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Issue: Dismantlement Costs
Witness: Christopher "Chris" Robert Rogers
Type of Exhibit: Direct Testimony
Sponsoring Party: Kansas City Power & Light Company
Case No.: ER-2016-0285
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MISSOURI PUBLIC SERVICE COMMISSION

CASE NO.: ER-2016-0285

DIRECT TESTIMONY

OF

CHRISTOPHER "CHRIS" ROBERT ROGERS

ON BEHALF OF

KANSAS CITY POWER & LIGHT COMPANY

Kansas City, Missouri
July 2016

KCP+L Exhibit No. 140
Date 2.8.17 Reporter LB
File No. ER-2016-0285

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DIRECT TESTIMONY

OF

CHRISTOPHER "CHRIS" ROBERT ROGERS

Case No. ER-2016-0285

Q: Please state your name and business address.

A: My name is Christopher "Chris" Robert Rogers and my business address is Sega, Inc., 16041 Foster Street, Overland Park, Kansas 66085.

Q: On whose behalf are you testifying?

A: I am testifying on behalf of Kansas City Power & Light Company ("KCP&L" or the "Company").

Q: What is the purpose of your testimony?

A: The purpose of my testimony is to present and support the report attached to my testimony as Schedule CRR-2 which separately addresses the near term costs of retirement and the potential future costs for dismantlement of KCP&L's fossil-fueled and wind electric generating units. All costs are presented in 2016 dollars as if incurred overnight. No timeline for retirement or dismantlement was considered in this study. As described later, certain activities are required by permit, regulation or contract to be performed upon retirement of a unit and the costs of such activites would be incurred immediately upon retirement.

Q: Please describe your educational background, professional training and experience.

A: Since graduating from Kansas State University with a Bachelor of Science in Mechanical Engineering, I have practiced engineering, principally in the power industry, for more than 40 years. During the first decade of my career, I performed design, construction

contracting, scheduling, and resident construction management services for new coal-fired electric generating stations with a nationally-recognized architect/engineer firm headquartered in Kansas City. During this interval I also completed a Master of Science in Civil Engineering specializing in construction management from the University of Missouri-Columbia.

From 1983 through 1986 I served as the Manager of Generating Facilities on the staff of the Missouri Public Service Commission ("Commission" or "MPSC") and participated in several major rate cases, including the AmerenUE Callaway Nuclear Plant and KCP&L Wolf Creek Nuclear Plant rate cases before the MPSC. Later while employed as a consultant, I provided testimony on behalf of Aquila, Inc. in the South Harper Generating Facility certification case before the MPSC. I have also testified before the Hawaii Public Utilities Commission on behalf of the Hawaii State Consumer Advocate.

I am currently an employee-owner and Vice President of Sega, Inc. ("Sega"), an engineering and technical services firm located in Overland Park, Kansas. Among other things, I provide consulting and project management services for Sega's electric power generating clients. Since joining Sega, Inc. in 1994, I have worked on many projects for KCP&L and our other electric utility clients. Sega, Inc. has performed numerous plant betterment engineering projects for KCP&L's generation stations.

Q: Do you hold any professional licenses?

A: Yes. I am a licensed professional engineer in the State of Missouri (License No. 21087) and 12 other states. I also hold a Certificate of Record from the National Council of Examiners for Engineering and Surveying (No. 19249).

Q: Have you prepared an appendix that describes your training, licenses and power industry experience?

A: Yes. My professional qualifications are provided in Schedule CRR-1.

Q: Have you previously testified in a proceeding before the MPSC or before any other utility regulatory agency?

A: Yes, I have previously testified before the MPSC, the Public Utility Commission of the State of Hawaii and the Kansas Corporation Commission.

In 2012, I provided pre-filed testimony in support of KCP&L before the Kansas Corporation Commission in Docket No. 12-KCPE-764-RTS regarding the near term costs of retirement and the potential future costs for dismantlement of the Company's fossil-fueled electric generating units. In 2014, I also provided pre-filed testimony for KCP&L before the MPSC in Case No. ER-2014-0370 on this issue.

In 2016, I provided pre-filed direct testimony on support of KCP&L Greater Missouri Operations Company, Inc. (GMO) before the Missouri Public Service Commission in Case No. ER-2016-0156 concerning the near terms costs of retirement and potential future costs for dismantlement of the GMO's fossil-fueled electric generating Stations.

The subject matter and references for all the cases in which I have participated are provided at the back of Schedule CRR-1.

SUMMARY

Q: Would you briefly describe the retirement and dismantlement costs developed for KCP&L's non-nuclear generating units?

A: Sega, Inc. was retained by KCP&L to study the cost of decommissioning KCP&L's non-nuclear generating units. Decommissioning is the planned and orderly retirement of a generating unit and the dismantlement and reclamation of the site. The term *decommissioning* includes both retirement and dismantlement activities. Upon retirement from service, a generating unit may either be rendered safe and stored in-situ almost indefinitely through on-going maintenance and security measures or it can be dismantled completely and the site reclaimed for other potential uses. Based upon our experience in the electric generation industry at large and our familiarity with KCP&L's generating fleet, Sega developed opinions of probable cost for KCP&L to retire each of its fossil-fueled generating units. Costs for dismantlement were also developed separately for each unit.

Q: Please summarize retirement of an electric generating unit.

A: Retirement, as used in this study, refers to the planned, orderly and safe shutdown and removal from service of an electric generating unit, and assumes that the unit will not be used for service again. No actions will be taken to preserve the unit or any of its components for reuse. Retirement activities are specific to each unit and to the common facilities at sites with multiple generating units. Since each of KCP&L's units except Osawatomie is located on a multiple unit site, it was assumed that the common site facilities will remain in service until the last unit on that site is retired.

Approximately three to six months before initiating retirement, a specific retirement plan will be prepared for each unit that takes into account environmental permits and regulatory requirements for removing that unit from service. The retirement plan will also provide for necessary safety and security measures during retirement of the unit and for the time period from retirement until dismantlement commences.

First, the unit is rendered safe by de-energizing it and disconnecting it from the electric grid. The switchyards at each unit will remain in service, but isolated to the greatest extent possible from the retired facility. Mechanical systems are de-energized as well. Fuel unloading, handling and storage facilities will be cleaned out, as well as all liquids, chemicals, coolants and reagents. Certain activities are required by specific unit permits and/or state or federal regulations to be performed when the unit ceases operations. These may include closure of ash landfills, removal of river water intakes, and/or removal of fuel oil storage tanks. However, retirement activities do not include asbestos and lead paint abatement measures that are typically handled as ongoing maintenance expenses during the operating life of the unit and continuing if necessary after retirement. More detail is provided on retirement activities in the report, which is Schedule CRR-2.

Q: Please summarize dismantlement of an electric generating unit.

A: Once the unit or facility has been retired and its dismantlement is scheduled, an Owner's Engineer will be retained to assist with environmental issues and technical details in a dismantlement plan. The unit or facility will be characterized and the boundaries for demolition defined to set the scope of the work. A specialty demolition contractor will be hired to perform dismantlement and salvage for the company. Dismantlement as

contemplated in this study provides for the orderly removal of the unit's components to maximize safety and scrap value while preventing damage to any surrounding facilities. The assumptions for dismantlement for each of the units and facilities are provided in Schedule CRR-2.

Q: Did you consider salvage value in reaching your opinion of probable dismantlement costs for these units?

A: Yes, the approximate scrap value for iron and steel and non-ferrous metals were tallied for each unit or facility, based upon estimated quantities and averages of current-year scrap prices. These scrap values were listed separately because the scrap metal prices vary considerably, depending on industry trends, international events and uncontrollable circumstances at the time of the salvage transactions.

Q: What are the results of your study?

A: The opinion of the probable costs for retirement and dismantlement developed by Sega for each of KCP&L's fossil-fueled units and the common facilities at each plant site are provided below in Table 1. All costs shown are in 2016 dollars and do not account for ownership percentages and jurisdictional allocations. The development of these costs is described and supported by the report in Schedule CRR-2.

As shown below in Table 1, there is a significant difference in cost between retiring and dismantling a power plant. The cost to retire all of KCP&L's non-nuclear generating units is estimated to be approximately $235.9 million. To dismantle all of KCP&L's non-nuclear units, I estimate that it would cost an additional $301.2 million. Some components could be sold for scrap during dismantlement thereby recovering an estimated $38.2 million at current average scrap prices, which brings the estimated Net

Terminal Value (cost to dismantle less salvage) for all of KCP&L's fossil-fueled plants to $263.0 million.

Table 1 - Opinion of The Probable Costs for Decommissioning KCP&L's Electric Generating Units

(All cost values in 2016 dollars)

Name	Unit No.	Capability[1]	First Year In Service	Retirement			Dismantlement		
				Unit Retirement	Activities Required by Permit, Regulation[3], or Agreement[4]	Total Retirement	Dismantlement	Scrap Value[5]	Net Terminal Cost
Montrose	1[6]	170	1958	$2,040,668	$5,699,874	$7,740,542	$11,092,556	$1,985,000	$9,107,556
	2	164	1960	$535,095	$5,699,874	$6,234,969	$10,855,969	$1,943,000	$8,912,969
	3	176	1964	$535,095	$5,699,874	$6,234,969	$11,325,826	$2,027,000	$9,298,826
	Common			$717,823	$6,642,773	$7,360,596	$11,361,236	$714,600	$10,646,636
Hawthorn	5	564	1969 / 2001	$1,021,157	$12,445,589	$13,466,746	$22,571,517	$4,076,000	$18,495,517
	Common			$360,857	$7,840,251	$8,201,108	$10,411,094	$489,120	$9,921,974
LaCygne	1	736	1973	$1,117,492	$2,674,758	$3,792,250	$37,028,117	$4,778,000	$32,250,117
	2	662	1977	$1,064,401	$2,674,758	$3,739,159	$39,375,338	$4,584,000	$34,791,338
	Common			$959,466	$88,268,826	$89,248,292	$17,654,670	$1,123,440	$16,531,230
Iatan	1	713	1980	$1,104,700	$395,036	$1,499,736	$25,805,172	$4,660,000	$21,145,172
	2	882	2010	$1,099,956		$1,099,956	$29,497,067	$5,327,000	$24,170,067
	Common			$645,328	$40,896,768	$41,542,096	$26,054,914	$1,198,000	$24,856,914
Northeast	11	52	1972	$550,692		$1,104,245	$11,042,180	$356,000	$10,686,180
	12	41	1972						
	13	46	1975						
	14	49	1975						
	15	53	1976						
	16	53	1976						
	17	53	1977						
	18	52	1977						
	Common				$553,553				
Hawthorn	7	78	2000	$368,777	$0	$368,777	$7,896,768	$89,000	$7,807,768
	8	79	2000						
West Gardner	1	80	2003	$429,179	$0	$429,179	$12,793,564	$178,000	$12,615,564
	2	79							
	3	77							
	4	78							
Osawatomie	1	76	2003	$293,506	$0	$293,506	$6,137,219	$44,500	$6,092,719
Hawthorn	6	235	1979	$431,914	$679,931	$1,111,845	$10,317,668	$1,150,000	$9,167,668
	9		2000						
Spearville[2]	1	31	2006	$16,274,266	$12,532,822	$28,807,088	$0	$2,359,000	($2,359,000)
	2	15	2010	$8,238,655	$5,369,894	$13,608,549	$0	$1,127,000	($1,127,000)
TOTALS		**5,294**		**$37,789,027**	**$198,094,580**	**$235,883,607**	**$301,220,875**	**$38,208,660**	**$263,012,215**

Notes

(1) Current net SPP accredited unit capability, MW.

(2) Spearville Phase 1 nameplate capacity is 100.5 MW, Phase 2 nameplate capacity is 48 MW.

(3) Activities required by permits and/or regulations that are to occur upon ceasing operations, including ash landfill closures, and river water intake.

(4) The Spearville Wind Project Decommissioning Agreements require each wind turbine to be dismantled within 12 months of ceasing operation.

(5) Current scrap values per averaged indices.

(6) SPP Acredited capacity (MW) of Montrose Unit 1 just prior to retirement on April 16, 2016. Capacity provided to indicate relative size of unit.

Q: Are retirement costs optional for KCP&L?

A: No. Retirement costs will unavoidably be incurred by the Company when the plant is shut-down, even if the closed plant is never dismantled. However, KCP&L is not currently required to dismantle its plants upon retirement, and therefore, it is not known

when, or even if, the portion of the costs in my study related only to dismantlement will be incurred.

Q: How have the results of your study been used in this case?

A: It is my understanding that the retirement costs I have identified have been incorporated into the depreciation study performed for KCP&L by Company witness, Mr. John Spanos. It is also my understanding that Mr. Spanos has not included the dismantling costs from my study in his depreciation study. By keeping the two categories of costs separate in my study, I have facilitated Mr. Spanos' efforts in this regard, and I have provided substantial evidence to the Commission clearly showing the distinction between the two categories of costs.

Q: Was the Schedule CRR-2 study prepared under your direction and supervision?

A: Yes. I am the Officer-in-Charge at Sega for this study and participated in determining the methodology and in oversight of our team's performance of the work. I have visited each of the plant sites for previous studies. I supervised the preparation of the report, and reviewed the results for reasonableness and appropriateness.

Q: Does this conclude your testimony?

A: Yes.

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

In the Matter of Kansas City Power & Light Company's Request for Authority to Implement A General Rate Increase for Electric Service	)))	Case No. ER-2016-0285

AFFIDAVIT OF CHRISTOPHER R. ROGERS

STATE OF KANSAS)
) ss
COUNTY OF JOHNSON)

Christopher R. Rogers, being first duly sworn on his oath, states:

1. My name is Christopher R. Rogers. I am employed by Sega, Inc. I have been retained to serve as an expert witness to provide testimony on behalf of Kansas City Power & Light Company.

2. Attached hereto and made a part hereof for all purposes is my Direct Testimony on behalf of Kansas City Power & Light Company consisting of eight (8) pages, having been prepared in written form for introduction into evidence in the above-captioned docket.

3. I have knowledge of the matters set forth therein. I hereby swear and affirm that my answers contained in the attached testimony to the questions therein propounded, including any attachments thereto, are true and accurate to the best of my knowledge, information and belief.

Christopher R. Rogers

Subscribed and sworn before me this 23rd day of June, 2016.

Notary Public

My commission expires: December 29, 2018

JUDITH A. DENNIS
NOTARY PUBLIC
My Appt. Exp. 12/29/18
STATE OF KANSAS

Chris R. Rogers, P.E.

POSITION Vice President, Sega Inc.

EDUCATION B.S.M.E., 1974
Kansas State University
Manhattan, Kansas

M.S.C.E. Civil Engineering – Construction Management, 1981
University of Missouri-Columbia
Columbia, Missouri

LICENSES Professional Engineer Licenses

- California
- Colorado
- Florida
- Hawaii
- Idaho
- Illinois
- Kansas
- Kentucky
- Michigan
- Missouri
- Montana
- North Carolina
- Utah
- NCEES Record Certificate

AFFILIATIONS American Society of Mechanical Engineers

EXPERIENCE SUMMARY

Mr. Rogers is a Vice President of Sega Inc. and a licensed professional engineer with 42 years of experience in the power industry. He leads the firm's corporate risk management activities and directs the firm's planning and studies practice. Mr. Rogers also provides project management and engineering services for Sega's electric power generating clients.

He has provided engineering and management services for many types of electric generating plants, including simple and combined cycle combustion turbine projects, coal and waste coal-fired fluidized bed boiler projects, pulverized coal units, and biomass-fired projects. He has performed engineering and feasibility reviews for financing, construction monitoring, and performance testing of numerous generating facilities.

Mr. Rogers was the Manager of Generating Facilities in the Electric Department of the staff of the Missouri Public Service Commission from 1983 through 1986. He covered issues in conjunction with the construction management audits and rate cases for the Callaway Plant and Wolfcreek Nuclear Generating Station, had limited participation in the Grand Gulf Nuclear Station rate case, and performed other assignments concerning regulated generating facilities throughout the State of Missouri.

During the first decade of his career, Mr. Rogers performed for mechanical engineering for large utility-owned coal-fired central generating facilities while employed by a nationally recognized consulting engineering firm. He served on project design teams in the main office and as the chief mechanical resident engineer on a plant construction site.

SELECTED PROJECT EXPERIENCE

- **Kansas City Power & Light Company, Kansas City, Missouri** - Officer-in-charge of the study for the 2016 Kansas City Power & Light – Greater Missouri Operations Company (GMO) Missouri rate case providing opinion of probable costs of retirement and dismantlement of 25 fossil-fueled generating units totaling approximately 1,720-MW of capacity, including six (6) coal-fired units, and fifteen (19) combustion turbines. Prepared direct testimony for filing with the Missouri Public Service Commission sponsoring Sega's report in Case No. ER-2016-0156.

  Officer-in-charge of study for the 2014 Missouri rate case providing opinion of probable costs of retirement and dismantlement of 24 fossil-fueled generating units and 99 wind turbine generators totaling 5,306-MW of capacity, including eight (8) coal-fired units, one (1) combined-cycle plant, and fifteen (15) combustion turbines. Submitted pre-filed direct testimony before the Missouri Public Service Commission sponsoring Sega's report in Case No. ER-2014-0370.

  Officer-in-charge of study for the 2014 Kansas rate case providing opinion of probable costs of retirement and dismantlement of 24 fossil-fueled generating units and 99 wind turbine generators totaling 5,306-MW of capacity, including eight (8) coal-fired units, one (1) combined-cycle plant, and fifteen (15) combustion turbines. Prepared direct testimony for filing with the Kansas Corporation Commission sponsoring Sega's report for Docket No. 15-KCPE-116-RTS.

  Officer-in-charge of study for the 2012 Kansas rate case providing opinion of probable costs for retirement and dismantlement of 24 fossil-fueled generating units totaling 5,260-MW of capacity, including eight (8) coal-fired units, one (1) combined-cycle plant, and fifteen (15) combustion turbines. Provided pre-filed direct and rebuttal testimony before the Kansas Corporation Commission sponsoring Sega's report in Docket No. 12-KCPE-764-RTS.

- **Kansas City Power & Light Company, Kansas City, Missouri** - Officer-in-charge and project manager for 2014 power plant siting study to identify and evaluate multiple candidate sites for potential location of a new combined-cycle plants, simple-cycle peaking turbines, and reciprocating engine generating plants. Provided detailed report of findings to Kansas City Power & Light Company Resource Planning Department.

- **Kansas City Power & Light Company, Kansas City, Missouri** – Officer-in-charge and project manager for 2010 Great Plains Energy combined cycle plant siting study to identify and evaluate multiple candidate sites for potential location of new 600-MW class combined-cycle plant. Provided detailed report of findings to Kansas City Power & Light Company Resource Planning Department.

- **Kansas City Power & Light Company, Lake Road Generating Station, St. Joseph, Missouri** – Officer-in-charge and project manager for a study that assessed the feasibility of the KCP&L industrial steam generation and delivery system to serve its industrial steam customers.

- **Kansas City Power & Light (Formerly Aquila), South Harper Peaking Facility, Peculiar, Missouri** – 315-MW simple-cycle peaking plant. Project manager of Owner's Engineer for siting, permitting support, detailed installation design, balance of plant procurement, construction management services, commissioning, and documentation support. Sega's project manager and site manager.

- **Kansas City Power & Light,** West Gardner and Osawatomie Generating Stations – Two simple-cycle peaking projects. Sega, Inc's turnkey proposal manager for engineer-led EPC proposal for 400-MW of GE 7E gas turbine generator sets.

- **Independence Power & Light Department, Independence, Missouri** – Master plan study for a nominal 320-MW municipal utility. Officer-in-charge and project manager for five-year planning study including existing generation assessment, transmission system assessment, load forecast, alternative power supply analysis and economic evaluation.

- **State of Hawaii Division of Consumer Advocacy** – Investigated island-wide blackouts that occurred on Oahu and Maui after the earthquakes on October 15, 2006 and on Oahu after lightning events on December 26, 2008. Officer-in-charge and project manager of team for investigation of causes of the outages, utility outage recovery operations and potential improvements to prevent or minimize future outages.

- **Utah Municipal Power Agency, Spanish Fork, Utah** – Officer-in-Charge and Project manager for a study assessing the feasibility of potential sites and development of opinions of probable cost for installation of simple-cycle combustion turbines and reciprocating engine generating sets as a subcontractor to Sawvel and Associates of Findlay, Ohio.

- **Utah Municipal Power Agency, Spanish Fork, Utah** – Officer-in-charge and project manager for due diligence assessment of a simple cycle 200-MW peaking plant consisting of five GE LM6000 combustion turbine generator sets.

- **Kansas City Board of Public Utilities, Nearman Creek CT4, Kansas City, Kansas** – 85-MW simple-cycle peaking plant. Owner's Engineer (Sega, Inc.) site manager for commissioning, including checkout, performance testing, emissions testing and management of construction completion closeout activities.

- **Idaho Power Company, Mountain Home, Idaho** – Sega, Inc.'s project manager for a study to convert 2 W 251B12 gas turbines from peaking to combined-cycle (150MW).

- **Trigen – Kansas City Energy Corporation, Kansas City, Missouri** – Sega, Inc.'s project manager for feasibility study to repower a district heating plant with an 80-MW combustion turbine and heat recovery steam generator cogeneration project.

- **Conserve Energy System, Centralia, Illinois** – Sega, Inc.'s project manager on a technical feasibility study for a 215-MW coal-fired atmospheric circulating fluidized bed boiler steam electric generating plant.

- **Tulare County Power Projects, Goshen and Tipton, California** – Sega, Inc.'s project manager for conceptual design and detailed design proposal for 24-MW net, natural gas-fired reciprocating engine generator set peaking plants located planned at four existing utility substations.

- **High Plains Corp Cogeneration Project, Wichita, Kansas** – Sega, Inc.'s project manager for conceptual design, feasibility study and detailed design-build proposal for a 6-MW net, landfill recovery gas-fired combustion turbine and heat recovery steam generator cogeneration project.

- **City Utilities of Springfield, Missouri** – Sega, Inc.'s project manager for feasibility study for a 8-MW net, natural gas-fired combustion turbine and heat recovery steam generator cogeneration project at local university campus.

- **Cargill, Inc., Blair, Nebraska** – Sega, Inc.'s project manager for feasibility study for an 100-MW net combustion turbine and heat recovery steam generator cogeneration project.

- **Quantum Dynamics, Inc./Quebecor Printing, Inc., Fernley, Nevada** – Sega Inc.'s project manager for balance-of-plant design/build contract on a 3-MW net, gas-fired combustion turbine (ASE40) and heat recovery project at a printing plant.

- **Trigen – St. Louis Energy Corporation, St. Louis, Missouri** – Sega, Inc.'s project manager providing detailed design, construction administration, and startup assistance

for a 20-MW condensing steam turbine addition to an existing cogeneration plant on a fast-tracked basis.

- **University of Missouri-Rolla/Rolla Municipal Utilities** – Sega, Inc.'s project manager for a joint participation cogeneration project feasibility study that investigated alternative power supplies, generating options, and interconnection arrangements for the mutual benefit of the University and the City.

- **LTV Hennepin, Hennepin, Illinois** – Sega, Inc.'s project manager of an engineer–led EPC team for a 9-MW net, gas-fired combustion turbine (3 x ASE 40) and heat recovery project at LTV Steel Company plant in Hennepin, Illinois.

- **University of Missouri-Columbia** – Combustion turbine consultant for Owner's Engineer (Sega, Inc.) on feasibility study and subsequent detailed project design and equipment procurement for a 27-MW cogeneration project that used two Solar Titan combustion turbine generator sets and heat recovery steam generators.

- **Witco Corporation**, Memphis, Tennessee – Sega, Inc.'s project manager on engineer–led EPC team 7-MW net, gas-fired combustion turbine (2 x ASE 50) and heat recovery project at Witco Corporation plant in Memphis, Tennessee. .

- **Trigen – St. Louis Energy Corporation, St. Louis, Missouri** – Sega, Inc.'s project manager for detailed installation design for 15-MW net, gas-fired combustion turbine (two Solar Taurus 60/STAC) and heat recovery project.

- **Independence Power & Light Department, Independence, Missouri** – Sega, Inc.'s project manager for major refurbishment program on six GE Frame 5 and one GE 7B-regenerative, oil and gas-fired gas turbines. Project included condition assessments, specifications, and contracting for renewal and upgrade components, unit controls replacement, remote digital controls addition, and major overhaul of each unit.

- **Somerset Generating Station, Somerset, Massachusetts** – Black & Veatch's project manager on independent engineering review, performing condition assessments for Montaup Electric Company's divestiture of a 40-MW net, oil-fired combustion turbine (2 x FT4) black start peaking unit, a 100-MW coal-fired power plant, a total of 16-MW of diesel generators (8 x 2-MW GM-EMD) and a 2-MW hydro electric plant.

- **Constellation Energy, Freehold, New Jersey** – Sega, Inc.'s project manager for review of project proforma and preparation of testimony before the New Jersey Board of Public Utilities concerning net present value of a 110-MW net, gas-fired combined cycle cogeneration project.

- **Cherokee County Cogeneration Project, Gaffney, South Carolina** – Sega, Inc.'s project manager for an 80-MW net, gas-fired combined cycle (GE 106FA) cogeneration project in Gaffney, South Carolina for Prudential Power Financing. Performed technical review of project during design, permitting, contracting, and financing. Conducted construction monitoring for lender. Also served as interim president of project development entity during lender's takeover of project and equity sale to FP&L.

- **Independence of Power and Light, Independence, Missouri** – Sega, Inc.'s project manager for study of 100-MW coal-fired steam electric unit, including conceptual design and estimating performance and cost for client's comparison to participation in Iatan II Project. Compiled and compared capital and operation and maintenance cost of alternative 100-MW coal-fired steam electric plants including pulverized coal and CFB plants, and natural gas-fired combined cycle and simple cycle units of the same size.

- **University of New Mexico** – Sega Inc.'s project manager for cogeneration feasibility study that evaluated replacement of campus central heating plant with a 30-MW net, gas-fired combustion turbine and heat recovery steam generator.

- **Florida State Correction Facility**, Starke, Florida – Bibb and Associates' project manager for independent review for potential equity investor, KLT Power, Inc. on a 23-MW, wood gasification and natural gas-fired, combined-cycle cogeneration project proposed near Starke, Florida.

- **Indeck-Oswego Energy Center, Oswego, New York** – Bibb and Associates' project manager on independent engineering review for BA Securities, Inc. regarding the power sales agreement during term of financing of 51-MW, gas-fired combined-cycle (GE6B) cogeneration project in Oswego, New York.

- **Honeywell FM&T, Kansas City, Missouri** – Bibb and Associates' project manager on AlliedSignal's engineering team for feasibility studies, conceptual design, permitting support, bidding, and evaluation of developer qualifications for a 40-MW, gas-fired, combustion turbine cogeneration project providing steam and electric service to a federal government complex in Kansas City, Missouri.

- **North Carolina EMC**, Raleigh, North Carolina – Bibb and Associates' project manager of the Owner's Engineer team that wrote specifications and evaluated EPC proposals for a 330-MW gas-fired combined-cycle project and 100-MW gas-fired simple-cycle project in North Carolina.

- **Indeck-Olean Energy Center, Olean, New York** – Bibb and Associates' project manager on independent engineering review for bank group consisting of Canadian Imperial Bank of Commerce, BOT Financial, Inc., Westpac Banking Corporation, and

Toronto Dominion Bank. Project was a 79-MW, gas-fired combined-cycle (GE 6B) cogeneration project in Olean, New York. Scope included review of technical feasibility and economic viability of project for financing, construction progress monitoring and oversight of performance demonstration tests.

- **Orlando CoGen Limited, L.P, Orlando, Florida.** – Bibb and Associates' project manager for independent engineering review for senior lender, the Sumitomo Bank, Limited of a 120-MW gas-fired, single-shaft combined cycle (ABB11N1/VAX) cogeneration project in Orlando, Florida developed by Air Products and Chemicals, Inc. and Utilicorp United.

- **Empire Cogen, Tampa, Florida** – Bibb and Associates' project manager for an independent engineering review for senior lender, National Westminster Bank PLC of a 10-MW, gas-fired multiple gas turbine (Allison/US Turbine) cogeneration project located on MacDill Air Force Base near Tampa, Florida.

- **ACE Cogeneration Project, Trona, California** – Bibb and Associates' project manager for independent engineering review for equity investor, US West Capital, Inc., including design, permit status, operations and maintenance of an existing 96-MW, coal-fired CFB steam electric plant.

- **Arroyo Cogeneration, Escondido, California** – Bibb and Associates' project manager for engineering review of project for development financing for Heller Financial, Inc, including alternate site selection program for a 49.9-MW, gas-fired, combined cycle (GE LM6000) cogeneration project.

- **Nestles Freehold Cogeneration Project, Freehold, New Jersey** – Bibb and Associates' project manager for independent engineering review for development financing by Heller Financial, Inc. of a proposed 110-MW, gas-fired, single-shaft combined cycle (ABB11N1/VAX) cogeneration project by Constellation Energy.

- **Northeast Cogen, Solvay, New York** – Bibb and Associates' independent review engineer for development financing by Heller Financial, Inc. for a proposed 49-MW, gas-fired combined cycle (GE6B/LM6000) cogeneration project.

- **Newbay Cogeneration Project, East Providence, Rhode Island** – Bibb and Associates' project manager for independent engineering review for development/bridge financing by Heller Financial, Inc of a proposed 72.2 MW, coal-fired circulating fluidized bed boiler generating plant. Reviewed design, permit applications, and development status.

- **Redding Power Project, Redding, California** – Bibb and Associates' project manager for independent engineering review for National Westminster Bank PLC during lay-up, preservation, foreclosure, receivership, and resale of 23-MW, two biomass-fired stoker boiler generating units.

- **San Joaquin Valley Energy Partners I, Fresno, California** – Bibb and Associates' project manager for independent engineering review for take-over lender Canadian Imperial Bank of Commerce, for the evaluation, and equity re-sale of a 43-MW, three unit, biomass-fired fluidized bed boiler plant.

- **Redding Peaking, Redding, California** – Bibb and Associates' project manager for engineering review for bridge financing for Heller Financial, Inc. of a proposed 49.9-MW, gas-fired simple cycle combustion turbine (GE 6) peaking plant.

- **Intercontinental Energy, Bellingham, Massachusetts and Sayreville, New Jersey** – Bibb and Associates' project manager for independent engineering review for potential equity investor, American Energy Division of Potomac Capital Investment Corporation, for two 300-MW, gas-fired combined cycle (2 x W501D) cogeneration projects.

- **Gifford-Hill Cement Cogeneration Project, Oro Grande, California** – Bibb and Associates' project manager for independent engineering review for US West Capital, Inc., for financing the sale/lease back of an existing 20-MW heat recovery steam electric cogeneration plant.

- **Sunnyside Cogeneration Project, Carbon County, Utah** – RW Beck and Associates' project manager for independent engineering review for senior lender, Swiss Bank Corporation, of the design and permitting review of a 50-MW waste coal-fired circulating fluidized bed boiler electric generating plant.

- **North Branch Power Project, Bayard, West Virginia** – RW Beck and Associates' project manager on independent engineering review for financing and construction monitoring for senior lender, Security Pacific Bank of a 80-MW waste coal-fired, circulating fluidized bed boiler project.

- **Unocal Geothermal, Monterey, California** – RW Beck and Associates' engineer, retained by Unocal to provide independent third-party oversight and monitoring of biennial performance tests by Pacific Gas and Electric Company at the Moss Landing Power Station (two 750-MW super-critical, gas and oil-fired steam electric generating units) related to geothermal steam pricing at Unocal's Geysers Geothermal projects.

- **Viking Power Projects, Lincoln, Michigan, McBain, Michigan, and Northumberland, Pennsylvania** – RW Beck and Associates' project manager on independent engineering review for financing, construction monitoring and performance testing for senior lender, CIGNA, of three 16-MW biomass fueled stoker-generating plants.

- **St. Nicholas Power Project, Mahanoy Township, Pennsylvania** – RW Beck and Associates' project manager on independent engineering review for financing, construction monitoring and performance test monitoring for senior lender, Bank of New England for an 80-MW waste coal-fired steam electric plant.

- **Chinese Station, Inyokern, California** – RW Beck and Associates' project manager on engineering review for take-over and resale; reviewed design, plant betterment program, and projected operation and maintenance program of a 25-MW biomass-fired generating plant.

- **Koma Kulshan Hydro Project, Whatcom County, Washington** – RW Beck and Associates' project manager on independent engineering review of design and construction monitoring for senior lender National Westminster Bank PLC of a 12-MW hydroelectric station.

- **Scrubgrass Power Project, Venango County, Pennsylvania** – RW Beck and Associates' project manager on independent engineering review of design, permits, and contracts for financing and construction monitoring for senior lender, National Westminster Bank, PLC of an 80-MW waste coal-fired, circulating fluidized-bed boiler project.

- **Callaway Nuclear Generating Station, Fulton, Missouri** – Manager of Generating Facilities for the Missouri PSC staff, investigated and/or provided testimony concerning project construction management, in-service criteria, net electric capability, decommissioning funding, and in-service completion in rate case for a1150-MW, PWR nuclear generating station.

- **Wolf Creek Nuclear Generating Station, Burlington, Kansas** – Manager of Generating Facilities for the Missouri PSC staff, investigated and/or provided testimony concerning project construction management, in-service criteria and startup, related fossil-fuel plant retirements, related plant accreditations, depreciation, and net electric capability in rate case for an 1120-MW PWR nuclear generating station.

- **Grand Gulf Generating Station I, Grand Gulf, Mississippi** –. Manager of Generating Facilities for the Missouri PSC staff, investigated and provided testimony concerning in-service criteria, in-service status, and overall project NRC inspection and licensing status for a 1250-MW BWR nuclear generating station.

- **Plains-Escalante Generating Station, Unit 1, Prewitt, New Mexico** – Burns & McDonnell's senior mechanical design engineer for mechanical equipment and systems, equipment procurement, construction contracting and coordination; and chief resident mechanical engineer during construction of a 210-MW pulverized coal power plant.

- **EPRI-DOE Fuel Cell Demonstration Project, San Jose, California** – Burns & McDonnell's mechanical engineer on cogeneration feasibility study for commercial demonstration of 5-MW fuel cell cogeneration demonstration project.

- **Basin Electric Power Cooperative, Inc., Laramie River Station, Wheatland, Wyoming** - Burns & McDonnell's mechanical design engineer for equipment and systems, equipment procurement, and construction contracting and CPM scheduler for coordination of construction completion of systems with sequenced system start-up program for three, 550-MW net, pulverized coal-generating units for the Missouri Basin Joint Power Project Agency, lead by the Basin Electric Power Cooperative, Inc.

Chris R. Rogers, P.E.

TESTIMONY BEFORE THE MISSOURI PUBLIC SERVICE COMMISSION

Issue Description	Exhibit No.		Transcript Vol. No.	Page Nos.
AMEREN				
CASE NOS. EO-85-17 & ER-84-168 (on behalf of the MO PSC Staff)				
Phase I – Inservice Criteria	Direct	A-7		
	Rebuttal	A-12		
	Surrebuttal	A-14	7	492-83
Phase II – Net Electric Capability	Direct	C-76		
	Surrebuttal	C-77	30	2852-2868
Phase III – Funding Decommissioning	Surrebuttal	C-38	28	2434-2440
Phase III – Inservice Review	Supplemental (1-28-85)	NA	NA	NA
AMEREN				
CASE NO. ER-85-20 (on behalf of the MO PSC Staff)				
Status of Grand Gulf 1 and Waterford 3	Supplemental	12	4	118-181
KANSAS CITY POWER & LIGHT				
CASE NO. ER-85-128 & EO-85-185 (on behalf of the MO PSC Staff)				
Phase I – Inservice Criteria Startup	Affidavits Direct (filed 1/10/85)		NA	NA
Phase IV – Fossil Plant Retirement Dates	Direct	262		
	Surrebuttal	266	23	1798-1817
Phase IV – Depreciation – Wolf Creek	Rebuttal	259		
Phase IV – AWS Structural Steel Welding	Direct	301		
	Surrebuttal	302	26	2294-2329
Phase IV – Net Electric Capability	Direct	399		
	Surrebuttal	400	33	3682-3699
Phase IV – Accreditation Overview	Direct	262	23	1798-1817
	Surrebuttal	436	7	4451-4483
	Appendices (9/10/82)	263		

TESTIMONY BEFORE THE MISSOURI PUBLIC SERVICE COMMISSION (Cont'd)

Issue Description	Exhibit No.	Transcript Vol. No.	Page Nos.
AMEREN CASE NO. ER-85-265 (on behalf of the MO PSC Staff)			
Functionalization and Classification of Costs (Jurisdictional Allocations)	Surrebuttal 89	6	844-848
KCP&L GREATER MISSOURI OPERATIONS COMPANY (Formerly AQUIL INC.) CASE NO. EA-2006-0309 (on behalf of the Company)			
South Harper Peaking Facility Site Selection	Direct (filed 01/27/06)	N/A	N/A
KANSAS CITY POWER & LIGHT COMPANY, INC. CASE NO. ER-2014-0370 (on behalf of the Company)			
The Costs of Retirement and Dismantlement: Decommissioning KCP&L Fossil-Fueled Generating Units	Direct Testimony 131	N/A	N/A
KCP&L GREATER MISSIORI OPERATIONS COMPANY, INC. CASE NO. ER-2016-0156 (on behalf of the Company)			
The Costs of Retirement and Dismantlement: Decommissioning KCP&L-GMO Fossil-Fueled Generating Units	Direct Testimony ___	N/A	N/A

TESTIMONY BEFORE THE KANSAS CORPORATION COMMISSION

Issue Description	Exhibit No.	Transcript Vol. No.	Page Nos.
KANSAS CITY POWER & LIGHT COMPANY, INC. DOCKET NO. 12-KCPE-764-RTS			
The Costs of Retirement and Dismantlement: Decommissioning KCP&L Fossil-Fueled Generating Units	Pre-filed Direct Testimony Pre-filed Rebuttal Testimony		

TESTIMONY BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF HAWAII

Issue Description	Exhibit No.	Transcript Vol. No.	Page Nos.
HAWAII ELECTRIC LIGHT COMPANY, INC. DOCKET NO. 99-207 (on behalf of Consumer Advocate)			
Keahole Projects or Facilities:	Direct Pre-filed CA-T-		288 – 301
1. Shop/Warehouse Building	12	II	301 – 309
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4. Inclusion in Rate Base Amounts			
HAWAII ELECTRIC COMPANY, INC., MAUI ELECTRIC COMPANY, LTD., AND HAWAII ELECTRIC LIGHT COMPANY, INC. DOCKET NO. 2006-0431 (on behalf of Consumer Advocate)			
Consumer Advocates Statement of Position:	Filed August 24, 2007		
Consumer Advocate's Supplement	Filed: September , 19, 2008		

SCHEDULE CRR-2

Kansas City Power & Light Co.

The Costs of Retirement and Dismantlement:

Decommissioning KCP&L's Generating Units

June 2016

ENGINEERING & TECHNICAL SERVICES

Project No. 16-0101

Kansas City Power & Light Co.

The Costs of Retirement and Dismantlement:

Decommissioning KCP&L's Generating Units

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June 2016

ENGINEERING & TECHNICAL SERVICES

Project No. 16-0101

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CERTIFICATION

CERTIFICATION

I hereby certify that this document was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Missouri.

Christopher Robert Rogers
June 28, 2016

Christopher Robert Rogers, P.E.
State of Missouri P.E. No. E-21087

SECTION 1

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

1.1 INTRODUCTION

Kansas City Power & Light Company (KCP&L) retained Sega, Inc. (Sega) to provide an opinion of probable costs for retirement and dismantlement of its electric generating units with the exception of the Wolf Creek Nuclear Generating Facility which has been covered under a separate study. This report updates the cost results presented in Sega's October 2014 study (Sega Project No. 14-0162) for decommissioning these facilities.

Decommissioning is comprised of two principal phases: ***retirement*** and ***dismantlement.*** ***Retirement*** is the shutdown or closure and removal from service of a generating unit or facility, and includes disconnection, de-energization, cleanout, and securing of the units to render them safe. ***Retirement*** triggers unavoidable costs for compliance with the mandatory provisions of the various plants' permits and with the specific requirements of State and Federal regulations for the closure of ash landfills, the removal and remediation of fuel-oil tanks, and the reclamation of river water intakes.

KCP&L is not required to dismantle its plants upon retirement, and therefore, it is not known when, or even if, dismantlement costs will be incurred. Often a unit may not be dismantled until sometime after it is retired, particularly if there are other operational generating units on the same site. ***Dismantlement*** is the orderly demolition of the unit in a controlled and safe manner so as to preserve the scrap value of reclaimed materials while appropriately protecting the workers and the environment. Scrap values are considered separately from dismantlement costs because scrap values have proven volatile over time. Scrap values in this report were developed from current average index prices, and were netted out against dismantlement costs to produce net terminal costs for each unit. All costs are provided in current day, 2016 dollars.

1.2 DESCRIPTION OF FACILITIES

The KCP&L generating facilities are located on eight sites and include 15 simple-cycle combustion turbines, one combined-cycle plant, two wind generation units, and eight steam electric generating units. The major attributes of each unit are provided in *Figure 1.1* and further described below.

Plant Name	Unit No.	Current Net SPP Accredited Capability, MW	First Year In Service	Fuel / Type
Montrose	1	170	1958	Coal / Steam
	2	164	1960	
	3	176	1964	
Hawthorn	5	564	1969 / 2001	Coal / Steam
La Cygne	1	736	1973	Coal / Steam
	2	662	1977	Coal / Steam
Iatan	1	713	1980	Coal / Steam
	2	882	2010	Coal / Steam
Northeast	11	52	1972	Distillate-Fired Combustion Turbines
	12	41		
	13	46	1975	
	14	49		
	15	53	1976	
	16	53		
	17	53	1977	
	18	52		
Hawthorn	7	78	2000	Natural Gas-Fired Gas Turbines
	8	79	2000	
Hawthorn	6	235	1997	Natural Gas-Fired Gas Turbine
	9		2000	HRSG & Turbine in Combined Cycle
West Gardner	1	80	2003	Natural Gas-Fired Gas Turbines
	2	79		
	3	77		
	4	78		
Osawatomie	1	76	2003	Natural Gas-Fired Gas Turbine
Spearville	1	100.5	2006	Wind
	2	48	2010	

Figure 1.1 - KCP&L Electric Generating Units

1.2.1 Facility Descriptions

Montrose Generating Station is a three-unit pulverized coal-fired electric generating station located in rural Henry County, near the town of Montrose, Missouri. Each Montrose unit has an electrostatic precipitator. This report includes actual reported costs for retirement of Unit 1 and opinion of probable costs for Units 2 and 3.

Hawthorn Generating Station is located in eastern Kansas City within Jackson County, Missouri and is comprised of several different types of units. Unit 5 is a pulverized coal-fired steam electric plant with a selective catalytic reduction (SCR) system, baghouse, and dry scrubber. Unit 6 is a natural gas-fired combustion turbine generator that can be operated alone in simple cycle through its bypass stack or in combined cycle in conjunction with Unit 9, a heat recovery steam generator (HRSG) with a condensing steam turbine generator that was originally part of Unit 4. Units 1 through 3 and the remainder of Unit 4 were coal and natural gas-fired steam electric generators that were retired in place awaiting dismantlement. Units 7 and 8 are simple-cycle, natural gas-fired combustion turbine generator sets.

La Cygne Generating Station is comprised of two coal-fired steam electric units in rural Linn County near the town of La Cygne, Kansas. Unit 1 is a super-critical, coal-fired cyclone boiler steam electric plant with an SCR. Unit 2 is a pulverized coal-fired steam electric plant with an SCR. Both units have a baghouse and wet scrubber.

Iatan Generating Station is located in rural Platte County, near the town of Weston, Missouri. Unit 1 is a pulverized coal-fired, sub-critical steam electric plant with an SCR, baghouse, and wet scrubber. Unit 2 is a pulverized coal-fired, super-critical steam electric plant with an SCR, baghouse, and wet scrubber.

Northeast Generating Station is an eight-unit, distillate oil-fired combustion turbine peaking plant located near downtown Kansas City, in Jackson County, Missouri.

West Gardner Generating Station is a four-unit, natural gas-fired combustion turbine peaking plant in suburban Johnson County, near the town of Gardner, Kansas.

Osawatomie Generating Station is a single-unit, natural gas-fired combustion peaking plant located in rural Miami County, between the towns of Osawatomie and Paola, Kansas.

Spearville Generating Station is a wind generation plant located in rural Ford County near Spearville, Kansas. Unit 1 has 67 wind turbines. Unit 2 has 32 wind turbines.

1.3 APPROACH

As part of the 2012 report, Sega met with representatives of KCP&L to gather information about the generating units and visited each of the plant sites. Discussions were held with certain plant staff, further documentation was obtained, and a walkdown of each unit was conducted. Sega utilized Microsoft® Project (MS Project), Version 2010 software with resource loading to develop and compile an opinion of probable costs and schedule for the retirement of each unit. Costs were developed based on KCP&L current labor rates and those of its present maintenance contractors. Site-specific retirement costs were developed using a bottom-up approach for each task.

For the 2016 report, the methodology remains the same; however, costs and tasks were updated using MS Project, Version 2013 software with revised loaded resources using client data or inflation adjusted costs. Asset retirement obligation (ARO) activities, union rates, single bulk activities (i.e., stack capping), and miscellaneous individual line items were included in the updated opinion of probable costs where actual costs were not available.

For the 2012 study, the basis and limits for retiring or dismantling each unit were defined while visiting the plant sites. For instance, it was assumed that the switchyard and/or substation (as applicable) for each generator would remain in service following either retirement or dismantlement. In general, plant roads, fencing, and site grading were

presumed to remain undisturbed unless otherwise specifically required to be removed. Closure of ash landfills, and the removal and remediation of river water intakes and fuel oil storage tanks were included in the retirement phase as required by applicable permits. This approach remains unchanged from the 2012 original report.

Because specific quantity information was available for Iatan Unit 1 and La Cygne Unit 2, the dismantlement costs of these two units were developed from the ground up. It was assumed that common facilities at each plant site, such as coal unloading, storage and handling systems, water treatment systems, ash handling systems, and office buildings, would remain in service until the last unit is retired. For multiple-unit sites, retirement and dismantlement costs were developed separately for the common plant facilities. In the case of Hawthorn, the common facilities associated with the coal-fired unit, Hawthorn 5, will be retired with that unit. The remaining units at the Hawthorn site are gas-fired and do not require many of the common site facilities for operation.

Spearville will be dismantled per the Spearville Wind Project Decommissioning Agreement between KCP&L and Ford County, Kansas. This agreement states that the dismantlement of each wind turbine shall include the removal of the turbine and tower, removal of the tower foundation to a depth at least 4 feet below grade, and removal of the interconnection transmission poles and lines. The dismantlement of the wind turbines shall commence within 12 months after each unit is retired.

The estimates of probable cost for "stack removal" and "final site grading and drainage" for the various sites were not developed using MS Project software. The "stack removal" costs for the various stacks were based on the actual costs to dismantle the La Cygne Units 1 and 2 stack. This cost was scaled to estimate the demolition for the other stacks involved in this study. The "final site grading and drainage" estimate of probable cost was developed by Sega but was not developed in an MS Project schedule. Both of these activities are represented in the MS Project schedule in Appendix A for the applicable units as a onetime cost/use in the resource allocation section of the file; therefore, they appear as a one-day activity in the schedule with the estimated costs as a one-time expense.

1.4 RESULTS

The opinion of the probable costs for retirement and dismantlement developed by Sega for each of KCP&L's units and the common facilities at each plant site are provided in *Figure 1.2.* All costs shown are in 2016 dollars. The costs are provided for the full ownership of these generating facilities. Fractional shares of ownership and jurisdictional allocations have not been taken into account in these costs. Ongoing expenses for the sites such as security, routine inspections, groundwater monitoring, etc., which would continue as long as the Company continues to own the sites, are included in the decommissioning costs. Retirement costs are separately provided for each unit and for related common plant facilities. The costs of dismantlement and scrap values are provided for each unit and for common plant, as well as the final net terminal costs.

As shown in *Figure 1.2,* there is a significant difference between the costs of retiring and the costs of dismantling a power plant. In Sega's opinion, the probable cost to dismantle all of KCP&L's units is approximately $319 million. Some materials could be sold for scrap, thereby recovering approximately $38 million and bringing the estimated net terminal value for dismantling all of KCP&L's plants to $281 million, based upon the current averaged scrap indices.

However, were KCP&L to retire its generating units in place without dismantlement, Sega believes the cost would be approximately $236 million. As explained more fully in Section 2 - Retirement, the bulk of these retirement costs are tied to activities that must be completed upon retirement of the unit or whenever the unit ceases operations, as required by regulation, permits, or agreements. KCP&L accounts for most of these costs in AROs.

Name	Unit No.				Dismantlement		
		Unit Retirement	Activities Required by Permit Agreement [4] or Regulation [2]	Total Retirement	Dismantlement	Scrap Value [3]	Net Terminal Cost
Montrose	1	$2,040,668	$5,699,874	$7,740,542	$11,092,556	$1,985,000	$9,107,556
	2	$535,095	$5,699,874	$6,234,969	$10,855,969	$1,943,000	$8,912,969
	3	$535,095	$5,699,874	$6,234,969	$11,325,826	$2,027,000	$9,298,826
	Common	$717,823	$6,642,773	$7,360,596	$11,361,236	$714,600	$10,646,636
Hawthorn	5	$1,021,157	$12,445,589	$13,466,746	$22,571,517	$4,076,000	$18,495,517
	Common	$360,857	$7,840,251	$8,201,108	$10,411,094	$489,120	$9,921,974
La Cygne	1	$1,117,492	$2,674,758	$3,792,249	$37,028,117	$4,778,000	$32,250,117
	2	$1,064,401	$2,674,758	$3,739,158	$39,375,338	$4,584,000	$34,791,338
	Common	$959,466	$88,288,826	$89,248,293	$17,654,670	$1,123,440	$16,531,230
Iatan	1	$1,104,700	$395,036	$1,499,736	$25,805,172	$4,660,000	$21,145,172
	2	$1,099,956		$1,099,956	$29,497,067	$5,327,000	$24,170,067
	Common	$645,328	$40,896,768	$41,542,095	$26,054,914	$1,198,000	$24,856,914
Northeast	11 12 13 14 15 16 17 18	$555,987		$1,109,540	$11,042,180	$356,000	$10,686,180
	Common		$553,553				
Hawthorn	7	$368,777	$0	$368,777	$7,896,768	$89,000	$7,807,768
	8						
West Gardner	1 2 3 4	$429,179	$0	$429,179	$12,793,564	$178,000	$12,615,564
Osawatomie	1	$293,506	$0	$293,506	$6,137,219	$44,500	$6,092,719
Hawthorn	6	$431,914	$679,931	$1,111,846	$10,317,668	$1,150,000	$9,167,668
	9						
Spearville[4]	1	$16,274,266	$12,532,822	$28,807,088	$0	$2,359,000	($2,359,000)
	2	$8,238,655	$5,396,894	$13,635,549	$0	$1,127,000	($1,127,000)
		$37,794,323	**$198,121,580**	**$235,915,903**	**$301,220,874**	**$38,208,660**	**$263,012,214**

(1) All values in 2016 U.S. dollars.

(2) Activities required by permits and/or regulations that are to occur upon ceasing operations, including ash landfill closures, and river water intake.

(3) Current scrap values per averaged indices.

(4) The Spearville Land Lease requires the wind turbines be dismantled within 12 months of retirement.

Figure 1.2 - Probable Costs of Decommissioning
KCP&L Electric Generating Units [1]

1.5 REVISION SUMMARY

This document is a stand-alone report; however, the cost values contained in this report have been updated and revised based from previous work versions. The major revisions are described as follows.

1.5.1 Coal Combustion Residue / Effluent Limitation Guidelines Regulatory Changes

The United Sates Environmental Protection Agency (EPA) implemented new rules regulating the disposal of coal combustion residue (CCR) in the fall of 2015. Among other things, the final CCR rules established new requirements applicable to CCR landfills, CCR surface impoundments, and all lateral expansions of CCR units. These requirements, which were intended to reduce the risks of catastrophic structural failures and to protect groundwater quality, pertain to operation, closure, and post-closure of all CCR facilities at coal-fired generating units.

The existing KCP&L ARO accounts for tracking funding for closure of CCR landfills and surface impoundments that were required to be implemented upon retirement of their coal units under existing permits and regulations were used in Sega' s previous reports. In order to capture the costs of the significantly increased requirements in the 2015 CCR rules, KCP&L commissioned studies to determine the impacts and estimate the costs of implementing the new CCR rules on each unit. These studies (performed by others) became the basis for KCP&L's revised ash pond/impoundment AROs for each of the coal-fired units. This report incorporated KCP&L's revised CCR AROs in the retirement category of costs for activities required by permit, agreement or regulation, as previously shown in *Figure 1.2.*

1.5.2 Asbestos Remediation Costs

In prior studies, asbestos abatement was not included for any unit or facility. Asbestos abatement activities were being implemented at affected sites throughout the operating life of the units in conjunction with major maintenance activities. However, KCP&L previously set up AROs for asbestos removal at the Montrose, Hawthorn Unit 5, and La Cygne plants to more accurately capture the actual costs KCP&L expects to incur at retirement. While asbestos remediation is not strictly required at the time of retirement by permit, contract or regulation, KCP&L is ultimately responsible for remediation of all such hazardous materials at all of its facilities. If not handled at retirement, asbestos could be exposed or released while the facilities set idle awaiting dismantlement. This could cause ongoing issues and increase the maintenance costs for non-producing assets. KCP&L is unavoidably responsible for asbestos remediation prior to dismantlement in any event. Thus, the AROs for asbestos abatement were added into the retirement category of costs for activities required by permit, agreement or regulation, as previously shown in *Figure 1.2.*

1.5.3 Current Dismantlement Activities

As a result of the La Cygne Environmental Retrofit projects, several components are currently being dismantled. Therefore, Sega utilized the fully burdened KCP&L costs for dismantlement of these components to more accurately capture the overall dismantlement costs for these units. In Sega's prior decommissioning reports the construction quantities, which were known for La Cygne Unit 2, were used for development of dismantlement costs for that unit and became the basis for scaling the costs of other similar units. To the extent that portions of the dismantlement cost of La Cygne Unit 2 are now known, those costs were utilized to adjust the total dismantlement costs. The known ongoing dismantlement costs were for the following components:

1. La Cygne Unit 1:
    a. Wet Scrubber Building.
    b. Induced Draft (ID) Fans and Drives.
    c. Limestone Ball Mill Facility.

d. Stack.

2. La Cygne Unit 2:

   a. Electrostatic Precipitator.

   b. Stack.

1.5.4 Montrose Unit 1 Retirement

Montrose Unit 1 was retired on April 16, 2016. In previous decommissioning studies, Sega developed opinions of the probable of retirement. One component of retirement is a planning study that is performed three to six months prior to retirement. Specific retirement activities are adjusted as a result of the planning study because greater detail is known and the configuration and operating plans of the remaining units and common facilities are known at that point. The retirement plan is currently being implemented on Unit 1 while Units 2 and 3 remain in operation. Sega utilized the actual cost of the planning study and other ongoing retirement activities for Montrose Unit 1 in this report and accordingly reduced the Owner's Contingency allowance from 25 percent to 5 percent.

1.5.5 Other Adjustments

Base calculations used in prior studies, other than those described above were updated for the changes in escalation from 2014 through 2016. ARO values were adjusted using the basis for each previously set by KCP&L. Finally, scrap prices were adjusted to reflect the currently reduced values of 2016 average indices.

SECTION 2

RETIREMENT

RETIREMENT

2.1 INTRODUCTION

Sega developed an opinion of probable costs to retire the KCP&L facilities previously listed in *Figure 1.1* and further described in Appendix A. The opinion of probable costs is a buildup of estimated costs to perform the retirement activities to leave each facility in a safe state. A resource-loaded MS Project schedule was developed for the retirement of each facility where actual costs were not available. Each schedule includes the activity, duration of the activity, resources required for each activity, and the probable cost of each activity. The results for each facility are provided in Appendix A of this report.

The opinion of probable costs for the retirement of each coal-fired generating facility is broken down into the retirement of each unit, plus the retirement of the common facilities. With the exception of Hawthorn, the common facilities will be retired when the last unit is retired at a site. In the case of Hawthorn, the common facilities associated with the coal-fired unit, Hawthorn 5, will be retired with that unit. The remaining units at the Hawthorn site are gas-fired and do not require many of the common site facilities for operation.

2.2 OPINION OF PROBABLE COSTS BASIS

Retirement activities will be performed by KCP&L bargaining unit personnel and managed by KCP&L. Man-hour costs for both management and bargaining unit personnel were provided by KCP&L. At the direction of KCP&L, the direct man-hour rate was multiplied by 1.4 to account for benefits and overhead loadings.

The estimates of probable cost to retire the combustion turbines are based on retiring all of the combustion turbines at a given site, not on an individual combustion turbine retirement basis.

A 5-percent "Owner Internal Costs" is included in the opinion of probable cost. This line item is included to cover the costs of various internal KCP&L departments that will charge to the project during the implementation of the retirement activities.

A 25-percent "Owner Contingency" is included in the opinion of probable cost. This level of contingency is consistent with Association for the Advancement of Cost Engineering (AACE-International) contingency level guidelines based on the engineering progress completed at the point when the cost estimate was developed. For Montrose Unit 1, the Owner Contingency is 5 percent based on actual costs for the retirement activities.

2.3 RETIREMENT ACTIVITIES

Prior to starting the actual retirement activities, a retirement plan will be developed. This plan will address any laws, ordinances, regulations, and standards dictating how ash, slag, scrubber by-products, and any other waste stream is stored and/or removed from the plant site. An environmental assessment will be performed to develop a plan to address these issues and to assure that permits required to complete the retirement activities are in place. The retirement plan will also address plant safety during the time interval between plant retirement and eventual dismantlement. This plan should include the requirements for periodic inspections to assess the condition and integrity of the plant structures so that contractors can safely demolish the plant when so required. The costs to perform these activities are estimated in the "Pre-Retirement Activities" line item of each facility's opinion of probable cost.

The following activities and conditions are required to leave a generating facility (unit, common facilities, or entire plant, as may be applicable) in a safe state and are included in each facility's opinion of probable cost:

3. All equipment, tanks, vessels, containers, drums, headers, exchangers, and sumps will be drained and vented. Fuel oil, lubricating oil, liquid propane, bulk hydrogen, Halon, liquid ammonia, water treatment chemicals, lab chemicals, cleaning solutions, and Freon will be handled per plant procedures and plan permitting requirements. Man-ways, hand-holes, vents, and drains will be opened to ensure drainage. Drains will remain open.

4. The electrical sources will be isolated from the facility. The exact details of this scope of work will be determined during the pre-retirement activities phase. At a minimum, all electrical buses will be disconnected at the source. The medium- and low-voltage switchgear will be racked out by fully withdrawing the circuit breakers. Fuses will be removed, and circuit breakers and disconnect switches will be left in the open position. Motors will be disconnected at the source and motor lube oil will be drained (as applicable).

5. Fuel yard equipment will be cleaned and vacuumed to reduce or eliminate the hazards of fugitive coal dust.

6. To the maximum extent possible, all drains will be emptied and vented. Low-point drains will remain open.

7. Fuel gas piping and city/rural water piping will be cut and capped at the property line.

8. Chimney Federal Aviation Agency (FAA) required lighting will be kept in service.

9. Buildings will be "secured". The determination of the detailed activities required to leave a building in a secure state is included in the pre-retirement activities and will include isolating all power sources, draining potable water lines, draining and venting sewage lines, securing doors and windows, capping any means of egress for vermin, removing hazardous materials, and moving any relevant plant documentation to alternate off-site storage sites.

10. Fuel oil and waste oil will be drained and removed.

11. Boiler chemicals will be drained and removed.

12. Boilers and HRSGs will be drained. The water and steam side will be vented. The gas side will be vacuumed to remove ash and slag. Drum doors and boiler doors will be left open. Bottom ash systems will be drained, cleaned, and vented.

13. Ductwork will be vacuumed and left opened.

14. Condensate and feedwater piping will be drained and vented.

15. Feedwater heaters will be drained and vented.

16. Deaerator and deaerator storage tanks will be drained and vented.

17. The turbine and condenser will be drained and vented. Turbine lube oil will be removed.

18. The generator will be electrically and mechanically isolated. The generator and exciter cooling water systems will be drained and vented. Hydrogen gas tanks and the generator hydrogen systems will be vented.

19. Compressed air systems will be drained and vented. Desiccant will be removed from the compressed air dryer systems.

20. Circulating water systems and turbine cooling water systems will be drained and vented. Circulating water chemical feeds will be drained and vented.

21. Baghouses will be opened, cleaned, and vented. Filter bags and cages will be removed.

22. Wet Flue Gas Desulfurization (FGD) systems will be drained, opened, cleaned, and vented.

23. Dry FGD systems will be drained, opened, cleaned, and vented.

24. Re-agent preparation facilities will be drained, opened, cleaned, and vented.

25. SCRs will be opened, cleaned, and vented. Catalyst will be removed. Ammonia storage tanks will be emptied and vented.

26. The battery systems will have the battery electrolytes and battery cells removed and disposed.

27. Sewage treatment facilities will be drained, cleaned, and vented.

28. Oily drain tanks will be opened and pumped out.

29. CO_2 systems used for fire protection will be drained, opened, and vented.

30. Any other activities required by law, regulation, or permit for a specific unit, common facility, or plant site will be performed.

Once the site retirement activities are complete, several months of post-retirement activities will commence. These activities include determining the disposition of site documentation, assuring permits are in correct condition, developing plans to monitor the retired facility, accounting and environmental activities, and re-assigning personnel as required.

2.4 ASSET RETIREMENT OBLIGATION ACTIVITIES

AROs are a means that KCP&L utilizes to track the costs of activities that are required to be performed when one of its generating units ceases operation and is removed from service. These are activities that are required to be performed upon retirement according to permits, statutes, agreements, and regulations. For certain activities, such as ash landfill closures, KCP&L is required to periodically report estimated cost updates to state environmental agencies (Kansas Department of Health and Environment and Missouri Department of Natural Resources). These agencies require KCP&L to periodically demonstrate the ability to fund these closure activities. This is because the costs for ash landfill closures and post-closure activities are significant. In fact, landfill closure costs and post-closure activities exceed the costs of all other retirement activities for the respective units at the Montrose, La Cygne, and Iatan Generating Stations.

Other activities, such as the removal of river water intakes, are stated requirements in the standard form permits issued by the United States Army Corp of Engineers. Also included in AROs are amounts for the abatement and removal of fuel oil storage tanks of the plants located in Missouri (Montrose, Northeast, and Iatan Generating Stations). Since the Kansas fuel oil tank permits do not specifically require their removal upon ending operation, the costs for their removal are in the demolition (La Cygne Generating Station).

Asbestos abatement activities in AROs for the La Cygne, Montrose, and Hawthorn Generating Stations are included in the general ARO costs and as separate line items from the retirement and decommissioning costs. Asbestos abatement activities are ongoing at each of these sites during the life of the units, and will continue to be performed after retirement, but before dismantlement.

In addition, Sega included amounts for closure and removal of the sanitary waste lagoons at the Montrose and La Cygne Generating Stations, since these activities are required by Kansas and Missouri regulations when operations cease. However, the probable costs for these closures are below KCP&L's threshold for maintaining an ARO.

Wherever KCP&L already had estimates and a basis for valuing the costs of such ARO closure activities, Sega reviewed and utilized these estimates, adjusting to 2016 present-day dollars. Where there was no prior estimate available, Sega developed an opinion of probable costs for their closure. Each of these costs is provided in Appendix A.

Appendix D is a table showing the source of the requirement that dictates each ARO Activity.

SECTION 3

DISMANTLEMENT

DISMANTLEMENT

3.1 INTRODUCTION

Sega developed an opinion of probable costs to dismantle the KCP&L facilities that are listed in Appendix A. The opinion of probable costs is a buildup of estimated costs to perform the dismantlement activities to remove equipment and building superstructures down to grade-level foundations. Below-grade foundations, piping, and duct banks will be abandoned in place. A resource-loaded MS Project schedule was developed for the dismantlement of the facilities. Each schedule includes the activity, duration of the activity, resource required for each activity, and the probable cost of each activity. The results for each of the facilities are provided in Appendix A.

The opinion of probable costs for the dismantlement of each coal-fired generating facility is broken down into the dismantlement of each unit, plus the dismantlement of the common facilities. The common facilities will be dismantled when the last unit at the site is dismantled.

The estimate of probable cost to dismantle the combustion turbines are based on dismantling all of the combustion turbines at the site, not on an individual combustion turbine dismantlement basis.

The estimate of probable costs to dismantle the wind generation facility is based on dismantling all of the wind turbines at the site, not on an individual wind turbine dismantlement basis.

3.2 OPINION OF PROBABLE COSTS BASIS

The project will be managed by KCP&L staff. KCP&L will hire an Owner's Engineer to assist with environmental issues and the technical dismantlement details. KCP&L will hire a Demolition General Contractor (DGC) to perform the complete dismantlement of each unit.

The opinion of probable costs is presented as the straight netting of the DGC's firm price cost, minus the current scrap value of the equipment and materials.

At the initiation of dismantlement, this study assumes that the unit or common facility has been previously decommissioned as detailed in Section 2 - Retirement.

A resource-loaded MS Project dismantlement schedule and opinion of probable costs were developed for Spearville (both units), Northeast (all eight units), Hawthorn 7 and 8 (both units combined), West Gardner (all four units), Osawatomie (one unit), Hawthorn 6 and 9 (both units combined), Iatan Unit 1, La Cygne Unit 2, and the Common facilities for each of these plant sites. The dismantlement schedules for Iatan Unit 1 and La Cygne Unit 2 were developed based on the actual quantities and materials documented in the final construction reports for each unit. The costs for these units were used to derive the dismantlement costs for Montrose Units 1, 2, and 3, Iatan Unit 2, Hawthorn Unit 5, and La Cygne Unit 1 using the AACE International Capacity Factor Method.

A 5-percent "Owner Internal Cost" is included in the opinion of probable cost. This line item is included to cover the costs of various internal KCP&L departments that will charge to the project during the implementation of the dismantlement activities.

A 25-percent "Owner Contingency" is included in the opinion of probable cost. This level of contingency is consistent with the AACE International contingency level based on the engineering progress completed at the point when the cost estimate is developed.

3.3 DISMANTLEMENT ACTIVITIES

The dismantlement of a facility is divided into pre-dismantlement activities, dismantlement activities, and project closure activities.

3.3.1 Pre-Dismantlement Activities

Pre-dismantlement activities consist of the detailed pre-planning of the dismantlement process. This pre-planning includes establishing the KCP&L project management team;

hiring an Owner's Engineer; developing a detailed dismantlement scope of work, including how to address any environmental issues; developing a level 1 project schedule; and contracting with a DGC.

The KCP&L project management team will be responsible for the project execution and will consist of a full-time project manager, two full-time engineers, a full-time project administrative assistant, and a part-time procurement specialist. This team will have the authority to manage the dismantlement of the plant.

The Owner's Engineer will assist KCP&L with the technical aspects of executing the project. The Owner's Engineer will help establish the boundaries of demolition, provide environmental consulting, and develop the technical specifications for the DGC contract request for proposal. The Owner's Engineer will provide 1-1/2 full-time equivalent field engineers during the demolition phase of the project. The Owner's Engineer will also provide detailed design for equipment that requires modifications to keep other units or common facilities in operation during demolition and after the unit is dismantled.

The KCP&L project management team and the Owner's Engineer will review all existing permits to assure that any relevant existing permit requirements are met during demolition. This team will also put into place any additional required permits for demolition (outside of the normal permits that are the responsibility of the DGC).

Prior to dismantlement activities, a detailed site characterization study will be performed. This study involves a series of site investigations to determine potential subsurface environmental issues at the site, a description of the hydrological and hydrogeological conditions on the site, and a determination of potential waste streams generated during the demolition work. Based on the outcome of the site characterization study, reclamation, and remediation plans that address the environmental issues and site conditions will be developed. The site characterization study and the development of the remediation plans can take up to six months to complete. The site characterization study will be performed by the Owner's Engineer.

,The KCP&L project management team will identify the boundaries of dismantlement and the location of system and equipment isolation points between the unit to be demolished, common facilities, and units to remain.

The KCP&L project management team will be responsible for bidding and contracting with a qualified DGC.

Prior to the DGC mobilizing on site, the KCP&L project management team will confirm that the unit to be dismantled is ready to be turned over to the DGC.

3.3.2 Dismantlement Activities for a Coal-Fired Unit

The demolition contractor will be structured into several crews that will bring equipment and materials to the ground. A separate dedicated crew will be responsible for classifying the scrap by type and removing the scrap from the site.

The coal-fired units will be demolished in a phased and sequential manner to assure worker safety and to minimize any interferences with surrounding equipment. Please refer to the man-power loaded schedule and graphs in Appendix A for the details of each demolition phase.

3.3.2.1 *Phase 1 Demolition - Boiler and Turbine Equipment Removal*

Mechanical and electrical equipment and material inside the boiler and turbine building footprints will be removed. The goal of this phase is to remove the majority of the equipment in the boiler and turbine buildings leaving only the boiler, turbine, building, and support steel.

In this phase of the project, the switchyard is disconnected from the generating facility.

3.3.2.2 *Phase 2 Demolition - Boiler and Turbine Removal*

The boiler equipment will be removed at the start of this phase. Then, the boiler furnace and backpass will be removed from the bottom up (boilers are hung from the top of the boiler structure) and the structural steel is removed from the top down. Once the structural steel and all equipment are removed, the boiler equipment foundations will be demolished to existing grade.

In parallel with the above activities, the turbine, condenser neck heat exchangers, condenser, and miscellaneous turbine equipment will be removed. The turbine building and turbine pedestal is then demolished to grade.

3.3.2.3 *Phase 3 Demolition - Precipitator and AQCS Dismantlement*

If the unit has a precipitator, the precipitator will be removed similar to the process for removing the boiler. The precipitator internals will be removed from the bottom up and the precipitator structural steel will be removed from the top down. The precipitator foundation will be removed down to grade.

If the unit has a wet or dry scrubber and/or a baghouse, the dismantlement will start at the stack and work back towards the boiler to avoid dismantlement activities interferences.

3.3.2.4 *Phase 4 Demolition - Yard Demolition*

This phase removes equipment and materials external to the boiler and turbine areas. Underground piping, conduit, and duct banks will be abandoned in place with the exception of the circulating water pipe. The concrete reinforced circulating water pipes will be excavated, collapsed by crushing, and backfilled. Electrical man-holes will be collapsed by crushing and backfilled. Special care will be taken to assure that any materials left in the ground will not adversely impact site drainage.

3.3.2.5 *Phase 5 - Final Site Grading and Drainage*

Final grading and drainage includes a minimum amount of grading to assure that the site drainage facilities remain in place and includes final seeding of the site.

3.3.3 Dismantlement Activities for a Combustion Turbine Site

The demolition contractor will be structured into several crews that will bring equipment and materials to the ground. A separate dedicated crew will be responsible for classifying the scrap by type and removing the scrap from the site.

The combustion turbines, auxiliary equipment, and buildings will be demolished in a phased and sequential manner to assure worker safety and to minimize any interferences with surrounding equipment. Please refer to the man-power loaded schedule and graphs in Appendix A for the details of each demolition phase.

Final grading and drainage includes a minimum amount of grading to assure that the site drainage facilities remain in place and includes final seeding of the site.

3.3.4 Dismantlement Activities for Common Facilities

The demolition contractor will be structured into several crews that will bring equipment and materials to the ground. A separate dedicated crew will be responsible for classifying the scrap by type and removing the scrap from the site.

The common facilities dismantlement activities consist primarily of the removal of chimneys, fuel yard equipment, removal of site-specific common equipment, and the removal of facility buildings. The phasing of the common dismantlement processes are site specific and will be determined during the pre-dismantlement activity phase of the project.

Final grading and drainage includes a minimum amount of grading to assure that the site drainage facilities remain in place and includes final seeding of the site.

3.3.5 Dismantlement Activities for Wind Generation Plants

Each wind turbine will be brought down to the ground. The scrap structural steel, generators, and gearboxes will be loaded onto trucks and transported to the appropriate recycling facility. The turbine blades are fabricated from polyester thermoset glass reinforced plastic which is currently not a recyclable material and will have to be landfilled. The turbine blades will be cut into pieces on site, loaded onto 53-foot trailers, and transported to the appropriate landfill. The underground collection cables will be removed and the cable will be recycled. The foundation support columns will be removed down to the foundation bases. The plant roads will be removed by removing the geo-fabric and gravel.

3.4 PROJECT CLOSURE ACTIVITIES

This phase of the project confirms that the remediation and reclamation of the site has been successfully complete and that all required "record" documentation needed by KCP&L is complete and on file.

3.5 SCRAP METAL VALUES

Scrap metal weights were developed for Iatan Unit 1 based on the actual quantities and materials documented in the final construction reports. These scrap metal weights were applied to the other coal-fired units using the AACE International Capacity Factor Method.

Scrap metal weights for the combustion turbines were based on combustion turbine weights and generator weights for similar-sized combustion turbines and generators from previous Sega projects.

Scrap metal weights for the wind turbines were based on actual quantities and materials documented in the shipping bill of lading found in the original plant construction documentation.

Please see Appendix B for the opinion of current average scrap values for each unit.

SECTION 4

APPENDICES

APPENDIX A

OPINIONS OF COSTS BY UNITS

MONTROSE GENERATING STATION

MONTROSE GENERATING STATION

The Montrose Generating Station consists of three coal-fired power plants.

Montrose Unit 1 has an SPP-accredited unit rating of 170 MW and was placed in service in 1958. Unit 1 has a sub-critical Combustion Engineering boiler and a General Electric turbine. Lake water is used for condenser cooling. Unit 1 has an electrostatic precipitator for particulate removal.

Montrose Unit 2 has an SPP-accredited unit rating of 164 MW and was placed in service in 1960. Unit 2 has a sub-critical Combustion Engineering boiler and a General Electric turbine. Lake water is used for condenser cooling. Unit 2 has an electrostatic precipitator for particulate removal.

Montrose Unit 3 has an SPP-accredited unit rating of 176 MW and was placed in service in 1964. Unit 3 has a sub-critical Combustion Engineering boiler and a Westinghouse turbine. Lake water is used for condenser cooling. Unit 3 has an electrostatic precipitator for particulate removal.

The Montrose fuel yard has a rotary car dumper to unload unit trains of coal. Coal is stored in a common fuel yard. Fuel is reclaimed from the common fuel yard via a reclaim pit. Coal is transferred from the common conveyor system to dedicated unit conveyors (located near the final coal transfer points for each unit).

All three Montrose units have a fuel oil igniter system. The units are supplied with fuel oil from a common fuel oil unloading and storage facility.

All three units beneficially use coal combustion products off site. Coal combustion products that are not beneficially used off site are disposed of in the on-site solid waste landfill.

The following are the major systems and equipment that were included in the retirement and dismantlement of each unit and the major systems and equipment that were considered common (additional details are listed in the attached retirement and dismantlement schedules included in this Appendix).

It should be noted that Unit 1 at Montrose Generating Station includes KCP&L's actual retirement costs. The costs for retirement were directly supplied by the Owner and were incorporated into the study analysis. These costs were not developed by Sega using the MS Project rate sheet and resource loaded schedule as shown in other cases.

MONTROSE UNIT 1

1. Boiler and boiler auxiliaries.
2. Turbine, heat balance equipment, and turbine auxiliaries.
3. Electrostatic precipitator.
4. Circulating water intake structure.
5. Dedicated Unit 1 fuel handling equipment.
6. Dedicated Unit 1 fuel oil equipment.

MONTROSE UNIT 2

1. Boiler and boiler auxiliaries.
2. Turbine, heat balance equipment, and turbine auxiliaries.
3. Electrostatic precipitator.
4. Circulating water intake structure.
5. Dedicated Unit 2 fuel handling equipment.
6. Dedicated Unit 2 fuel oil equipment.

MONTROSE UNIT 3

1. Boiler and boiler auxiliaries.
2. Turbine, heat balance equipment, and turbine auxiliaries.
3. Electrostatic precipitator.
4. Circulating water intake structure and piping.
5. Dedicated Unit 3 fuel handling equipment.
6. Dedicated Unit 3 fuel oil equipment.

COMMON

1. Administration building.
2. Fuel yard office building.
3. Training building.
4. Warehouses.
5. Maintenance shops.
6. Water treatment.
7. Miscellaneous small buildings and enclosures
8. Common fuel handling equipment.
9. Fuel oil storage and unloading.
10. Fire water systems.
11. Stacks (three).
12. Landfill.

UNIT 1

Montrose 1 Retirement

Owner Costs				
Pre-Retirement Activities		$120,000		
Retirement Activities		$1,704,382		
Post-Retirement Activities		$26,564		
Owner Direct Total			$1,850,946	
Owner Internal Costs	5.00%		$92,547	
Owner Contingency:	5.00%		$97,175	
Montrose 1 Retirement Cost:				$2,040,668
Activities Required by Permit or Regulation				
Asbestos Abatement			$5,699,874	
Activities Required by Permit or Regulation				$5,699,874

Montrose 1 Dismantlement

Owner Costs			
Pre-Dismantlement Activities		$478,260	
Overhead During Dismantlement		$868,081	
Post-Dismantlement Activities		$30,097	
Owner Costs Total			$1,376,438
Demolition General Contractor (DGC) Costs			
Site Management		$419,630	
Equipment Rental		$707,233	
Consumables		$705,579	
Scrap Crew(s)		$689,061	
Dismantlement*		$3,391,803	
DGC Insurance	2.00%	$118,266	
Contingency/Profit	15.00%	$904,736	
Performance Bond	2.00%	$138,726	
Contractor Costs Total:			$7,075,034
Total:			$8,451,471
Owner Internal Costs:	5.00%		$422,574
Owner Contingency:	25.00%		$2,218,511
Montrose Unit 1 Dismantlement Opinion of Probable Cost:			$11,092,556

UNIT 2

Montrose 2 Retirement

Owner Costs				
Pre-Retirement Activities		$106,968		
Retirement Activities		$272,542		
Post-Retirement Activities		$28,182		
Owner Direct Total			$407,692	
Owner Internal Costs	5.00%		$20,385	
Owner Contingency:	25.00%		$107,019	
Montrose 2 Retirement Opinion of Probable Cost:				$535,095

Activities Required by Permit or Regulation

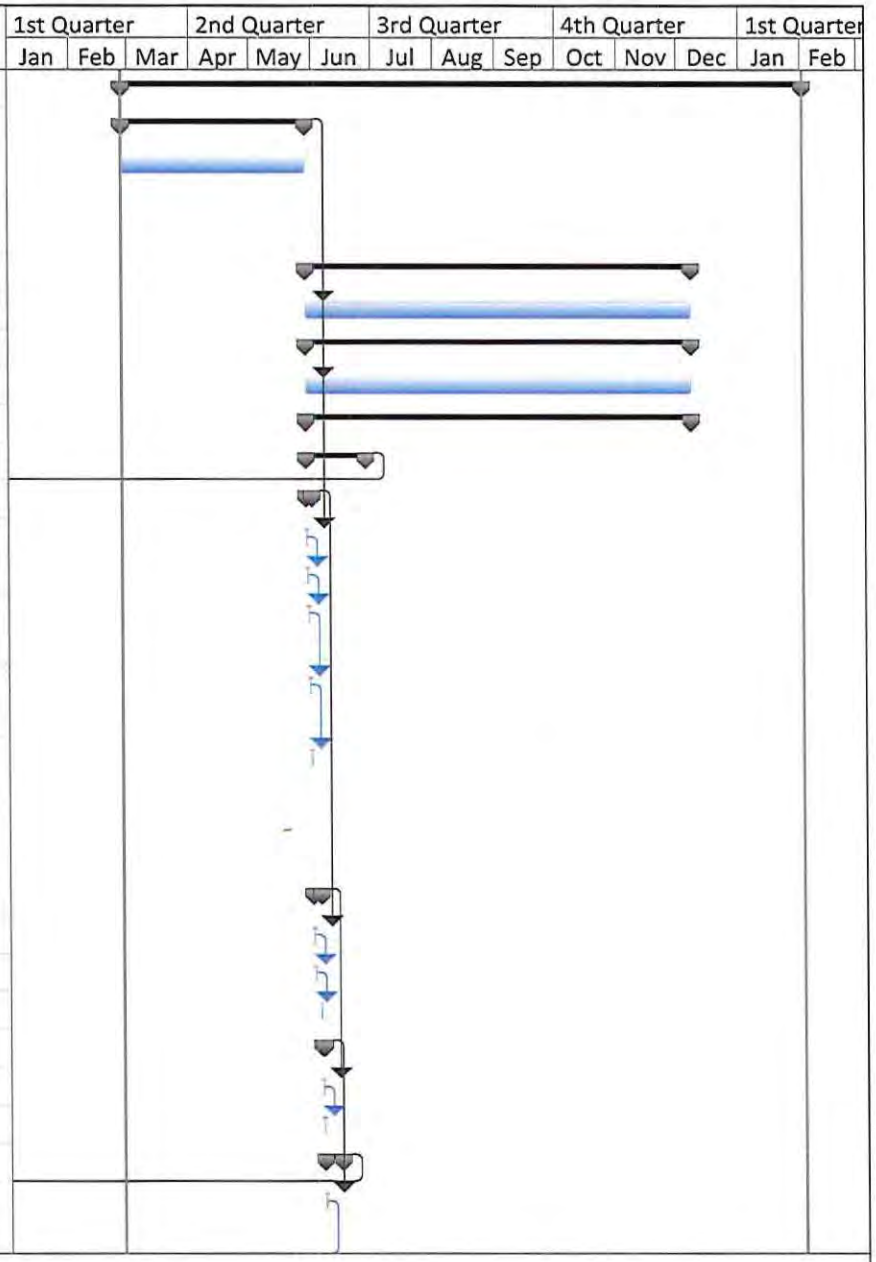
Asbestos Abatement		$5,699,874	
Activities Required by Permit or Regulation			$5,699,874

ID	Task Name	Remaining
1	**Montrose 2 Retirement**	**$407,691.60**
2	**Pre-Engineering**	**$106,967.52**
3	Permit review and engineering analysis, establish isolation points, and confirm fuel yard inventory has been reduced to zero tons.	$106,967.52
4	**KCL&L Overhead Costs**	**$91,361.92**
5	KCP&L Retirement Manager	$91,361.92
6	**Equipment Rentals**	**$30,624.48**
7	Vacuum truck	$30,624.48
8	**Retirement**	**$150,555.28**
9	**Electrical**	**$20,553.92**
10	**Medium and Low Voltage Draw out Switchgear**	**$2,903.52**
11	De-energize all buses at the source.	$483.92
12	Open all circuit breakers.	$483.92
13	Rack all circuit breakers into the fully withdrawn, disconnected position.	$483.92
14	Verify that the closing/tripping springs are discharged.	$483.92
15	De-energize control power and auxiliary power circuits of each circuit breaker at the source and by opening control power circuit breakers or removing fuses in each breaker cubicle.	$967.84
16	**Motor Control Centers**	**$1,935.68**
17	De-energize all buses at the source.	$483.92
18	Open all circuit breakers and disconnect switches.	$483.92
19	Remove all fuses in control circuits.	$967.84
20	**Low-voltage Switchboards and Panelboards**	**$967.84**
21	De-energize all buses at the source.	$483.92
22	Open all circuit breakers and disconnect switches.	$483.92
23	**Oil-Filled Power Transformers**	**$6,072.32**
24	De-energize all transformer primaries and verify that the secondary is de-energized.	$967.84
25	De-energize all low-voltage AC or DC power sources for space heaters, cooling equipment, controls, etc. at the source and open circuit breakers or remove fuses at transformer end.	$967.84
26	Drain and dispose of oil.	$2,867.52
27	Clean up and dispose of oil on surface areas around the transformers on in containment pits.	$1,269.12
28	**Dry-type Power Transformers**	**$1,935.68**
29	De-energize all transformer primaries and verify that the secondary is de-energized.	$967.84
30	De-energize all low-voltage AC or DC power sources for space heaters, cooling equipment, controls, etc. at the source and open circuit breakers or remove fuses at transformer end.	$967.84
31	**Motors**	**$6,738.88**
32	De-energize all primary power at the source.	$1,935.68
33	De-energize all low-voltage power sources for space heaters or other auxiliary equipment at the source.	$1,935.68
34	Drain lube oil system (if applicable) and dispose of oil.	$2,867.52
35	**Coal Handling**	**$30,905.36**
36	Empty all transfer hoppers.	$1,853.84

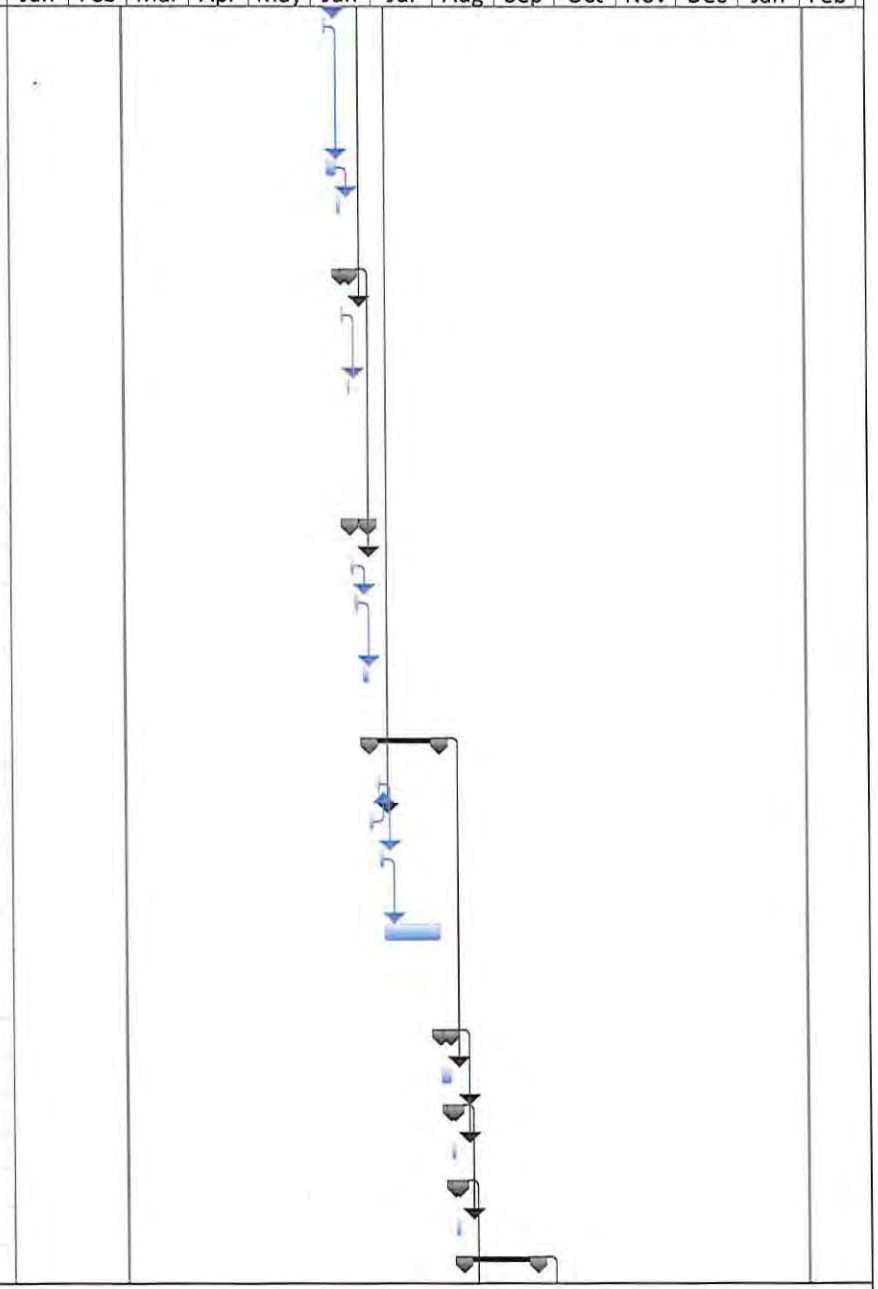
ID	Task Name	Remaining
37	Burn out coal silos.	$1,834.56
38	Confirm all fuel lines, conveyors and trippers are clear of fuel.	$1,834.56
39	Perform cleaning of the coal handling equipment to assure that all coal and coal dust has been removed from site.	$25,382.40
40	**Fuel Oil and Igniter System**	**$2,751.84**
41	Drain fuel oil system	$2,751.84
42	**Waste Oil System**	**$1,834.56**
43	Drain all waste oil systems	$1,834.56
44	**Boiler Chemical Feed**	**$1,834.56**
45	Drain all chemical feed tanks.	$1,834.56
46	**Boiler**	**$30,927.60**
47	Open boiler doors.	$955.84
48	Gas side - perform cleaning of the boiler and bottom ash system.	$25,382.40
49	Drain boiler, drum, downcomers and headers.	$917.28
50	Open drum doors.	$955.84
51	Drain and clean the submerged flight conveyor system.	$2,716.24
52	**Stack and Ductwork**	**$13,647.04**
53	Open ductwork doors.	$955.84
54	Perform cleaning of the ductwork.	$12,691.20
55	**Condensate and Feedwater Piping**	**$1,834.56**
56	Drain water from the system.	$917.28
57	Leave open vents and drains.	$917.28
58	**Feedwater heaters**	**$2,751.84**
59	Drain feedwater heaters	$917.28
60	Leave open vents and drains.	$1,834.56
61	**Deaerator and Deaerator Storage Tank**	**$1,834.56**
62	Drain Deaerator and Storage	$917.28
63	Leave open vents and drains.	$917.28
64	**Precipitator**	**$15,358.64**
65	Multiple cleaning cycles for collection plates.	$2,751.84
66	Clear hoppers of all ash	$3,103.68
67	Disconnect tranformers.	$2,160.96
68	Mechanically secure all compartment dampers and hopper outlet valves in open position.	$955.84
69	Disconnect ash transport piping and washdown baghouse hoppers and interior of casing.	$1,571.12
70	Install bird screens across hopper ash outlet and ash line flanges.	$955.84
71	Padlock or tack weld all hopper doors shut. (note: if ash hopper doors are indoors, they could be removed and the opening covered with bird screens.)	$955.84
72	Pull electrical supply breakers on all electrical equipment except lighting and HVAC components that are to remain in service.	$2,903.52
73	**Turbine(s) and Condenser**	**$5,715.76**
74	Drain hotwell and leave doors open.	$936.56
75	Open main turbine doors.	$955.84
76	Open bfp turbine doors.	$955.84
77	Remove lube oil.	$2,867.52

ID	Task Name	Remaining
78	**Generator**	**$6,618.48**
79	Verify that generator circuit breaker is open and racked out or that high-voltage disconnect switch on substation side of GSU transformer is locked in the open position.	$483.92
80	Verify that generator field breaker or contactor (if applicable) is open.	$483.92
81	De-energize power supplies to generator excitation system at the source.	$483.92
82	De-energize AC and DC power supplies to generator and exciter space heaters, cooling equipment, controls, lighting, etc. at the source and open circuit breakers or remove fuses at the generator and exciter.	$483.92
83	Drain generator and exciter cooling water systems (if applicable).	$936.56
84	Disconnect and remove hydrogen gas tanks and purge generator hydrogen system.	$1,834.56
85	Disconnect and remove fire protection system gas/foam tanks and purge fire protection system.	$1,911.68
86	**Circulation Water and Turbine Cooling Water System**	**$3,707.68**
87	Drain.	$1,834.56
88	Open water box doors.	$955.84
89	Drain any circulating water chemical feed tanks.	$917.28
90	**Compressed Air System**	**$917.28**
91	Open vents and drains.	$917.28
92	**Auxiliary Steam System**	**$1,834.56**
93	Drain water from system.	$917.28
94	Remove aux boiler chemicals.	$917.28
95	**Auxiliary Cooling Water System**	**$917.28**
96	Drain water from system.	$917.28
97	**Condenser Air Extraction**	**$917.28**
98	Drain water from system.	$917.28
99	**Building Heating System**	**$917.28**
100	Drain water from system.	$917.28
101	**Battery System**	**$4,775.20**
102	De-energize all battery chargers from the source.	$483.92
103	Open all AC and DC circuit breakers and/or fused switches on battery chargers and disconnect cables from batteries.	$483.92
104	Remove and dispose of battery electrolyte.	$1,903.68
105	Remove and dispose of battery cells.	$1,269.12
106	Clean up and dispose of electrolyte on surface areas around batteries.	$634.56
107	**Post Retirement Activities**	**$28,182.40**
108	Post Retirement Activities	$28,182.40

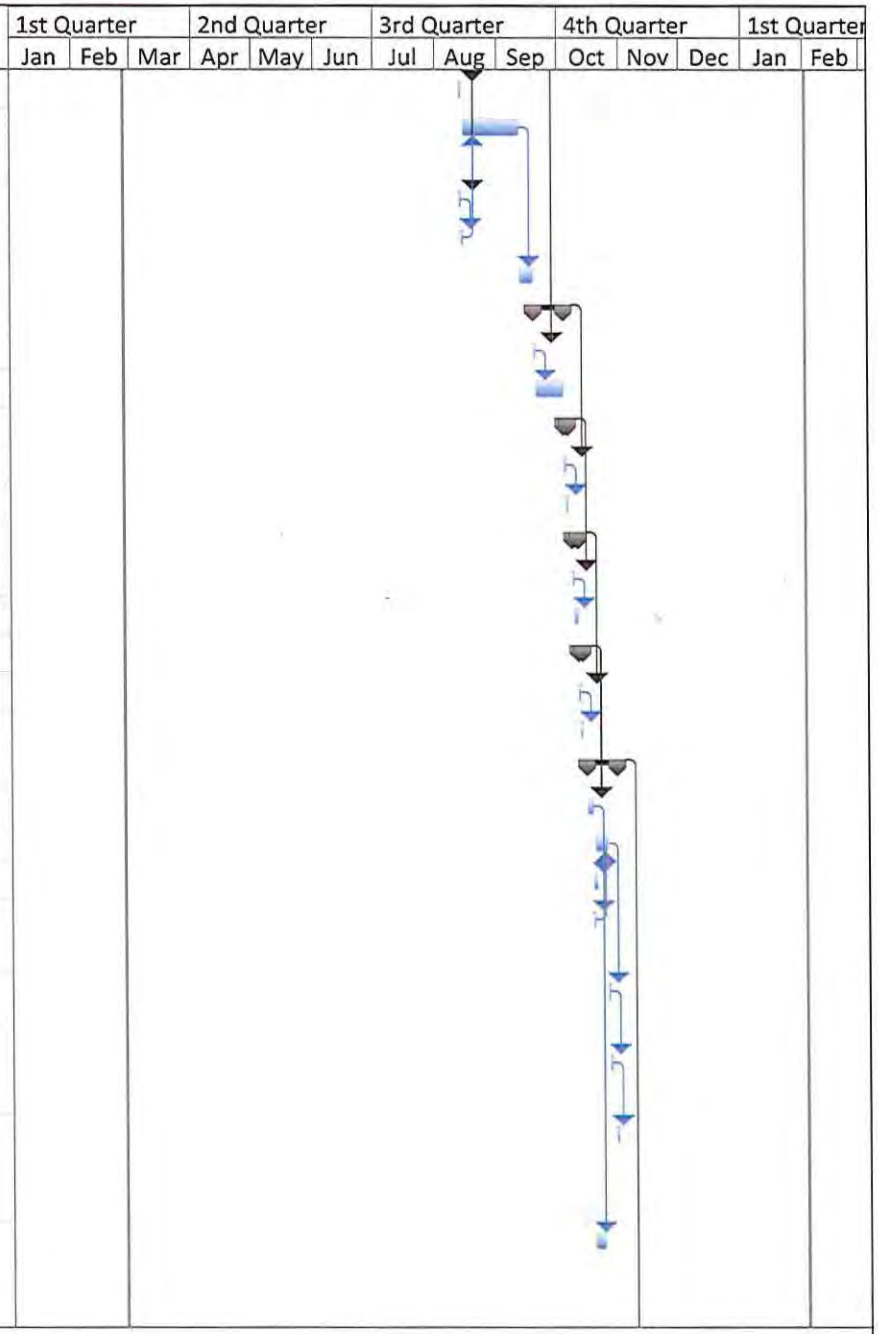
ID	Task Name	Duration
1	**Montrose 2 Retirement**	**245 days**
2	**Pre-Engineering**	**66 days**
3	Permit review and engineering analysis, establish isolation points, and confirm fuel yard inventory has been reduced to zero tons.	66 days
4	**KCL&L Overhead Costs**	**139 days**
5	KCP&L Retirement Manager	139 days
6	**Equipment Rentals**	**139 days**
7	Vacuum truck	139 days
8	**Retirement**	**139 days**
9	**Electrical**	**22 days**
10	**Medium and Low Voltage Draw out Switchgear**	**3 days**
11	De-energize all buses at the source.	0.5 days
12	Open all circuit breakers.	0.5 days
13	Rack all circuit breakers into the fully withdrawn, disconnected position.	0.5 days
14	Verify that the closing/tripping springs are discharged.	0.5 days
15	De-energize control power and auxiliary power circuits of each circuit breaker at the source and by opening control power circuit breakers or removing fuses in each breaker cubicle.	1 day
16	**Motor Control Centers**	**2 days**
17	De-energize all buses at the source.	0.5 days
18	Open all circuit breakers and disconnect switches.	0.5 days
19	Remove all fuses in control circuits.	1 day
20	**Low-voltage Switchboards and Panelboards**	**1 day**
21	De-energize all buses at the source.	0.5 days
22	Open all circuit breakers and disconnect switches.	0.5 days
23	**Oil-Filled Power Transformers**	**7 days**
24	De-energize all transformer primaries and verify that the secondary is de-energized.	1 day



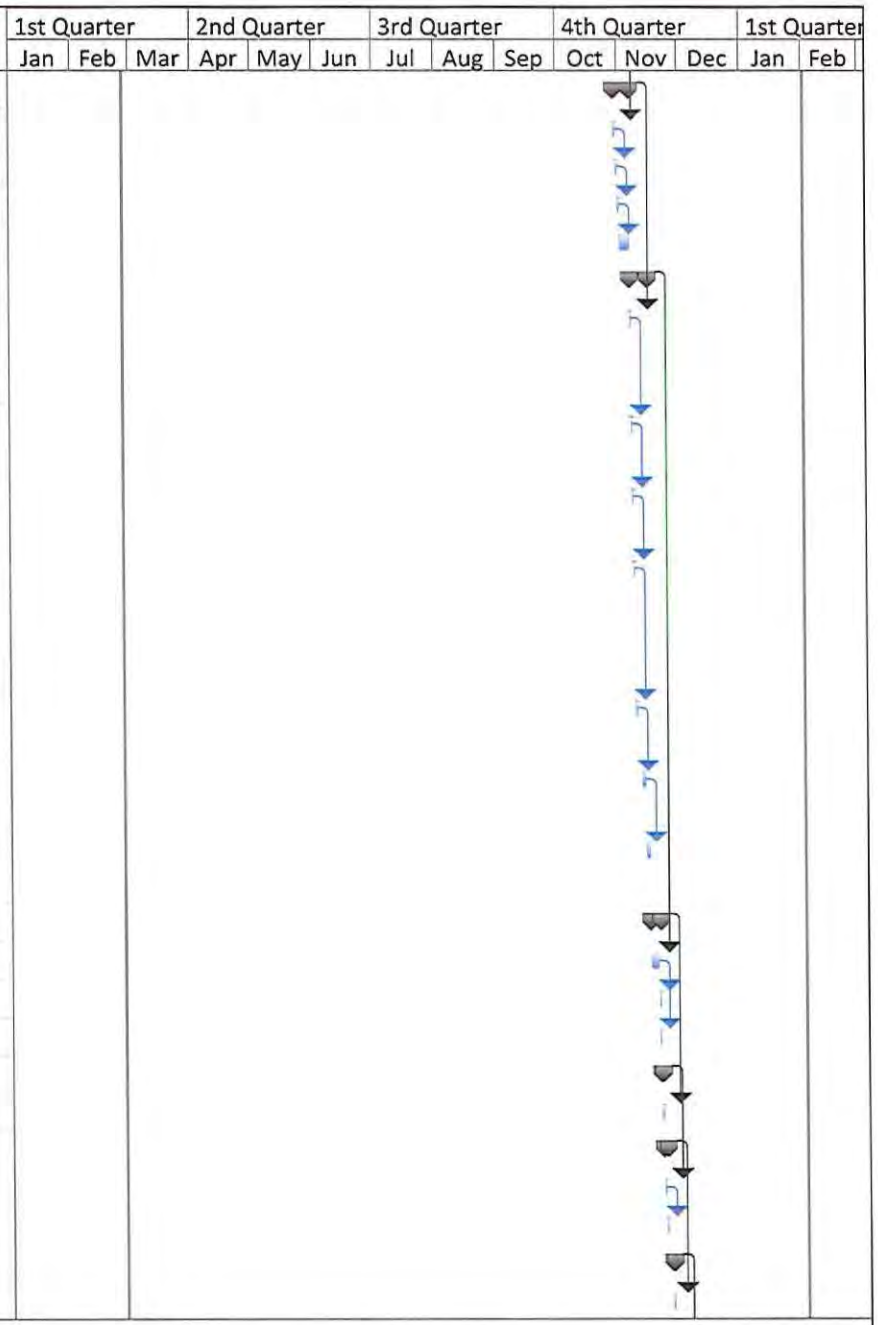
ID	Task Name	Duration
25	De-energize all low-voltage AC or DC power sources for space heaters, cooling equipment, controls, etc. at the source and open circuit breakers or remove fuses at transformer end.	1 day
26	Drain and dispose of oil.	3 days
27	Clean up and dispose of oil on surface areas around the transformers on in containment pits.	2 days
28	**Dry-type Power Transformers**	**2 days**
29	De-energize all transformer primaries and verify that the secondary is de-energized.	1 day
30	De-energize all low-voltage AC or DC power sources for space heaters, cooling equipment, controls, etc. at the source and open circuit breakers or remove fuses at transformer end.	1 day
31	**Motors**	**7 days**
32	De-energize all primary power at the source.	2 days
33	De-energize all low-voltage power sources for space heaters or other auxiliary equipment at the source.	2 days
34	Drain lube oil system (if applicable) and dispose of oil.	3 days
35	**Coal Handling**	**25 days**
36	Empty all transfer hoppers.	1 day
37	Burn out coal silos.	2 days
38	Confirm all fuel lines, conveyors and trippers are clear of fuel.	2 days
39	Perform cleaning of the coal handling equipment to assure that all coal and coal dust has been removed from site.	20 days
40	**Fuel Oil and Igniter System**	**3 days**
41	Drain fuel oil system	3 days
42	**Waste Oil System**	**2 days**
43	Drain all waste oil systems	2 days
44	**Boiler Chemical Feed**	**2 days**
45	Drain all chemical feed tanks.	2 days
46	**Boiler**	**27 days**



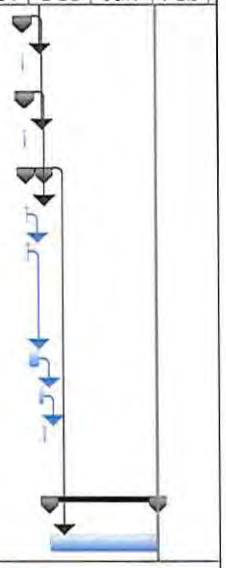
ID	Task Name	Duration
47	Open boiler doors.	1 day
48	Gas side - perform cleaning of the boiler and bottom ash system.	20 days
49	Drain boiler, drum, downcomers and headers.	1 day
50	Open drum doors.	1 day
51	Drain and clean the submerged flight conveyor system.	5 days
52	**Stack and Ductwork**	**11 days**
53	Open ductwork doors.	1 day
54	Perform cleaning of the ductwork.	10 days
55	**Condensate and Feedwater Piping**	**2 days**
56	Drain water from the system.	1 day
57	Leave open vents and drains.	1 day
58	**Feedwater heaters**	**3 days**
59	Drain feedwater heaters	1 day
60	Leave open vents and drains.	2 days
61	**Deaerator and Deaerator Storage Tank**	**2 days**
62	Drain Deaerator and Storage	1 day
63	Leave open vents and drains.	1 day
64	**Precipitator**	**11 days**
65	Multiple cleaning cycles for collection plates.	3 days
66	Clear hoppers of all ash	4 days
67	Disconnect tranformers.	2 days
68	Mechanically secure all compartment dampers and hopper outlet valves in open position.	1 day
69	Disconnect ash transport piping and washdown baghouse hoppers and interior of casing.	1 day
70	Install bird screens across hopper ash outlet and ash line flanges.	1 day
71	Padlock or tack weld all hopper doors shut. (note: if ash hopper doors are indoors, they could be removed and the opening covered with bird screens.)	1 day
72	Pull electrical supply breakers on all electrical equipment except lighting and HVAC components that are to remain ir service.	3 days



ID	Task Name	Duration
73	**Turbine(s) and Condenser**	**6 days**
74	Drain hotwell and leave doors open.	1 day
75	Open main turbine doors.	1 day
76	Open bfp turbine doors.	1 day
77	Remove lube oil.	3 days
78	**Generator**	**7 days**
79	Verify that generator circuit breaker is open and racked out or that high-voltage disconnect switch on substation side of GSU transformer is locked in the open position.	0.5 days
80	Verify that generator field breaker or contactor (if applicable) is open.	0.5 days
81	De-energize power supplies to generator excitation system at the source.	0.5 days
82	De-energize AC and DC power supplies to generator and exciter space heaters, cooling equipment, controls, lighting, etc. at the source and open circuit breakers or remove fuses at the generator and exciter.	0.5 days
83	Drain generator and exciter cooling water systems (if applicable).	1 day
84	Disconnect and remove hydrogen gas tanks and purge generator hydrogen system.	2 days
85	Disconnect and remove fire protection system gas/foam tanks and purge fire protection system.	2 days
86	**Circulation Water and Turbine Cooling Water System**	**3 days**
87	Drain.	2 days
88	Open water box doors.	1 day
89	Drain any circulating water chemical feed tanks.	1 day
90	**Compressed Air System**	**1 day**
91	Open vents and drains.	1 day
92	**Auxiliary Steam System**	**2 days**
93	Drain water from system.	1 day
94	Remove aux boiler chemicals.	1 day
95	**Auxiliary Cooling Water System**	**1 day**
96	Drain water from system.	1 day



ID	Task Name	Duration
97	**Condenser Air Extraction**	**1 day**
98	Drain water from system.	1 day
99	**Building Heating System**	**1 day**
100	Drain water from system.	1 day
101	**Battery System**	**7 days**
102	De-energize all battery chargers from the source.	0.5 days
103	Open all AC and DC circuit breakers and/or fused switches on battery chargers and disconnect cables from batteries.	0.5 days
104	Remove and dispose of battery electrolyte.	3 days
105	Remove and dispose of battery cells.	2 days
106	Clean up and dispose of electrolyte on surface areas around batteries.	1 day
107	**Post Retirement Activities**	**40 days**
108	Post Retirement Activities	40 days



Montrose 2 Dismantlement

Owner Costs			
Pre-Dismantlement Activities		$468,059	
Overhead During Dismantlement		$849,566	
Post-Dismantlement Activities		$29,455	
Owner Costs Total			$1,347,081
Demolition General Contractor (DGC) Costs			
Site Management		$410,680	
Equipment Rental		$692,148	
Consumables		$690,530	
Scrap Crew(s)		$674,364	
Dismantlement*		$3,319,461	
DGC Insurance	2.00%	$115,744	
Contingency/Profit	15.00%	$885,439	
Performance Bond	2.00%	$135,767	
Contractor Costs Total:			$6,924,134

Total:		$8,271,215
Owner Internal Costs:	5.00%	$413,561
Owner Contingency:	25.00%	$2,171,194
Montrose Unit 2 Dismantlement Opinion of Probable Cost:		$10,855,969

UNIT 3

Montrose 3 Retirement

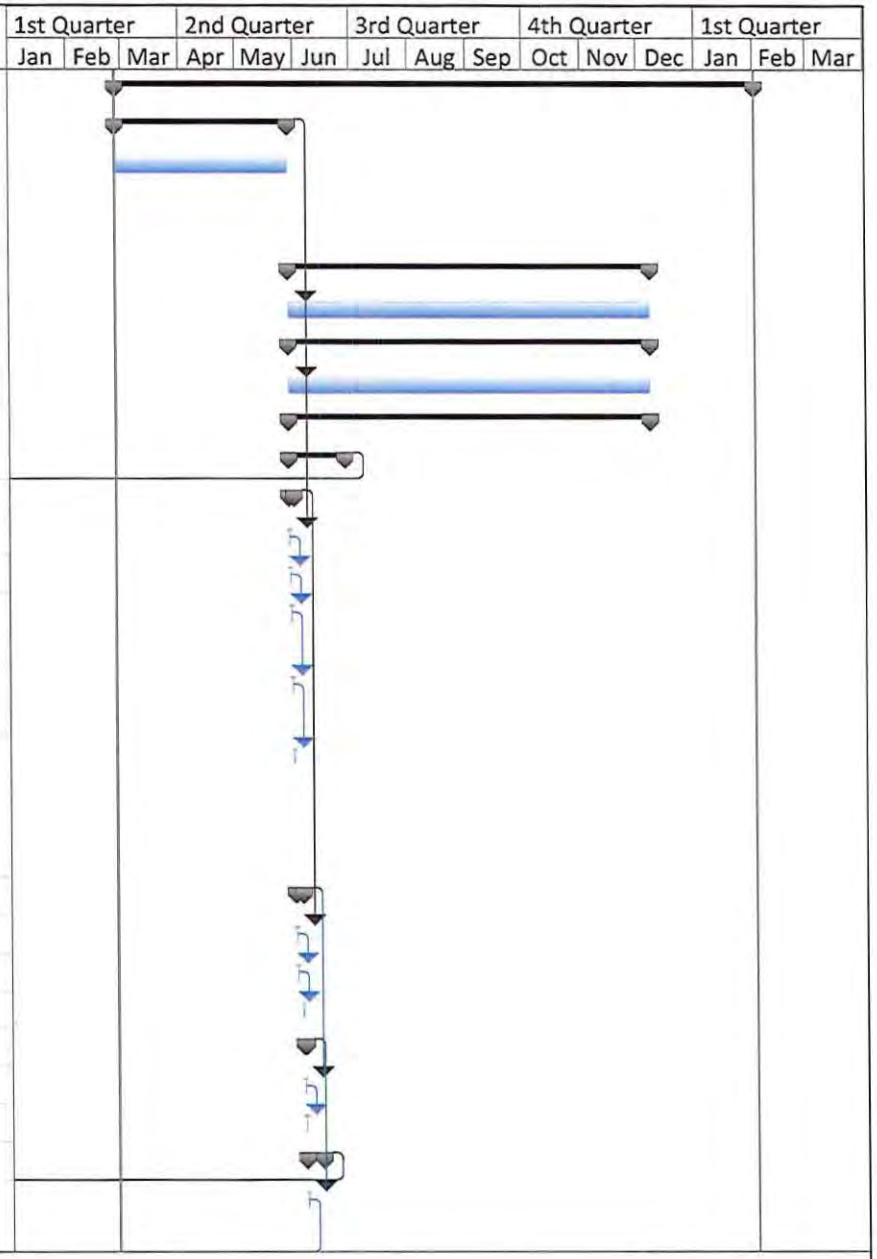
Owner Costs				
Pre-Retirement Activities		$106,968		
Retirement Activities		$272,542		
Post-Retirement Activities		$28,182		
Owner Direct Total			$407,692	
Owner Internal Costs	5.00%		$20,385	
Owner Contingency:	25.00%		$107,019	
Montrose 3 Retirement Opinion of Probable Cost:				$535,095
Activities Required by Permit or Regulation				
Asbestos Abatement			$5,699,874	
Activities Required by Permit or Regulation				$5,699,874

ID	Task Name	Remaining
1	**Montrose 3 Retirement**	**$407,691.60**
2	**Pre-Engineering**	**$106,967.52**
3	Permit review and engineering analysis, establish isolation points, and confirm fuel yard inventory has been reduced to zero tons.	$106,967.52
4	**KCL&L Overhead Costs**	**$91,361.92**
5	KCP&L Retirement Manager	$91,361.92
6	**Equipment Rentals**	**$30,624.48**
7	Vacuum truck	$30,624.48
8	**Retirement**	**$150,555.28**
9	**Electrical**	**$20,553.92**
10	**Medium and Low Voltage Draw out Switchgear**	**$2,903.52**
11	De-energize all buses at the source.	$483.92
12	Open all circuit breakers.	$483.92
13	Rack all circuit breakers into the fully withdrawn, disconnected position.	$483.92
14	Verify that the closing/tripping springs are discharged.	$483.92
15	De-energize control power and auxiliary power circuits of each circuit breaker at the source and by opening control power circuit breakers or removing fuses in each breaker cubicle.	$967.84
16	**Motor Control Centers**	**$1,935.68**
17	De-energize all buses at the source.	$483.92
18	Open all circuit breakers and disconnect switches.	$483.92
19	Remove all fuses in control circuits.	$967.84
20	**Low-voltage Switchboards and Panelboards**	**$967.84**
21	De-energize all buses at the source.	$483.92
22	Open all circuit breakers and disconnect switches.	$483.92
23	**Oil-Filled Power Transformers**	**$6,072.32**
24	De-energize all transformer primaries and verify that the secondary is de-energized.	$967.84
25	De-energize all low-voltage AC or DC power sources for space heaters, cooling equipment, controls, etc. at the source and open circuit breakers or remove fuses at transformer end.	$967.84
26	Drain and dispose of oil.	$2,867.52
27	Clean up and dispose of oil on surface areas around the transformers on in containment pits.	$1,269.12
28	**Dry-type Power Transformers**	**$1,935.68**
29	De-energize all transformer primaries and verify that the secondary is de-energized.	$967.84
30	De-energize all low-voltage AC or DC power sources for space heaters, cooling equipment, controls, etc. at the source and open circuit breakers or remove fuses at transformer end.	$967.84
31	**Motors**	**$6,738.88**
32	De-energize all primary power at the source.	$1,935.68
33	De-energize all low-voltage power sources for space heaters or other auxiliary equipment at the source.	$1,935.68
34	Drain lube oil system (if applicable) and dispose of oil.	$2,867.52
35	**Coal Handling**	**$30,905.36**
36	Empty all transfer hoppers.	$1,853.84

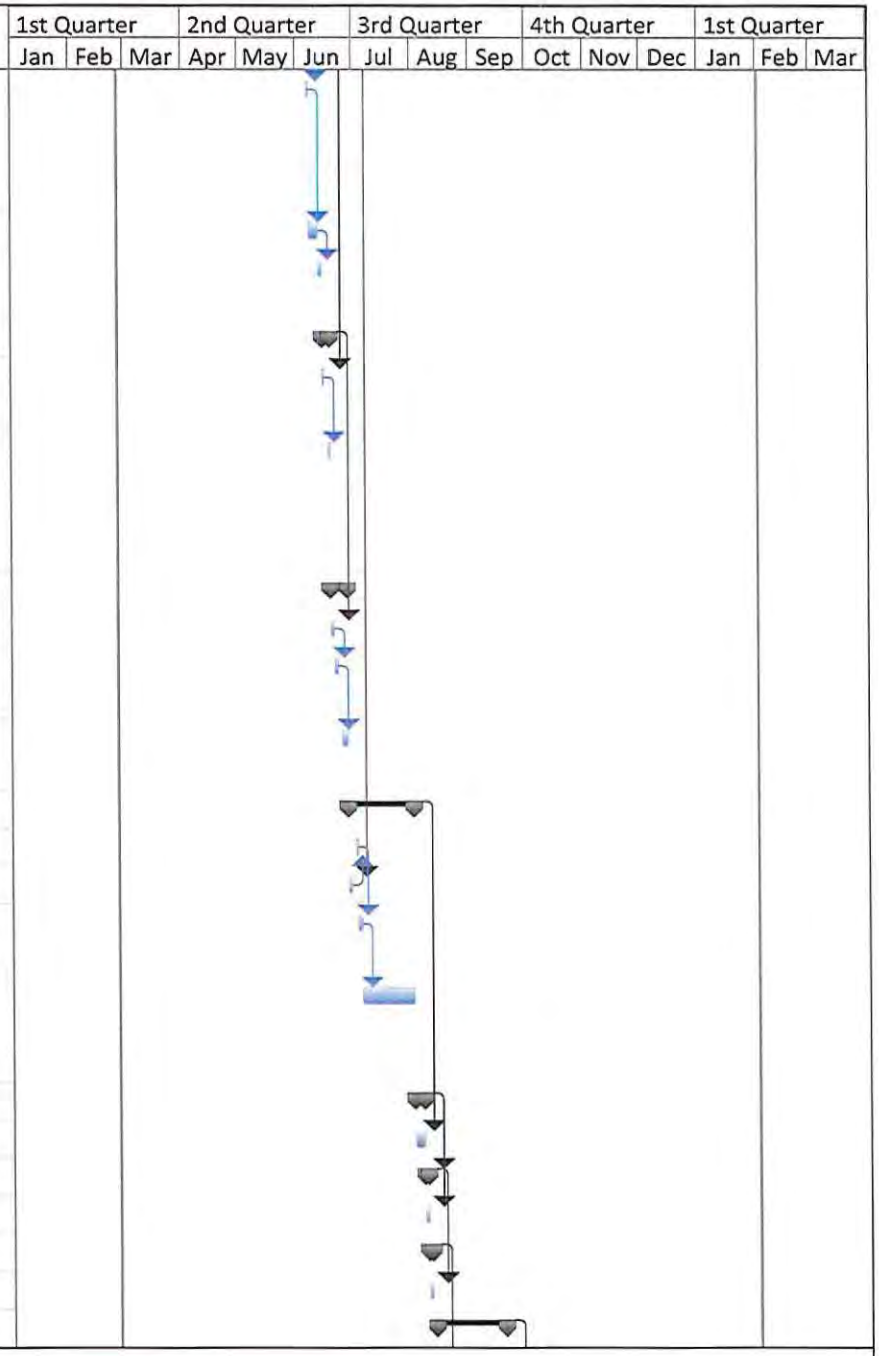
ID	Task Name	Remaining
37	Burn out coal silos.	$1,834.56
38	Confirm all fuel lines, conveyors and trippers are clear of fuel.	$1,834.56
39	Perform cleaning of the coal handling equipment to assure that all coal and coal dust has been removed from site.	$25,382.40
40	**Fuel Oil and Igniter System**	**$2,751.84**
41	Drain fuel oil system	$2,751.84
42	**Waste Oil System**	**$1,834.56**
43	Drain all waste oil systems	$1,834.56
44	**Boiler Chemical Feed**	**$1,834.56**
45	Drain all chemical feed tanks.	$1,834.56
46	**Boiler**	**$30,927.60**
47	Open boiler doors.	$955.84
48	Gas side - perform cleaning of the boiler and bottom ash system.	$25,382.40
49	Drain boiler, drum, downcomers and headers.	$917.28
50	Open drum doors.	$955.84
51	Drain and clean the submerged flight conveyor system.	$2,716.24
52	**Stack and Ductwork**	**$13,647.04**
53	Open ductwork doors.	$955.84
54	Perform cleaning of the ductwork.	$12,691.20
55	**Condensate and Feedwater Piping**	**$1,834.56**
56	Drain water from the system.	$917.28
57	Leave open vents and drains.	$917.28
58	**Feedwater heaters**	**$2,751.84**
59	Drain feedwater heaters	$917.28
60	Leave open vents and drains.	$1,834.56
61	**Deaerator and Deaerator Storage Tank**	**$1,834.56**
62	Drain Deaerator and Storage	$917.28
63	Leave open vents and drains.	$917.28
64	**Precipitator**	**$15,358.64**
65	Multiple cleaning cycles for collection plates.	$2,751.84
66	Clear hoppers of all ash	$3,103.68
67	Disconnect tranformers.	$2,160.96
68	Mechanically secure all compartment dampers and hopper outlet valves in open position.	$955.84
69	Disconnect ash transport piping and washdown baghouse hoppers and interior of casing.	$1,571.12
70	Install bird screens across hopper ash outlet and ash line flanges.	$955.84
71	Padlock or tack weld all hopper doors shut. (note: if ash hopper doors are indoors, they could be removed and the opening covered with bird screens.)	$955.84
72	Pull electrical supply breakers on all electrical equipment except lighting and HVAC components that are to remain in service.	$2,903.52
73	**Turbine(s) and Condenser**	**$5,715.76**
74	Drain hotwell and leave doors open.	$936.56
75	Open main turbine doors.	$955.84
76	Open bfp turbine doors.	$955.84
77	Remove lube oil.	$2,867.52

ID	Task Name	Remaining
78	**Generator**	**$6,618.48**
79	Verify that generator circuit breaker is open and racked out or that high-voltage disconnect switch on substation side of GSU transformer is locked in the open position.	$483.92
80	Verify that generator field breaker or contactor (if applicable) is open.	$483.92
81	De-energize power supplies to generator excitation system at the source.	$483.92
82	De-energize AC and DC power supplies to generator and exciter space heaters, cooling equipment, controls, lighting, etc. at the source and open circuit breakers or remove fuses at the generator and exciter.	$483.92
83	Drain generator and exciter cooling water systems (if applicable).	$936.56
84	Disconnect and remove hydrogen gas tanks and purge generator hydrogen system.	$1,834.56
85	Disconnect and remove fire protection system gas/foam tanks and purge fire protection system.	$1,911.68
86	**Circulation Water and Turbine Cooling Water System**	**$3,707.68**
87	Drain.	$1,834.56
88	Open water box doors.	$955.84
89	Drain any circulating water chemical feed tanks.	$917.28
90	**Compressed Air System**	**$917.28**
91	Open vents and drains.	$917.28
92	**Auxiliary Steam System**	**$1,834.56**
93	Drain water from system.	$917.28
94	Remove aux boiler chemicals.	$917.28
95	**Auxiliary Cooling Water System**	**$917.28**
96	Drain water from system.	$917.28
97	**Condenser Air Extraction**	**$917.28**
98	Drain water from system.	$917.28
99	**Building Heating System**	**$917.28**
100	Drain water from system.	$917.28
101	**Battery System**	**$4,775.20**
102	De-energize all battery chargers from the source.	$483.92
103	Open all AC and DC circuit breakers and/or fused switches on battery chargers and disconnect cables from batteries.	$483.92
104	Remove and dispose of battery electrolyte.	$1,903.68
105	Remove and dispose of battery cells.	$1,269.12
106	Clean up and dispose of electrolyte on surface areas around batteries.	$634.56
107	**Post Retirement Activities**	**$28,182.40**
108	Post Retirement Activities	$28,182.40

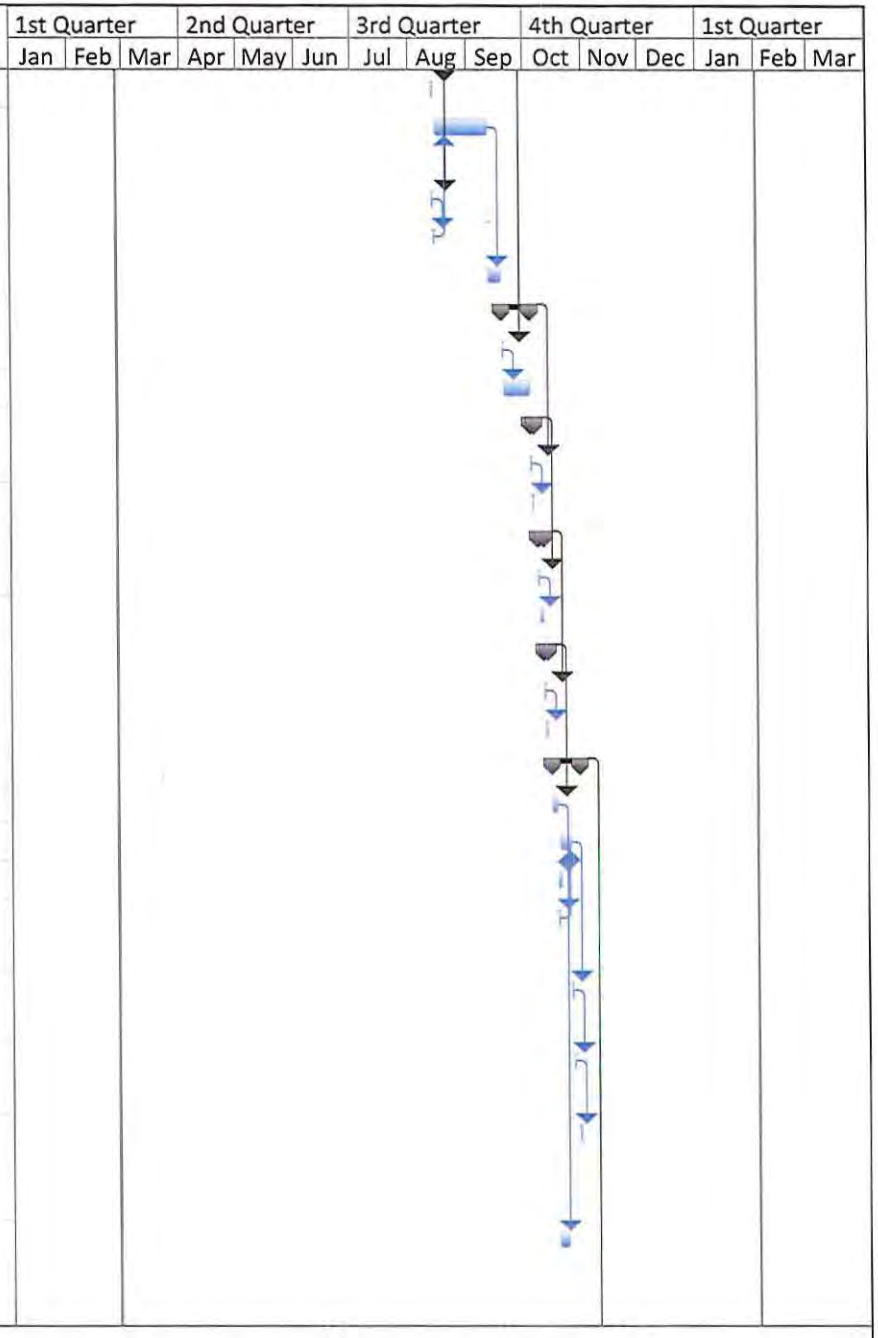
ID	Task Name	Duration
1	**Montrose 3 Retirement**	**245 days**
2	**Pre-Engineering**	**66 days**
3	Permit review and engineering analysis, establish isolation points, and confirm fuel yard inventory has been reduced to zero tons.	66 days
4	**KCL&L Overhead Costs**	**139 days**
5	KCP&L Retirement Manager	139 days
6	**Equipment Rentals**	**139 days**
7	Vacuum truck	139 days
8	**Retirement**	**139 days**
9	**Electrical**	**22 days**
10	**Medium and Low Voltage Draw out Switchgear**	**3 days**
11	De-energize all buses at the source.	0.5 days
12	Open all circuit breakers.	0.5 days
13	Rack all circuit breakers into the fully withdrawn, disconnected position.	0.5 days
14	Verify that the closing/tripping springs are discharged.	0.5 days
15	De-energize control power and auxiliary power circuits of each circuit breaker at the source and by opening control power circuit breakers or removing fuses in each breaker cubicle.	1 day
16	**Motor Control Centers**	**2 days**
17	De-energize all buses at the source.	0.5 days
18	Open all circuit breakers and disconnect switches.	0.5 days
19	Remove all fuses in control circuits.	1 day
20	**Low-voltage Switchboards and Panelboards**	**1 day**
21	De-energize all buses at the source.	0.5 days
22	Open all circuit breakers and disconnect switches.	0.5 days
23	**Oil-Filled Power Transformers**	**7 days**
24	De-energize all transformer primaries and verify that the secondary is de-energized.	1 day



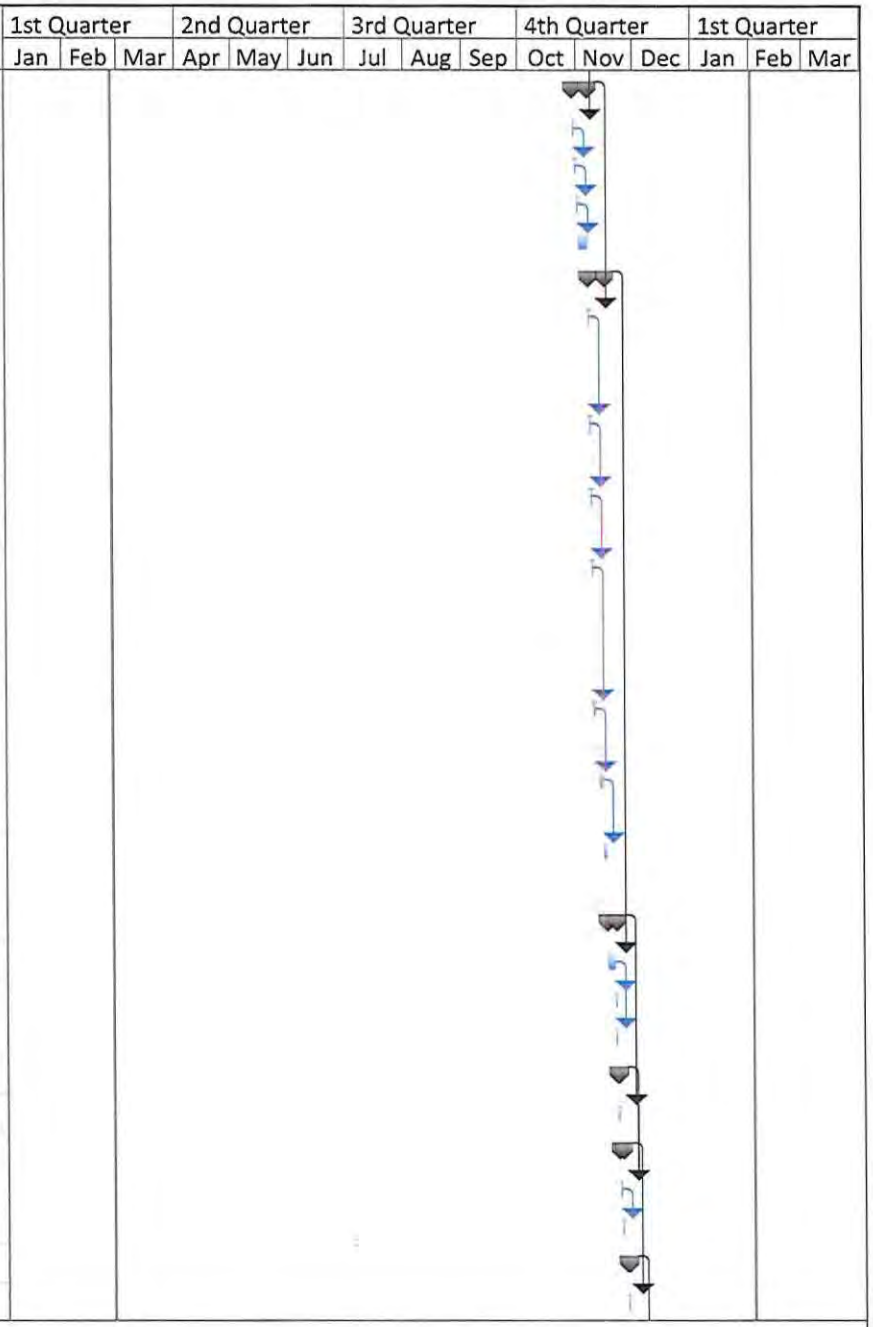
ID	Task Name	Duration
25	De-energize all low-voltage AC or DC power sources for space heaters, cooling equipment, controls, etc. at the source and open circuit breakers or remove fuses at transformer end.	1 day
26	Drain and dispose of oil.	3 days
27	Clean up and dispose of oil on surface areas around the transformers on in containment pits.	2 days
28	**Dry-type Power Transformers**	**2 days**
29	De-energize all transformer primaries and verify that the secondary is de-energized.	1 day
30	De-energize all low-voltage AC or DC power sources for space heaters, cooling equipment, controls, etc. at the source and open circuit breakers or remove fuses at transformer end.	1 day
31	**Motors**	**7 days**
32	De-energize all primary power at the source.	2 days
33	De-energize all low-voltage power sources for space heaters or other auxiliary equipment at the source.	2 days
34	Drain lube oil system (if applicable) and dispose of oil.	3 days
35	**Coal Handling**	**25 days**
36	Empty all transfer hoppers.	1 day
37	Burn out coal silos.	2 days
38	Confirm all fuel lines, conveyors and trippers are clear of fuel.	2 days
39	Perform cleaning of the coal handling equipment to assure that all coal and coal dust has been removed from site.	20 days
40	**Fuel Oil and Igniter System**	**3 days**
41	Drain fuel oil system	3 days
42	**Waste Oil System**	**2 days**
43	Drain all waste oil systems	2 days
44	**Boiler Chemical Feed**	**2 days**
45	Drain all chemical feed tanks.	2 days
46	**Boiler**	**27 days**



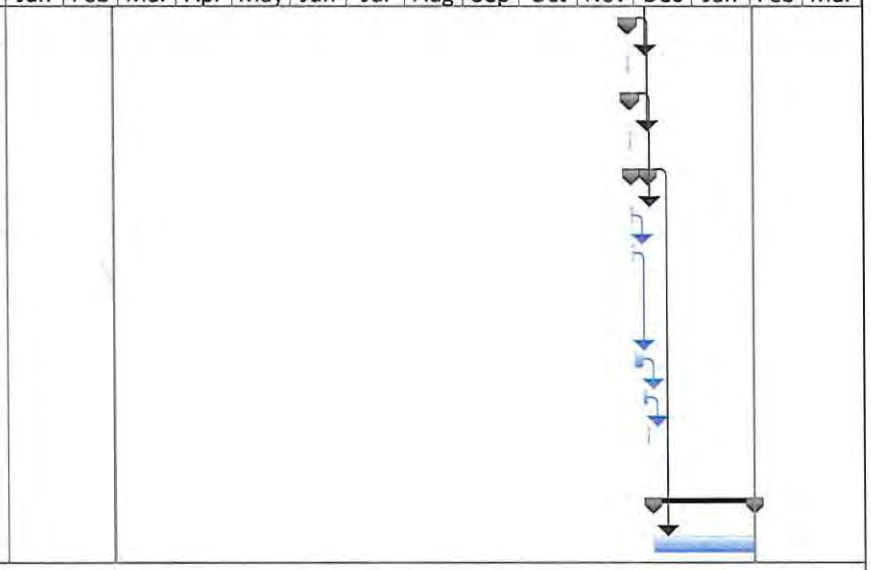
ID	Task Name	Duration
47	Open boiler doors.	1 day
48	Gas side - perform cleaning of the boiler and bottom ash system.	20 days
49	Drain boiler, drum, downcomers and headers.	1 day
50	Open drum doors.	1 day
51	Drain and clean the submerged flight conveyor system.	5 days
52	**Stack and Ductwork**	**11 days**
53	Open ductwork doors.	1 day
54	Perform cleaning of the ductwork.	10 days
55	**Condensate and Feedwater Piping**	**2 days**
56	Drain water from the system.	1 day
57	Leave open vents and drains.	1 day
58	**Feedwater heaters**	**3 days**
59	Drain feedwater heaters	1 day
60	Leave open vents and drains.	2 days
61	**Deaerator and Deaerator Storage Tank**	**2 days**
62	Drain Deaerator and Storage	1 day
63	Leave open vents and drains.	1 day
64	**Precipitator**	**11 days**
65	Multiple cleaning cycles for collection plates.	3 days
66	Clear hoppers of all ash	4 days
67	Disconnect tranformers.	2 days
68	Mechanically secure all compartment dampers and hopper outlet valves in open position.	1 day
69	Disconnect ash transport piping and washdown baghouse hoppers and interior of casing.	1 day
70	Install bird screens across hopper ash outlet and ash line flanges.	1 day
71	Padlock or tack weld all hopper doors shut. (note: if ash hopper doors are indoors, they could be removed and the opening covered with bird screens.)	1 day
72	Pull electrical supply breakers on all electrical equipment except lighting and HVAC components that are to remain ir service.	3 days



ID	Task Name	Duration
73	**Turbine(s) and Condenser**	**6 days**
74	Drain hotwell and leave doors open.	1 day
75	Open main turbine doors.	1 day
76	Open bfp turbine doors.	1 day
77	Remove lube oil.	3 days
78	**Generator**	**7 days**
79	Verify that generator circuit breaker is open and racked out or that high-voltage disconnect switch on substation side of GSU transformer is locked in the open position.	0.5 days
80	Verify that generator field breaker or contactor (if applicable) is open.	0.5 days
81	De-energize power supplies to generator excitation system at the source.	0.5 days
82	De-energize AC and DC power supplies to generator and exciter space heaters, cooling equipment, controls, lighting, etc. at the source and open circuit breakers or remove fuses at the generator and exciter.	0.5 days
83	Drain generator and exciter cooling water systems (if applicable).	1 day
84	Disconnect and remove hydrogen gas tanks and purge generator hydrogen system.	2 days
85	Disconnect and remove fire protection system gas/foam tanks and purge fire protection system.	2 days
86	**Circulation Water and Turbine Cooling Water System**	**3 days**
87	Drain.	2 days
88	Open water box doors.	1 day
89	Drain any circulating water chemical feed tanks.	1 day
90	**Compressed Air System**	**1 day**
91	Open vents and drains.	1 day
92	**Auxiliary Steam System**	**2 days**
93	Drain water from system.	1 day
94	Remove aux boiler chemicals.	1 day
95	**Auxiliary Cooling Water System**	**1 day**
96	Drain water from system.	1 day



ID	Task Name	Duration
97	**Condenser Air Extraction**	**1 day**
98	Drain water from system.	1 day
99	**Building Heating System**	**1 day**
100	Drain water from system.	1 day
101	**Battery System**	**7 days**
102	De-energize all battery chargers from the source.	0.5 days
103	Open all AC and DC circuit breakers and/or fused switches on battery chargers and disconnect cables from batteries.	0.5 days
104	Remove and dispose of battery electrolyte.	3 days
105	Remove and dispose of battery cells.	2 days
106	Clean up and dispose of electrolyte on surface areas around batteries.	1 day
107	**Post Retirement Activities**	**40 days**
108	Post Retirement Activities	40 days



Montrose 3 Dismantlement

Owner Costs			
Pre-Dismantlement Activities		$488,317	
Overhead During Dismantlement		$886,336	
Post-Dismantlement Activities		$30,730	
Owner Costs Total			$1,405,384
Demolition General Contractor (DGC) Costs			
Site Management		$428,454	
Equipment Rental		$722,105	
Consumables		$720,417	
Scrap Crew(s)		$703,552	
Dismantlement*		$3,463,130	
DGC Insurance	2.00%	$120,753	
Contingency/Profit	15.00%	$923,762	
Performance Bond	2.00%	$141,643	
Contractor Costs Total:			$7,223,817

Total:		$8,629,201
Owner Internal Costs:	5.00%	$431,460
Owner Contingency:	25.00%	$2,265,165
Montrose Unit 3 Dismantlement Opinion of Probable Cost:		$11,325,826

COMMON

Montrose Common Retirement

Owner Costs				
Pre-Retirement Activities		$54,474		
Retirement Activities		$476,006		
Post-Retirement Activities		$16,432		
Owner Direct Total			$546,913	
Owner Internal Costs	5.00%		$27,346	
Owner Contingency:	25.00%		$143,565	
Montrose Common Retirement Opinion of Probable Cost:				$717,823

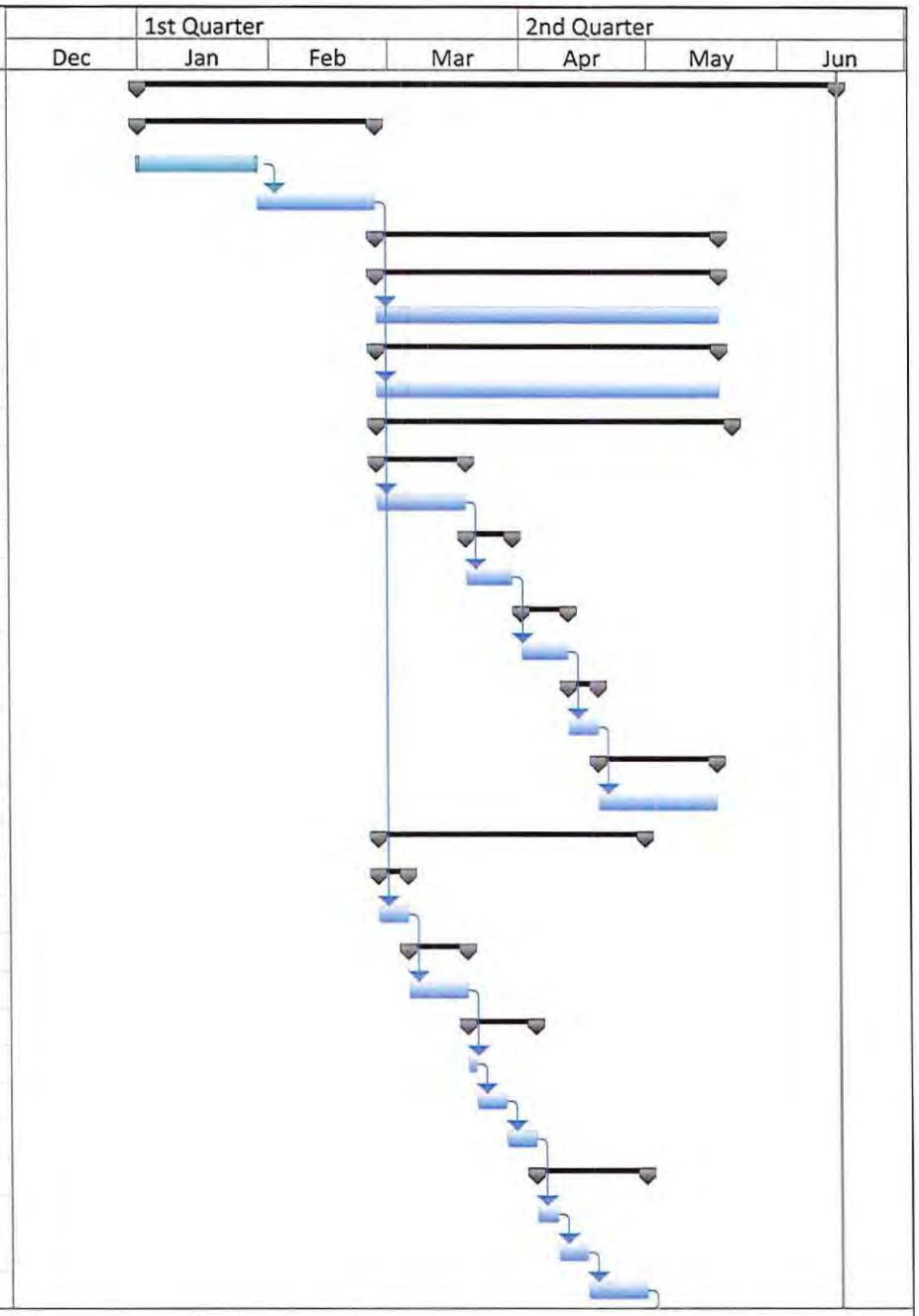
Activities Required by Permit or Regulation

Asbestos Abatement		$1,899,958	
Fuel Oil Tank Removal		$264,743	
Landfill Closure		$2,329,000	
Landfill Post Closure		$1,874,330	
Ash Pond(s)		$274,742	
Activities Required by Permit or Regulation			$6,642,773

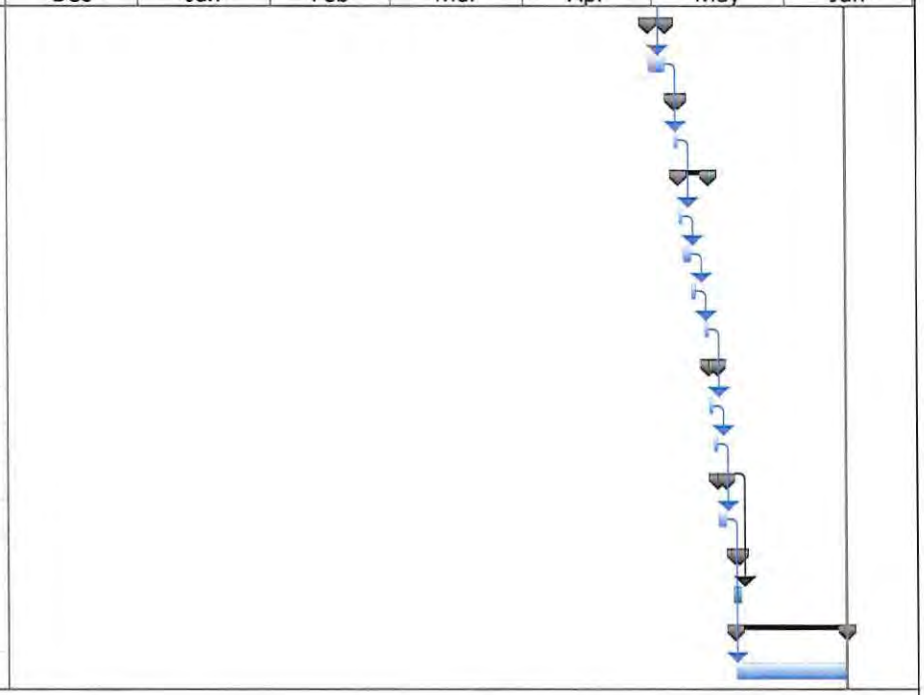
ID	Task Name	Remaining
1	**Montrose Common Retirement**	**$546,885.20**
2	**Pre-Retirement Activities**	**$54,456.00**
3	Permitting Review	$27,228.00
4	Develop Detailed Retirement Plan	$27,228.00
5	**Overheads**	**$105,298.48**
6	**Common Retirement Overheads**	**$92,299.60**
7	Added Overhead Staff for Common Retirement	$92,299.60
8	**Common Retirment Equipment Rental**	**$12,998.88**
9	Common Removal Equipment Rental	$12,998.88
10	**Retirement Activities**	**$370,707.52**
11	**Administration Building**	**$25,700.80**
12	Secure Administration Building	$25,700.80
13	**Fuel Yard Office Building**	**$15,420.48**
14	Secure Fuel Yard Office Building	$15,420.48
15	**Training Building**	**$15,420.48**
16	Secure Training Building	$15,420.48
17	**Warehouse(s)**	**$11,688.80**
18	Secure Unit Warehouse(s)	$11,688.80
19	**Maintenance Shop**	**$46,755.20**
20	Secure Maintenance Shop	$46,755.20
21	**Fuel Yard**	**$101,153.60**
22	**Crusher Tower**	**$27,771.20**
23	Clean Crusher Tower	$9,172.80
24	**Conveyors**	**$18,345.60**
25	Clean Conveyor 10,42,43,44, 51	$18,345.60
26	**Car Dumper**	**$22,014.72**
27	Empty Car Dumper Hoppers	$3,669.12
28	Clean Car Dumper	$9,172.80
29	Secure Dumper Building	$9,172.80
30	**Reclaim**	**$33,022.08**
31	Clean Unit 1 Reclaim	$5,503.68
32	Secure Unit 1 Reclaim Building	$9,172.80
33	Clean Stock Out Conveyor Reclaim	$18,345.60
34	**Sewage Treatment**	**$6,420.96**
35	Clean Sewage Treatment and Transfer Points	$6,420.96
36	**Fuel Oil Storage and Unloading**	**$917.28**
37	Remove Fuel Oil from Fuel Oil Storage and Vent	$917.28
38	**Water Treatment**	**$7,338.24**
39	Drain All Tanks and Vessels	$1,834.56
40	Remove Membranes, Resin and Sand from Filters	$3,669.12
41	Remove Chemicals	$917.28
42	Open and Vent Vessels	$917.28
43	**Compressed Air**	**$1,834.56**
44	Vent Compressed Air	$917.28
45	Vent Compressed Air Vessels	$917.28
46	**Yard Fire Water Systems**	**$2,771.12**

ID	Task Name	Remaining
47	Drain Yard Fire Water System	$2,771.12
48	**Wastewater Lagoons**	**$135,286.00**
49	Removal of Lagoons	$135,286.00
50	**Post Retirement Closure Activities**	**$16,423.20**
51	Post Retirement Closure Activities	$16,423.20

ID	Task Name	Duration
1	**Montrose Common Retirement**	**119 days**
2	**Pre-Retirement Activities**	**40 days**
3	Permitting Review	20 days
4	Develop Detailed Retirement Plan	20 days
5	**Overheads**	**59 days**
6	**Common Retirement Overheads**	**59 days**
7	Added Overhead Staff for Common Retirement	59 days
8	**Common Retirment Equipment Rental**	**59 days**
9	Common Removal Equipment Rental	59 days
10	**Retirement Activities**	**60 days**
11	**Administration Building**	**15 days**
12	Secure Administration Building	15 days
13	**Fuel Yard Office Building**	**9 days**
14	Secure Fuel Yard Office Building	9 days
15	**Training Building**	**9 days**
16	Secure Training Building	9 days
17	**Warehouse(s)**	**5 days**
18	Secure Unit Warehouse(s)	5 days
19	**Maintenance Shop**	**20 days**
20	Secure Maintenance Shop	20 days
21	**Fuel Yard**	**45 days**
22	**Crusher Tower**	**5 days**
23	Clean Crusher Tower	5 days
24	**Conveyors**	**10 days**
25	Clean Conveyor 10,42,43,44, 51	10 days
26	**Car Dumper**	**12 days**
27	Empty Car Dumper Hoppers	2 days
28	Clean Car Dumper	5 days
29	Secure Dumper Building	5 days
30	**Reclaim**	**18 days**
31	Clean Unit 1 Reclaim	3 days
32	Secure Unit 1 Reclaim Building	5 days
33	Clean Stock Out Conveyor Reclaim	10 days



ID	Task Name	Duration
34	**Sewage Treatment**	**4 days**
35	Clean Sewage Treatment and Transfer Points	4 days
36	**Fuel Oil Storage and Unloading**	**1 day**
37	Remove Fuel Oil from Fuel Oil Storage and Vent	1 day
38	**Water Treatment**	**5 days**
39	Drain All Tanks and Vessels	1 day
40	Remove Membranes, Resin and Sand from Filters	2 days
41	Remove Chemicals	1 day
42	Open and Vent Vessels	1 day
43	**Compressed Air**	**2 days**
44	Vent Compressed Air	1 day
45	Vent Compressed Air Vessels	1 day
46	**Yard Fire Water Systems**	**2 days**
47	Drain Yard Fire Water System	2 days
48	**Wastewater Lagoons**	**1 day**
49	Removal of Lagoons	1 day
50	**Post Retirement Closure Activities**	**20 days**
51	Post Retirement Closure Activities	20 days

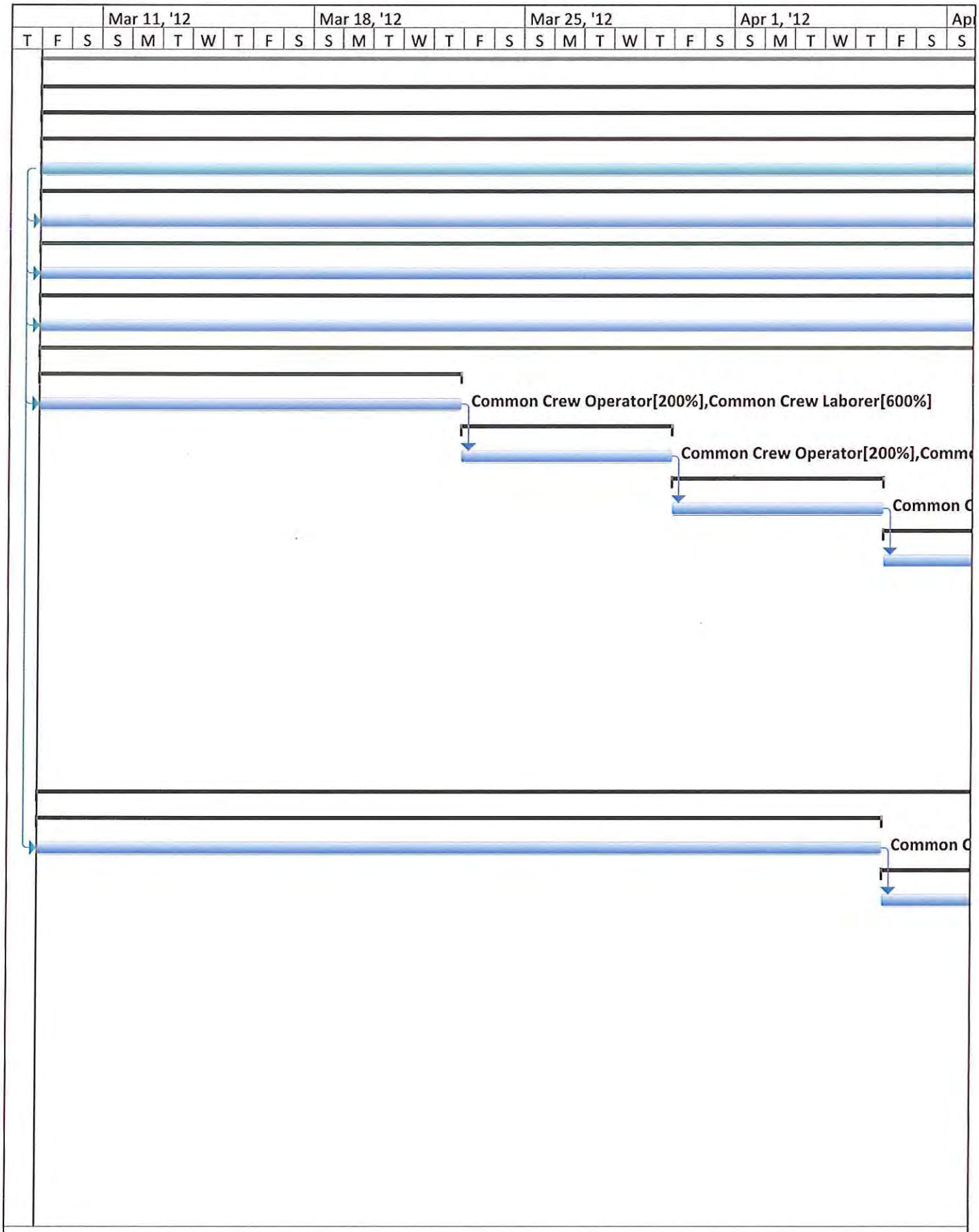


Montrose Common Dismantlement

Owner Additional Costs				
Pre-Dismantlement Activities		$0		
Overhead During Dismantlement		$0		
Owner Costs Total			$0	
Demolition General Contractor (DGC) Costs				
Additional Site Management		$46,650		
Equipment Rental		$723,933		
Consumables		$225,120		
Scrap Crew(s)		$329,385		
Dismantlement		$5,909,737		
DGC Insurance	2.00%	$144,697		
Contingency/Profit	15.00%	$1,106,928		
Performance Bond	2.00%	$169,729		
Contractor Costs Total:			$8,656,180	
Total:				$8,656,180
Owner Internal Costs:	5.00%			$432,809
Owner Contingency:	25.00%			$2,272,247
Montrose Common Dismantlement Opinion of Probable Cost:				$11,361,236

ID	Task Name	Remaining
0	**Montrose Common Dismantlement**	**$6,680,320.19**
1	**Montrose Common Dismantlement**	**$6,680,320.19**
2	**Overheads**	**$770,583.36**
3	**Common Removal Overheads**	**$46,650.24**
4	Added Overhead Staff for Common Removals	$46,650.24
5	**Common Removal Equipment Rental**	**$169,427.52**
6	Common Removal Equipment Rental	$169,427.52
7	**Scrap Crew**	**$329,385.44**
8	Crew(s) to Handle Scrap Material	$329,385.44
9	**Demolition Contractor Consummables**	**$225,120.16**
10	Consummables	$225,120.16
11	**Dismantlement Activities**	**$5,909,736.83**
12	**Administration Building**	**$37,009.60**
13	Remove Administration Building	$37,009.60
14	**Fuel Yard Office Building**	**$18,504.80**
15	Remove Fuel Yard Office Building	$18,504.80
16	**Training Building**	**$18,504.80**
17	Remove Training Building	$18,504.80
18	**Parking Lots and Plant Roads**	**$85,122.08**
19	Plant Roads and Parking Areas	$74,019.20
20	Guard Shack	$11,102.88
21	**Warehouse(s)**	**$18,504.80**
22	Remove Warehouse	$18,504.80
23	**Maintenance Shop**	**$23,984.80**
24	Remove Maintenance Shop	$23,984.80
25	**Water Treatment**	**$40,710.56**
26	Remove Water Treatment Equipment	$18,504.80
27	Remove Water Treatment Building	$22,205.76
28	**Fuel Yard**	**$403,404.64**
29	**Crusher Tower**	**$148,038.40**
30	Remove Crusher Building and Equipment	$74,019.20
31	**Conveyors**	**$92,524.00**
32	Remove Conveyor 10, 42, 43, 44, and 51	$92,524.00
33	**Car Dumper**	**$96,224.96**
34	Remove Underground Equipment	$14,803.84
35	Remove Above Ground Equipment	$37,009.60
36	Remove Building	$25,906.72
37	Backfill Dumper Structure	$18,504.80
38	**Reclaim**	**$66,617.28**
39	Remove Underground Equipment	$18,504.80
40	Remove Above Ground Equipment	$18,504.80
41	Remove Building	$14,803.84
42	Backfill Structure	$14,803.84
43	**Yard Fire Water Systems**	**$37,009.60**
44	Remove Hydrants and Fire Water System Piping Down to 3' Below Grade	$37,009.60

ID	Task Name	Remaining	W
45	**Stacks**	**$4,731,233.84**	
46	Remove Unit 1 and Unit 2 Stack to Grade	$2,814,765.08	
47	Remove Unit 3 Stack to Grade	$1,916,468.76	
48	**Final Site Grading and Drainage**	**$495,747.31**	
49	Final Site Grading and Drainage	$495,747.31	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Mar 18, '12
Mar 25, '12
Apr 1, '12
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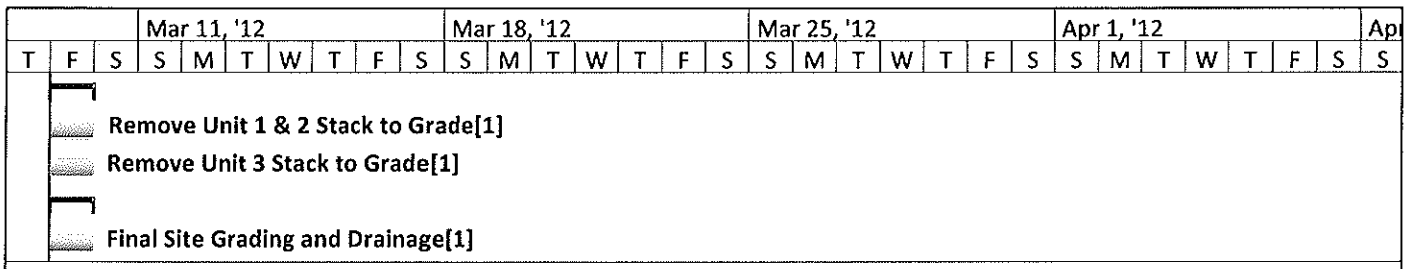
Mar 11, '12
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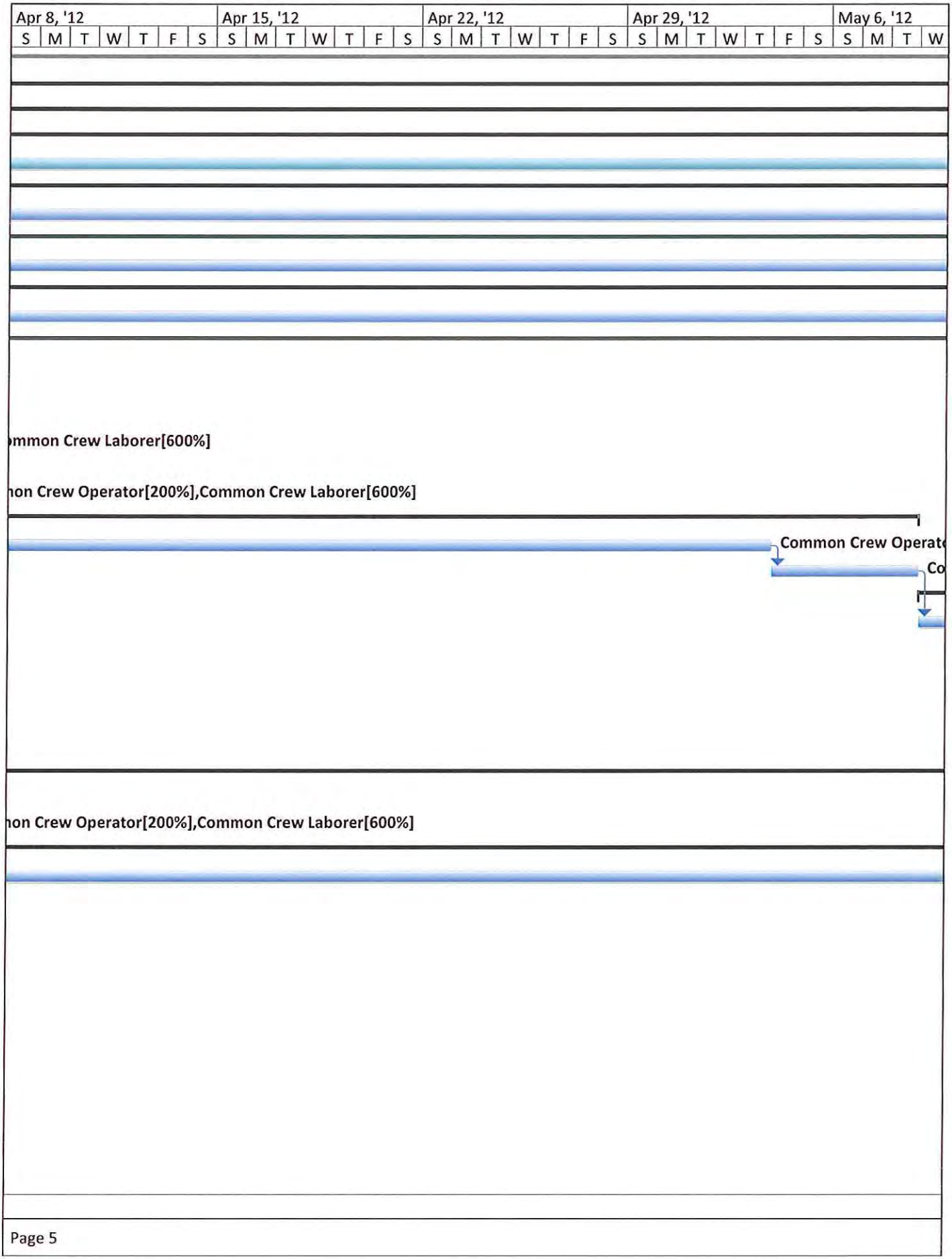
T F S S M T W T F S S M T W T F S S M T W T F S S M T W T F S S
Remove Unit 1 & 2 Stack to Grade[1]
Remove Unit 3 Stack to Grade[1]
Final Site Grading and Drainage[1]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Apr 22, '12
Apr 29, '12
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Apr 8, '12							Apr 15, '12							Apr 22, '12							Apr 29, '12							May 6, '12			
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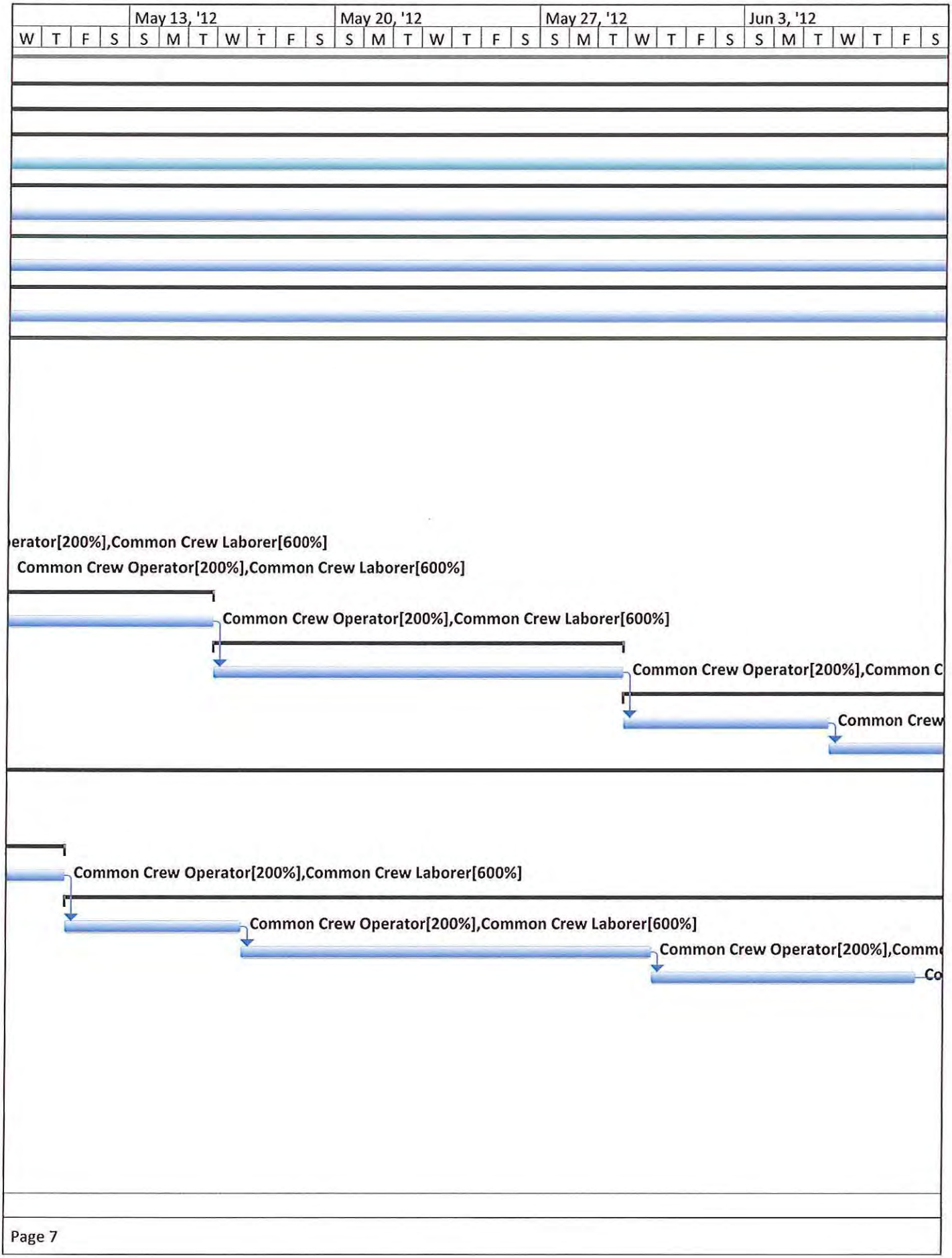
May 13, '12
May 20, '12
May 27, '12
Jun 3, '12
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				May 13, '12							May 20, '12							May 27, '12							Jun 3, '12						
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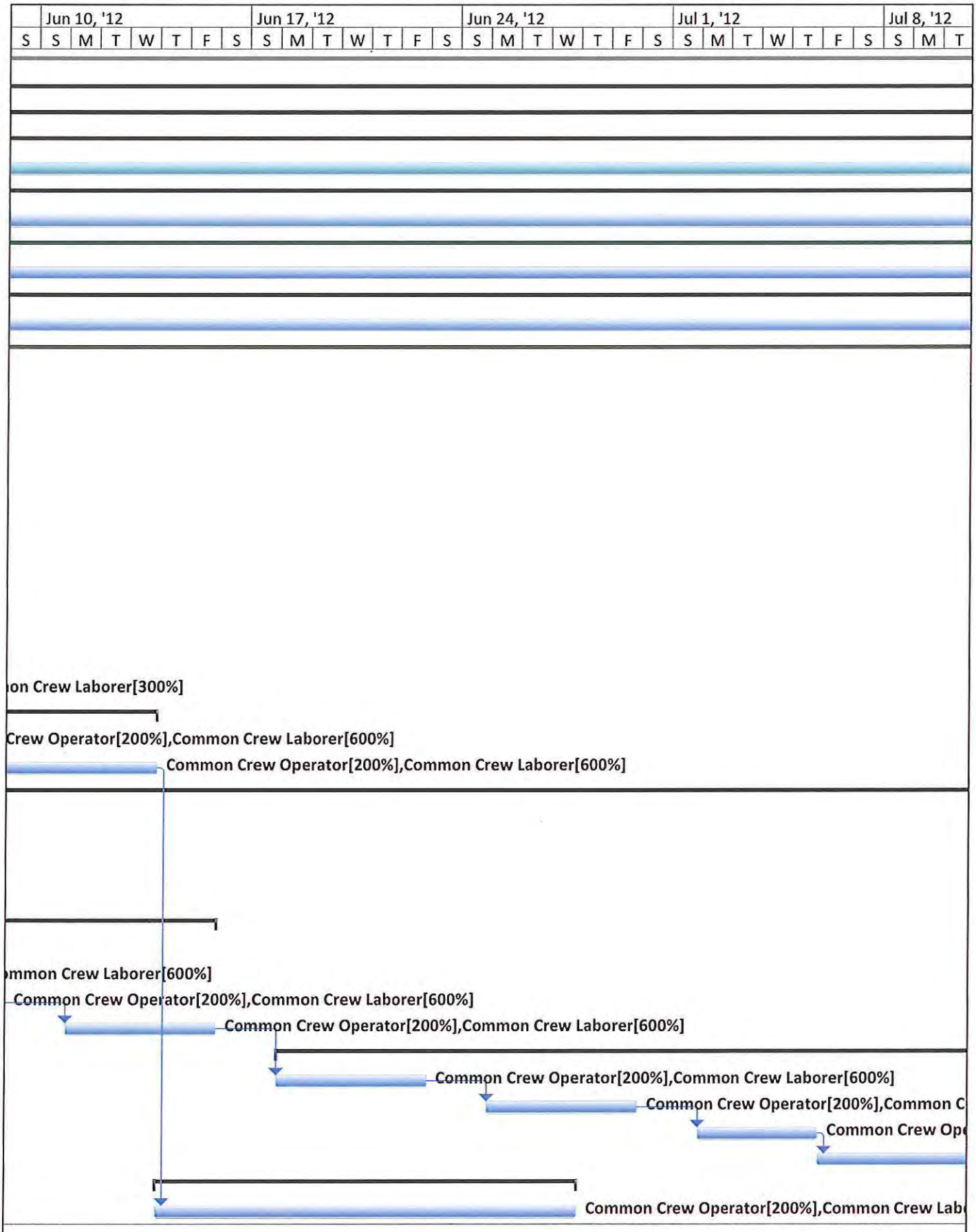
Jun 10, '12
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Crew Operator[200%],Common Crew Laborer[600%]
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	Jun 10, '12							Jun 17, '12							Jun 24, '12							Jul 1, '12							Jul 8, '12		
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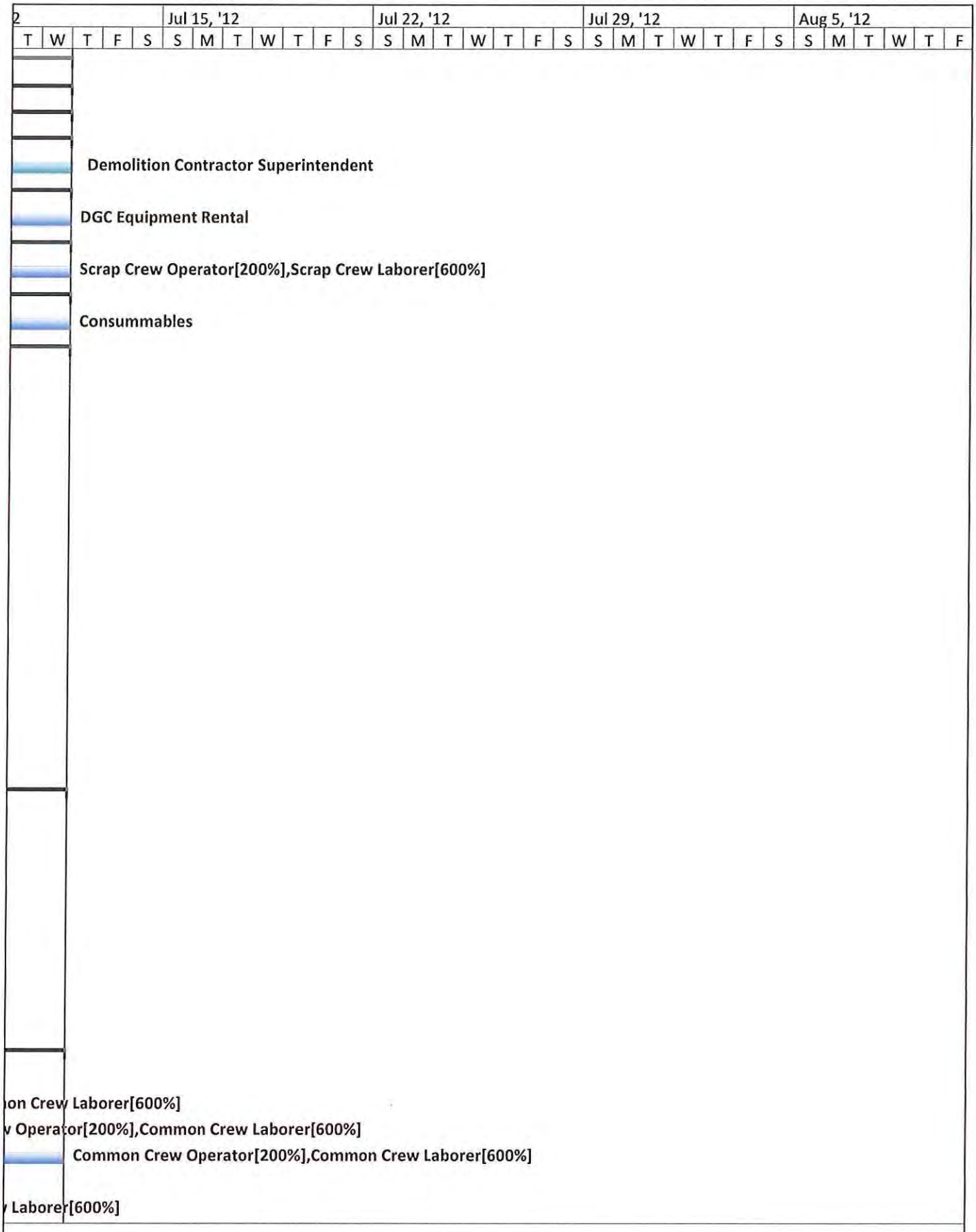
2
Jul 15, '12
Jul 22, '12
Jul 29, '12
Aug 5, '12
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Demolition Contractor Superintendent
DGC Equipment Rental
Scrap Crew Operator[200%],Scrap Crew Laborer[600%]
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on Crew Laborer[600%]
v Operator[200%],Common Crew Laborer[600%]
Common Crew Operator[200%],Common Crew Laborer[600%]
Laborer[600%]

2					Jul 15, '12							Jul 22, '12							Jul 29, '12							Aug 5, '12					
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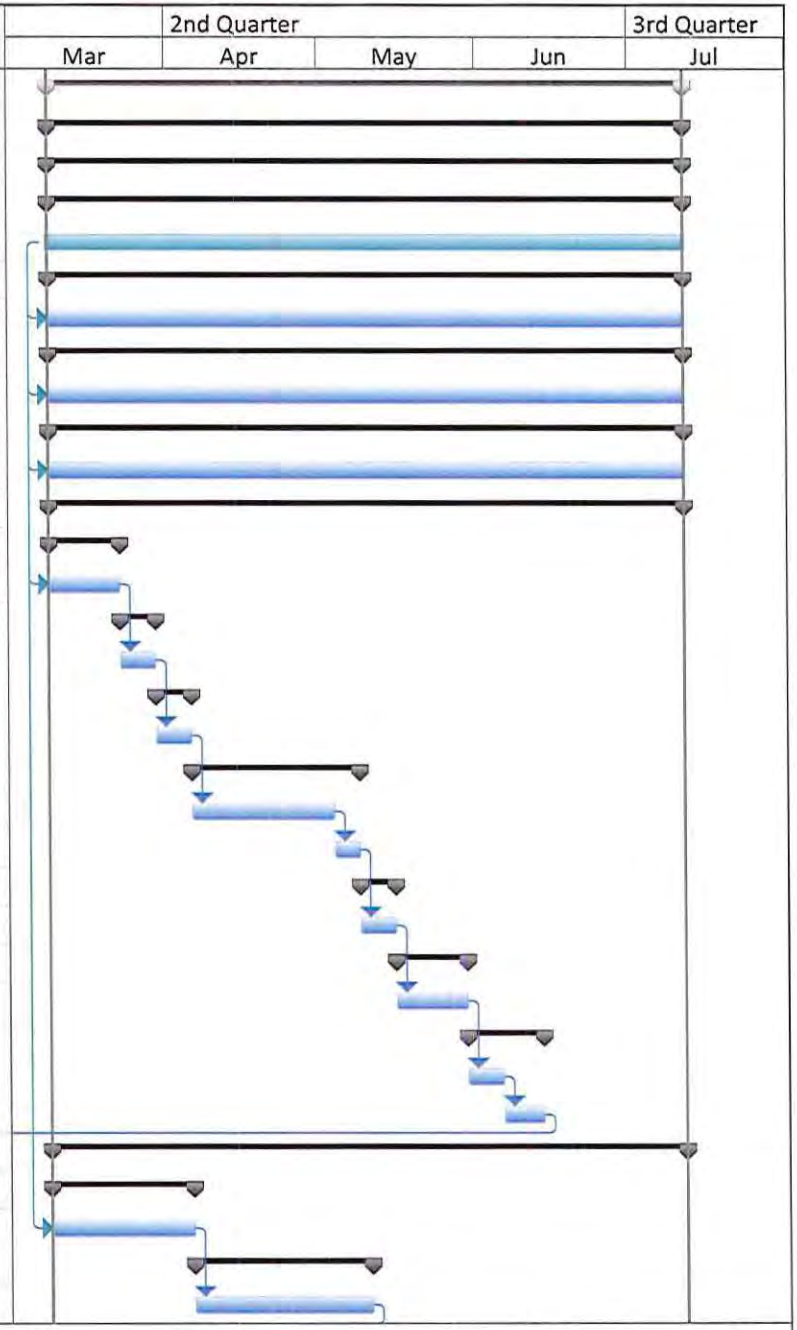
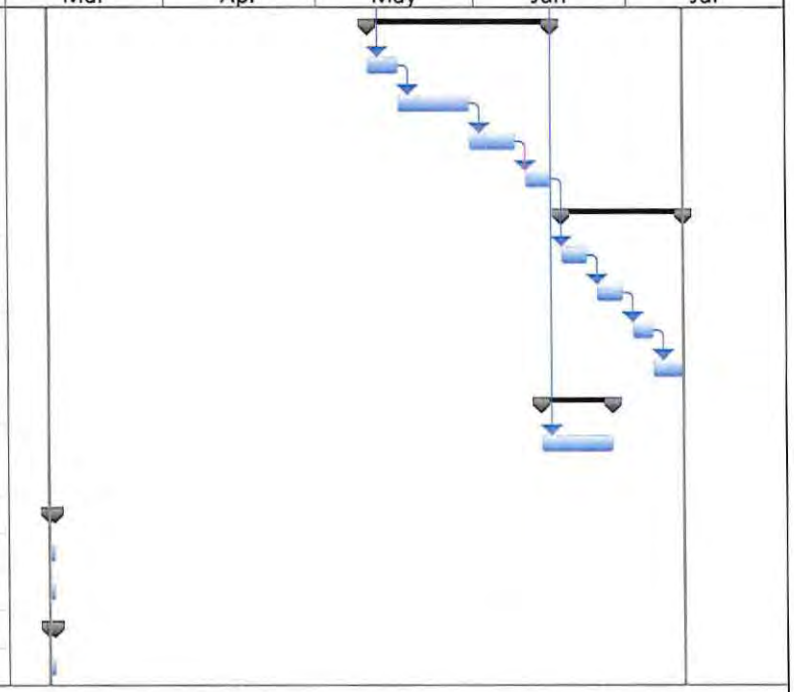
ID	Task Name	Duration
0	**Montrose Common Dismantlement**	**89 days**
1	**Montrose Common Dismantlement**	**89 days**
2	**Overheads**	**89 days**
3	**Common Removal Overheads**	**89 days**
4	Added Overhead Staff for Common Removals	89 days
5	**Common Removal Equipment Rental**	**89 days**
6	Common Removal Equipment Rental	89 days
7	**Scrap Crew**	**89 days**
8	Crew(s) to Handle Scrap Material	89 days
9	**Demolition Contractor Consummables**	**89 days**
10	Consummables	89 days
11	**Dismantlement Activities**	**89 days**
12	**Administration Building**	**10 days**
13	Remove Administration Building	10 days
14	**Fuel Yard Office Building**	**5 days**
15	Remove Fuel Yard Office Building	5 days
16	**Training Building**	**5 days**
17	Remove Training Building	5 days
18	**Parking Lots and Plant Roads**	**23 days**
19	Plant Roads and Parking Areas	20 days
20	Guard Shack	3 days
21	**Warehouse(s)**	**5 days**
22	Remove Warehouse	5 days
23	**Maintenance Shop**	**10 days**
24	Remove Maintenance Shop	10 days
25	**Water Treatment**	**11 days**
26	Remove Water Treatment Equipment	5 days
27	Remove Water Treatment Building	6 days
28	**Fuel Yard**	**89 days**
29	**Crusher Tower**	**20 days**
30	Remove Crusher Building and Equipment	20 days
31	**Conveyors**	**25 days**
32	Remove Conveyor 10, 42, 43, 44, and 51	25 days



ID	Task Name	Duration
33	**Car Dumper**	**26 days**
34	Remove Underground Equipment	4 days
35	Remove Above Ground Equipment	10 days
36	Remove Building	7 days
37	Backfill Dumper Structure	5 days
38	**Reclaim**	**18 days**
39	Remove Underground Equipment	5 days
40	Remove Above Ground Equipment	5 days
41	Remove Building	4 days
42	Backfill Structure	4 days
43	**Yard Fire Water Systems**	**10 days**
44	Remove Hydrants and Fire Water System Piping Down to 3' Below Grade	10 days
45	**Stacks**	**1 day**
46	Remove Unit 1 and Unit 2 Stack to Grade	1 day
47	Remove Unit 3 Stack to Grade	1 day
48	**Final Site Grading and Drainage**	**1 day**
49	Final Site Grading and Drainage	1 day



HAWTHORN GENERATING STATION
UNIT 5 AND COMMON

HAWTHORN GENERATING STATION
UNIT 5 AND COMMON

The Hawthorn Generating Station consists of one coal-fired power plant (Hawthorn Unit 5), two simple-cycle combustion turbines (Hawthorn Units 7 and 8), and a one-on-one combined-cycle plant (Hawthorn Units 6 and 9).

Note: This section of the report covers Hawthorn Unit 5 and the Hawthorn Common facilities.

Hawthorn Unit 5 has an SPP-accredited unit rating of 564 MW and was placed in service in 2001. Unit 5 has a sub-critical Babcock & Wilcox boiler and a General Electric turbine. Unit 5 has an SCR, dry scrubber with a dedicated reagent preparation system, and baghouse. River water is used for condenser cooling.

The Hawthorn fuel yard has a rotary car dumper to unload unit trains of coal. The coal is unloaded to the ground. Coal is transferred to Hawthorn Unit 5 via a reclaim pit and a series of conveyors.

Hawthorn Unit 5 has a fuel gas igniter system. The gas is supplied by a regional natural gas supplier via underground pipelines.

Hawthorn Unit 5 beneficially uses the majority of their coal combustion products off site. Coal combustion products that are not beneficially used off site are disposed in an off-site landfill.

The following are the major systems and equipment that were included in the retirement and dismantlement of each unit and the major systems and equipment that were considered common (additional details are listed in the attached retirement and dismantlement schedules included in this Appendix).

HAWTHORN UNIT 5

1. Boiler, SCR, and boiler auxiliaries.
2. Turbine, heat balance equipment, and turbine auxiliaries.
3. Baghouse, dry scrubber, and dry scrubber auxiliaries.
4. Fuel handling equipment.

COMMON

1. Administration building.
2. Fuel yard office building.
3. Training building.
4. Warehouses.
5. Maintenance shops.
6. Water treatment.
7. Fire water systems.
8. Hawthorn Units 1 and 2 intake structure and circulating water piping.
9. Hawthorn Unit 5 intake structure and circulating water piping.
10. Hawthorn Unit 5 stack.

UNIT 5

Hawthorn 5 Retirement

Owner Costs			
Pre-Retirement Activities		$106,968	
Retirement Activities		$642,874	
Post-Retirement Activities		$28,182	
Owner Direct Total		$778,024	
Owner Internal Costs	5.00%	$38,901	
Owner Contingency:	25.00%	$204,231	
Hawthorn 5 Retirement Opinion of Probable Cost:			$1,021,157

Activities Required by Permit or Regulation

Hawthorn Asbestos Removal	$11,173,839	
Hawthorn 5 Intake Equip, Intake Structures, Levee piping Removal	$1,271,750	
Activities Required by Permit or Regulation		$12,445,589

ID	Task Name	Cost
1	**Hawthorn 5 Retirement**	**$778,024.32**
2	**Pre-Engineering**	**$106,967.52**
3	Permit review and engineering analysis, establish isolation points, and confirm fuel yard inventory has been reduced to zero tons.	$106,967.52
4	**KCL&L Overhead Costs**	**$111,080.32**
5	KCP&L Retirement Manager	$111,080.32
6	**Equipment Rentals**	**$37,234.08**
7	Vacuum truck	$37,234.08
8	**Retirement**	**$494,560.00**
9	**Electrical**	**$16,718.56**
10	**Medium and Low Voltage Draw out Switchgear**	**$2,903.52**
11	De-energize all buses at the source.	$483.92
12	Open all circuit breakers.	$483.92
13	Rack all circuit breakers into the fully withdrawn, disconnected position.	$483.92
14	Verify that the closing/tripping springs are discharged.	$483.92
15	De-energize control power and auxiliary power circuits of each circuit breaker at the source and by opening control power circuit breakers or removing fuses in each breaker cubicle.	$967.84
16	**Motor Control Centers**	**$1,935.68**
17	De-energize all buses at the source.	$483.92
18	Open all circuit breakers and disconnect switches.	$483.92
19	Remove all fuses in control circuits.	$967.84
20	**Low-voltage Switchboards and Panelboards**	**$967.84**
21	De-energize all buses at the source.	$483.92
22	Open all circuit breakers and disconnect switches.	$483.92
23	**Oil-Filled Power Transformers**	**$4,638.56**
24	De-energize all transformer primaries and verify that the secondary is de-energizec	$967.84
25	De-energize all low-voltage AC or DC power sources for space heaters, cooling equipment, controls, etc. at the source and open circuit breakers or remove fuses at transformer end.	$967.84
26	Drain and dispose of oil.	$1,433.76
27	Clean up and dispose of oil on surface areas around transformers and in containment pits.	$1,269.12
28	**Dry-type Power Transformers**	**$1,935.68**

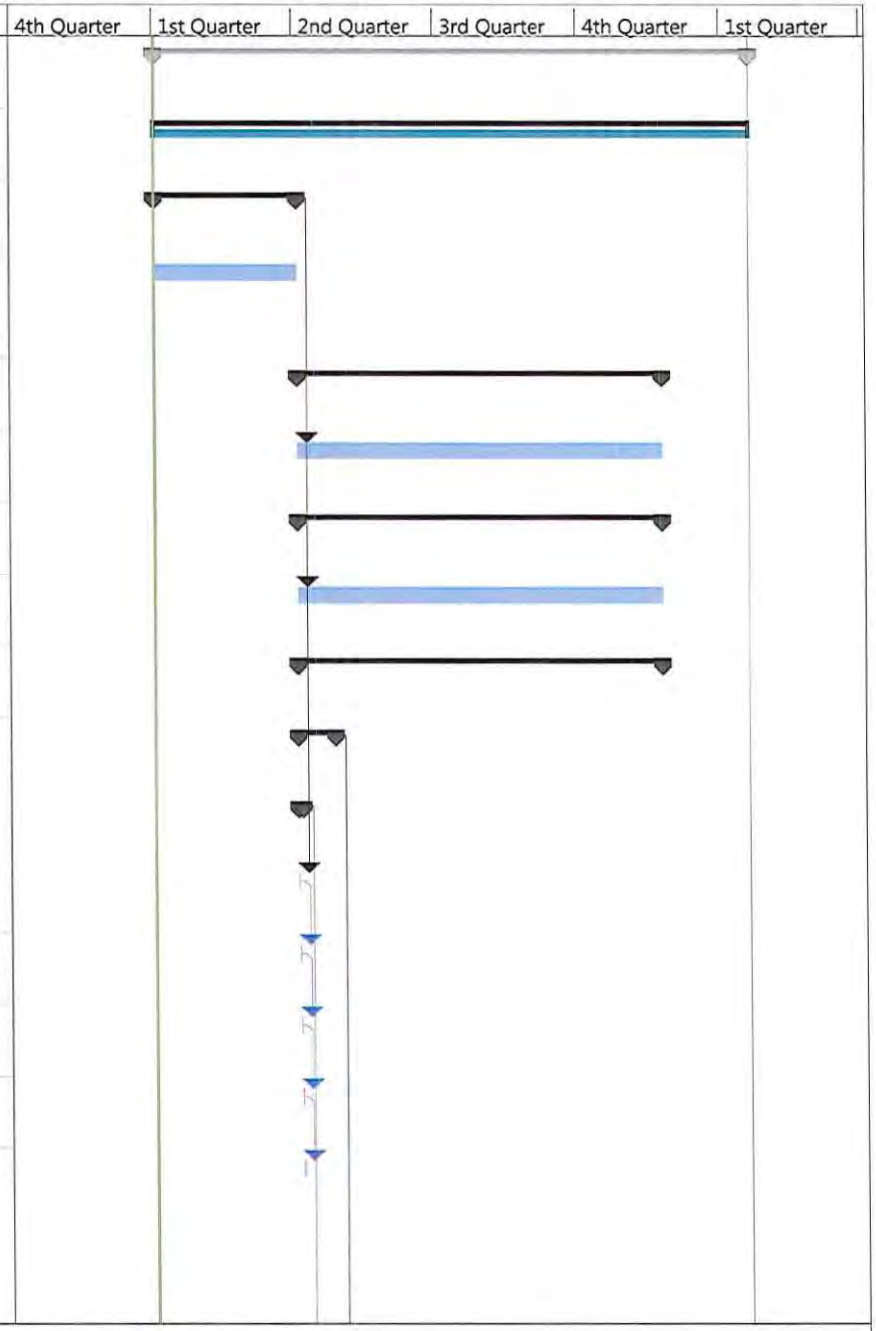
ID	Task Name	Cost
29	De-energize all transformer primaries and verify that the secondary is de-energizec	$967.84
30	De-energize all low-voltage AC or DC power sources for space heaters, cooling equipment, controls, etc. at the source and open circuit breakers or remove fuses at transformer end.	$967.84
31	**Motors**	**$4,337.28**
32	De-energize all primary power at the source.	$967.84
33	De-energize all low-voltage power sources for space heaters or other auxiliary equipment at the source.	$1,935.68
34	Drain lube oil system (if applicable) and dispose of oil.	$1,433.76
35	**Coal Handling**	**$30,905.36**
36	Empty all transfer hoppers.	$1,853.84
37	Burn out coal silos.	$1,834.56
38	Confirm all fuel lines, conveyors and trippers are clear of fuel.	$1,834.56
39	Perform cleaning of the coal handling equipment to assure that all coal and coal dust has been removed from site.	$25,382.40
40	**Gas and Igniter System**	**$1,911.68**
41	Isolate fuel gas system in gas yard and vent gas piping	$1,911.68
42	**Waste Oil System**	**$1,834.56**
43	Drain all waste oil systems	$1,834.56
44	**Boiler Chemical Feed**	**$1,834.56**
45	Drain all chemical feed tanks.	$1,834.56
46	**Boiler**	**$30,927.60**
47	Open boiler doors.	$955.84
48	Gas side - perform cleaning of the boiler and bottom ash system.	$25,382.40
49	Drain boiler, drum, downcomers and headers.	$917.28
50	Open drum doors.	$955.84
51	Drain and clean the submerged flight conveyor system.	$2,716.24
52	**Stack and Ductwork**	**$328,527.12**
53	Open ductwork doors.	$955.84
54	Perform extensive cleaning of the ductwork.	$12,691.20
55	Place cap over stack opening to keep moisture out.	$314,880.08
56	**Condensate and Feedwater Piping**	**$1,834.56**
57	Drain water from the system.	$917.28
58	Leave open vents and drains.	$917.28

ID	Task Name	Cost
59	**Feedwater heaters**	**$2,751.84**
60	Drain feedwater heaters	$917.28
61	Leave open vents and drains.	$1,834.56
62	**Deaerator and Deaerator Storage Tank**	**$1,834.56**
63	Drain Deaerator and Storage	$917.28
64	Leave open vents and drains.	$917.28
65	**Baghouse**	**$18,919.84**
66	Multiple cleaning cycles for filter bags.	$2,751.84
67	Open all vent and drain lines on bag cleaning air and control air lines. Leave in open position or remove vent valves.	$917.28
68	Remove all filter bags and cages.	$955.84
69	Clear hoppers of all ash	$3,103.68
70	Mechanically secure all compartment dampers and hopper outlet valves in open position.	$955.84
71	Disconnect ash transport piping and washdown baghouse hoppers and interior of casing.	$1,571.12
72	Install bird screens across hopper ash outlet and ash line flanges.	$955.84
73	Padlock or tack weld all hopper doors shut. (note: if ash hopper doors are indoors, they could be removed and the opening covered with bird screens.)	$955.84
74	If walk-in plenum, padlock or tack weld all outlet plenum doors and compartment ventilation dampers shut.	$955.84
75	If top-door plenum, close and secure top doors and remove/disable door lift hoist.	$1,873.12
76	If top-door plenum, establish natural ventilation or maintain HVAC fan to provide minimum air changes per hour in penthouse enclosure.	$1,020.08
77	Pull electrical supply breakers on all electrical equipment except lighting and HVAC components that are to remain in service.	$2,903.52
78	**Spray Dryer Absorber FGD**	**$5,328.64**
79	Clear SDA of all accumulated solids	$4,372.80
80	Padlock or tack weld SDA module access doors closed.	$955.84
81	**Lime Slurry Preparation System**	**$11,783.20**
82	Remove lime from day bins.	$2,186.40
83	Removed cartridges/bags from bin vent filters	$775.92
84	Padlock or tack weld all bin access doors shut. (note: if doors are indoors, they could be removed and the opening covered with bird screens.)	$955.84

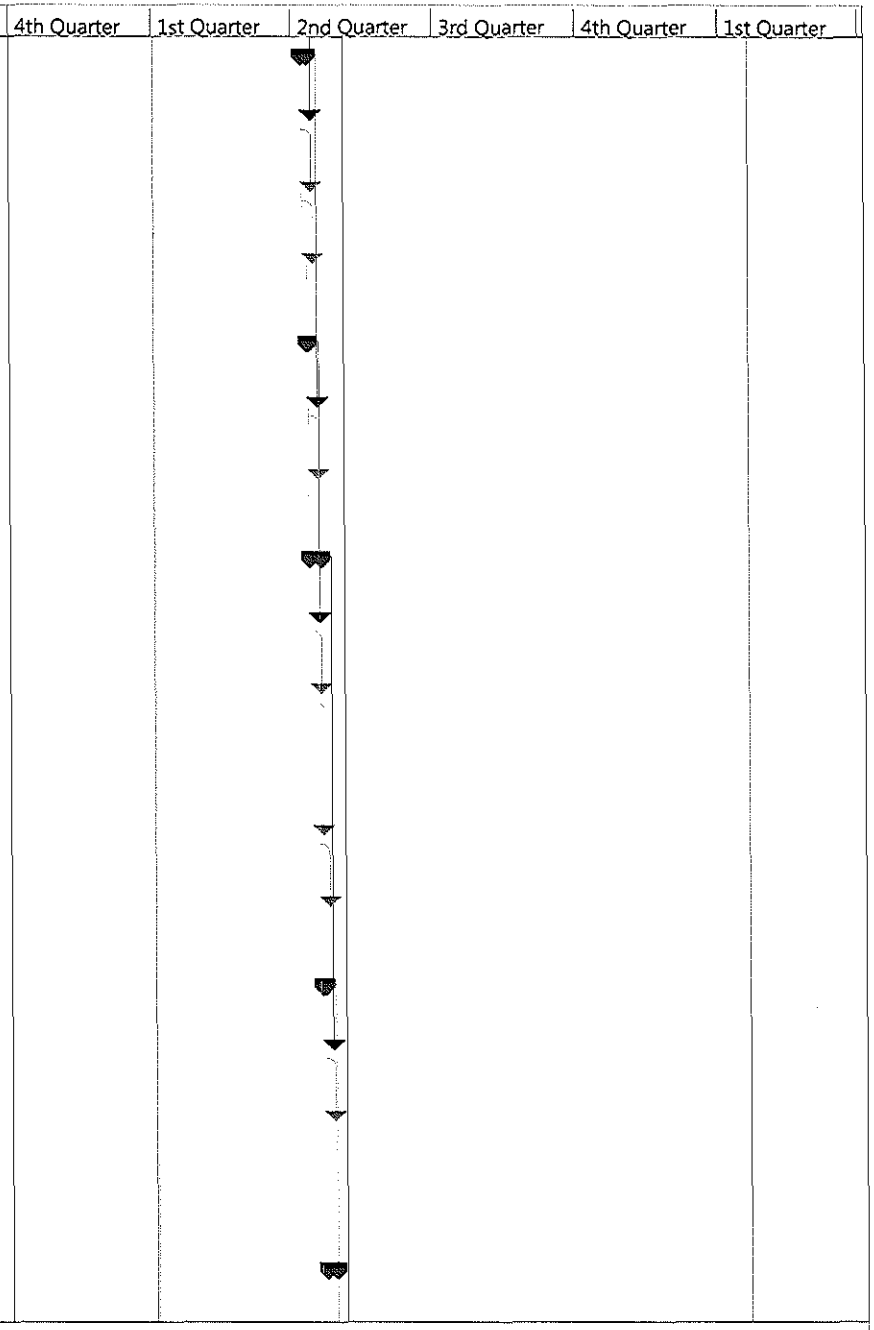
ID	Task Name	Cost
85	Remove bin discharge isolation valve and install bird screen.	$955.84
86	Thoroughly wash and drain slakers.	$1,234.56
87	Remove balls from any ball mills from ball mill slakers.	$795.20
88	Padlock or tack weld slaker access doors closed.	$955.84
89	Establish natural ventilation or maintain HVAC fan to provide minimum air changes per hour in building.	$1,020.08
90	Pull electrical supply breakers on all electrical equipment except lighting and HVAC components that are to remain in service.	$2,903.52
91	**SCR**	**$11,098.96**
92	Vacuum fly ash from catalyst.	$2,538.24
93	Remove catalyst of salvage or disposal.	$3,180.80
94	Padlock or tack weld access doors shut.	$955.84
95	Remove ammonia from storage tank for resale.	$775.92
96	Wash out and drain storage tank and supply piping.	$775.92
97	Vent storage tank and all piping. Leave vent and drain valves open or remove. Install bird screens.	$936.56
98	Pull electrical supply breakers on all electrical equipment except lighting and HVAC components that are to remain in service.	$1,935.68
99	**Turbine(s) and Condenser**	**$5,715.76**
100	Drain hotwell and leave doors open.	$936.56
101	Open main turbine doors.	$955.84
102	Open bfp turbine doors.	$955.84
103	Remove lube oil.	$2,867.52
104	**Generator**	**$6,618.48**
105	Verify that generator circuit breaker is open and racked out or that high-voltage disconnect switch on substation side of GSU transformer is locked in the open position.	$483.92
106	Verify that generator field breaker or contactor (if applicable) is open.	$483.92
107	De-energize power supplies to generator excitation system at the source.	$483.92
108	De-energize AC and DC power supplies to generator and exciter space heaters, cooling equipment, controls, lighting, etc. at the source and open circuit breakers or remove fuses at the generator and exciter.	$483.92
109	Drain generator and exciter cooling water systems (if applicable).	$936.56
110	Disconnect and remove hydrogen gas tanks and purge generator hydrogen system.	$1,834.56

ID	Task Name	Cost
111	Disconnect and remove fire protection system gas/foam tanks and purge fire protection system.	$1,911.68
112	**Circulation Water and Turbine Cooling Water System**	**$3,707.68**
113	Drain.	$1,834.56
114	Open water box doors.	$955.84
115	Drain any circulating water chemical feed tanks.	$917.28
116	**Compressed Air System**	**$2,945.44**
117	Open vents and drains.	$917.28
118	Remove desiccant from desiccant dryers.	$2,028.16
119	**Auxiliary Steam System**	**$1,834.56**
120	Drain water from system.	$917.28
121	Remove aux boiler chemicals.	$917.28
122	**Auxiliary Cooling Water System**	**$917.28**
123	Drain water from system.	$917.28
124	**Condenser Air Extraction and Waterbox Priming System**	**$917.28**
125	Drain water from system.	$917.28
126	**Building Heating System**	**$917.28**
127	Drain water from system.	$917.28
128	**Battery System**	**$4,775.20**
129	De-energize all battery chargers from the source.	$483.92
130	Open all AC and DC circuit breakers and/or fused switches on battery chargers and disconnect cables from batteries.	$483.92
131	Remove and dispose of battery electrolyte.	$1,903.68
132	Remove and dispose of battery cells.	$1,269.12
133	Clean up and dispose of electrolyte on surface areas around batteries.	$634.56
134	**Post Retirement Activities**	**$28,182.40**
135	Post Retirement Activities	$28,182.40

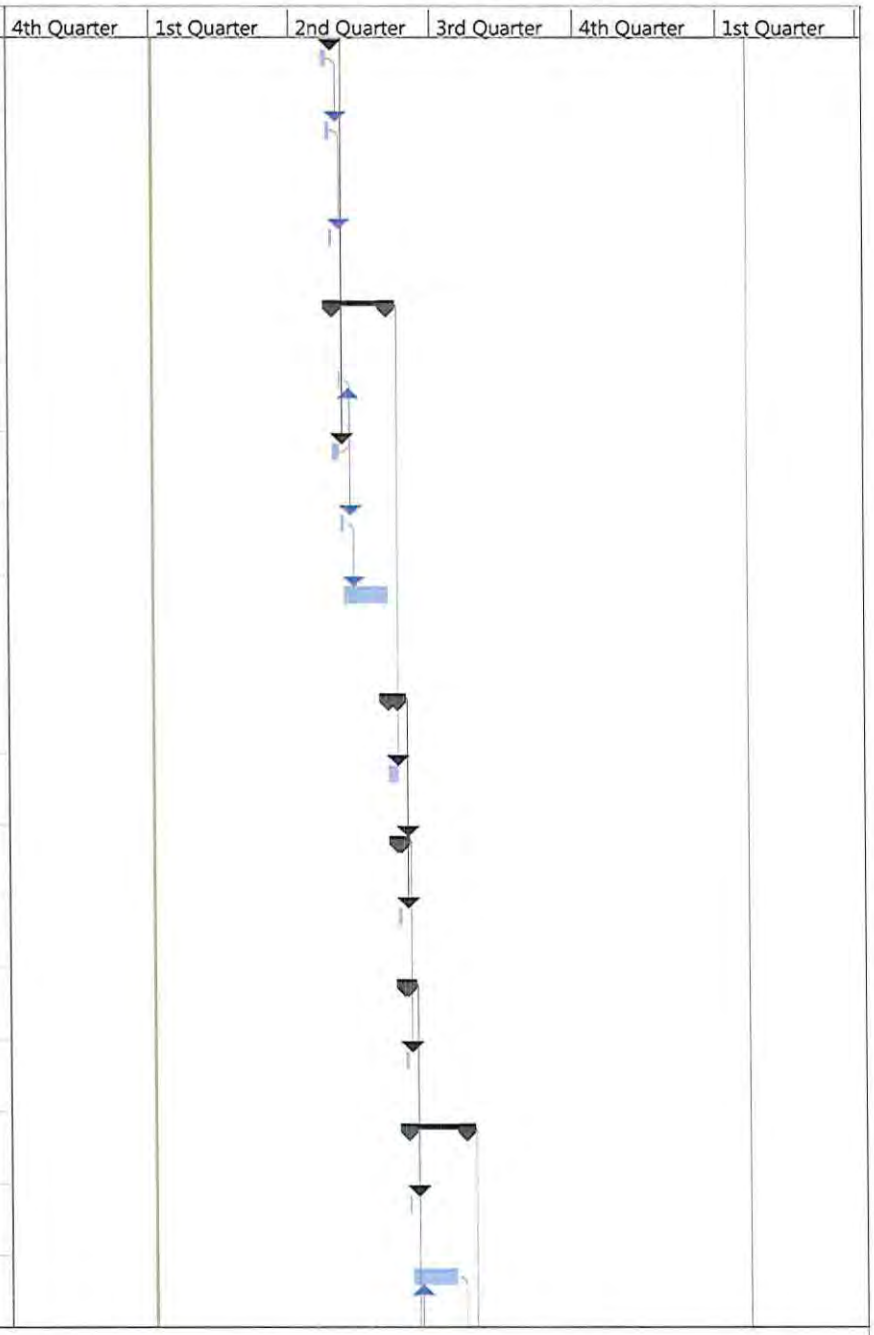
ID	Task Name	Duration
0	**Hawthorne 5**	**275 days**
1	**Hawthorn 5 Retirement**	**275 days**
2	**Pre-Engineering**	**66 days**
3	Permit review and engineering analysis, establish isolation points, and confirm fuel yard inventory has been reduced to zero tons.	66 days
4	**KCL&L Overhead Costs**	**169 days**
5	KCP&L Retirement Manager	169 days
6	**Equipment Rentals**	**169 days**
7	Vacuum truck	169 days
8	**Retirement**	**169 days**
9	**Electrical**	**18 days**
10	**Medium and Low Voltage Draw out Switchgear**	**3 days**
11	De-energize all buses at the source.	0.5 days
12	Open all circuit breakers.	0.5 days
13	Rack all circuit breakers into the fully withdrawn, disconnected position.	0.5 days
14	Verify that the closing/tripping springs are discharged.	0.5 days
15	De-energize control power and auxiliary power circuits of each circuit breaker at the source and by opening control power circuit breakers or removing fuses in each breaker cubicle.	1 day



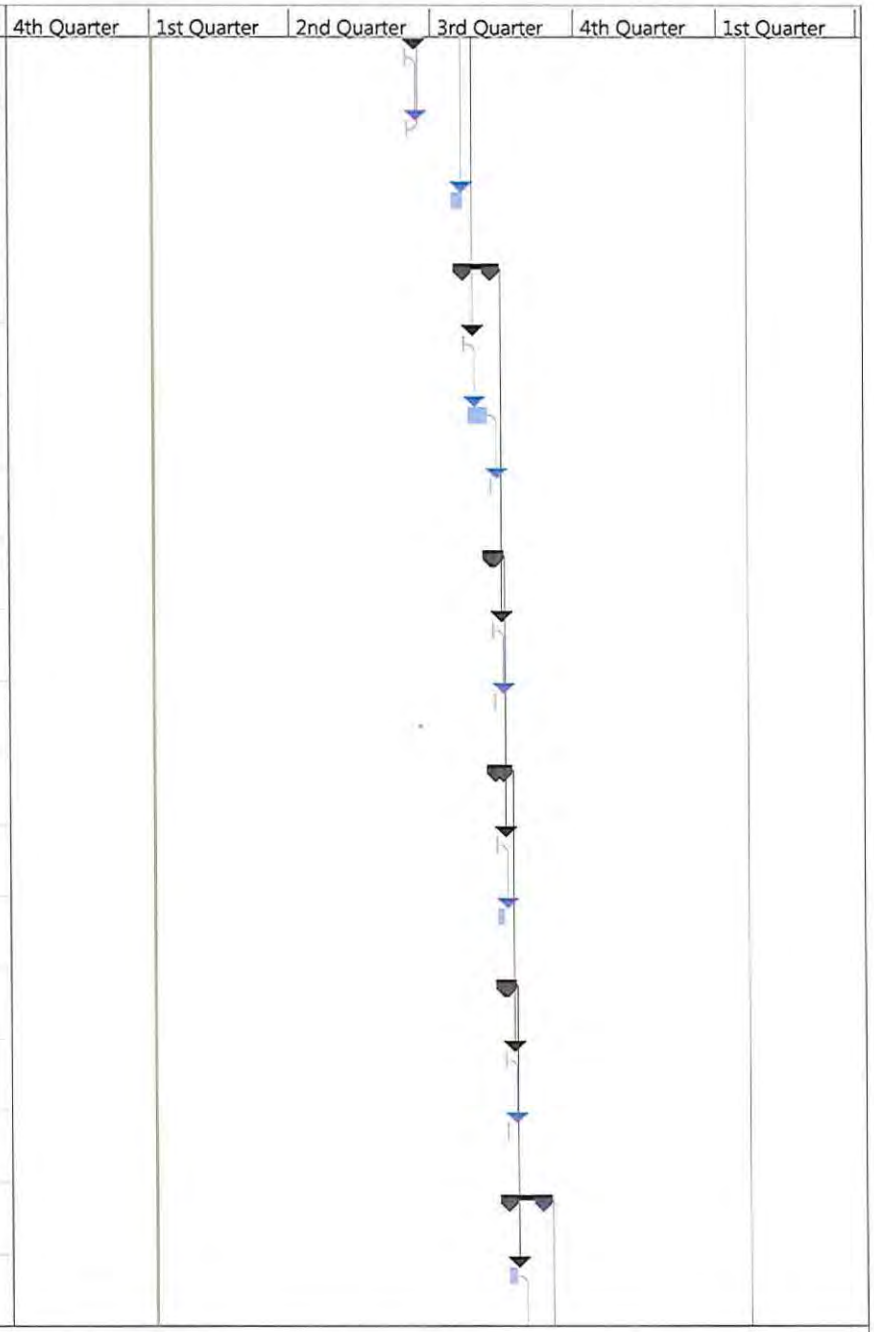
ID	Task Name	Duration
16	**Motor Control Centers**	**2 days**
17	De-energize all buses at the source.	0.5 days
18	Open all circuit breakers and disconnect switches.	0.5 days
19	Remove all fuses in control circuits.	1 day
20	**Low-voltage Switchboards and Panelboards**	**1 day**
21	De-energize all buses at the source.	0.5 days
22	Open all circuit breakers and disconnect switches.	0.5 days
23	**Oil-Filled Power Transformers**	**5.5 days**
24	De-energize all transformer primaries and verify that the secondary is de-energized.	1 day
25	De-energize all low-voltage AC or DC power sources for space heaters, cooling equipment, controls, etc. at the source and open circuit breakers or remove fuses at transformer end.	1 day
26	Drain and dispose of oil.	1.5 days
27	Clean up and dispose of oil on surface areas around transformers and in containment pits.	2 days
28	**Dry-type Power Transformers**	**2 days**
29	De-energize all transformer primaries and verify that the secondary is de-energized.	1 day
30	De-energize all low-voltage AC or DC power sources for space heaters, cooling equipment, controls, etc. at the source and open circuit breakers or remove fuses at transformer end.	1 day
31	**Motors**	**4.5 days**



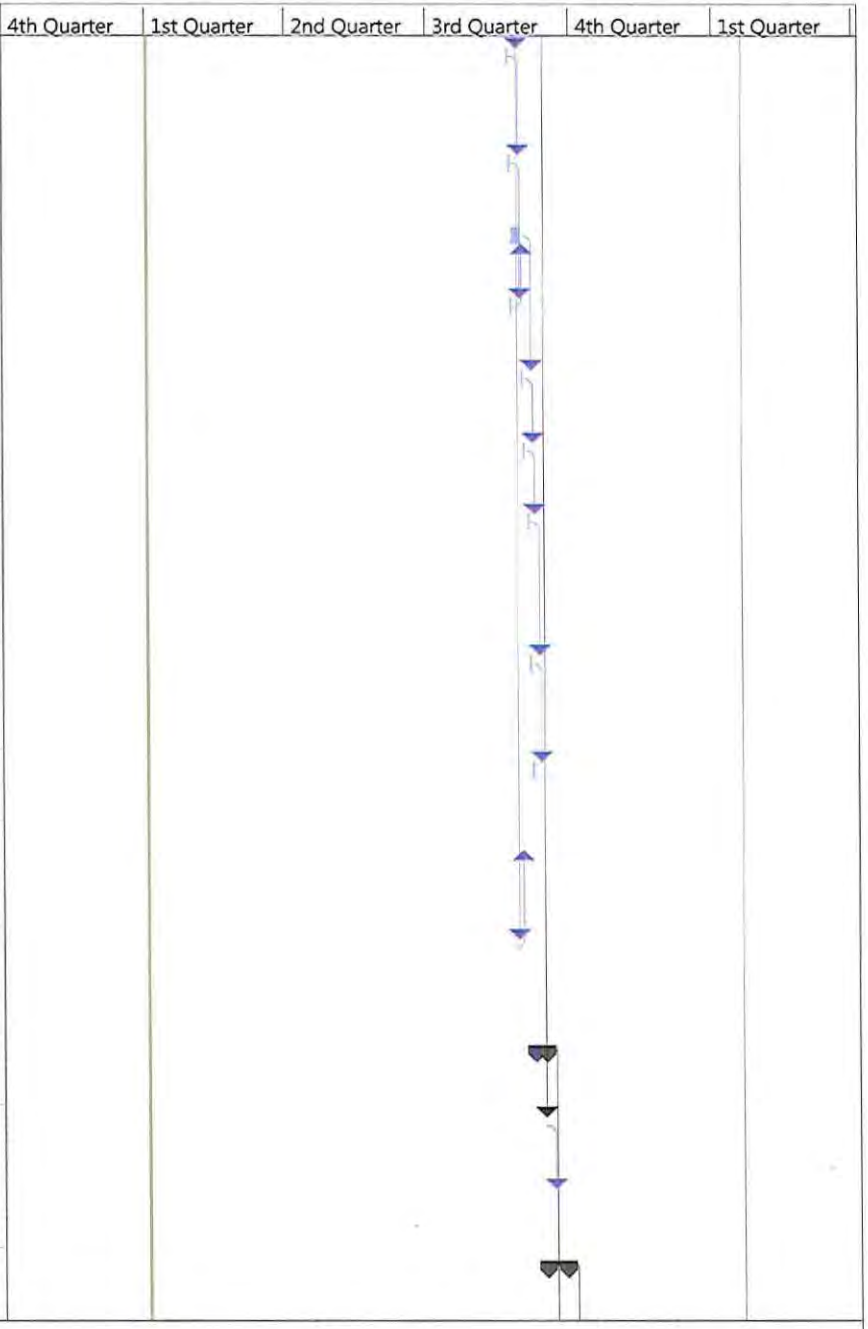
ID	Task Name	Duration
32	De-energize all primary power at the source.	1 day
33	De-energize all low-voltage power sources for space heaters or other auxiliary equipment at the source.	2 days
34	Drain lube oil system (if applicable) and dispose of oil.	1.5 days
35	**Coal Handling**	**25 days**
36	Empty all transfer hoppers.	1 day
37	Burn out coal silos.	2 days
38	Confirm all fuel lines, conveyors and trippers are clear of fuel.	2 days
39	Perform cleaning of the coal handling equipment to assure that all coal and coal dust has been removed from site.	20 days
40	**Gas and Igniter System**	**4 days**
41	Isolate fuel gas system in gas yard and vent gas piping	3 days
42	**Waste Oil System**	**2 days**
43	Drain all waste oil systems	2 days
44	**Boiler Chemical Feed**	**2 days**
45	Drain all chemical feed tanks.	2 days
46	**Boiler**	**27 days**
47	Open boiler doors.	1 day
48	Gas side - perform cleaning of the boiler and bottom ash system.	20 days



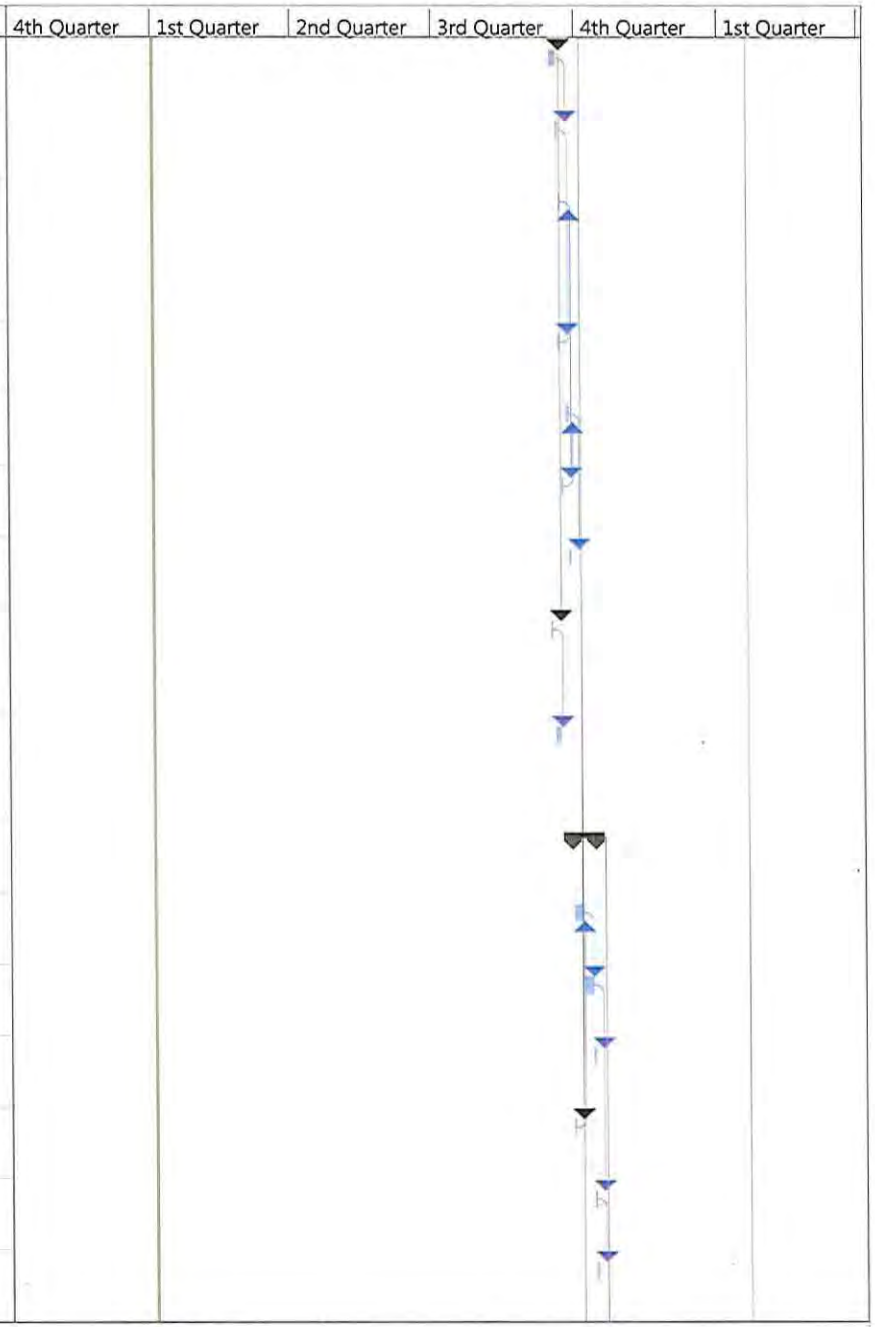
ID	Task Name	Duration
49	Drain boiler, drum, downcomers and headers.	1 day
50	Open drum doors.	1 day
51	Drain and clean the submerged flight conveyor system.	5 days
52	**Stack and Ductwork**	**12 days**
53	Open ductwork doors.	1 day
54	Perform extensive cleaning of the ductwork.	10 days
55	Place cap over stack opening to keep moisture out.	1 day
56	**Condensate and Feedwater Piping**	**2 days**
57	Drain water from the system.	1 day
58	Leave open vents and drains.	1 day
59	**Feedwater heaters**	**3 days**
60	Drain feedwater heaters	1 day
61	Leave open vents and drains.	2 days
62	**Deaerator and Deaerator Storage Tank**	**2 days**
63	Drain Deaerator and Storage	1 day
64	Leave open vents and drains.	1 day
65	**Baghouse**	**16 days**
66	Multiple cleaning cycles for filter bags.	3 days



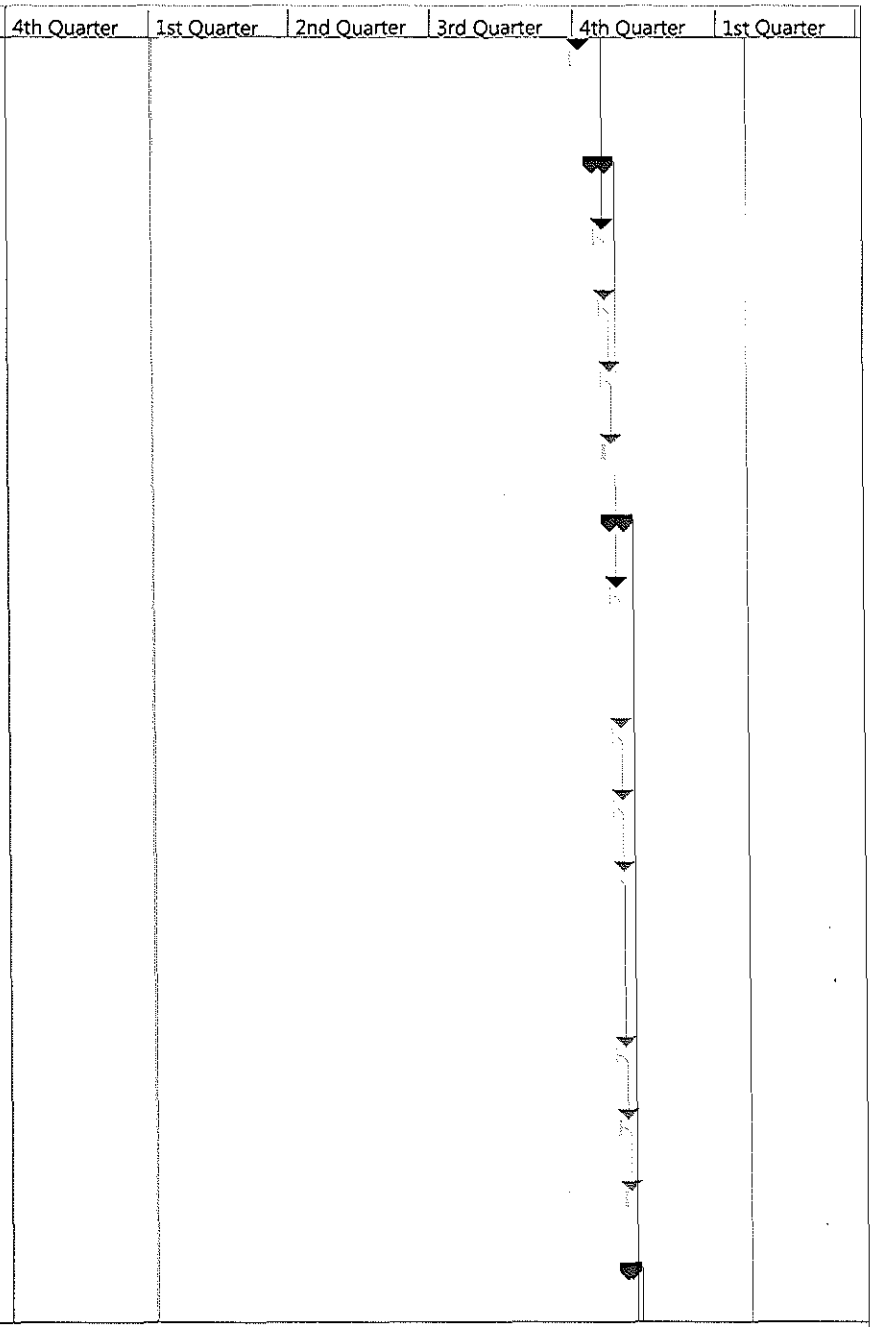
ID	Task Name	Duration
67	Open all vent and drain lines on bag cleaning air and control air lines. Leave in open position or remove vent valves.	1 day
68	Remove all filter bags and cages.	1 day
69	Clear hoppers of all ash	4 days
70	Mechanically secure all compartment dampers and hopper outlet valves in open position.	1 day
71	Disconnect ash transport piping and washdown baghouse hoppers and interior of casing.	1 day
72	Install bird screens across hopper ash outlet and ash line flanges.	1 day
73	Padlock or tack weld all hopper doors shut. (note: if ash hopper doors are indoors, they could be removed and the opening covered with bird screens.)	1 day
74	If walk-in plenum, padlock or tack weld all outlet plenum doors and compartment ventilation dampers shut.	1 day
75	If top-door plenum, close and secure top doors and remove/disable door lift hoist.	2 days
76	If top-door plenum, establish natural ventilation or maintain HVAC fan to provide minimum air changes per hour in penthouse enclosure.	1 day
77	Pull electrical supply breakers on all electrical equipment except lighting and HVAC components that are to remain in service.	3 days
78	**Spray Dryer Absorber FGD**	**5 days**
79	Clear SDA of all accumulated solids	4 days
80	Padlock or tack weld SDA module access doors closed.	1 day
81	**Lime Slurry Preparation System**	**9 days**



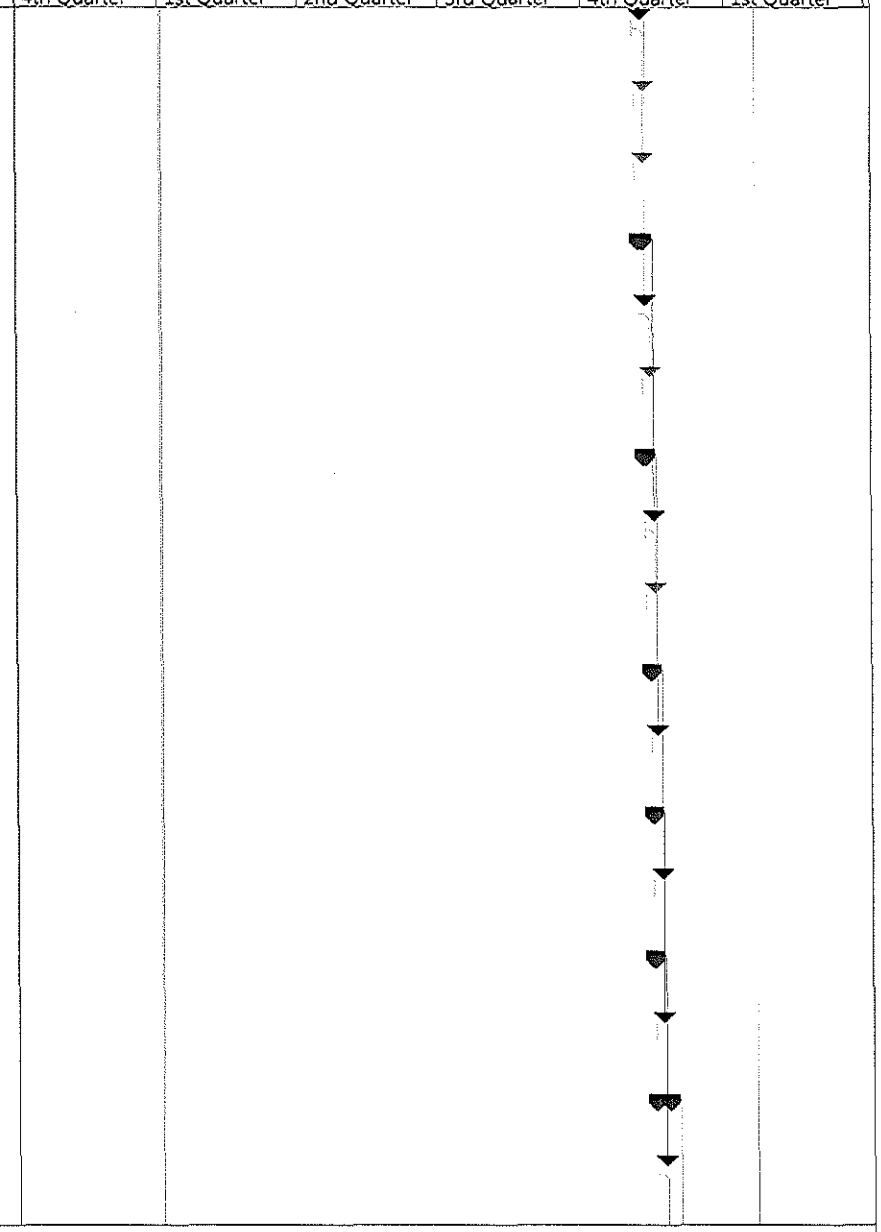
ID	Task Name	Duration
82	Remove lime from day bins.	2 days
83	Removed cartridges/bags from bin vent filters	1 day
84	Padlock or tack weld all bin access doors shut. (note: if doors are indoors, they could be removed and the opening covered with bird screens.)	1 day
85	Remove bin discharge isolation valve and install bird screen.	1 day
86	Thoroughly wash and drain slakers.	2 days
87	Remove balls from any ball mills from ball mill slakers.	1 day
88	Padlock or tack weld slaker access doors closed.	1 day
89	Establish natural ventilation or maintain HVAC fan to provide minimum air changes per hour in building.	1 day
90	Pull electrical supply breakers on all electrical equipment except lighting and HVAC components that are to remain in service.	3 days
91	**SCR**	**11 days**
92	Vacuum fly ash from catalyst.	4 days
93	Remove catalyst of salvage or disposal.	4 days
94	Padlock or tack weld access doors shut.	1 day
95	Remove ammonia from storage tank for resale.	1 day
96	Wash out and drain storage tank and supply piping.	1 day
97	Vent storage tank and all piping. Leave vent and drain valves open or remove. Install bird screens.	1 day



ID	Task Name	Duration
98	Pull electrical supply breakers on all electrical equipment except lighting and HVAC components that are to remain in service.	2 days
99	**Turbine(s) and Condenser**	**6 days**
100	Drain hotwell and leave doors open.	1 day
101	Open main turbine doors.	1 day
102	Open bfp turbine doors.	1 day
103	Remove lube oil.	3 days
104	**Generator**	**7 days**
105	Verify that generator circuit breaker is open and racked out or that high-voltage disconnect switch on substation side of GSU transformer is locked in the open position.	0.5 days
106	Verify that generator field breaker or contactor (if applicable) is open.	0.5 days
107	De-energize power supplies to generator excitation system at the source.	0.5 days
108	De-energize AC and DC power supplies to generator and exciter space heaters, cooling equipment, controls, lighting, etc. at the source and open circuit breakers or remove fuses at the generator and exciter.	0.5 days
109	Drain generator and exciter cooling water systems (if applicable).	1 day
110	Disconnect and remove hydrogen gas tanks and purge generator hydrogen system.	2 days
111	Disconnect and remove fire protection system gas/foam tanks and purge fire protection system.	2 days
112	**Circulation Water and Turbine Cooling Water System**	**3 days**



ID	Task Name	Duration
113	Drain.	2 days
114	Open water box doors.	1 day
115	Drain any circulating water chemical feed tanks.	1 day
116	**Compressed Air System**	**3 days**
117	Open vents and drains.	1 day
118	Remove desiccant from desiccant dryers.	2 days
119	**Auxiliary Steam System**	**2 days**
120	Drain water from system.	1 day
121	Remove aux boiler chemicals.	1 day
122	**Auxiliary Cooling Water System**	**1 day**
123	Drain water from system.	1 day
124	**Condenser Air Extraction and Waterbox Priming System**	**1 day**
125	Drain water from system.	1 day
126	**Building Heating System**	**1 day**
127	Drain water from system.	1 day
128	**Battery System**	**7 days**
129	De-energize all battery chargers from the source.	0.5 days



ID	Task Name	Duration	4th Quarter	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	1st Quarter
130	Open all AC and DC circuit breakers and/or fused switches on battery chargers and disconnect cables from batteries.	0.5 days						
131	Remove and dispose of battery electrolyte.	3 days						
132	Remove and dispose of battery cells.	2 days						
133	Clean up and dispose of electrolyte on surface areas around batteries.	1 day						
134	**Post Retirement Activities**	**40 days**						
135	Post Retirement Activities	40 days						

Hawthorn 5 Dismantlement

Owner Additional Costs			
Pre-Dismantlement Activities		$966,146	
Overhead During Dismantlement		$1,753,636	
Post-Dismantlement Activities		$60,800	
Owner Costs Total			$2,780,582
Demolition General Contractor (DGC) Costs			
Additional Site Management		$1,164,253	
Equipment Rental		$1,994,845	
Consumables		$2,177,603	
Scrap Crew(s)		$1,942,315	
Dismantlement*		$4,770,500	
DGC Insurance	2.00%	$240,990	
Contingency/Profit	15.00%	$1,843,576	
Performance Bond	2.00%	$282,681.65	
Contractor Costs Total:			$14,416,764
Total:			$17,197,346
Owner Internal Costs:	5.00%		$859,867
Owner Contingency:	25.00%		$4,514,303
Hawthorn Unit 5 Dismantlement Opinion of Probable Cost:			$22,571,517

COMMON

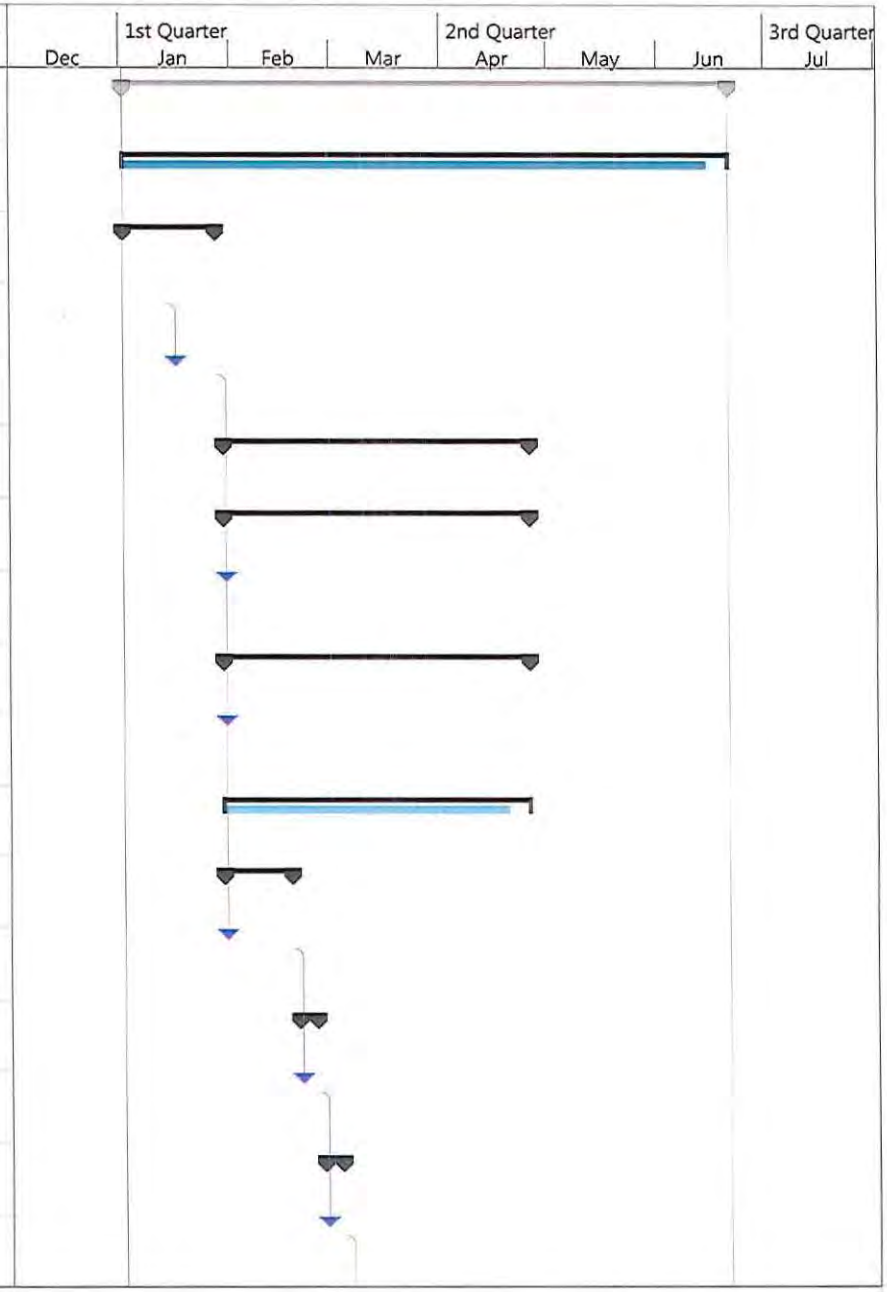
Hawthorn Common Retirement

Owner Costs				
Pre-Retirement Activities		$27,822		
Retirement Activities		$213,081		
Post-Retirement Activities		$34,035		
Owner Direct Total			$274,938	
Owner Internal Costs	5.00%		$13,747	
Owner Contingency:	25.00%		$72,171	
Hawthorn Common Retirement Opinion of Probable Cost:				$360,857
Activities Required by Permit or Regulation				
Hawthorn Ash Pond(s)		$7,840,251		
Activities Required by Permit or Regulation:				$7,840,251

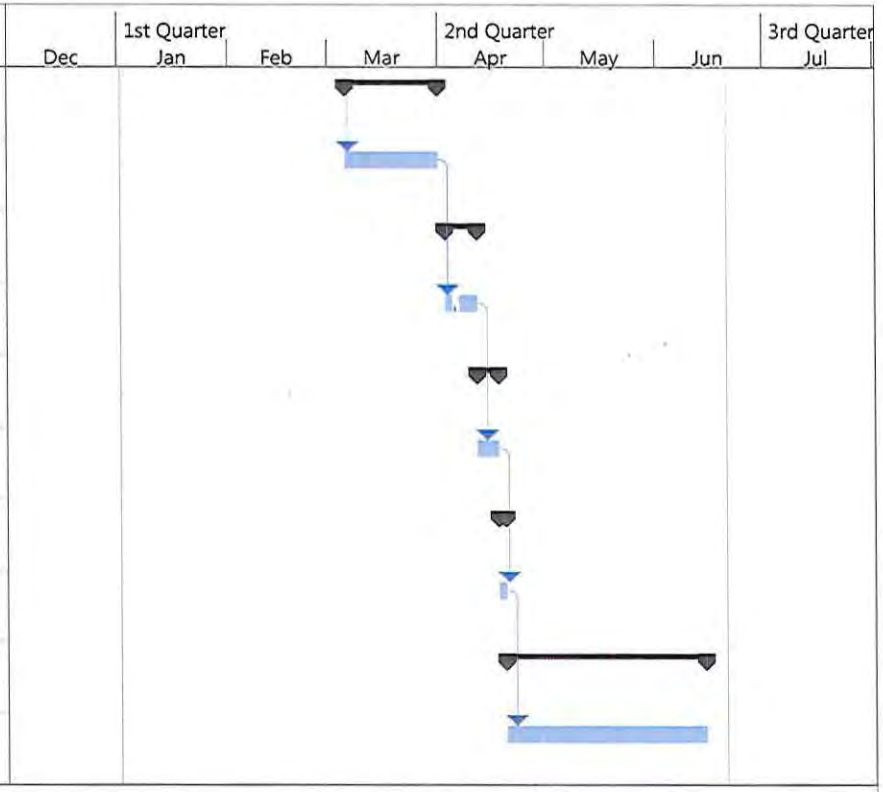
Hawthorn Common Retirement

ID	Task Name	Cost
0	**Hawthorn Common Retirement**	**$274,938.32**
1	**Hawthorn Common Retirement**	**$274,938.32**
2	**Pre-Retirement Activities**	**$27,822.40**
3	Permitting Review	$13,911.20
4	Develop Detailed Retirement Plan	$13,911.20
5	**Overheads**	**$110,652.64**
6	**Common Retirement Overheads**	**$96,992.80**
7	Added Overhead Staff for Common Retirement	$96,992.80
8	**Common Retirment Equipment Rental**	**$13,659.84**
9	Common Removal Equipment Rental	$13,659.84
10	**Retirement Activities**	**$102,428.08**
11	**Administration Building**	**$25,700.80**
12	Secure Administration Building	$25,700.80
13	**Training Building**	**$9,815.68**
14	Secure Training Building	$9,815.68
15	**Warehouse(s)**	**$11,688.80**
16	Secure Unit Warehouse(s)	$11,688.80
17	**Maintenance Shops**	**$46,755.20**
18	Secure Maintenance Shops	$46,755.20
19	**Sewage Treatment**	**$5,696.48**
20	Isolate and Cap Sewage Lines	$5,696.48
21	**City Water**	**$0.00**
22	Isolate and Cap City Water Lines	$0.00
23	**Yard Fire Water Systems**	**$2,771.12**
24	Drain Yard Fire Water System	$2,771.12
25	**Post Retirement Closure Activities**	**$34,035.20**
26	Post Retirement Closure Activities	$34,035.20

ID	Task Name	Duration
0	**Hawthorn Common Retirement**	**122 days**
1	**Hawthorn Common Retirement**	**122 days**
2	**Pre-Retirement Activities**	**20 days**
3	Permitting Review	10 days
4	Develop Detailed Retirement Plan	10 days
5	**Overheads**	**62 days**
6	**Common Retirement Overheads**	**62 days**
7	Added Overhead Staff for Common Retirement	62 days
8	**Common Retirment Equipment Rental**	**62 days**
9	Common Removal Equipment Rental	62 days
10	**Retirement Activities**	**62 days**
11	**Administration Building**	**15 days**
12	Secure Administration Building	15 days
13	**Training Building**	**5 days**
14	Secure Training Building	5 days
15	**Warehouse(s)**	**5 days**
16	Secure Unit Warehouse(s)	5 days



ID	Task Name	Duration
17	**Maintenance Shops**	**20 days**
18	Secure Maintenance Shops	20 days
19	**Sewage Treatment**	**7 days**
20	Isolate and Cap Sewage Lines	5 days
21	**City Water**	**4 days**
22	Isolate and Cap City Water Lines	4 days
23	**Yard Fire Water Systems**	**2 days**
24	Drain Yard Fire Water System	2 days
25	**Post Retirement Closure Activities**	**40 days**
26	Post Retirement Closure Activities	40 days



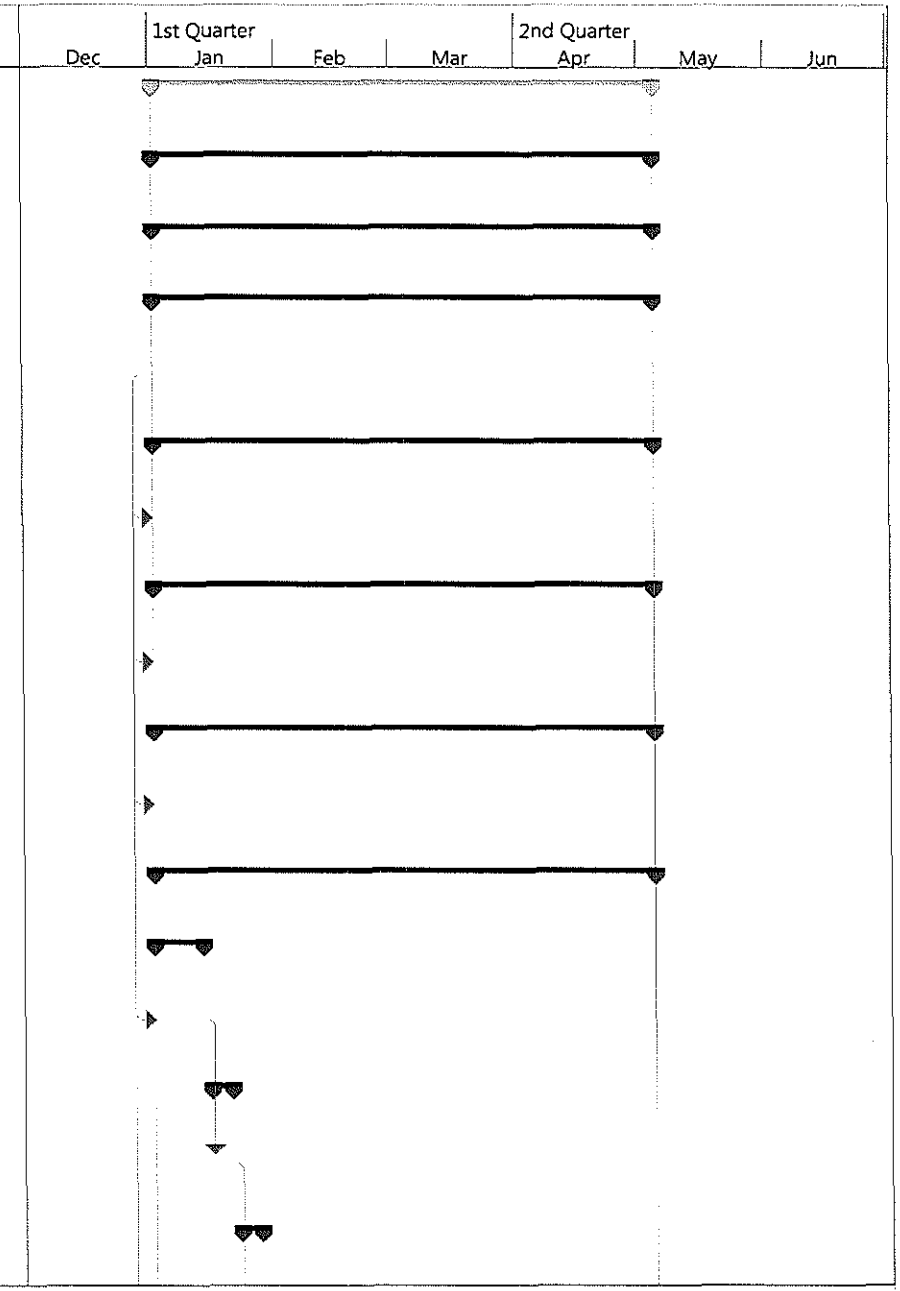
Hawthorn Common Dismantlement

Owner Additional Costs				
Pre-Dismantlement Activities		$0		
Overhead During Dismantlement		$0		
Owner Costs Total			$0	
Demolition General Contractor (DGC) Costs				
Additional Site Management		$46,650		
Equipment Rental		$169,428		
Consumables		$225,120		
Scrap Crew(s)		$329,385		
Dismantlement		$5,859,193		
DGC Insurance	2.00%	$132,596		
Contingency/Profit	15.00%	$1,014,356		
Performance Bond	2.00%	$155,535		
Contractor Costs Total:			$7,932,262	
Total:				$7,932,262
Owner Internal Costs:	5.00%			$396,613
Owner Contingency:	25.00%			$2,082,219
Hawthorn Common Dismantlement Opinion of Probable Cost:				$10,411,094

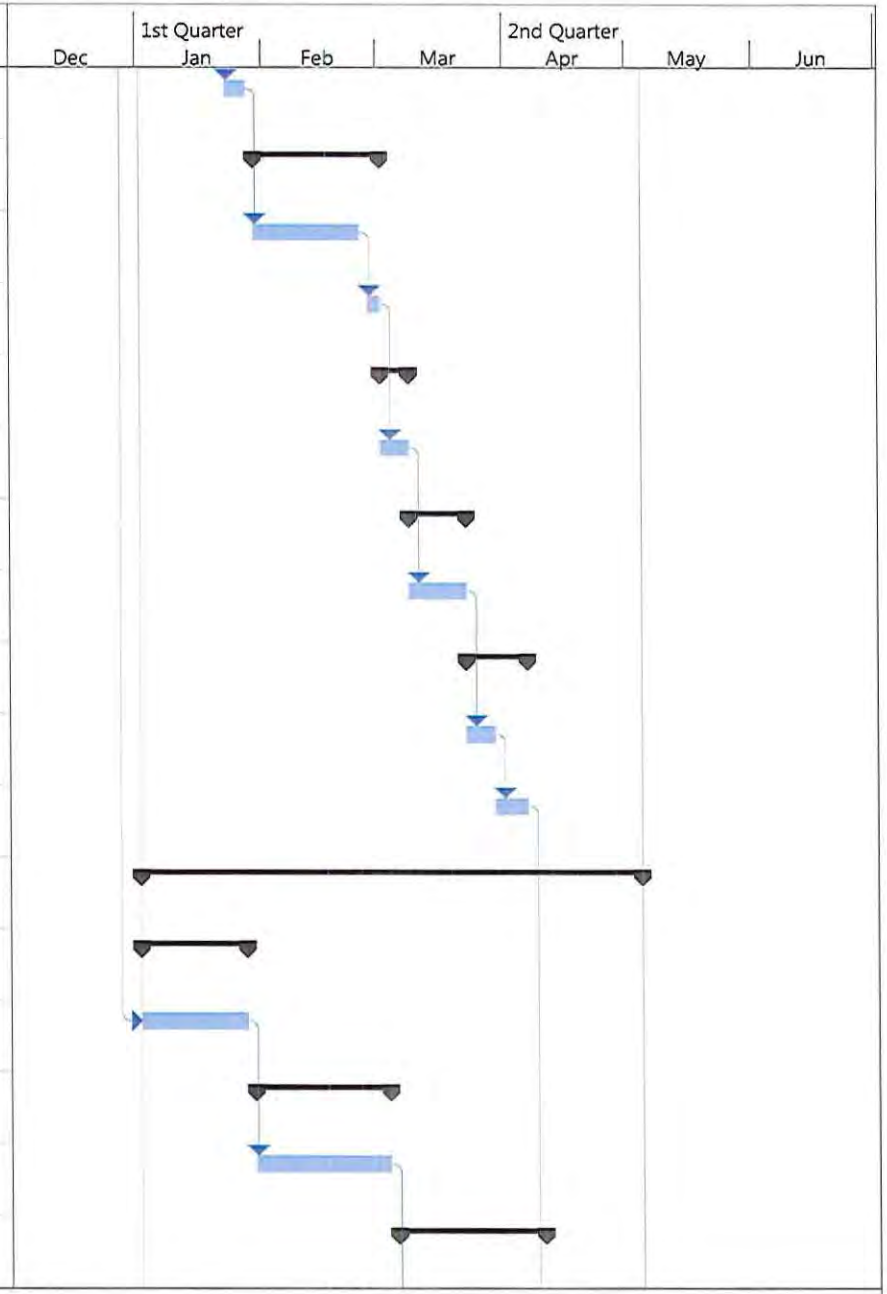
Hawthorn Common Dismantlement

ID	Task Name	Cost
0	**Hawthorn Common Dismantlement**	**$6,629,775.99**
1	**Hawthorn Common Dismantlement**	**$6,629,775.99**
2	**Overheads**	**$770,583.36**
3	**Common Removal Overheads**	**$46,650.24**
4	Added Overhead Staff for Common Removals	$46,650.24
5	**Common Removal Equipment Rental**	**$169,427.52**
6	Common Removal Equipment Rental	$169,427.52
7	**Scrap Crew**	**$329,385.44**
8	Crew(s) to Handle Scrap Material	$329,385.44
9	**Demolition Contractor Consummables**	**$225,120.16**
10	Consummables	$225,120.16
11	**Dismantlement Activities**	**$5,859,192.63**
12	**Administration Building**	**$37,009.60**
13	Remove Administration Building	$37,009.60
14	**Fuel Yard Office Building**	**$18,504.80**
15	Remove Fuel Yard Office Building	$18,504.80
16	**Training Building**	**$18,504.80**
17	Remove Training Building	$18,504.80
18	**Parking Lots and Plant Roads**	**$85,122.08**
19	Plant Roads and Parking Areas	$74,019.20
20	Guard Shack	$11,102.88
21	**Warehouse(s)**	**$18,504.80**
22	Remove Warehouse	$18,504.80
23	**Maintenance Shop**	**$23,984.80**
24	Remove Maintenance Shop	$23,984.80
25	**Water Treatment**	**$40,710.56**
26	Remove Water Treatment Equipment	$18,504.80
27	Remove Water Treatment Building	$22,205.76
28	**Fuel Yard**	**$403,404.64**
29	**Crusher Tower**	**$148,038.40**
30	Remove Crusher Building and Equipment	$74,019.20
31	**Conveyors**	**$92,524.00**
32	Remove Conveyor 10, 42, 43, 44, and 51	$92,524.00
33	**Car Dumper**	**$96,224.96**
34	Remove Underground Equipment	$14,803.84
35	Remove Above Ground Equipment	$37,009.60
36	Remove Building	$25,906.72
37	Backfill Dumper Structure	$18,504.80
38	**Reclaim**	**$66,617.28**
39	Remove Underground Equipment	$18,504.80
40	Remove Above Ground Equipment	$18,504.80
41	Remove Building	$14,803.84
42	Backfill Structure	$14,803.84
43	**Yard Fire Water Systems**	**$37,009.60**
44	Remove Hydrants and Fire Water System Piping Down to 3' Below Grade	$37,009.60
45	**Stacks**	**$3,854,444.13**
46	Remove Hawthorn 5 Stack to Grade	$3,854,444.13
47	**Final Site Grading and Drainage**	**$1,321,992.82**
48	Final Site Grading and Drainage	$1,321,992.82

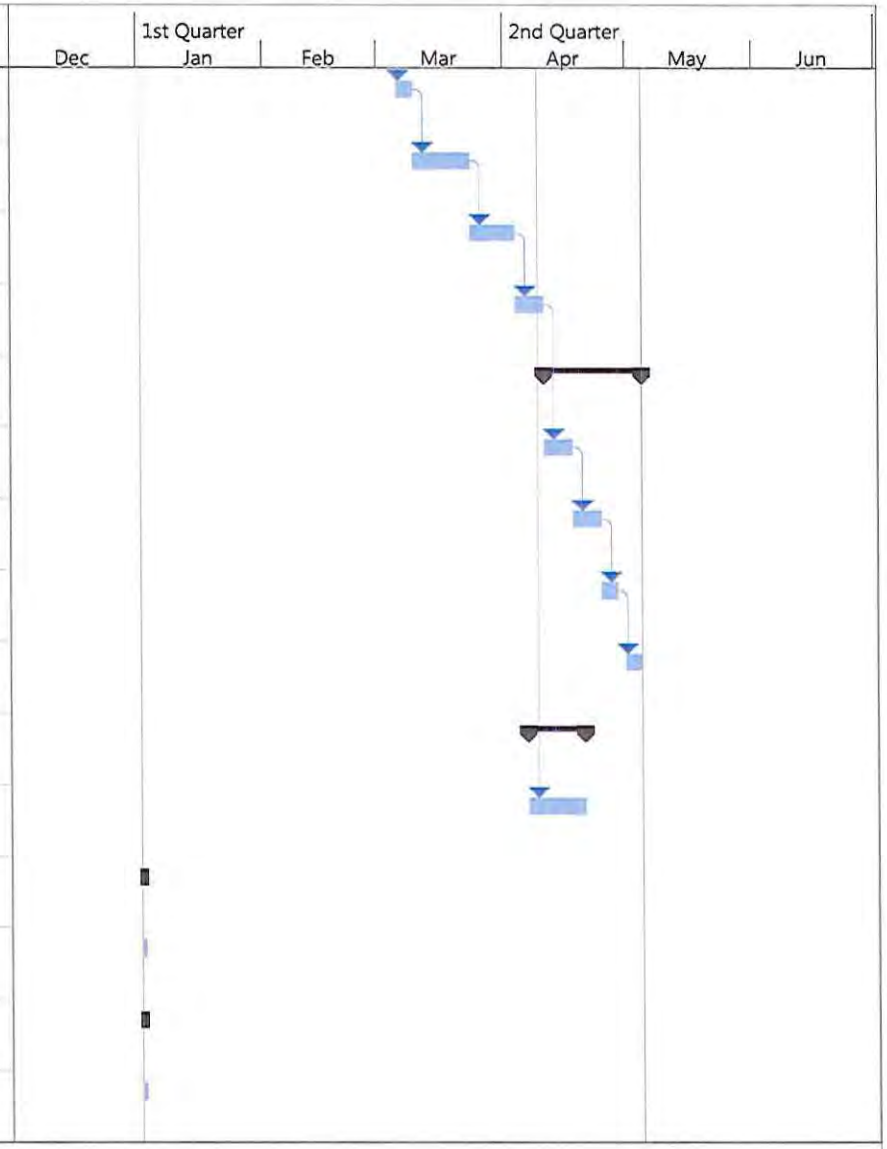
ID	Task Name	Duration
0	**Hawthorn Common Dismantlement**	**89 days**
1	**Hawthorn Common Dismantlement**	**89 days**
2	**Overheads**	**89 days**
3	**Common Removal Overheads**	**89 days**
4	Added Overhead Staff for Common Removals	89 days
5	**Common Removal Equipment Rental**	**89 days**
6	Common Removal Equipment Rental	89 days
7	**Scrap Crew**	**89 days**
8	Crew(s) to Handle Scrap Material	89 days
9	**Demolition Contractor Consummables**	**89 days**
10	Consummables	89 days
11	**Dismantlement Activities**	**89 days**
12	**Administration Building**	**10 days**
13	Remove Administration Building	10 days
14	**Fuel Yard Office Building**	**5 days**
15	Remove Fuel Yard Office Building	5 days
16	**Training Building**	**5 days**



ID	Task Name	Duration
17	Remove Training Building	5 days
18	**Parking Lots and Plant Roads**	**23 days**
19	Plant Roads and Parking Areas	20 days
20	Guard Shack	3 days
21	**Warehouse(s)**	**5 days**
22	Remove Warehouse	5 days
23	**Maintenance Shop**	**10 days**
24	Remove Maintenance Shop	10 days
25	**Water Treatment**	**11 days**
26	Remove Water Treatment Equipment	5 days
27	Remove Water Treatment Building	6 days
28	**Fuel Yard**	**89 days**
29	**Crusher Tower**	**20 days**
30	Remove Crusher Building and Equipment	20 days
31	**Conveyors**	**25 days**
32	Remove Conveyor 10, 42, 43, 44, and 51	25 days
33	**Car Dumper**	**26 days**



ID	Task Name	Duration
34	Remove Underground Equipment	4 days
35	Remove Above Ground Equipment	10 days
36	Remove Building	7 days
37	Backfill Dumper Structure	5 days
38	**Reclaim**	**18 days**
39	Remove Underground Equipment	5 days
40	Remove Above Ground Equipment	5 days
41	Remove Building	4 days
42	Backfill Structure	4 days
43	**Yard Fire Water Systems**	**10 days**
44	Remove Hydrants and Fire Water System Piping Down to 3' Below Grade	10 days
45	**Stacks**	**1 day**
46	Remove Hawthorn 5 Stack to Grade	1 day
47	**Final Site Grading and Drainage**	**1 day**
48	Final Site Grading and Drainage	1 day



LA CYGNE GENERATING STATION

LA CYGNE GENERATING STATION

The La Cygne Generating Station consists of two coal-fired power plants.

La Cygne Unit 1 has an SPP-accredited rating of 735 MW and was placed in service in 1973. Unit 1 has a super-critical Babcock & Wilcox boiler and a Westinghouse turbine. Lake water is used for condenser cooling. La Cygne Unit 1 was originally commissioned with an eight-module wet scrubber with a dedicated limestone slurry preparation facility and a dedicated stack. In 2006, La Cygne Unit 1 was retrofitted with an SCR. In 2015, a baghouse, wet scrubber, and new dual flue chimney will be commissioned. The retirement and dismantlement of this new equipment is included in this study. The original stack and limestone slurry equipment, ID fans, and outlet flues are currently being removed. These costs are included in this study. The original scrubber building and equipment inside the building will be removed. The retirement and dismantlement of this equipment is included in this study.

La Cygne Unit 2 has an SPP-accredited unit rating of 686 MW and was placed in service in 1977. Unit 2 has a sub-critical Babcock & Wilcox boiler and a General Electric turbine. Lake water is used for condenser cooling. La Cygne Unit 2 was originally commissioned with a dedicated chimney and an electrostatic precipitator for flue gas particulate removal. In 2014, La Cygne Unit 2 was retrofitted with an SCR, baghouse, wet scrubber, and a new dual flue chimney. Current plans are to abandon the electrostatic precipitator in place. The dismantlement of the electrostatic precipitator is included in this study. The original chimney will be dismantled in 2015. This cost is not included in this study.

Both La Cygne Units 1 and 2 have a fuel oil igniter system. Both units are supplied with fuel oil from a common fuel oil unloading and storage facility.

Both Units 1 and 2 have a wet scrubber that utilizes a common reagent preparation and gypsum handling facility. This facility includes a limestone unloading and storage area, a limestone slurry preparation system, a gypsum preparation system, and a gypsum stack-out storage system.

Both Units 1 and 2 beneficially use coal combustion products off site. Coal combustion products that are not beneficially used off site are disposed of in the on-site landfill.

The following are the major systems and equipment that were included in the retirement and dismantlement of each unit and the major systems and equipment that were considered common (additional details are listed in the attached retirement and dismantlement schedules included in this Appendix).

LA CYGNE UNIT 1

1. Boiler, SCR, and boiler auxiliaries.
2. Turbine, heat balance equipment, and turbine auxiliaries.
3. Wet scrubber and baghouse.
4. Dedicated Unit 1 fuel handling equipment.
5. Dedicated Unit 1 fuel oil equipment.
6. Original eight-module wet scrubber building.

LA CYGNE UNIT 2

1. Boiler and boiler auxiliaries.
2. Turbine, heat balance equipment, and turbine auxiliaries.
3. Wet scrubber and baghouse original precipitator.
4. Dedicated Unit 2 fuel handling equipment.
5. Dedicated Unit 2 fuel oil equipment.

COMMON

1. Administration building.
2. Fuel yard office building.
3. Training building.
4. Warehouses.
5. Maintenance shops.
6. Welding shop.
7. Insulators shop.
8. Auxiliary boilers.
9. Circulating water intake structure and circulating water piping.
10. Common fuel handling equipment.
11. Sewage treatment and wastewater lagoon.
12. Fuel oil storage and unloading.
13. Fire water systems.
14. Dual fuel stack.
15. Reagent preparation and gypsum handling facility.
16. Landfill.

UNIT 1

La Cygne 1 Retirement

Owner Costs				
Pre-Retirement Activities		$106,968		
Retirement Activities		$716,272		
Post-Retirement Activities		$28,182		
Owner Direct Total			$851,422	
Owner Internal Costs	5.00%		$42,571	
Owner Contingency:	25.00%		$223,498	
La Cygne 1 Retirement Opinion of Probable Cost:				$1,117,492
Activities Required by Permit or Regulation				
La Cygne Station Asbestos Removal			$2,674,758	
Activities Required by Permit or Regulation:				$2,674,758

La Cygne 1

ID	Task Name	Cost
0	**La Cygne 1**	**$851,422.21**
1	**La Cygne 1 Retirement**	**$851,422.21**
2	**Pre-Engineering**	**$106,967.52**
3	Permit review and engineering analysis, establish isolation points, and confirm fi	$0.00
4	**KCL&L Overhead Costs**	**$130,798.72**
5	KCP&L Retirement Manager	$130,798.72
6	**Equipment Rentals**	**$43,843.68**
7	Vacuum truck	$43,843.68
8	**Retirement**	**$541,629.89**
9	**Electrical**	**$20,553.92**
10	**Medium and Low Voltage Draw out Switchgear**	**$2,903.52**
11	De-energize all buses at the source.	$483.92
12	Open all circuit breakers.	$483.92
13	Rack all circuit breakers into the fully withdrawn, disconnected position.	$483.92
14	Verify that the closing/tripping springs are discharged.	$483.92
15	De-energize control power and auxiliary power circuits of each circuit breal	$967.84
16	**Motor Control Centers**	**$1,935.68**
17	De-energize all buses at the source.	$483.92
18	Open all circuit breakers and disconnect switches.	$483.92
19	Remove all fuses in control circuits.	$967.84
20	**Low-voltage Switchboards and Panelboards**	**$967.84**
21	De-energize all buses at the source.	$483.92
22	Open all circuit breakers and disconnect switches.	$483.92
23	**Oil-Filled Power Transformers**	**$6,072.32**
24	De-energize all transformer primaries and verify that the secondary is de-ei	$967.84
25	De-energize all low-voltage AC or DC power sources for space heaters, cool	$967.84
26	Drain and dispose of oil.	$2,867.52
27	Clean up and dispose of oil on surface areas around the transformers on in	$1,269.12
28	**Dry-type Power Transformers**	**$1,935.68**
29	De-energize all transformer primaries and verify that the secondary is de-ei	$967.84
30	De-energize all low-voltage AC or DC power sources for space heaters, cool	$967.84
31	**Motors**	**$6,738.88**
32	De-energize all primary power at the source.	$1,935.68
33	De-energize all low-voltage power sources for space heaters or other auxili	$1,935.68
34	Drain lube oil system (if applicable) and dispose of oil.	$2,867.52
35	**Coal Handling**	**$29,070.80**
36	Empty all transfer hoppers.	$1,853.84
37	Confirm all fuel lines and conveyors.	$1,834.56
38	Perform cleaning of the coal handling equipment to assure that all coal and c	$25,382.40
39	**Fuel Oil and Igniter System**	**$2,751.84**
40	Drain fuel oil system	$2,751.84
41	**Boiler Chemical Feed**	**$1,834.56**
42	Drain all chemical feed tanks.	$1,834.56
43	**Condensate Polisher**	**$4,976.80**
44	Drain water from system.	$917.28
45	Drain acid and caustic tanks.	$1,834.56
46	Open tanks and vessels.	$955.84
47	Remove resin.	$1,269.12
48	**Boiler**	**$30,927.60**

La Cygne 1

ID	Task Name	Cost
49	Open boiler doors.	$955.84
50	Gas side - perform cleaning of the boiler and bottom ash system.	$25,382.40
51	Drain boiler, drum, downcomers and headers.	$917.28
52	Open drum doors.	$955.84
53	Drain and clean the submerged flight conveyor system.	$2,716.24
54	**Ductwork**	**$344,145.25**
55	Open ductwork doors.	$955.84
56	Perform extensive cleaning of the ductwork.	$12,691.20
57	Install Flue Cap on L1 Stack Flue	$330,498.21
58	**Condensate and Feedwater Piping**	**$1,834.56**
59	Drain water from the system.	$917.28
60	Leave open vents and drains.	$917.28
61	**Feedwater heaters**	**$2,751.84**
62	Drain feedwater heaters	$917.28
63	Leave open vents and drains.	$1,834.56
64	**Deaerator and Deaerator Storage Tank**	**$1,834.56**
65	Drain Deaerator and Storage	$917.28
66	Leave open vents and drains.	$917.28
67	**Baghouse**	**$18,919.84**
68	Multiple cleaning cycles for filter bags.	$2,751.84
69	Open all vent and drain lines on bag cleaning air and control air lines. Leave in	$917.28
70	Remove all filter bags and cages.	$955.84
71	Clear hoppers of all ash	$3,103.68
72	Mechanically secure all compartment dampers and hopper outlet valves in op	$955.84
73	Disconnect ash transport piping and washdown baghouse hoppers and interic	$1,571.12
74	Install bird screens across hopper ash outlet and ash line flanges.	$955.84
75	Padlock or tack weld all hopper doors shut. (note: if ash hopper doors are ind	$955.84
76	If walk-in plenum, padlock or tack weld all outlet plenum doors and compartn	$955.84
77	If top-door plenum, close and secure top doors and remove/disable door lift h	$1,873.12
78	If top-door plenum, establish natural ventilation or maintain HVAC fan to pro	$1,020.08
79	Pull electrical supply breakers on all electrical equipment except lighting and h	$2,903.52
80	**Wet FGD system**	**$26,222.88**
81	Multiple mist eliminator wash cycles. Remove ME's from absorber.	$2,331.76
82	Drain and flush all slurry and reclaim water pumps and piping. Leave vent and	$1,873.12
83	Drain and wash out the reaction tank, reagent storage tank, recycle water tan	$5,183.28
84	Leave all tank drain valves open or remove. Install bird screens across opening	$1,911.68
85	Drain all makeup and mist eliminator water pumps and piping. Leave vent and	$2,828.96
86	Mechanically secure all flue gas isolation dampers in open position or remove	$1,911.68
87	Remove solids from all inlet and outlet ductwork as necessary	$2,538.24
88	Open all vent station air and control air lines. Leave in open position or remo	$1,873.12
89	Padlock or tack weld all access doors to modules and ductwork shut.	$1,911.68
90	Remove access doors to open-top tanks.	$955.84
91	Pull electrical supply breakers on all electrical equipment except lighting and h	$2,903.52
92	**FGD Reagent Preparation-Limestone wet Scrubber**	**$11,270.00**
93	Remove limestone from day bins.	$1,551.84
94	Removed cartridges/bags from bin vent filters	$1,551.84
95	Padlock or tack weld all bin access doors shut. (note: if doors are indoors, the	$955.84
96	Remove bin discharge isolation valve and install bird screen.	$477.92
97	Thoroughly wash and drain mills	$1,551.84

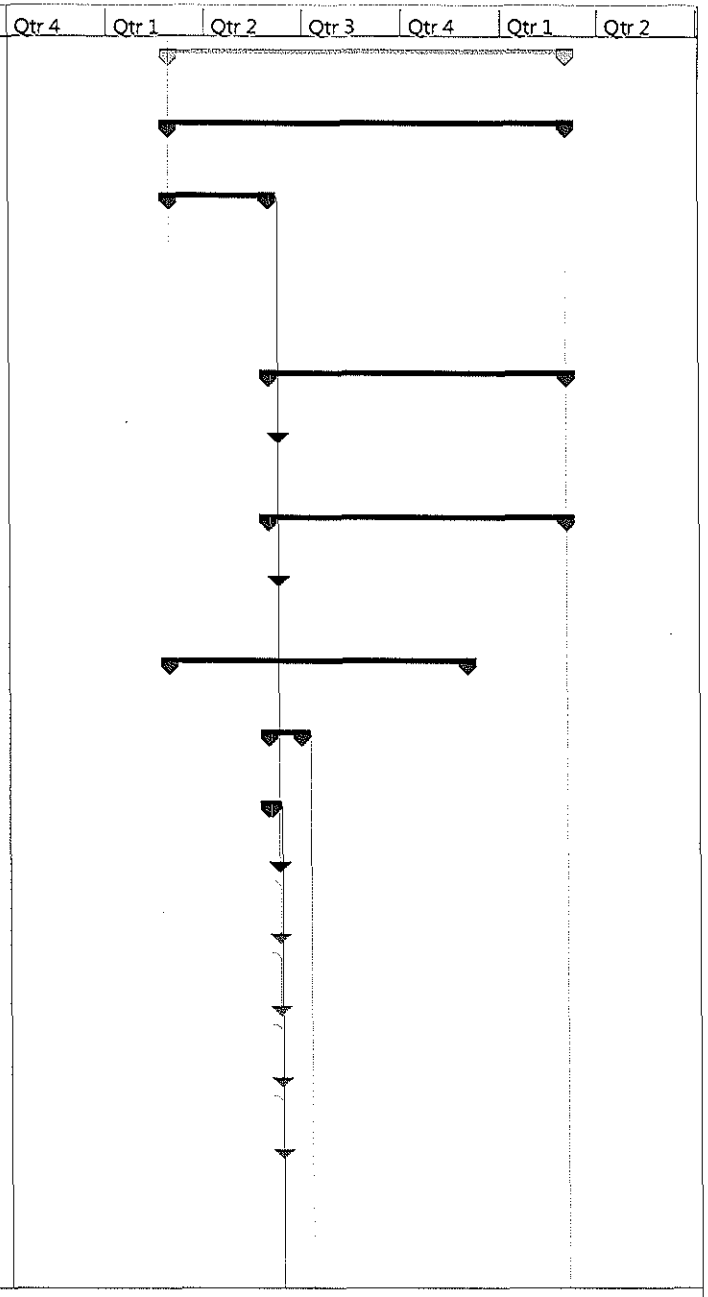
La Cygne 1

ID	Task Name	Cost
98	Remove balls from any ball mills	$1,269.12
99	Padlock or tack weld mill access doors closed.	$955.84
100	Establish natural ventilation or maintain HVAC fan to provide minimum air ch	$1,020.08
101	Pull electrical supply breakers on all electrical equipment except lighting and I	$1,935.68
102	**FGD Byproduct Dewatering - Hydrocyclones and Vacuum Filters**	**$8,032.96**
103	Wash vacuum filter belt and remove all accumulated solids	$2,538.24
104	Wash out vacuum receiver, remove pressure relief valve and access door. Inst	$1,571.12
105	Establish natural ventilation or maintain HVAC fan to provide minimum air ch	$1,020.08
106	Pull electrical supply breakers on all electrical equipment except lighting and I	$2,903.52
107	**SCR**	**$11,098.96**
108	Vacuum fly ash from catalyst.	$2,538.24
109	Remove catalyst of salvage or disposal.	$3,180.80
110	Padlock or tack weld access doors shut.	$955.84
111	Remove ammonia from storage tank for resale.	$775.92
112	Wash out and drain storage tank and supply piping.	$775.92
113	Vent storage tank and all piping. Leave vent and drain valves open or remove.	$936.56
114	Pull electrical supply breakers on all electrical equipment except lighting and I	$1,935.68
115	**Turbine(s) and Condenser**	**$5,715.76**
116	Drain hotwell and leave doors open.	$936.56
117	Open main turbine doors.	$955.84
118	Open bfp turbine doors.	$955.84
119	Remove lube oil.	$2,867.52
120	**Generator**	**$6,618.48**
121	Verify that generator circuit breaker is open and racked out or that high-volta	$483.92
122	Verify that generator field breaker or contactor (if applicable) is open.	$483.92
123	De-energize power supplies to generator excitation system at the source.	$483.92
124	De-energize AC and DC power supplies to generator and exciter space heaters	$483.92
125	Drain generator and exciter cooling water systems (if applicable).	$936.56
126	Disconnect and remove hydrogen gas tanks and purge generator hydrogen sy	$1,834.56
127	Disconnect and remove fire protection system gas/foam tanks and purge fire	$1,911.68
128	**Circulation Water and Turbine Cooling Water System**	**$3,707.68**
129	Drain.	$1,834.56
130	Open water box doors.	$955.84
131	Drain any circulating water chemical feed tanks.	$917.28
132	**Compressed Air System**	**$917.28**
133	Open vents and drains.	$917.28
134	**Auxiliary Steam System**	**$917.28**
135	Drain water from system.	$917.28
136	**Auxiliary Cooling Water System**	**$917.28**
137	Drain water from system.	$917.28
138	**Condenser Air Extraction and Waterbox Priming System**	**$917.28**
139	Drain water from system.	$917.28
140	**Building Heating System**	**$917.28**
141	Drain water from system.	$917.28
142	**Battery System**	**$4,775.20**
143	De-energize all battery chargers from the source.	$483.92
144	Open all AC and DC circuit breakers and/or fused switches on battery charger	$483.92
145	Remove and dispose of battery electrolyte.	$1,903.68
146	Remove and dispose of battery cells.	$1,269.12

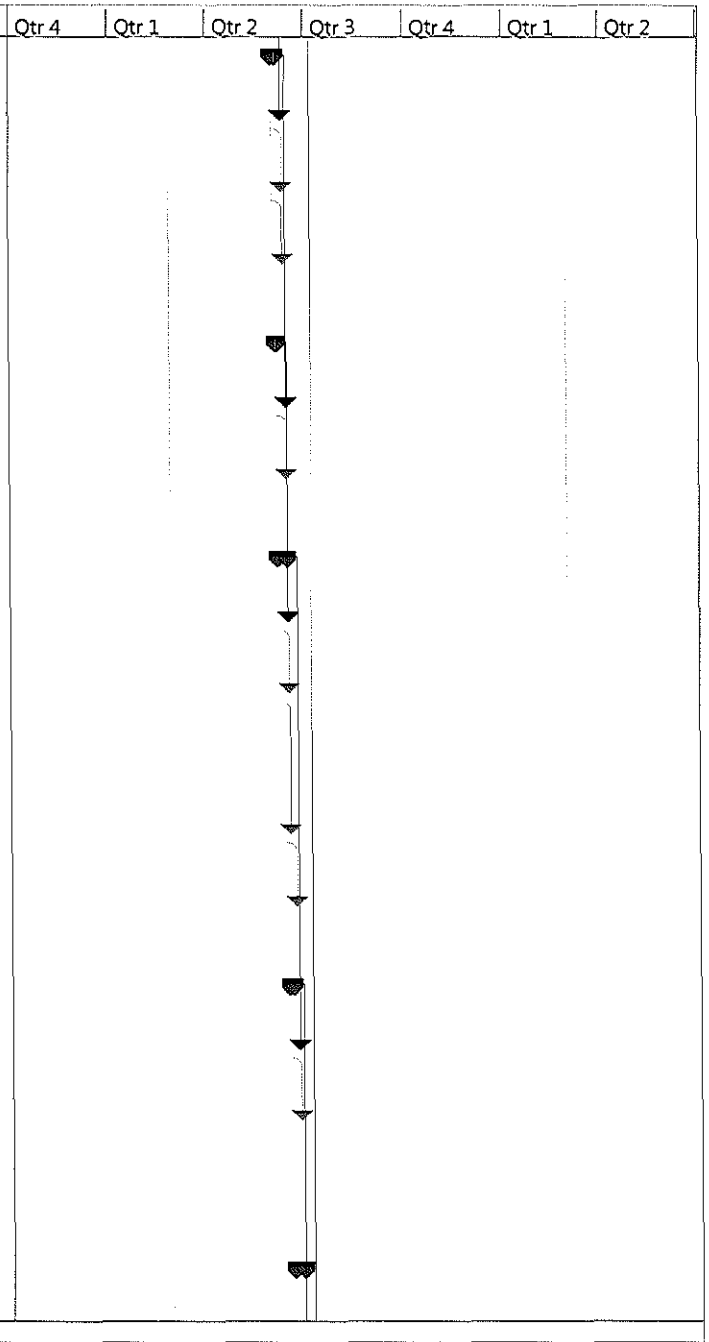
La Cygne 1

ID	Task Name	Cost
147	Clean up and dispose of electrolyte on surface areas around batteries.	$634.56
148	**Post Retirement Activities**	**$28,182.40**
149	Post Retirement Activities	$28,182.40

ID	Task Name	Duration
0	**La Cygne 1**	**265 days**
1	**La Cygne 1 Retirement**	**265 days**
2	**Pre-Engineering**	**66 days**
3	Permit review and engineering analysis, establish isolation points, and confirm fuel yard inventory has been reduced to zero tons.	66 days
4	**KCL&L Overhead Costs**	**199 days**
5	KCP&L Retirement Manager	199 days
6	**Equipment Rentals**	**199 days**
7	Vacuum truck	199 days
8	**Retirement**	**199 days**
9	**Electrical**	**22 days**
10	**Medium and Low Voltage Draw out Switchgear**	**3 days**
11	De-energize all buses at the source.	0.5 days
12	Open all circuit breakers.	0.5 days
13	Rack all circuit breakers into the fully withdrawn, disconnected position.	0.5 days
14	Verify that the closing/tripping springs are discharged.	0.5 days
15	De-energize control power and auxiliary power circuits of each circuit breaker at the source and by opening control power circuit breakers or removing fuses in each breaker cubicle.	1 day



ID	Task Name	Duration
16	**Motor Control Centers**	**2 days**
17	De-energize all buses at the source.	0.5 days
18	Open all circuit breakers and disconnect switches.	0.5 days
19	Remove all fuses in control circuits.	1 day
20	**Low-voltage Switchboards and Panelboards**	**1 day**
21	De-energize all buses at the source.	0.5 days
22	Open all circuit breakers and disconnect switches.	0.5 days
23	**Oil-Filled Power Transformers**	**7 days**
24	De-energize all transformer primaries and verify that the secondary is de-energized.	1 day
25	De-energize all low-voltage AC or DC power sources for space heaters, cooling equipment, controls, etc. at the source and open circuit breakers or remove fuses at transformer end.	1 day
26	Drain and dispose of oil.	3 days
27	Clean up and dispose of oil on surface areas around the transformers on in containment pits.	2 days
28	**Dry-type Power Transformers**	**2 days**
29	De-energize all transformer primaries and verify that the secondary is de-energized.	1 day
30	De-energize all low-voltage AC or DC power sources for space heaters, cooling equipment, controls, etc. at the source and open circuit breakers or remove fuses at transformer end.	1 day
31	**Motors**	**7 days**



ID	Task Name	Duration
32	De-energize all primary power at the source.	2 days
33	De-energize all low-voltage power sources for space heaters or other auxiliary equipment at the source.	2 days
34	Drain lube oil system (if applicable) and dispose of oil.	3 days
35	**Coal Handling**	**23 days**
36	Empty all transfer hoppers.	1 day
37	Confirm all fuel lines and conveyors.	2 days
38	Perform cleaning of the coal handling equipment to assure that all coal and coal dust has been removed from site.	20 days
39	**Fuel Oil and Igniter System**	**3 days**
40	Drain fuel oil system	3 days
41	**Boiler Chemical Feed**	**2 days**
42	Drain all chemical feed tanks.	2 days
43	**Condensate Polisher**	**6 days**
44	Drain water from system.	1 day
45	Drain acid and caustic tanks.	2 days
46	Open tanks and vessels.	1 day
47	Remove resin.	2 days
48	**Boiler**	**27 days**
49	Open boiler doors.	1 day