      | X    |      |      |      |      |      |      |      |      |      |      |      |      |           |                      |      |
| Nose  | +           | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +         |                      |      |
| Leukemia Mononuclear  |             |      |      |      |      |      |      |      |      |      |      |      |      | X    |      |      |      |      |      |      | X    |      |      |      |           |                      |      |
| Trachea   | +           | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +         |                      |      |
| <b>SPECIAL SENSES SYSTEM</b>                                  |             |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |           |                      |      |
| Ear   |             |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |           |                      |      |
| Eye   | +           | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +         |                      |      |
| Harderian Gland   | +           | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +         |                      |      |
| <b>URINARY SYSTEM</b>   |             |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |           |                      |      |
| Kidney  | +           | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +         |                      |      |
| Leukemia Mononuclear  |             |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      | X    |           |                      |      |
| Urinary Bladder   | +           | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +         |                      |      |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue

M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically

Experiment Number: 60311 - 05

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: RATS/F344/N Tac

P04: NEOPLASMS BY INDIVIDUAL ANIMAL

Cobalt

CAS Number: 7440-48-4

Date Report Requested: 01/18/2012

Time Report Requested: 14:48:11

First Dose M/F: 05/08/06 / 05/08/06

Lab: BNW

|  |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| <b>FISCHER 344-TACONIC RATS</b><br><b>FEMALE</b><br><b>5.0 mg/m3</b> | DAY ON TEST | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |   |
|  |             | 7 | 7 | 7 | 4 | 7 | 4 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 6 | 7 | 5 | 5 | 7 | 6 | 7 | 4 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
|  |             | 3 | 3 | 3 | 7 | 3 | 7 | 0 | 2 | 3 | 3 | 3 | 3 | 3 | 9 | 1 | 3 | 0 | 3 | 4 | 3 | 8 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
|  | 1           | 0 | 1 | 8 | 0 | 3 | 0 | 5 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 0 | 6 | 2 | 6 | 2 | 9 | 2 | 1 | 1 | 1 | 1 | 1 | 2 |   |
| ANIMAL ID  | 0           | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |   |
|  | 7           | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |   |
|  | 0           | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |   |
|  | 1           | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 |   |   |   |   |
|  |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|  |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|  |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|  |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|  |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |

females  
(cont...)

Schwannoma Malignant, Metastatic, Skin

SYSTEMIC LESIONS

|                      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|----------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Multiple Organ       | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Leukemia Mononuclear | X |   | X |   | X | X |   | X |   | X |   |   |   | X | X |   |   |   |   | X | X | X |   |   |   |   |   |   |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue

M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically

Experiment Number: 60311 - 05  
Test Type: CHRONIC  
Route: RESPIRATORY EXPOSURE WHOLE BODY  
Species/Strain: RATS/F344/N Tac

**P04: NEOPLASMS BY INDIVIDUAL ANIMAL**  
Cobalt  
CAS Number: 7440-48-4

Date Report Requested: 01/18/2012  
Time Report Requested: 14:48:11  
First Dose M/F: 05/08/06 / 05/08/06  
Lab: BNW

| DAY ON TEST                                | 0               | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
|--|-----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| <b>FISCHER 344-TACONIC RATS<br/>FEMALE</b> | 6               | 6 | 4 | 7 | 7 | 5 | 7 | 6 | 6 | 6 | 7 | 5 | 7 | 6 | 7 | 7 | 5 | 7 | 6 | 7 | 7 | 7 | 7 | 6 | 7 | 6 | 7 | 7 |
| <b>5.0 mg/m3</b>                           | 7               | 0 | 7 | 3 | 3 | 9 | 3 | 3 | 1 | 4 | 3 | 7 | 3 | 7 | 3 | 2 | 7 | 1 | 7 | 3 | 3 | 3 | 1 | 2 | 3 | 2 | 3 | 2 |
|  | 4               | 3 | 1 | 2 | 1 | 0 | 0 | 4 | 8 | 1 | 1 | 9 | 0 | 0 | 1 | 6 | 9 | 7 | 0 | 2 | 1 | 0 | 7 | 1 | 2 | 1 | 2 | 0 |
| ANIMAL ID                                  | 0               | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
|  | 0               | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
|  | 7               | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
|  | 2               | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 |
|  | 6               | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 0 |
|  | <b>* TOTALS</b> |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |

**ALIMENTARY SYSTEM**

|                           |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |
|---------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|
| Esophagus                 | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M | M | + | + | + | + | + | + | + | + | 48 |
| Intestine Large, Cecum    | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Intestine Large, Colon    | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Intestine Large, Rectum   | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |
| Intestine Small, Duodenum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Intestine Small, Ileum    | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Intestine Small, Jejunum  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Liver                     | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Leukemia Mononuclear      | X | X |   | X | X | X | X |   | X | X |   | X |   | X |   | X |   | X |   | X |   |   |   | X | X |   |   | 24 |
| Mesentery                 |   | + |   |   |   |   |   |   | + |   |   |   |   |   | + |   |   |   |   |   | + | + |   |   |   |   |   | 9  |
| Leukemia Mononuclear      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1  |
| Pancreas                  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Salivary Glands           | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Stomach, Forestomach      | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Squamous Cell Papilloma   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1  |
| Stomach, Glandular        | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
+ .. Tissue examined microscopically  
X .. Lesion present  
I .. Insufficient tissue

M .. Missing tissue  
A .. Autolysis precludes evaluation  
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Experiment Number: 60311 - 05  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: RATS/F344/N Tac

P04: NEOPLASMS BY INDIVIDUAL ANIMAL  
 Cobalt  
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012  
 Time Report Requested: 14:48:11  
 First Dose M/F: 05/08/06 / 05/08/06  
 Lab: BNW

| FISCHER 344-TACONIC RATS<br>FEMALE<br>5.0 mg/m3 | DAY ON TEST |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | * TOTALS |       |       |       |
|---|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|-------|-------|-------|
|   | 0674        | 0673  | 0641  | 0673  | 0673  | 0659  | 0673  | 0663  | 0666  | 0671  | 0675  | 0673  | 0676  | 0677  | 0677  | 0675  | 0677  | 0667  | 0673  | 0673  |          | 0677  | 0677  | 0667  |
| ANIMAL ID                                       | 00726       | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777    | 00777 | 00777 | 00777 |
| 0674  | 0673        | 0641  | 0673  | 0673  | 0659  | 0673  | 0663  | 0666  | 0671  | 0675  | 0673  | 0676  | 0677  | 0677  | 0675  | 0677  | 0667  | 0673  | 0673  | 0677  | 0677     | 0667  | 0673  | 0673  |
| 00726   | 00777       | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777    | 00777 | 00777 | 00777 |

Tooth + + 2

### CARDIOVASCULAR SYSTEM

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|
| Heart   | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Leukemia Mononuclear  |   | X |   |   |   | X |   | X |   | X |   |   |   |   | X |   |   |   |   |   | X |   | X | 8  |
| Pheochromocytoma Malignant, Metastatic, Adrenal Medulla           |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | X |   |   | 1  |
| Pericardium, Rhabdomyosarcoma, Metastatic, Uncertain Primary Site |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1  |

### ENDOCRINE SYSTEM

|                                       |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |
|---------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|
| Adrenal Cortex                        | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Leukemia Mononuclear                  |   | X |   |   |   |   |   | X |   | X |   |   |   | X |   |   | X |   |   | X | X |   |   | 11 |
| Adrenal Medulla                       | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Leukemia Mononuclear                  | X | X |   |   |   |   |   | X |   | X |   |   |   | X |   |   | X |   |   | X | X |   | X | 12 |
| Pheochromocytoma Benign               |   |   |   | X | X |   |   |   | X | X | X |   |   |   | X | X | X |   | X | X |   |   | X | 17 |
| Pheochromocytoma Malignant            |   |   | X |   |   |   |   | X |   | X |   |   |   |   |   |   |   |   | X |   |   |   |   | 7  |
| Bilateral, Pheochromocytoma Benign    | X |   |   |   |   | X | X | X |   |   |   | X | X | X |   |   |   |   |   |   |   | X |   | 19 |
| Bilateral, Pheochromocytoma Malignant |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | X |   |   |   | X |   |   | 4  |
| Islets, Pancreatic                    | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Adenoma                               |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1  |
| Carcinoma                             |   |   |   |   |   |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   | 3  |
| Parathyroid Gland                     | M | + | + | + | + | + | + | M | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + | 45 |
| Pituitary Gland                       | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue

M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically

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 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: RATS/F344/N Tac

P04: NEOPLASMS BY INDIVIDUAL ANIMAL  
 Cobalt  
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012  
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| FISCHER 344-TACONIC RATS<br>FEMALE<br>5.0 mg/m3 | DAY ON TEST |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | * TOTALS |
|---|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|
|   | 0674        | 0673  | 0471  | 0772  | 0771  | 0570  | 0770  | 0674  | 0668  | 0661  | 0773  | 0579  | 0770  | 0676  | 0771  | 0776  | 0579  | 0777  | 0670  | 0772  | 0773  | 0770  | 0677  | 0671  |          |
|   | ANIMAL ID   | 00726 | 00772 | 00778 | 00779 | 00777 | 00773 | 00773 | 00733 | 00733 | 00734 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 |          |
| Leukemia Mononuclear                            |             |       |       |       |       |       |       |       | X     |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 1        |
| Pars Distalis, Adenoma                          |             | X     |       |       |       | X     |       |       | X     | X     | X     |       | X     |       |       |       |       | X     | X     | X     | X     |       |       |       | 22       |
| Pars Distalis, Carcinoma                        |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 1        |
| Thyroid Gland                                   | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | 50       |
| C-cell, Adenoma                                 |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 2        |
| C-cell, Carcinoma                               |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 1        |
| Follicular Cell, Adenoma                        |             |       |       |       |       |       |       |       | X     |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 1        |
| <b>GENERAL BODY SYSTEM</b>                      |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |
| NONE  |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |
| <b>GENITAL SYSTEM</b>                           |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |
| Clitoral Gland                                  | +           | +     | +     | +     | +     | M     | +     | +     | +     | +     | +     | +     | +     | +     | M     | +     | +     | +     | +     | +     | +     | +     | +     | +     | 46       |
| Adenoma   |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | X     |       |       |       |       | 2        |
| Carcinoma                                       |             |       |       |       |       | X     |       |       |       |       | X     |       |       |       | X     |       |       |       |       |       |       |       |       |       | 4        |
| Ovary   | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | 50       |
| Leukemia Mononuclear                            |             |       |       |       |       | X     |       |       | X     | X     |       |       |       |       | X     |       |       |       |       |       |       |       | X     |       | 7        |
| Thecoma Benign                                  |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | X     |       |       | 1        |
| Uterus  | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | 50       |
| Leukemia Mononuclear                            |             |       |       |       |       |       |       |       | X     |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 1        |
| Polyp Stromal                                   | X           |       |       | X     | X     |       |       |       |       |       |       |       | X     | X     | X     |       |       |       | X     |       |       |       |       |       | 10       |
| <b>HEMATOPOIETIC SYSTEM</b>                     |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |
| Bone Marrow                                     | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | 50       |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue

M .. Missing tissue  
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P04: NEOPLASMS BY INDIVIDUAL ANIMAL  
 Cobalt  
 CAS Number: 7440-48-4

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 Lab: BNW

| FISCHER 344-TACONIC RATS<br>FEMALE<br>5.0 mg/m3  | DAY ON TEST |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | * TOTALS |       |      |
|--|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|-------|------|
|  | 0674        | 0673  | 0471  | 0773  | 0773  | 0579  | 0773  | 0663  | 0663  | 0663  | 0773  | 0579  | 0773  | 0663  | 0773  | 0773  | 0579  | 0773  | 0663  | 0773  |          | 0663  | 0773 |
| ANIMAL ID  | 00726       | 00772 | 00778 | 00779 | 00777 | 00773 | 00773 | 00733 | 00733 | 00733 | 00733 | 00733 | 00733 | 00733 | 00733 | 00733 | 00733 | 00733 | 00733 | 00733 | 00733    | 00733 |      |
| Leukemia Mononuclear                             |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       | 1    |
| Lymph Node                                       |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       | 5    |
| Lumbar, Pancreatic, Renal, Leukemia Mononuclear  |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       | 1    |
| Pancreatic, Leukemia Mononuclear                 |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       | 2    |
| Renal, Leukemia Mononuclear                      |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       | 1    |
| Lymph Node, Bronchial                            | M           | +     | +     | +     | +     | M     | M     | M     | M     | M     | M     | M     | M     | M     | M     | M     | M     | M     | M     | M     | M        | M     | 17   |
| Alveolar/Bronchiolar Carcinoma, Metastatic, Lung |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       | 1    |
| Leukemia Mononuclear                             |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       | 2    |
| Lymph Node, Mandibular                           | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | +     | 47   |
| Leukemia Mononuclear                             | X           |       |       |       |       |       |       |       |       | X     |       |       |       | X     |       |       |       |       |       |       |          |       | 9    |
| Lymph Node, Mediastinal                          | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | M     | +     | +     | +     | M     | +     | +     | +     | +     | +     | +        | +     | 48   |
| Leukemia Mononuclear                             |             |       |       |       |       |       |       |       |       | X     |       |       |       |       |       |       |       |       |       |       |          | X     | 6    |
| Lymph Node, Mesenteric                           | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | +     | 50   |
| Leukemia Mononuclear                             |             |       |       |       |       |       |       |       |       | X     |       |       |       | X     |       |       |       |       |       |       |          | X     | 5    |
| Spleen   | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | +     | 50   |
| Leukemia Mononuclear                             | X           | X     |       | X     | X     | X     | X     |       | X     | X     |       | X     |       |       | X     |       | X     | X     | X     |       |          | X     | 27   |
| Thymus   | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | M     | +     | +     | +     | +     | +        | +     | 47   |
| Alveolar/Bronchiolar Carcinoma, Metastatic, Lung |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       | 1    |
| Leukemia Mononuclear                             |             |       |       |       |       |       |       |       |       |       | X     |       |       |       |       |       |       |       |       |       |          | X     | 3    |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
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|---|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|-------|-------|-------|
|   | 0674        | 0673  | 0641  | 0672  | 0673  | 0659  | 0673  | 0663  | 0666  | 0666  | 0674  | 0657  | 0673  | 0667  | 0666  | 0673  | 0657  | 0667  | 0673  | 0673  |          | 0667  | 0667  | 0676  |
| ANIMAL ID                                       | 00726       | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777    | 00777 | 00777 | 00777 |

**INTEGUMENTARY SYSTEM**

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|
| Mammary Gland                             | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Adenoma                                   |   |   |   |   |   |   |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   | 1  |
| Carcinoma                                 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 3  |
| Fibroadenoma                              |   |   |   |   |   |   |   |   |   |   |   |   | X |   |   |   |   |   |   | X |   |   |   |   | 5  |
| Skin                                      | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Keratoacanthoma                           |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1  |
| Subcutaneous Tissue, Fibroma              |   |   |   |   |   |   |   |   |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   |   | 1  |
| Subcutaneous Tissue, Schwannoma Malignant | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1  |

**MUSCULOSKELETAL SYSTEM**

|  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|
| Bone                                   | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Skeletal Muscle                        | + |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1  |
| Schwannoma Malignant, Metastatic, Skin | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1  |

**NERVOUS SYSTEM**

|  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|
| Brain                                  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Carcinoma, Metastatic, Pituitary Gland |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1  |
| Leukemia Mononuclear                   |   |   |   |   |   |   |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   | 2  |

**RESPIRATORY SYSTEM**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|
| Larynx | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Lung   | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue

M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically

Experiment Number: 60311 - 05  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: RATS/F344/N Tac

P04: NEOPLASMS BY INDIVIDUAL ANIMAL  
 Cobalt  
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012  
 Time Report Requested: 14:48:11  
 First Dose M/F: 05/08/06 / 05/08/06  
 Lab: BNW

| FISCHER 344-TACONIC RATS<br>FEMALE<br>5.0 mg/m3               | DAY ON TEST |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | * TOTALS |
|---|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|
|   | 0674        | 0673  | 0641  | 0672  | 0673  | 0659  | 0673  | 0663  | 0666  | 0666  | 0671  | 0657  | 0673  | 0673  | 0667  | 0677  | 0667  | 0673  | 0673  | 0673  | 0671  | 0672  | 0673  | 0667  |          |
| ANIMAL ID   | 00726       | 00772 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 |          |
| Alveolar/Bronchiolar Adenoma                                  |             |       |       | X     |       |       |       |       |       |       | X     |       |       | X     |       |       |       |       | X     |       |       |       |       | 9     |          |
| Alveolar/Bronchiolar Adenoma, Multiple                        |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | X     |       |       |       |       |       | 4     |          |
| Alveolar/Bronchiolar Carcinoma                                |             |       | X     |       |       |       | X     |       |       |       |       | X     |       | X     |       |       |       | X     | X     |       | X     |       |       | 12    |          |
| Alveolar/Bronchiolar Carcinoma, Multiple                      | X           |       |       |       | X     |       |       |       |       | X     |       | X     |       |       |       | X     |       |       | X     |       |       | X     |       | 18    |          |
| Cystic Keratinizing Epithelioma                               |             | X     |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 2     |          |
| Leukemia Mononuclear  | X           | X     |       |       | X     | X     |       |       | X     |       | X     |       |       |       | X     |       |       |       |       |       | X     | X     |       | 14    |          |
| Pheochromocytoma Malignant, Metastatic, Adrenal Medulla       |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | X     |       |       |       | 1     |          |
| Squamous Cell Carcinoma                                       |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | X     |       |       |       | 1     |          |
| Mediastinum, Alveolar/Bronchiolar Carcinoma, Metastatic, Lung |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 1     |          |
| Nose  | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | 50    |          |
| Leukemia Mononuclear  |             |       |       |       |       |       |       |       | X     |       |       |       |       |       | X     |       |       |       |       |       |       |       |       | 4     |          |
| Trachea   | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | 50    |          |
| <b>SPECIAL SENSES SYSTEM</b>                                  |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |
| Ear   |             |       |       |       | +     |       | +     |       |       |       |       |       |       |       |       |       |       |       |       | +     |       |       |       | 3     |          |
| Eye   | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | 50    |          |
| Harderian Gland   | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | 50    |          |
| <b>URINARY SYSTEM</b>   |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |
| Kidney  | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | 50    |          |
| Leukemia Mononuclear  |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 1     |          |
| Urinary Bladder   | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | 50    |          |

\* .. Total animals with tissue examined microscopically; Total animals with tumor  
 + .. Tissue examined microscopically  
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|  |  | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | * TOTALS |   |
|--|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|----------|---|
| DAY ON TEST                            |  | 6 | 6 | 4 | 7 | 7 | 5 | 7 | 6 | 6 | 6 | 7 | 5 | 7 | 6 | 7 | 7 | 5 | 7 | 6 | 7 | 7 | 7 | 6 | 7  |          |   |
| FISCHER 344-TACONIC RATS FEMALE        |  | 7 | 0 | 7 | 3 | 3 | 9 | 3 | 3 | 1 | 4 | 3 | 7 | 3 | 7 | 3 | 2 | 7 | 1 | 7 | 3 | 3 | 3 | 1 | 2  |          | 3 |
| 5.0 mg/m3                              |  | 4 | 3 | 1 | 2 | 1 | 0 | 0 | 4 | 8 | 1 | 1 | 9 | 0 | 0 | 1 | 6 | 9 | 7 | 0 | 2 | 1 | 0 | 7 | 2  |          |   |
| ANIMAL ID                              |  | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0        |   |
|  |  | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7  | 7        |   |
|  |  | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5  | 7        |   |
|  |  | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9  | 0        |   |
| Schwannoma Malignant, Metastatic, Skin |  | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1  |          |   |
| <b>SYSTEMIC LESIONS</b>                |  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |          |   |
| Multiple Organ                         |  | + |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 50 |          |   |
| Leukemia Mononuclear                   |  | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 27 |          |   |

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

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