

**Rancho Seco**  
**Final Status Survey Summary Report**  
**May 28, 2008**  
**East Radwaste System Piping**  
**Survey Unit F8990422**

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Dismantlement Superintendent, Radiological

## **FINAL STATUS SURVEY SUMMARY REPORT**

### **Survey Unit:**

F8990422, Radwaste System Piping

### **Survey Unit Description:**

**Operating History:** This system transported liquid radioactive waste through the waste processing system. This system was designed to be contaminated. Operating records and the HSA support its status as radioactively contaminated system piping.

**Site Characterization:** Direct measurements were made of the interior surfaces of the system piping which confirmed the presence of plant-derived radionuclides. Direct measurements of the interior showed a mean gross activity level of 49,700,000 dpm/100 cm<sup>2</sup> and a maximum value of 211,000,000 dpm/100 cm<sup>2</sup>. Based on the classification procedure (DSIP-0020) and levels of gross activity reported, the system was determined to be a Class 1 system.

**HSA Events:** N/A Radioactive by design.

### **Survey Unit Design Information:**

The Survey Unit Design Parameters are presented in Table 1 below. The survey unit and measurement locations are depicted on the maps in Attachment 1. Direct measurement locations were spaced at 15cm intervals and 30.4 m<sup>2</sup> were scanned for 100% coverage. The instrumentation used for the survey along with the MDC values are listed in Tables 2-1 and 2-2 in Attachment 2.

**Table 1. Survey Unit Design Parameters**

| <b>Survey Design Parameter</b>                | <b>Value</b>  | <b>Comment</b>                   |
|-----------------------------------------------|---------------|----------------------------------|
| <b>Survey Area:</b>                           | F899          | Radwaste System Piping           |
| <b>Survey Unit:</b>                           | 0422          | Structure Surface                |
| <b>Class:</b>                                 | 1             | LTP Table 5-4                    |
| <b>SU Area (m<sup>2</sup>):</b>               | 30.4          |                                  |
| <b>Evaluator:</b>                             | Erin L. Brown |                                  |
| <b>DCGL (dpm/100 cm<sup>2</sup>):</b>         | 100000        | Gross Activity DCGL              |
| <b>Area Factor:</b>                           | 1             | Class 1                          |
| <b>Design DCGL (dpm/100 cm<sup>2</sup>):</b>  | 100000        | Class 1                          |
| <b>LBGR (dpm/100 cm<sup>2</sup>):</b>         | 50000         | Default = 50% DCGL               |
| <b>Design Sigma (dpm/100 cm<sup>2</sup>):</b> | 100000        |                                  |
| <b>Type I Error:</b>                          | 0.05          |                                  |
| <b>Type II Error:</b>                         | 0.05          |                                  |
| <b>Predominant Nuclide:</b>                   | Cs-137        |                                  |
| <b>Sample Area (m<sup>2</sup>):</b>           | N/A           | Class 1                          |
| <b>Scan Area (m<sup>2</sup>):</b>             | 30.4          |                                  |
| <b>Scan Coverage (%):</b>                     | 100%          | Class 1                          |
| <b>Z<sub>1-α</sub>:</b>                       | 1.645         |                                  |
| <b>Z<sub>1-β</sub>:</b>                       | 1.645         |                                  |
| <b>Sign P:</b>                                | 0.691462      |                                  |
| <b>Calculated Relative Shift:</b>             | 0.5           |                                  |
| <b>Relative Shift Used:</b>                   | 0.5           | Uses 3.0 if Relative Shift is >3 |
| <b>N-Value:</b>                               | 74            |                                  |
| <b>Design N-Value + 20%:</b>                  | 89            | NUREG-1575 Table 5-5             |
| <b>Design Min Samples N:</b>                  | 89            | Class 1                          |
| <b>Grid Spacing L:</b>                        | 0.5           | Class 1                          |

### Survey Results:

A total of 696 direct measurements were made in F8990422. The results including mean, median, standard deviation and range are shown in Table 2. All direct measurements were less than the DCGL. None of the measurements indicated areas of elevated activity. Survey activity ranged from 1917 to 92283 dpm/100 cm<sup>2</sup>, based on the pipe detector efficiency.

**Table 2. Direct Measurement Results**

| Measurement ID   | Gross Activity<br>(dpm/100 cm <sup>2</sup> ) |
|------------------|----------------------------------------------|
| F8990422-M0001GI | 8717                                         |
| F8990422-M0002GI | 6647                                         |
| F8990422-M0003GI | 5845                                         |
| F8990422-M0004GI | 4993                                         |
| F8990422-M0005GI | 5307                                         |
| F8990422-M0006GI | 7706                                         |
| F8990422-M0007GI | 7005                                         |
| F8990422-M0008GI | 4588                                         |
| F8990422-M0009GI | 4129                                         |
| F8990422-M0010GI | 4321                                         |
| F8990422-M0011GI | 4447                                         |
| F8990422-M0012GI | 4184                                         |
| F8990422-M0013GI | 4270                                         |
| F8990422-M0014GI | 4866                                         |
| F8990422-M0015GI | 4350                                         |
| F8990422-M0016GI | 4241                                         |
| F8990422-M0017GI | 4603                                         |
| F8990422-M0018GI | 4306                                         |
| F8990422-M0019GI | 4129                                         |
| F8990422-M0020GI | 4874                                         |
| F8990422-M0021GI | 4397                                         |
| F8990422-M0022GI | 4762                                         |
| F8990422-M0023GI | 4191                                         |
| F8990422-M0024GI | 5466                                         |
| F8990422-M0025GI | 7962                                         |
| F8990422-M0026GI | 4191                                         |
| F8990422-M0027GI | 4165                                         |
| F8990422-M0028GI | 4939                                         |
| F8990422-M0029GI | 4523                                         |
| F8990422-M0030GI | 4751                                         |
| F8990422-M0031GI | 4711                                         |
| F8990422-M0032GI | 4426                                         |
| F8990422-M0033GI | 4281                                         |
| F8990422-M0034GI | 4624                                         |
| F8990422-M0035GI | 4458                                         |
| F8990422-M0036GI | 4660                                         |
| F8990422-M0037GI | 4097                                         |
| F8990422-M0038GI | 5983                                         |
| F8990422-M0039GI | 4671                                         |
| F8990422-M0040GI | 5441                                         |

|                  |      |
|------------------|------|
| F8990422-M0041GI | 5300 |
| F8990422-M0042GI | 6239 |
| F8990422-M0043GI | 4725 |
| F8990422-M0044GI | 5271 |
| F8990422-M0045GI | 5452 |
| F8990422-M0046GI | 4436 |
| F8990422-M0047GI | 4599 |
| F8990422-M0048GI | 4447 |
| F8990422-M0049GI | 5329 |
| F8990422-M0050GI | 8219 |
| F8990422-M0051GI | 8020 |
| F8990422-M0052GI | 7110 |
| F8990422-M0053GI | 4668 |
| F8990422-M0054GI | 4050 |
| F8990422-M0055GI | 4523 |
| F8990422-M0056GI | 4220 |
| F8990422-M0057GI | 5242 |
| F8990422-M0058GI | 4751 |
| F8990422-M0059GI | 4314 |
| F8990422-M0060GI | 4072 |
| F8990422-M0061GI | 4053 |
| F8990422-M0062GI | 4650 |
| F8990422-M0139GI | 6633 |
| F8990422-M0140GI | 4527 |
| F8990422-M0141GI | 4512 |
| F8990422-M0142GI | 4733 |
| F8990422-M0143GI | 5101 |
| F8990422-M0144GI | 4541 |
| F8990422-M0145GI | 4754 |
| F8990422-M0146GI | 5112 |
| F8990422-M0147GI | 4819 |
| F8990422-M0148GI | 4411 |
| F8990422-M0149GI | 4613 |
| F8990422-M0150GI | 4996 |
| F8990422-M0151GI | 4151 |
| F8990422-M0152GI | 4501 |
| F8990422-M0153GI | 4267 |
| F8990422-M0154GI | 4173 |
| F8990422-M0155GI | 4371 |
| F8990422-M0156GI | 4440 |
| F8990422-M0157GI | 4111 |
| F8990422-M0158GI | 4595 |
| F8990422-M0159GI | 4415 |
| F8990422-M0160GI | 4444 |
| F8990422-M0161GI | 4158 |
| F8990422-M0162GI | 4743 |
| F8990422-M0163GI | 4422 |
| F8990422-M0164GI | 3866 |
| F8990422-M0165GI | 4436 |
| F8990422-M0166GI | 4241 |
| F8990422-M0167GI | 4487 |
| F8990422-M0168GI | 4736 |
| F8990422-M0169GI | 4350 |
| F8990422-M0170GI | 4140 |
| F8990422-M0171GI | 4281 |
| F8990422-M0172GI | 4743 |

|                  |       |
|------------------|-------|
| F8990422-M0173GI | 4184  |
| F8990422-M0174GI | 4046  |
| F8990422-M0175GI | 3884  |
| F8990422-M0176GI | 3905  |
| F8990422-M0177GI | 4285  |
| F8990422-M0178GI | 3819  |
| F8990422-M0179GI | 4342  |
| F8990422-M0180GI | 4155  |
| F8990422-M0181GI | 4426  |
| F8990422-M0182GI | 4151  |
| F8990422-M0183GI | 5354  |
| F8990422-M0184GI | 4917  |
| F8990422-M0185GI | 4238  |
| F8990422-M0186GI | 4570  |
| F8990422-M0187GI | 3873  |
| F8990422-M0188GI | 4483  |
| F8990422-M0189GI | 45448 |
| F8990422-M0190GI | 6409  |
| F8990422-M0191GI | 4845  |
| F8990422-M0192GI | 4111  |
| F8990422-M0193GI | 4675  |
| F8990422-M0194GI | 4693  |
| F8990422-M0195GI | 4371  |
| F8990422-M0196GI | 4379  |
| F8990422-M0197GI | 4574  |
| F8990422-M0198GI | 4566  |
| F8990422-M0199GI | 4176  |
| F8990422-M0200GI | 4386  |
| F8990422-M0201GI | 4202  |
| F8990422-M0202GI | 4527  |
| F8990422-M0203GI | 4411  |
| F8990422-M0204GI | 4827  |
| F8990422-M0205GI | 4527  |
| F8990422-M0206GI | 4715  |
| F8990422-M0207GI | 4758  |
| F8990422-M0208GI | 4621  |
| F8990422-M0209GI | 4610  |
| F8990422-M0210GI | 4212  |
| F8990422-M0211GI | 4588  |
| F8990422-M0212GI | 4339  |
| F8990422-M0213GI | 4100  |
| F8990422-M0214GI | 4375  |
| F8990422-M0215GI | 4220  |
| F8990422-M0216GI | 4252  |
| F8990422-M0217GI | 3909  |
| F8990422-M0218GI | 4118  |
| F8990422-M0219GI | 4462  |
| F8990422-M0220GI | 4368  |
| F8990422-M0221GI | 4184  |
| F8990422-M0222GI | 4249  |
| F8990422-M0223GI | 4462  |
| F8990422-M0224GI | 5166  |
| F8990422-M0225GI | 5329  |
| F8990422-M0226GI | 5231  |
| F8990422-M0227GI | 4361  |
| F8990422-M0228GI | 4852  |

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| F8990422-M0229GI | 4025  |
| F8990422-M0230GI | 4397  |
| F8990422-M0231GI | 4628  |
| F8990422-M0232GI | 4888  |
| F8990422-M0233GI | 5123  |
| F8990422-M0234GI | 4946  |
| F8990422-M0235GI | 4772  |
| F8990422-M0236GI | 4440  |
| F8990422-M0237GI | 4440  |
| F8990422-M0238GI | 4473  |
| F8990422-M0239GI | 4202  |
| F8990422-M0240GI | 4267  |
| F8990422-M0241GI | 4548  |
| F8990422-M0242GI | 4263  |
| F8990422-M0243GI | 4025  |
| F8990422-M0244GI | 4559  |
| F8990422-M0245GI | 3952  |
| F8990422-M0246GI | 4007  |
| F8990422-M0247GI | 4382  |
| F8990422-M0248GI | 4299  |
| F8990422-M0249GI | 4429  |
| F8990422-M0250GI | 4118  |
| F8990422-M0251GI | 4310  |
| F8990422-M0252GI | 4180  |
| F8990422-M0253GI | 4921  |
| F8990422-M0254GI | 5791  |
| F8990422-M0255GI | 4751  |
| F8990422-M0256GI | 4733  |
| F8990422-M0257GI | 4624  |
| F8990422-M0258GI | 4610  |
| F8990422-M0259GI | 4935  |
| F8990422-M0260GI | 4986  |
| F8990422-M0261GI | 6431  |
| F8990422-M0262GI | 4467  |
| F8990422-M0263GI | 4853  |
| F8990422-M0264GI | 3320  |
| F8990422-M0265GI | 3724  |
| F8990422-M0266GI | 2534  |
| F8990422-M0267GI | 2400  |
| F8990422-M0268GI | 2319  |
| F8990422-M0269GI | 2291  |
| F8990422-M0270GI | 2403  |
| F8990422-M0271GI | 2400  |
| F8990422-M0272GI | 2248  |
| F8990422-M0273GI | 2101  |
| F8990422-M0274GI | 2319  |
| F8990422-M0275GI | 14820 |
| F8990422-M0276GI | 4672  |
| F8990422-M0277GI | 2749  |
| F8990422-M0278GI | 2463  |
| F8990422-M0279GI | 3376  |
| F8990422-M0280GI | 2562  |
| F8990422-M0281GI | 2448  |
| F8990422-M0282GI | 2353  |
| F8990422-M0283GI | 2269  |
| F8990422-M0284GI | 2336  |

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| F8990422-M0285GI | 2282  |
| F8990422-M0286GI | 2487  |
| F8990422-M0287GI | 2381  |
| F8990422-M0288GI | 4622  |
| F8990422-M0289GI | 2629  |
| F8990422-M0290GI | 2850  |
| F8990422-M0291GI | 2551  |
| F8990422-M0292GI | 2243  |
| F8990422-M0293GI | 2241  |
| F8990422-M0294GI | 2166  |
| F8990422-M0295GI | 2179  |
| F8990422-M0296GI | 2138  |
| F8990422-M0297GI | 2220  |
| F8990422-M0298GI | 2080  |
| F8990422-M0299GI | 2092  |
| F8990422-M0300GI | 2620  |
| F8990422-M0301GI | 2433  |
| F8990422-M0302GI | 2142  |
| F8990422-M0303GI | 2401  |
| F8990422-M0304GI | 2474  |
| F8990422-M0305GI | 3085  |
| F8990422-M0306GI | 5303  |
| F8990422-M0307GI | 6621  |
| F8990422-M0308GI | 9636  |
| F8990422-M0309GI | 9877  |
| F8990422-M0310GI | 9816  |
| F8990422-M0311GI | 9332  |
| F8990422-M0312GI | 8833  |
| F8990422-M0313GI | 8838  |
| F8990422-M0314GI | 8095  |
| F8990422-M0315GI | 6500  |
| F8990422-M0316GI | 5522  |
| F8990422-M0317GI | 3882  |
| F8990422-M0318GI | 3624  |
| F8990422-M0319GI | 4220  |
| F8990422-M0320GI | 4617  |
| F8990422-M0321GI | 6435  |
| F8990422-M0322GI | 7577  |
| F8990422-M0323GI | 8676  |
| F8990422-M0324GI | 8223  |
| F8990422-M0325GI | 7147  |
| F8990422-M0326GI | 9225  |
| F8990422-M0327GI | 10256 |
| F8990422-M0328GI | 6287  |
| F8990422-M0329GI | 4354  |
| F8990422-M0330GI | 4056  |
| F8990422-M0331GI | 4227  |
| F8990422-M0332GI | 4893  |
| F8990422-M0333GI | 6054  |
| F8990422-M0334GI | 6325  |
| F8990422-M0335GI | 9140  |
| F8990422-M0336GI | 13181 |
| F8990422-M0337GI | 13589 |
| F8990422-M0338GI | 11479 |
| F8990422-M0339GI | 8421  |
| F8990422-M0340GI | 8498  |



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| F8990422-M0341GI | 10456 |
| F8990422-M0342GI | 10750 |
| F8990422-M0343GI | 10579 |
| F8990422-M0344GI | 7787  |
| F8990422-M0345GI | 7995  |
| F8990422-M0346GI | 8259  |
| F8990422-M0347GI | 9657  |
| F8990422-M0348GI | 11492 |
| F8990422-M0349GI | 10878 |
| F8990422-M0350GI | 10392 |
| F8990422-M0351GI | 11913 |
| F8990422-M0352GI | 11089 |
| F8990422-M0353GI | 12005 |
| F8990422-M0353GI | 11450 |
| F8990422-M0354GI | 11055 |
| F8990422-M0355GI | 10556 |
| F8990422-M0356GI | 12201 |
| F8990422-M0357GI | 12957 |
| F8990422-M0358GI | 10771 |
| F8990422-M0359GI | 9343  |
| F8990422-M0360GI | 12074 |
| F8990422-M0361GI | 15413 |
| F8990422-M0362GI | 12112 |
| F8990422-M0363GI | 9816  |
| F8990422-M0364GI | 7938  |
| F8990422-M0365GI | 6188  |
| F8990422-M0366GI | 5094  |
| F8990422-M0367GI | 3926  |
| F8990422-M0368GI | 3380  |
| F8990422-M0369GI | 3053  |
| F8990422-M0370GI | 2858  |
| F8990422-M0371GI | 3260  |
| F8990422-M0372GI | 3724  |
| F8990422-M0373GI | 6114  |
| F8990422-M0374GI | 5370  |
| F8990422-M0375GI | 7073  |
| F8990422-M0376GI | 5391  |
| F8990422-M0377GI | 5459  |
| F8990422-M0378GI | 5420  |
| F8990422-M0379GI | 3623  |
| F8990422-M0380GI | 3629  |
| F8990422-M0381GI | 3493  |
| F8990422-M0382GI | 3452  |
| F8990422-M0383GI | 3459  |
| F8990422-M0384GI | 2676  |
| F8990422-M0385GI | 2961  |
| F8990422-M0386GI | 5030  |
| F8990422-M0387GI | 5741  |
| F8990422-M0388GI | 7800  |
| F8990422-M0389GI | 8400  |
| F8990422-M0390GI | 6395  |
| F8990422-M0391GI | 4848  |
| F8990422-M0392GI | 4892  |
| F8990422-M0393GI | 4491  |
| F8990422-M0394GI | 4866  |
| F8990422-M0395GI | 4837  |

|                  |      |
|------------------|------|
| F8990422-M0396GI | 5437 |
| F8990422-M0397GI | 5188 |
| F8990422-M0398GI | 5058 |
| F8990422-M0399GI | 4848 |
| F8990422-M0400GI | 5444 |
| F8990422-M0401GI | 5802 |
| F8990422-M0402GI | 5585 |
| F8990422-M0403GI | 5509 |
| F8990422-M0404GI | 6008 |
| F8990422-M0405GI | 5679 |
| F8990422-M0406GI | 5932 |
| F8990422-M0407GI | 5957 |
| F8990422-M0408GI | 6069 |
| F8990422-M0409GI | 6922 |
| F8990422-M0410GI | 4819 |
| F8990422-M0411GI | 4292 |
| F8990422-M0412GI | 4375 |
| F8990422-M0413GI | 4527 |
| F8990422-M0414GI | 4288 |
| F8990422-M0415GI | 4476 |
| F8990422-M0416GI | 4783 |
| F8990422-M0417GI | 4632 |
| F8990422-M0418GI | 4371 |
| F8990422-M0419GI | 4650 |
| F8990422-M0420GI | 6546 |
| F8990422-M0421GI | 5878 |
| F8990422-M0422GI | 5647 |
| F8990422-M0423GI | 8277 |
| F8990422-M0424GI | 7475 |
| F8990422-M0425GI | 4418 |
| F8990422-M0426GI | 4332 |
| F8990422-M0427GI | 4079 |
| F8990422-M0428GI | 3811 |
| F8990422-M0429GI | 4100 |
| F8990422-M0430GI | 4451 |
| F8990422-M0431GI | 4198 |
| F8990422-M0432GI | 4541 |
| F8990422-M0433GI | 4285 |
| F8990422-M0434GI | 4389 |
| F8990422-M0435GI | 3913 |
| F8990422-M0436GI | 3999 |
| F8990422-M0437GI | 4433 |
| F8990422-M0438GI | 3920 |
| F8990422-M0439GI | 4512 |
| F8990422-M0440GI | 4397 |
| F8990422-M0441GI | 4469 |
| F8990422-M0442GI | 4556 |
| F8990422-M0443GI | 4256 |
| F8990422-M0444GI | 4104 |
| F8990422-M0445GI | 4147 |
| F8990422-M0446GI | 4122 |
| F8990422-M0447GI | 4007 |
| F8990422-M0448GI | 4317 |
| F8990422-M0449GI | 4194 |
| F8990422-M0450GI | 4444 |
| F8990422-M0451GI | 5560 |

|                  |       |
|------------------|-------|
| F8990422-M0452GI | 4917  |
| F8990422-M0453GI | 4436  |
| F8990422-M0454GI | 4462  |
| F8990422-M0455GI | 4863  |
| F8990422-M0456GI | 4754  |
| F8990422-M0457GI | 4209  |
| F8990422-M0458GI | 5014  |
| F8990422-M0459GI | 4700  |
| F8990422-M0460GI | 4538  |
| F8990422-M0461GI | 5119  |
| F8990422-M0462GI | 5437  |
| F8990422-M0463GI | 5462  |
| F8990422-M0464GI | 5665  |
| F8990422-M0465GI | 6507  |
| F8990422-M0466GI | 4884  |
| F8990422-M0467GI | 4664  |
| F8990422-M0468GI | 5343  |
| F8990422-M0469GI | 6225  |
| F8990422-M0470GI | 5831  |
| F8990422-M0471GI | 5007  |
| F8990422-M0472GI | 11181 |
| F8990422-M0473GI | 5462  |
| F8990422-M0474GI | 6102  |
| F8990422-M0475GI | 9292  |
| F8990422-M0476GI | 5264  |
| F8990422-M0477GI | 5983  |
| F8990422-M0478GI | 4660  |
| F8990422-M0479GI | 6297  |
| F8990422-M0480GI | 5766  |
| F8990422-M0481GI | 4935  |
| F8990422-M0482GI | 4910  |
| F8990422-M0483GI | 5448  |
| F8990422-M0484GI | 5694  |
| F8990422-M0485GI | 8692  |
| F8990422-M0486GI | 7554  |
| F8990422-M0487GI | 7655  |
| F8990422-M0488GI | 7103  |
| F8990422-M0489GI | 5462  |
| F8990422-M0490GI | 4765  |
| F8990422-M0491GI | 5043  |
| F8990422-M0492GI | 4429  |
| F8990422-M0493GI | 4624  |
| F8990422-M0494GI | 4982  |
| F8990422-M0495GI | 6694  |
| F8990422-M0496GI | 7095  |
| F8990422-M0497GI | 5658  |
| F8990422-M0498GI | 5939  |
| F8990422-M0499GI | 5983  |
| F8990422-M0500GI | 5296  |
| F8990422-M0501GI | 5300  |
| F8990422-M0502GI | 3428  |
| F8990422-M0503GI | 2225  |
| F8990422-M0504GI | 2324  |
| F8990422-M0505GI | 3433  |
| F8990422-M0506GI | 2259  |
| F8990422-M0507GI | 2176  |

|                  |      |
|------------------|------|
| F8990422-M0508GI | 2003 |
| F8990422-M0509GI | 1968 |
| F8990422-M0510GI | 1999 |
| F8990422-M0511GI | 1981 |
| F8990422-M0512GI | 1917 |
| F8990422-M0513GI | 1966 |
| F8990422-M0514GI | 2033 |
| F8990422-M0515GI | 2040 |
| F8990422-M0516GI | 2195 |
| F8990422-M0517GI | 2085 |
| F8990422-M0518GI | 2109 |
| F8990422-M0519GI | 2045 |
| F8990422-M0520GI | 2064 |
| F8990422-M0521GI | 2044 |
| F8990422-M0522GI | 2079 |
| F8990422-M0523GI | 2231 |
| F8990422-M0524GI | 2913 |
| F8990422-M0525GI | 2307 |
| F8990422-M0526GI | 2676 |
| F8990422-M0527GI | 2633 |
| F8990422-M0528GI | 2424 |
| F8990422-M0529GI | 2309 |
| F8990422-M0530GI | 2870 |
| F8990422-M0531GI | 3587 |
| F8990422-M0532GI | 3842 |
| F8990422-M0533GI | 2278 |
| F8990422-M0534GI | 2172 |
| F8990422-M0535GI | 2142 |
| F8990422-M0536GI | 2192 |
| F8990422-M0537GI | 2215 |
| F8990422-M0538GI | 2174 |
| F8990422-M0539GI | 2085 |
| F8990422-M0540GI | 2158 |
| F8990422-M0541GI | 2147 |
| F8990422-M0542GI | 2124 |
| F8990422-M0543GI | 2210 |
| F8990422-M0544GI | 2212 |
| F8990422-M0545GI | 2214 |
| F8990422-M0546GI | 2145 |
| F8990422-M0547GI | 2190 |
| F8990422-M0548GI | 2209 |
| F8990422-M0549GI | 2171 |
| F8990422-M0550GI | 2322 |
| F8990422-M0551GI | 2210 |
| F8990422-M0552GI | 2322 |
| F8990422-M0553GI | 2313 |
| F8990422-M0554GI | 2478 |
| F8990422-M0555GI | 2529 |
| F8990422-M0556GI | 2815 |
| F8990422-M0557GI | 3088 |
| F8990422-M0558GI | 3089 |
| F8990422-M0559GI | 3072 |
| F8990422-M0560GI | 3066 |
| F8990422-M0561GI | 3023 |
| F8990422-M0562GI | 2847 |
| F8990422-M0563GI | 2649 |

|                  |       |
|------------------|-------|
| F8990422-M0564GI | 2541  |
| F8990422-M0565GI | 2640  |
| F8990422-M0566GI | 2671  |
| F8990422-M0567GI | 2779  |
| F8990422-M0568GI | 2504  |
| F8990422-M0569GI | 2322  |
| F8990422-M0570GI | 2296  |
| F8990422-M0571GI | 2399  |
| F8990422-M0572GI | 2415  |
| F8990422-M0573GI | 2423  |
| F8990422-M0574GI | 2496  |
| F8990422-M0575GI | 31577 |
| F8990422-M0576GI | 35359 |
| F8990422-M0577GI | 28261 |
| F8990422-M0578GI | 19853 |
| F8990422-M0579GI | 13276 |
| F8990422-M0580GI | 10100 |
| F8990422-M0581GI | 8213  |
| F8990422-M0582GI | 7895  |
| F8990422-M0583GI | 8613  |
| F8990422-M0584GI | 6578  |
| F8990422-M0585GI | 6060  |
| F8990422-M0586GI | 5680  |
| F8990422-M0587GI | 5472  |
| F8990422-M0588GI | 5643  |
| F8990422-M0589GI | 6188  |
| F8990422-M0590GI | 6655  |
| F8990422-M0591GI | 7166  |
| F8990422-M0592GI | 9228  |
| F8990422-M0593GI | 10357 |
| F8990422-M0594GI | 8988  |
| F8990422-M0595GI | 7499  |
| F8990422-M0596GI | 7796  |
| F8990422-M0597GI | 8432  |
| F8990422-M0598GI | 9889  |
| F8990422-M0599GI | 12604 |
| F8990422-M0600GI | 9556  |
| F8990422-M0601GI | 9171  |
| F8990422-M0602GI | 11041 |
| F8990422-M0603GI | 13299 |
| F8990422-M0604GI | 12170 |
| F8990422-M0605GI | 11129 |
| F8990422-M0606GI | 9529  |
| F8990422-M0607GI | 7580  |
| F8990422-M0608GI | 6573  |
| F8990422-M0609GI | 7747  |
| F8990422-M0610GI | 12904 |
| F8990422-M0611GI | 14885 |
| F8990422-M0612GI | 8926  |
| F8990422-M0613GI | 6639  |
| F8990422-M0614GI | 4653  |
| F8990422-M0615GI | 4427  |
| F8990422-M0616GI | 4311  |
| F8990422-M0617GI | 4562  |
| F8990422-M0618GI | 4386  |
| F8990422-M0619GI | 3700  |

|                  |       |
|------------------|-------|
| F8990422-M0620GI | 3715  |
| F8990422-M0621GI | 3909  |
| F8990422-M0622GI | 4157  |
| F8990422-M0623GI | 3778  |
| F8990422-M0624GI | 3631  |
| F8990422-M0625GI | 3768  |
| F8990422-M0626GI | 3709  |
| F8990422-M0627GI | 3646  |
| F8990422-M0628GI | 3635  |
| F8990422-M0629GI | 3626  |
| F8990422-M0630GI | 3615  |
| F8990422-M0631GI | 3583  |
| F8990422-M0632GI | 4099  |
| F8990422-M0633GI | 5096  |
| F8990422-M0634GI | 5409  |
| F8990422-M0635GI | 6225  |
| F8990422-M0636GI | 7244  |
| F8990422-M0637GI | 7557  |
| F8990422-M0638GI | 6919  |
| F8990422-M0639GI | 6045  |
| F8990422-M0640GI | 5532  |
| F8990422-M0641GI | 5538  |
| F8990422-M0642GI | 5566  |
| F8990422-M0643GI | 5994  |
| F8990422-M0644GI | 6369  |
| F8990422-M0645GI | 7137  |
| F8990422-M0646GI | 9009  |
| F8990422-M0647GI | 22988 |
| F8990422-M0648GI | 92283 |
| F8990422-M0649GI | 50321 |
| F8990422-M0650GI | 41812 |
| F8990422-M0651GI | 47497 |
| F8990422-M0658GI | 4194  |
| F8990422-M0659GI | 4057  |
| F8990422-M0660GI | 4241  |
| F8990422-M0661GI | 4487  |
| F8990422-M0662GI | 4245  |
| F8990422-M0663GI | 4397  |
| F8990422-M0664GI | 4436  |
| F8990422-M0665GI | 3913  |
| F8990422-M0666GI | 4245  |
| F8990422-M0667GI | 4259  |
| F8990422-M0668GI | 4751  |
| F8990422-M0669GI | 4408  |
| F8990422-M0670GI | 5210  |
| F8990422-M0671GI | 5401  |
| F8990422-M0672GI | 4819  |
| F8990422-M0673GI | 5755  |
| F8990422-M0674GI | 21788 |
| F8990422-M0675GI | 4606  |
| F8990422-M0676GI | 4552  |
| F8990422-M0677GI | 4010  |
| F8990422-M0678GI | 4202  |
| F8990422-M0683GI | 4227  |
| F8990422-M0684GI | 4603  |
| F8990422-M0685GI | 4429  |

|                  |       |
|------------------|-------|
| F8990422-M0686GI | 3970  |
| F8990422-M0687GI | 3808  |
| F8990422-M0688GI | 4556  |
| F8990422-M0689GI | 4404  |
| F8990422-M0690GI | 4350  |
| F8990422-M0691GI | 4249  |
| F8990422-M0692GI | 4147  |
| F8990422-M0693GI | 3790  |
| F8990422-M0694GI | 4035  |
| F8990422-M0695GI | 4223  |
| F8990422-M0696GI | 4888  |
| F8990422-M0697GI | 4263  |
| F8990422-M0698GI | 4144  |
| F8990422-M0699GI | 4780  |
| F8990422-M0716GI | 11467 |
| F8990422-M0717GI | 5948  |
| F8990422-M0718GI | 4170  |
| F8990422-M0719GI | 2806  |
| F8990422-M0720GI | 2588  |
| F8990422-M0721GI | 2290  |
| F8990422-M0722GI | 2345  |
| F8990422-M0723GI | 2621  |
| F8990422-M0724GI | 2961  |
| F8990422-M0725GI | 4280  |
| F8990422-M0726GI | 5764  |
| F8990422-M0727GI | 7708  |
| F8990422-M0728GI | 8510  |
| F8990422-M0729GI | 9077  |
| F8990422-M0730GI | 9158  |
| F8990422-M0731GI | 8000  |
| F8990422-M0732GI | 6938  |
| F8990422-M0733GI | 6544  |
| F8990422-M0734GI | 6454  |
| F8990422-M0735GI | 5905  |
| F8990422-M0736GI | 7453  |
| F8990422-M0737GI | 6808  |
| F8990422-M0738GI | 6317  |
| F8990422-M0739GI | 5725  |
| F8990422-M0740GI | 5895  |
| F8990422-M0741GI | 6040  |
| F8990422-M0742GI | 6099  |
| F8990422-M0743GI | 6320  |
| F8990422-M0744GI | 6558  |
| F8990422-M0745GI | 7027  |
| F8990422-M0746GI | 7191  |
| F8990422-M0747GI | 6980  |
| F8990422-M0748GI | 7551  |
| F8990422-M0749GI | 7420  |
| F8990422-M0750GI | 7077  |
| F8990422-M0751GI | 6991  |
| F8990422-M0752GI | 6954  |
| F8990422-M0753GI | 7152  |
| F8990422-M0754GI | 7198  |
| F8990422-M0755GI | 6923  |
| F8990422-M0756GI | 6323  |
| F8990422-M0757GI | 6028  |

|                     |              |
|---------------------|--------------|
| F8990422-M0758GI    | 5249         |
| F8990422-M0759GI    | 5219         |
| F8990422-M0760GI    | 5160         |
| F8990422-M0761GI    | 5519         |
| F8990422-M0762GI    | 5347         |
| F8990422-M0763GI    | 5218         |
| F8990422-M0764GI    | 5461         |
| F8990422-M0765GI    | 5573         |
| F8990422-M0766GI    | 5668         |
| F8990422-M0767GI    | 5883         |
| F8990422-M0768GI    | 5740         |
| F8990422-M0769GI    | 6429         |
| F8990422-M0770GI    | 6389         |
| F8990422-M0771GI    | 6509         |
| F8990422-M0772GI    | 5395         |
| F8990422-M0773GI    | 4384         |
| F8990422-M0774GI    | 4141         |
| F8990422-M0775GI    | 4032         |
| F8990422-M0776GI    | 4013         |
| F8990422-M0777GI    | 3530         |
| F8990422-M0778GI    | 3810         |
| F8990422-M0779GI    | 4229         |
| F8990422-M0780GI    | 3394         |
| F8990422-M0781GI    | 3261         |
| F8990422-M0782GI    | 3191         |
| F8990422-M0783GI    | 3177         |
| F8990422-M0784GI    | 3254         |
| F8990422-M0785GI    | 3495         |
| F8990422-M0786GI    | 3984         |
| F8990422-M0787GI    | 4109         |
| F8990422-M0788GI    | 4223         |
| F8990422-M0789GI    | 4259         |
| F8990422-M0790GI    | 4595         |
| F8990422-M0791GI    | 4963         |
| F8990422-M0792GI    | 9875         |
| F8990422-M0793GI    | 8597         |
| F8990422-M0794GI    | 5600         |
| F8990422-M0795GI    | 5611         |
| F8990422-M0796GI    | 10195        |
| F8990422-M0797GI    | 10398        |
| Mean:               | 5692         |
| Median:             | 4588         |
| Standard Deviation: | 5482         |
| Range:              | 1917 - 92283 |



**Survey Unit Data Assessment:**

The survey design required 696 direct measurements for the Sign Test. The critical value and the results of the Sign Test are presented in Table 4. The sample mean and median values were less than the DCGL. The sample standard deviation was less than the design standard deviation so no additional samples were required.

**Table 4. Data Assessment Results**

| <b>Survey Results Parameter</b>                             | <b>Value</b> | <b>Comment</b>                    |
|-------------------------------------------------------------|--------------|-----------------------------------|
| <b>Material Background Used</b> (dpm/100 cm <sup>2</sup> ): | N/A          | Average Ambient BKG = 0           |
| <b>Ambient Background Used</b> (dpm/100 cm <sup>2</sup> ):  | N/A          |                                   |
| <b>Actual Direct Measurements (N):</b>                      | 696          |                                   |
| <b>Median</b> (dpm/100 cm <sup>2</sup> ):                   | 4588         |                                   |
| <b>Mean</b> (dpm/100 cm <sup>2</sup> ):                     | 5692         |                                   |
| <b>Direct Measurement Standard Deviation</b>                | 5482         | Based on samples and backgrounds. |
| (dpm/100 cm <sup>2</sup> ):                                 |              |                                   |
| <b>Total Standard Deviation</b> (dpm/100 cm <sup>2</sup> ): | 5482         |                                   |
| <b>Maximum</b> (dpm/100 cm <sup>2</sup> ):                  | 92283        | Background Subtract Not Applied   |
| <b>Material Type:</b>                                       | N/A          |                                   |
| <b>Sign Test Final N Value:</b>                             | 696          | Class 1                           |
| <b>S+ Value:</b>                                            | 696          |                                   |
| <b>Critical Value:</b>                                      | 370          |                                   |
| <b>Sufficient Samples Collected:</b>                        | Yes          |                                   |
| <b>Maximum Value &lt; DCGL:</b>                             | Yes          |                                   |
| <b>Median Value &lt; DCGL:</b>                              | Yes          |                                   |
| <b>Mean Value &lt; DCGL:</b>                                | Yes          |                                   |
| <b>Maximum Value &lt; DCGL<sub>mc</sub>:</b>                | Yes          |                                   |
| <b>Total Standard Deviation &lt;= Sigma:</b>                | Yes          |                                   |
| <b>Pass the Sign Test?</b>                                  | Yes          |                                   |
| <b>Reject the Null Hypothesis?</b>                          | Yes          |                                   |
| <b>Does the Survey Unit Pass All Criteria?</b>              | Yes          |                                   |

**Survey Unit Investigations and Results:**

No investigations were required and no investigation results are reported.

**ALARA Statement:**

As stated in Chapter 4 of the LTP, as long as the residual activity within the survey unit is less than the DCGL (i.e. the survey unit average activity is less than the DCGL and the EMC criterion has been met), the ALARA criterion has been met.

**Changes in Initial Survey Unit Assumptions:**

The survey unit was designed as a Class 1 structure survey and the sample results are consistent with that classification. The variability of the survey results was less than the characterization data used for survey design. No potential areas of elevated activity were detected.

**Conclusion:**

The FSS of this survey unit was properly designed as a Class 1 survey based on Table 5-4 of the LTP. The required number of direct measurements was made and the scan coverage met the requirement of the LTP for pipe surveys. No direct measurements exceeded the DCGL of 100000 dpm/100 cm<sup>2</sup>. No investigations were required.

The direct measurement data support rejection of the null hypothesis, providing high confidence that the survey unit satisfied the release criteria and that the data quality objectives were met.

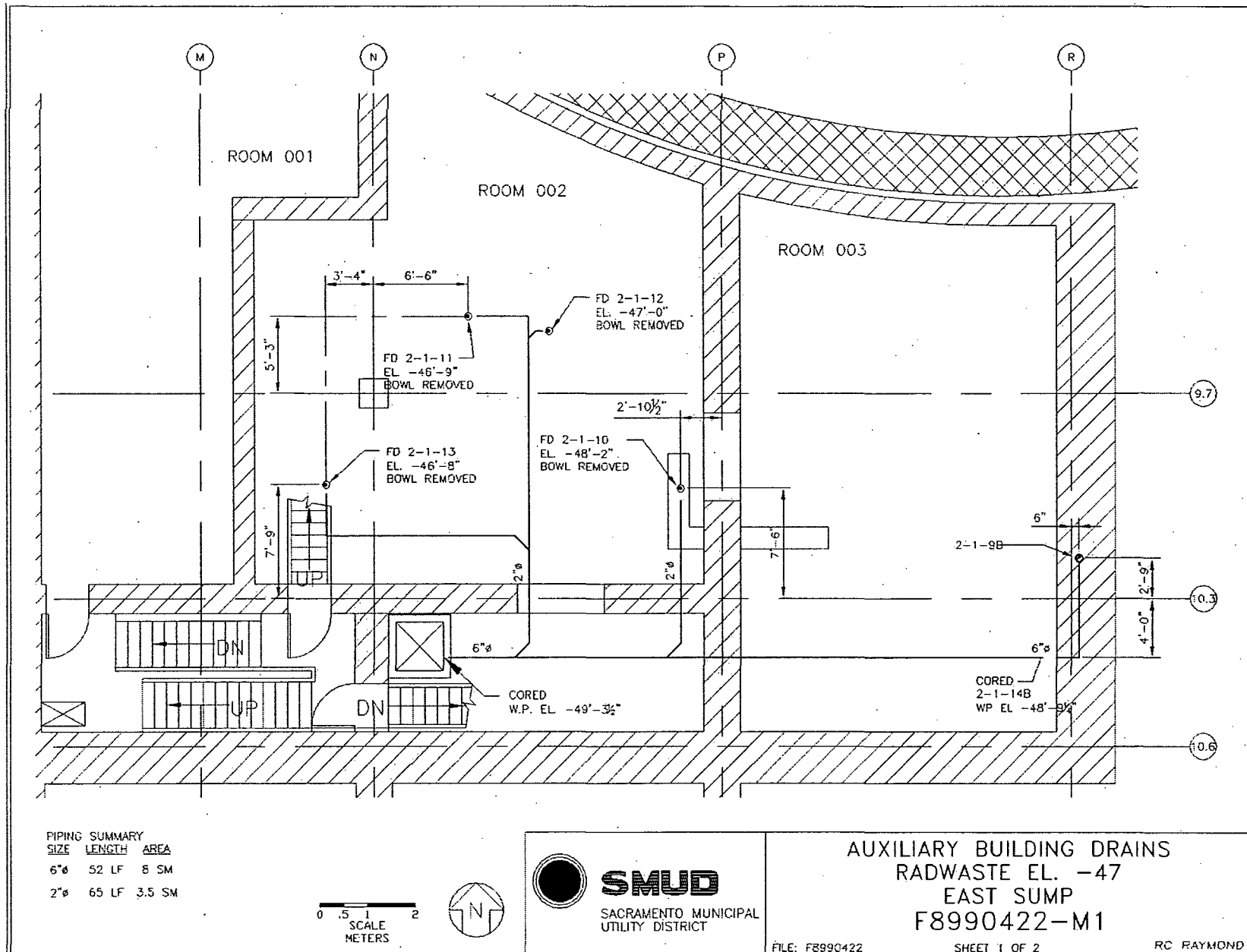
It is concluded that survey unit F8990422 meets the release criteria of 10CFR20.1402.

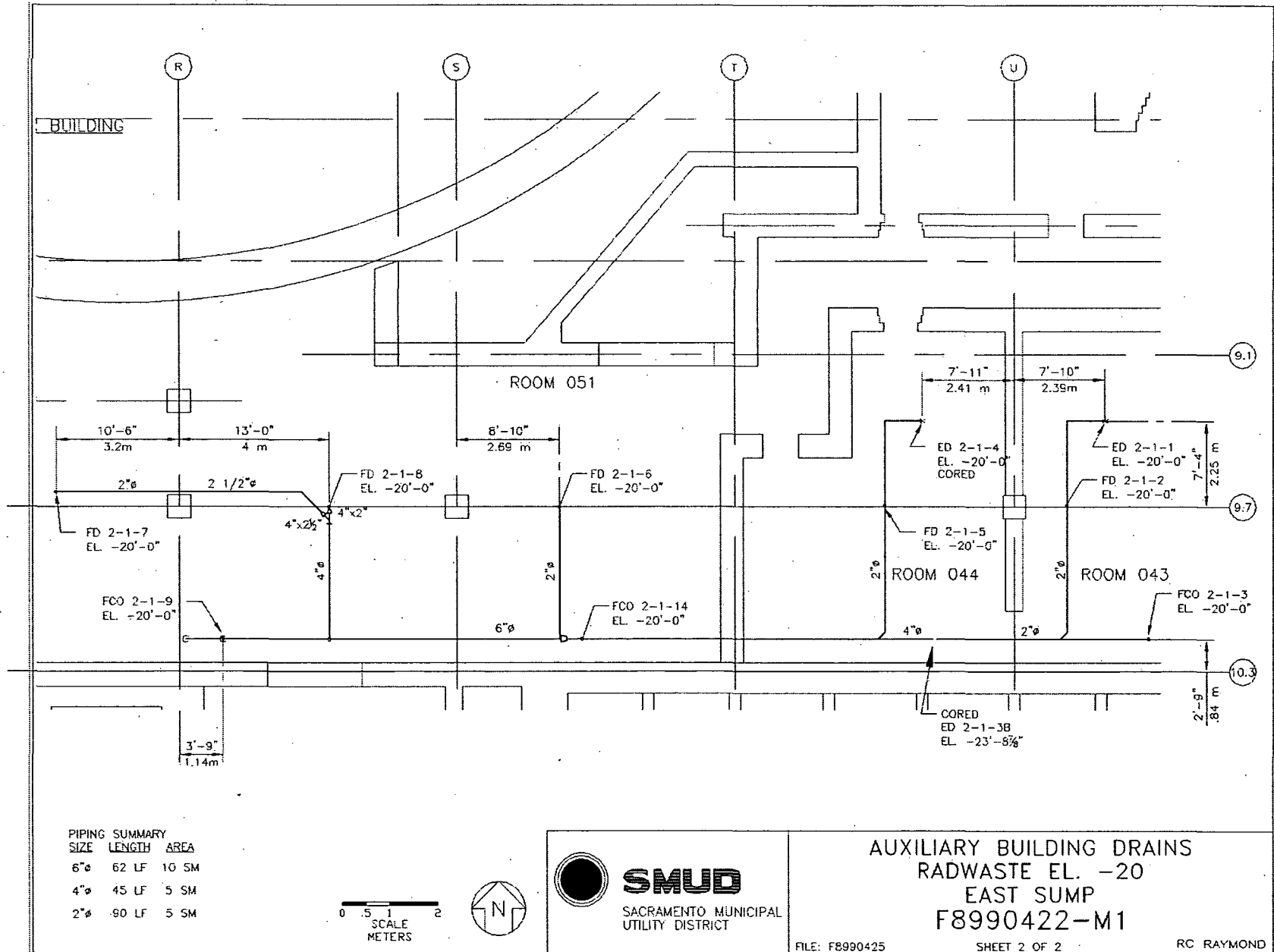
**Attachment 1**

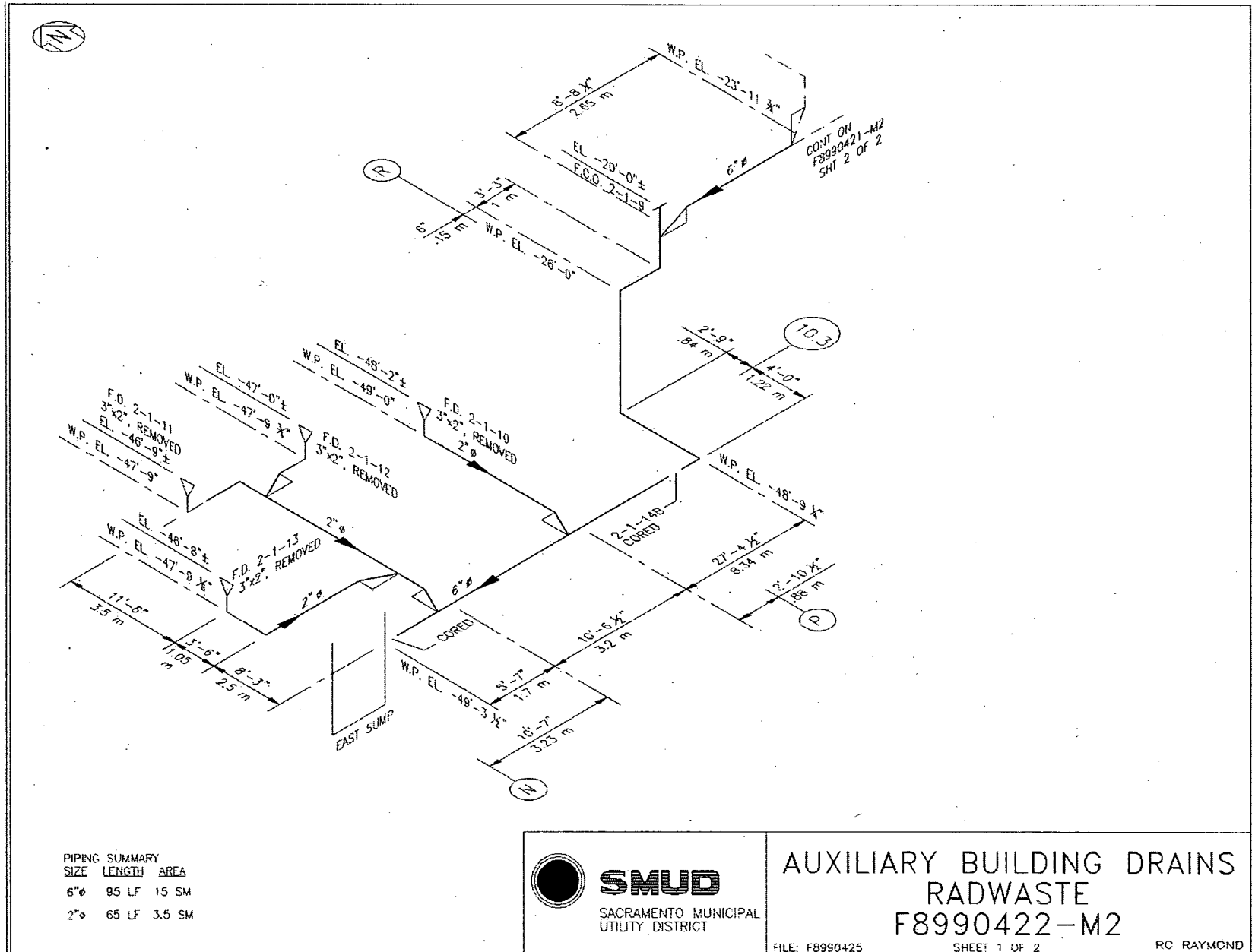
**Maps**

**May 28, 2008**

**Survey Unit F8990422**











**Attachment 2**

**Instrumentation**

**May 28, 2008**

**Survey Unit F8990422**

**Table 2-1. Survey Unit Instrumentation**

| <b>Instrument Model; Serial No.</b> | <b>Detector Model; Serial No.</b> | <b>MDC Static (dpm/100 cm<sup>2</sup>)</b> | <b>MDC Scan (dpm/100 cm<sup>2</sup>)</b> |
|-------------------------------------|-----------------------------------|--------------------------------------------|------------------------------------------|
| M2350; 189081                       | 44-159; 199736                    | 3930                                       | N/A                                      |
| M2350; 142512                       | 44-157; 215958                    | 1680                                       | N/A                                      |
| M2350; 189081                       | 44-157; 201250                    | 1750                                       | N/A                                      |

The MDC noted for the detector model 44-159 is for the 2" diameter piping which is the most conservative. The MDC noted for the detector model 44-157, serial number 201250 is for the 4' piping which is the most conservative.

**Table 2-2. Investigation Criteria and DCGL**

| <b>Parameter</b>                | <b>Value (dpm/100 cm<sup>2</sup>)</b> |
|---------------------------------|---------------------------------------|
| Investigation Criteria - Direct | 100000                                |
| Investigation Criteria – Scan   | N/A                                   |
| DCGL <sub>w</sub>               | 100000                                |
| DCGL <sub>EMC</sub>             | N/A                                   |

**Attachment 3**

**Investigation**

**May 28, 2008**

**Survey Unit F8990422**

**(none required)**

**Attachment 4**

**Data Assessment**

**May 28, 2008**

**Survey Unit F8990422**

