

**Agency: Commerce, Community and Economic Development**  
**Grants to Municipalities (AS 37.05.315)**

**Grant Recipient: Kenai**

**Federal Tax ID: 92-6001599**

**Project Title:**

**Project Type: Remodel, Reconstruction and Upgrades**

## Kenai - City Hall HVAC Improvements

**State Funding Requested: \$200,000**  
 Future Funding May Be Requested

**House District: 33 / Q**

### Brief Project Description:

Replacement of aging, inefficient heating, ventilation and air conditioning systems.

### Funding Plan:

Total Project Cost:	\$250,000
Funding Already Secured:	(\$0)
FY2012 State Funding Request:	<u>(\$200,000)</u>
Project Deficit:	\$50,000

### Detailed Project Description and Justification:

The central administration building was constructed in 1980, when the cost of energy was a substantially lower percentage of overall building operation costs than it is today. The City had an energy audit of its buildings accomplished in 2007 and selected sections of that study are included in this text.

A cost estimate for the replacement of the HVAC System is as follows:

Demolition	\$ 15,000	
Installation of new boilers (2 @ \$20,000)	40,000	
Installation of new control system	50,000	
Installation of new ventilation/air conditioning system		35,000
Installation of new insulated ducting system	20,000	
Repair/Re-installation of Roof	15,000	
Design & Admin	25,000	
<b>Total</b>	<b>\$ 200,000</b>	

### Project Timeline:

Design through Fall/Winter of 2011, construction during 2012.

### Entity Responsible for the Ongoing Operation and Maintenance of this Project:

City of Kenai

**Grant Recipient Contact Information:**

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Title:	Kenai City Manager
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Has this project been through a public review process at the local level and is it a community priority?  Yes  No

*For use by Co-chair Staff Only:*



*"Village with a Past, City with a Future"*

210 Fidalgo Avenue, Kenai, Alaska 99611-7794  
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[www.ci.kenai.ak.us](http://www.ci.kenai.ak.us)

## City Hall Heating Ventilation & Air Conditioning Improvements

The central administration building was constructed in 1980, when the cost of energy was a substantially lower percentage of overall building operation costs than it is today. The City had an energy audit of its buildings accomplished in 2007 and selected sections of that study are included in this text.

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Installation of new insulated ducting system	20,000
Repair/Re-installation of Roof	15,000
Design & Admin	<u>25,000</u>
Total	\$200,000



**BARRIE B. LOWE P.E.**

49760 Leisure Lake Drive  
Soldotna, AK 99669

CITY OF KENAI

**ENERGY AUDIT  
STUDY PREPARED FOR SIX MUNICIPAL BUILDINGS**

Prepared by

Barrie B. Lowe p.E.  
December 10, 2007



## TABLE OF CONTENTS

Foreword.....	2
Introduction/Objectives/Procedures.....	3-4
Energy Audit Preliminary.....	5
Building Characteristics.....	6-11
Electrical (HEA) Billings.....	12
Metered Consumption Monthly Data..	13-18
Natural Gas (Enstar) Billings.....	19
Energy Performance Summary.....	20-25
Table 1 Findings Summary.....	26
Summary Observations.....	27-32
Recommendations.....	33
Appendix A.....	34-37

## FOREWORD

This study brings together data and commentary which should prove useful in near term and future discussions and planning for continuing upgrades and expansions of the six (6) buildings presented. It is hoped that these sections of information based on inspections, discussions with maintenance personnel and drawings dated between 1965 and 1992 will yield design and installation options recommendations of value. Comments germane to a particular building appear in the Summary Observations section. Further detailed design guidance or "opinion engineering" will require more hand over hand systems inspections than were possible under this limited study and the drawings accuracies at this point..

## INTRODUCTION

The City of Kenai has requested an energy audit on six (6) municipal buildings. This audit reviewed energy consumption in terms of natural gas and electrical power billings. Usage is summarized and tabulated in format(s) to yield comparative evaluations among the six buildings. As buildings of widely varying purpose, consumption rates were not however expected to fall into any narrow band of consumption equivalencies per square foot. Nor were the buildings' differences expected to be influenced only by such features as building siting, usage, construction quality, lighting modernization or heating system efficiencies. Instead, it was expected and the study did find differing values for a number of reasons. Therefore, the study didn't pursue easy across the board recommendations toward the buildings' features with regard to energy usage efficiency. The study has not intended to infer suggested improvements with only minor tailoring to suit individual buildings for improved efficiencies. It is hoped that the study's described findings and descriptive recommendations will result in real value toward funding expenditures to improve conditions of energy losses of the specific buildings reviewed in the study.

## OBJECTIVES

This study is not devoted to a data base development. Complete gas and electric billings are available in the finance department. Nor are the monthly and annual consumption totals and their different manipulations with building statistics an end unto themselves. The presentation of these tabulations are a starting point and do represent certain proper and informative data. And, they represent inputs of a formal energy audit of buildings. Their real value lies in the ability to gather an over view of energy consumption rates, comparisons among affected buildings and bring to the forefront a dependable and a quantified cost of energy expenditures. And, within reason suggested remedies for areas of unusual losses can be initiated.

Specific areas of energy consumption improvements such as lighting are not so directly supported with only the past records of usage. Unless, for example more definite records of installation dates of more efficient lighting components are kept, real and quantified reductions in energy usage are not possible. In such instances, one relies only on the claims of the manufacturer and purchases with the expectancy of some savings eventually offsetting the changeover expenditures.

Exemplary of conflicting issues in lighting improvements for instance is the down side that improvements in lighting energy consumption can result in less heat dissipation to the spaces; increasing the load on heating equipment. And this heating equipment likely was sized to consider the heating contribution of the original lighting. However, these types of occurrences only need to be factored into the evaluation of any specific area of

energy improvement considered. By and large, the review and close analysis of unusual and suspect values in the assimilated energy consumption data will identify areas of concern and enable brainstorming of actions to mitigate such high usage zones. Coupled with on-site building inspections, discussions with occupants, review of the equipment operating parameters and actual system design critique(s); the consumption tabulations will direct activities to improve energy consumption rates.

## PROCEDURES

### Preliminary Energy Use Analysis

- Determination of the building's square footage and primary use,
- Assimilation of energy (gas & electric power) data & building characteristics,
- Development of energy and cost indices e.g. (EUI), and related energy data,
- Review and comments on irregularities of any utility billings,
- Consider target values of energy/demand/cost indices..... within reason,
- Provide remarks on odd energy utilization index (EUI) data among billings.

### Walk Through Data Discussions

- Achieve familiarity with the buildings' energy consuming systems,
- Survey and comment on buildings' operational & maintenance issues,
- Meet with City personnel cognizant and responsible for buildings' systems,
- Consider and offer possible improvement scenarios in existing systems,
- Review any functional or maintenance activities to enhance energy usage,
- Brainstorm any recommendations of maintenance personnel not considered.

### Buildings and Systems Findings Review

- Identification of low or no cost alterations to buildings or systems,
- Consideration of benefits of facility changes from cost standpoints,
- Review any particular special needs and related costs,
- Compare key operating parameters to expected efficiency factors,
- Systems testing or other e.g. thermal imaging camera monitoring methods,
- Seek comments germane to investigative endeavors regarding energy losses.

### Energy Analysis Summary and Recommendations

- Fill out standard ASHRAE Energy Audit forms to extent reasonable,
- Include discussion of identified problems detected during forms processing,
- Develop summarizing statements following assembly of forms and discussions,
- Propose and recommend discussion subjects for roundtable with City personnel,
- Follow up on any inputs from the City following review of the study.... such as:  
Outline opinions on recommended actions regarding need, urgency, installation ease etc,  
Additional opinions of impact of considered alterations on health, safety, locale etc,  
Impact on life or efficiency of existing building's integrity or systems' performance,  
Expected life of recommended new building alterations or systems renewal/refurbish,  
Provide some substantiation of the benefits of recommended energy improvements,  
Assist in estimating the cost of any equipment replacement or system redesign.



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Soldotna, AK 99669

September 11, 2007

CITY OF KENAI

ENERGY AUDIT  
PRELIMINARY

**PURPOSE:** Investigate six (6) municipal buildings in areas of energy expenditure arising from lighting and heating requirements. Of particular interest is the consumptive efficiencies in these buildings' usage of metered electrical and natural gas.

**HISTORY:** Certain of these buildings; notably by the prioritization ordering observed in their treatment herein are, or have experienced problems in either or both of these two areas of lighting and heating. So much so that steps have been taken to alleviate or postpone at least an inevitable overhaul or substitution of existing components. A cessation of such continued fixes hopefully will be a benefit of a study such as this one. The buildings approaching or beyond twenty years of age may not represent current energy conservation features which are both available today and actually imposed by government regulations.

**FOCUS:** This study began with and was intended to rather strictly follow guidelines of a document by the American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc (ASHRAE). The document **PROCEDURES FOR COMMERCIAL ENERGY AUDITS** notes disclaimers and states that the publication does not constitute endorsement, warranty or guarantee any product, service, process or the like. Inclusion of the forms (illustrations) herein represents use by a reviewer and hereby offers the appropriate disclaimer(s) and credit for this use. The progress through the study actually deviates from a pure adherence to these forms owing to departures from certain of the forms and attention more directed toward resolution of the inefficiencies and looking for building problem similarities more than purely spouting mathematical and analytical treatment terms.

Current and continued use and operation of equipment where modifications have been made to restore service are suspected of contributing to inefficiencies directly affecting energy consumption. However, the proof of such suspicions is difficult to establish without full and reliable sets of records which would have to be in detail as to dates and specificity not available. The best tool for such evaluations is likely reliance on the knowledge of maintenance people and pertinent expenditures' details and dates records.

Besides these developing inefficiencies from aging and band-aiding, the focus is of course on replacing components with newer more energy efficient products. To this end, the study is devoted through the use of the aforementioned forms to an over view of lighting and heating costs at the six (6) locations.

For each location, any special concern(s) as just discussed are brought up in more explanatory fashion. And, as mentioned quite recently, the study has leaned toward a design oriented/component discussion.

This overall study has been partially interrupted by the onset of the warmer spring and summer days and the inability to view heating system anomalies and find building heat losses as readily as in the winter.

### BUILDING CHARACTERISTICS

Building ID ADMIN BUILDING (CITY HALL) Date of Audit: JUNE 2007  
 City KENAI State/Prov. ALASKA Zip/Post 99607  
 Lat. 60 Long. 152 HDD 4,550 CDD 540 (Base 65°F) 06/07 (Year of Data)  
 Gross Floor Area, <sup>1</sup> 9,870 ft<sup>2</sup> Total Conditioned Area<sup>1</sup> \_\_\_\_\_ ft<sup>2</sup>  
 Conditioned Area, <sup>1</sup> heated only 9,870 ft<sup>2</sup> Conditioned Area, <sup>1</sup> cooled only \_\_\_\_\_ ft<sup>2</sup>  
 Conditioned Area, <sup>1</sup> heated & cooled \_\_\_\_\_ ft<sup>2</sup>  
 Number of conditioned floors: Above grade 2 Below grade 0  
 Year of Construction<sup>2</sup>: 1981  
 Brief Building Description: OFFICES & ASSY AREAS

### PRIMARY BUILDING TYPE<sup>3</sup> (check one only)

- |               |   |  |
|---------------|---|--|
| Office        | 11 <input checked="" type="checkbox"/> Owner Occupied | 69 [ ] Other—Define                                |
|               | 12 [ ] Leased (1-5 Tenants)                           |  |
|               | 13 [ ] Leased (5+ Tenants)                            | Retail   |
|               | 19 [ ] Other—Define                                   | 71 [ ] Drycleaning                                 |
|               |   | 72 [ ] Supermarket                                 |
|               |   | 73 [ ] General Merchandise                         |
| Hotel/Motel   | 21 [ ] Motel (No Food)                                | 74 [ ] Shopping Mall Without Tenant Loads          |
|               | 22 [ ] Hotel  | 75 [ ] Shopping Mall Without Tenant Lighting Loads |
|               | 23 [ ] Hotel/Convention                               | 76 [ ] Shopping Mall                               |
|               | 29 [ ] Other—Define                                   | 77 [ ] Specialty Shop                              |
| Apartment     | 31 [ ] General Occupancy                              | 78 [ ] Bakery                                      |
|               | 32 [ ] Seniors Only                                   | 79 [ ] Other—Define                                |
|               | 39 [ ] Other—Define                                   |  |
| Education     | 41 [ ] Primary  | Assembly   |
|               | 42 [ ] Secondary                                      | 81 [ ] Theatre                                     |
|               | 43 [ ] University                                     | 82 [ ] Museum/Gallery                              |
|               | 49 [ ] Other—Define                                   | 83 [ ] Church/Synagogue                            |
|               |   | 84 [ ] Arena/Gym                                   |
|               |   | 85 [ ] Arena/Rink                                  |
| Food Services | 51 [ ] Restaurant - Full Service                      | 89 [ ] Other—Define                                |
|               | 52 [ ] Fast Food                                      |  |
|               | 53 [ ] Take Out                                       | Other  |
|               | 54 [ ] Lounge   | 91 [ ] Laboratory                                  |
|               | 59 [ ] Other—Define                                   | 92 [ ] Warehouse                                   |
|               |   | 93 [ ] Warehouse—Refrigerated                      |
|               |   | 94 [ ] Recreation/Athletic Facility                |
| Health Care   | 61 [ ] Nursing Home                                   | 95 [ ] Jail  |
|               | 62 [ ] Psychiatric                                    | 96 [ ] Transport Terminal                          |
|               | 63 [ ] Clinic   | 97 [ ] Multi-Use. Complex                          |
|               | 64 [ ] Active Treatment Hospital                      | 99 [ ] Other—Define                                |

1. GROSS FLOOR AREA is all floor area contained within the outside finished surface of permanent outer building walls including basements, mechanical equipment floors, and penthouses (ANSI Standard Z65.1-1996, Construction Area). No exclusions are made for shafts, stairs, or atria. CONDITIONED AREA is that area provided with heating or cooling to maintain temperature between 50°F and 86°F (ANSI/ASHRAE Standard 105-1984).
2. THE MEDIAN YEAR for construction of at least 51% of the conditioned space.
3. BUILDING TYPE as characterized by at least 51% of the conditioned space.

## ELECTRICAL (HEA) BILLINGS

Caution is in order to accurately and quantitatively evaluate electrical consumption from the billing statements. To obtain reliable consumption figures from the HEA data, one must look carefully at the many entries on the account data. Of the 23 different entries, several appear to vary and would seem to represent figures which would track with actual usage. Not so.

The only accurate method of tracking and reviewing electrical consumption is to understand which entries do not contain factors unrelated to usage. HEA billings actually show in addition to the meter readings ten (10) different billing terms and their amounts; not including taxes or charges in arrears. Of these ten values, only one (1) strictly tracks with the meter readings. Even the Demand Charge dollar amounts which track with Demand Used and Billed Demand don't relate monetarily / numerically with meter readings. It is Demand Used times \$6.37; but Demand Used does not track the same each time with meter reading deltas.

Present meter readings minus previous readings times 80 equals KWH Usage. Note also that Demand Used and Billed Demand are the same value...a derived unit of consumption...but it differs each time; its numerical relationship with meter readings changes. However, Customer Charge is a constant eg. \$150.00. The Wholesale Power Cost is a varying positive or negative dollar amount. The Regulatory Cost Charge stays essentially the same (to the fourth decimal place), being \$.0004 times the KWH Usage.

All of this differentiation is to realize that any hard data looked for in a quantitative review of periodic usage comparisons must use caution and compare the proper column; apples/apples. The proper billings column is the one titled Energy Charge...even though it can represent less than one half the Total Billed! Energy Charge figures derive from a dollar multiplier (\$.0919 rounded/approximate) times the KWH Usage amount.

Now that we understand which electrical energy billing column would reflect consumption values variations from month to month or building to building, we can effect useful data in our audit and also reach reliable dollars per square foot figures. These cost per square foot figures show up and are used in energy and cost indices and related analyses of metered electrical demand; requiring faith in their derivation origin and accuracies of their values.

**METERED CONSUMPTION MONTHLY DATA: 2006/2007 (YEAR)**

Utility Company HEA Account # 637063 Rate Number \_\_\_\_\_  
 Energy Type ELEC Consumption Units<sup>1</sup> KWH  
 Electric Measured Demand Units<sup>2</sup> KW

METERING PERIOD DAY/MONTH/ YEAR			1. CONSUMPTION	"E" IF ESTIMATE	ELECTRICITY ONLY		COST <sup>3</sup>		
From	To	# of days			2. Measured Demand	3. Billed Demand	4. Consumption \$	5. Demand \$	6. Total \$
4/17	5/17	31	11360		142	32.88	1044.32	354.95	1399
5/17	6/19	33	11920		149	32.4	1095.81	351.66	1447
6/19	7/18	29	10720		134	32.24	985.49	312.38	1298
7/18	8/18	31	11680		146	31.36	1073.74	302.89	1377
8/18	9/19	32	11520		144	34.48	1059.03	323.83	1382
9/19	10/20	31	10880		136	32.4	1000.20	686.01	1686
10/20	11/17	28	10640		133	38.48	978.14	717.51	1696
11/17	12/19	32	14480		181	43.52	1,331.15	860.64	2197
12/19	1/18	30	12000		150	57.28	1,103.16	807.91	1911
1/18	2/16	29	10880		136	33.68	1000.20	630.09	1630
2/16	3/16	28	10640		133	34.16	978.14	627.29	1605
3/16	4/17	32	11200		140	30.16	1029.62	255.03	1285
Total			137,920				\$12,679.00		\$18913

- "Consumption" = HEA's "Kilowatt Usage" which is the monthly meter readings' difference times 80
- "Measured Demand" = the monthly meter readings' difference
- "Billed Demand" = HEA's "Billed Demand" ..same term but HEA's doesn't track only meter readings
- "Consumption \$" = HEA's "Energy Charge"
- "Demand \$" = HEA's "Customer Charge" + "Demand Charge" + "Wholesale Power Cost" + "Regulatory Cost Charge"
- "Total \$" = "Consumption" + "Demand" = HEA's "Total Billed" (rounded)

ADMIN/CITY HALL

- CCF, therms, kWh, gal, etc.
- kW, kVA, etc.
- Costs should include taxes, fees, contract charges, etc.

## NATURAL GAS (ENSTAR) BILLINGS

Charges include a Customer Charge of \$12.00 plus the fees relative to the metered amounts. These charges derive from the following and were affected by both an increase before the Enstar/Aurora change and the subsequent provider's rates as defined below.

A jump in prices occurred at the 12/29/06 billing. The increase was from a supplier gas cost of \$.50009 to \$.70279 per CCF.

The cost to the customer derives from the \$12.00 Customer Charge plus a base service charge of \$.155010/CCF plus an RCC fee of .449% ( $.00449 \times .155010 = .0007$ ) plus a supplier gas cost of \$.500090/CCF plus a "gas supplier agreement" of \$.00016/CCF. This total of \$.656/CCF then jumped related to the 40.5% increase in the supplier gas cost from \$.50009 to \$.70279/CCF.

The change to Aurora Power brought about a reduction in cost owing to an initial cost of \$.62786/CCF with a 7% discount rate; reducing to \$.5839/CCF. The Customer Charge including the RCC went to \$67.30.

These natural gas billings are much easier to read and track from period to period and building to building since the amount consumed is read directly from the billings without any other factors to sort through as we find in the electrical billings.

**ENERGY PERFORMANCE SUMMARY** 2006/2007 (YEAR) CITY HALL

This is a summary of energy account worksheets on succeeding pages.

ENERGY TYPE	KWH TOTAL ANNUAL USE	UNITS	CONVERSION MULTIPLIER To Thousands Btu See Page 17	THOUSANDS BTU (kBtu)	TOTAL ANNUAL COST (\$)
ELECTRICITY <sup>1</sup> / <sub>1000</sub> KWH USAGE	137,920	KWH	3.413	470,721	18,913
NATURAL GAS	16,359	CCF	10.3	1,684,977	12,574
PURCHASED STEAM					
PURCHASED HOT WATER					
PURCHASED CHILLED WATER					
OIL # _____					
PROPANE					
COAL					
OTHER					
				A	B

**ENERGY AND COST INDICES**

Energy Utilization Index (A ÷ Gross Floor Area) 218.41 kBtu/ft<sup>2</sup>/yr  
 Cost Index (B ÷ Gross Floor Area) 3.19 \$/ft<sup>2</sup>/yr  
 Total Water Use (C) \_\_\_\_\_ kGal/yr or \_\_\_\_\_ ft<sup>3</sup>/yr \_\_\_\_\_ \$/yr  
 Cost Index, Including Water (B + C) ÷ (Gross Floor Area) \_\_\_\_\_ \$/ft<sup>2</sup>/yr

**ANALYSIS OF METERED ELECTRICAL DEMAND**

Maximum Demand 14,480 kW or \_\_\_\_\_ kVA <sup>11-17-06 TO</sup> <sub>12-19-06</sub>(month)  
 Maximum Demand 14,480 kW × 1000 ÷ Gross Floor Area = 1,467 W/ft<sup>2</sup>  
 Minimum Demand 19,640 kW or \_\_\_\_\_ kVA <sup>10-20-06 TO</sup> <sub>11-17-06</sub>(month) *ALSO: 2-16-07 TO 3-16-07*  
 Minimum Demand 19,640 kW × 1000 ÷ Gross Floor Area = 1,078 W/ft<sup>2</sup>

CITY OF KENAI

TABLE 1  
ENERGY AUDIT  
FINDINGS SUMMARY

BUILDING	HEATING SYSTEM	ENERGY LOSSES	CORRECTIVE ACTION
City Hall	Central air (Pace)	Rooftop preheater Soffitted overhang	Remove preheater/rework duct Renew/repair structural insul.
Sr. Ctr.	Pace & basebd	Inefficient AHU & thermostats	Replace AHU serving din./misc. Rework thermostat controls
Airport Term.	Boilers serve basebd/AHU	Upper lvl glass Baggage areas Sidewalk htg	Reduce thermostatic settings Personnel habits; bag doors Look at settings; water temp.
Library	Central air	AHU controls Supply ducting	Review temp control & FA qty Localized ducting redesign
Rec Ctr	Roof AHUs	Lighting/habits Water heater	Upgrade lighting elements effy Counsel occupants on htg Upgrade water heater
Police/ Fire Sta	Boiler/base bd & Pkg A/C	Windows, boiler air/cont, thermos	Replace single pane windows boiler & controls upgrades

## SUMMARY OBSERVATIONS

### City Hall (Administration)

Considered the most in need of attention in the areas of heating and cooling, this building retains the original heating system design of 1980 and most of the originally installed equipment. And, this equipment has reached the end of its life and very much shows it. Some factors reflecting the early design and equipment performance degradation follow:

- A roof mounted preheater of an obsolete design remains part of the air admission system even though it no longer functions as intended,
- The large air handling unit requires continual repair of its ancillary components,
- Gas-fired boiler operation provides the heat for a unit (Pace) which represents a period when natural gas cost was a much smaller fraction of the cost of heating,
- Air flows have been manipulated to suit emergent needs to the point that different spaces experience different comfort situations; some too hot, some too cold and virtually all unbalanced in fresh air quantities.... Council Chambers in particular,
- Ducting is most likely in great need of cleaning which would undoubtedly reveal other performance diminishing factors.

Notwithstanding the equipment insufficiencies, the building is suffering from insulation shortcomings also. Thermal imaging equipment inspections have pointed up several areas of insulation deficiencies; again probably not so important when fuel cost was less. An area of suspected poor insulation was found to show no evidence of large heat loss through walls or windows. This northwest corner; the Public Works Manager's office did not show any significant heat loss except for a horizontal construction piece known as a belly band in traditional framing jargon. This steel trim piece occurs at the interface of the corrugated lower portion transitioning to the flat plate appearance up to the roof line. This would occur at about the top plate line and likely is merely a shortage of insulation due to difficulty in installing. However, worse by far are the two (2) overhanging soffits at this northwest corner and the southeast corner. This could certainly help explain the winter cold (Jack and Cary) and summer hot (Larry) office conditions. These soffitted overhangs are most assuredly lacking insulation integrity; showing high intensity heat losses on thermal imaging.

Regarding lighting, rather continual replacements have occurred for about the past four (4) years installing more efficient components. Any larger step in efficiency increase would require measures somewhat disruptive to business and cost a considerable amount. And, that direction actually begins to enter regions of other concerns. More efficient in this direction of less operating cost can bring along less actual lighting quality, lose the contribution of winter heat addition to the space (important here) and add a summer heat value (not so important here).

A broad brush class C estimate at the cost of substantially upgrading the heating system and adding the cooling side also would be at or near \$100,000.00. This would be the use of one or two package rooftop units supplying the building with a refrigerant type cooling and natural gas fired heating operation. Very widely used, these units could mount on the roof or with some landscape regrading of the northeast corner; be ground mounted.



Suggested by: Administration

**CITY OF KENAI**

**RESOLUTION NO. 2010-57**

A RESOLUTION OF THE COUNCIL OF THE CITY OF KENAI, ALASKA, ADOPTING THE CITY OF KENAI CAPITAL IMPROVEMENTS PLAN PRIORITY LIST FOR STATE AND FEDERAL FUNDING REQUESTS FOR THE FISCAL YEAR 2012.

WHEREAS, the Capital Improvements Plan (CIP) is a guide for capital expenditures; and,

WHEREAS, the City of Kenai CIP process has involved consideration of existing plans, programmatic needs and public input; and,

WHEREAS, the CIP compliments the legislative priorities, City Budget and Comprehensive Plan; and,

WHEREAS, the Kenai City Council held a public hearing on the Capital Improvements Program adoption on October 6, 2010.

NOW, THEREFORE, BE IT RESOLVED BY THE COUNCIL OF THE CITY OF KENAI, ALASKA, the City of Kenai Capital Improvements Plan Priority List for State and Federal Funding Requests for the Fiscal Year 2012, as provided in the attached Exhibit A, is adopted.

PASSED BY THE COUNCIL OF THE CITY OF KENAI, ALASKA, this sixth day of October, 2010.

  
PAT PORTER, MAYOR

ATTEST:

  
Carol L. Freas, City Clerk

**CITY OF KENAI  
CAPITAL IMPROVEMENTS PROGRAM (CIP) PRIORITIES  
FOR STATE & FEDERAL FUNDING REQUESTS FOR  
FY 2012**

PRIORITY NUMBER	PROJECT TITLE	DESCRIPTION	REQUIRED FUNDING	NOTES/COMMENTS
1	Kenai River Bluff Erosion/Stabilization	<p>Approximately one-mile of the bluff along the Kenai River is exhibiting substantial erosion. Several hundred feet of the original townsite have been lost over the last century. The U.S. Corp of Engineers estimates the rate of erosion to be 3 feet per year. Over the next 50 years, in excess of \$ 50 million (in 2006 dollars) of property and improvements will be lost, without the construction of stabilization improvements. The total cost estimate for the project is \$ 20 million. Approximately \$ 1.5 million has been spent to date on preliminary engineering &amp; studies. Kenai voters approved a \$ 2 million bond sale at the October 2007 election. Recently the Kenai Peninsula Borough Assembly passed a resolution to provide the quarry rock for the project at no cost. The value of the rock is estimated at \$ 4.8 million. Total funding in-hand and in-kind is approximately \$ 10.2 million.</p>	<p>Additional \$ 2,000,000 from the State of Alaska, and \$ 17,000,000 from the Federal Government through the US Corps of Engineers</p>	<p>The bluff erosion project has been the City of Kenai's number one Federal and State funding priority for at least the previous three years. Administration is requesting funding from the Governor and area Legislators. To date, funding of approximately \$ 1.5 million has been appropriated by Alaska's congressional delegation, but the outlook for additional federal funding is not good. The citizens of Kenai approved a G.O. bond proposition in the amount of \$ 2,000,000 in 2007. Given the State of Alaska's present financial condition the opportunity to receive funding is as good as it has been in some years.</p>
2	New Water Transmission mains (Phase III)	<p>1. Replace approximately 3,200 lf of asbestos cement (AC) water main which is presently the sole connection from the City's water production facilities and the distribution grid. Any failure of the AC piping would constitute a catastrophic failure of the City of Kenai's municipal water supply utility. 2. Construction of 2,500 lf of new water main along Swires Road between the Kenai Spur Highway &amp; Lawton Drive. This will provide a cross-connection between an existing water transmission main and the new water transmission main being constructed on Lawton Drive. These improvements will increase system reliance, and increase both operating pressures and flow volumes.</p>	<p>\$ 1,557,000.00</p>	<p>A grant application for this project has been submitted under the State of Alaska, Department of Environmental Conservation (ADEC) Municipal matching Grant Program (MMG). We have received the scoring and this project has scored well enough to probably be included in the Governor's FY 2012 capital budget. The City Council passed Resolution No. 2012-46 identifying this project as the number one ADEC MMG priority.</p>
3	Paving & Improvements to City Streets	<p>The City of Kenai maintains approximately 20 miles of gravel surfaced roadways within it's municipal boundaries. The cost of maintenance of gravel roadways is high, dust from gravel roadways is a health issue for the elderly &amp; young.</p>	<p>\$ 1,000,000.00</p>	<p>Administration recommends that a project of this type be perpetually included in capital project requests to the State of Alaska.</p>

**CITY OF KENAI**  
**CAPITAL IMPROVEMENTS PROGRAM (CIP) PRIORITIES**  
**FOR STATE & FEDERAL FUNDING REQUESTS FOR**  
**FY 2012**

PRIORITY NUMBER	PROJECT TITLE	DESCRIPTION	REQUIRED FUNDING	NOTES/COMMENTS
4	Construct New City Light/Heavy Equipment Maintenance Shop	This project would construct a 20,000 sq maintenance shop to replace the existing shop. The existing shop is a collection of buildings and conexs that lacks the room to perform maintenance on the City's equipment fleet, and also lacks engineered ventilation systems as well as other improvements found in designed facilities.	\$ 3,500,000.00	Shop facilities to support operations and maintenance activities are always difficult projects to move forward. The present facility was never designed to facilitate the support maintenance activities which are being accomplished. There may be an opportunity for Federal participation, specifically FAA funding in an amount commensurate with Airport use of the facility.
5	Vehicle Storage Facility for Kenai Senior Center Vehicles	This project would construct a six-bay vehicle storage facility at the City maintenance yard. At present the vehicles are stored outside the center. During the winter this results in vehicles running to maintain heat for trips for the senior clients, and also results in increased mechanical difficulties.	\$ 400,000.00	
6	City Hall HVAC & Energy Conservation Improvements	The current system does not provide uniform heat in the winter and does not include air conditioning (cooling) in the summer. The present system also does not provide an adequate number of air changes to meet current code requirements. The copy room which contains the computer servers is consistently at a significantly elevated temperature. Improvements would include the removal/replacement of the exterior building panels, replacement/addition of insulation in the walls and roof, removal and replacement of the roof mounted air-handling system with a ground-level HVAC/air handling system, and replacement of the existing roof.	\$ 400,000.00	This project could also be a candidate for the DOE competitive grant program.
7	Capital Improvements to Support State Personal Use Fishery	This project would construct three Fish Cleaning/Waste Transfer & Enforcement/Data Collection Stations. The three stations would be located at the North Beach, South Beach, and City Boat Launch.	\$ 300,000.00	In a recent candidates forum Governor Parnell stated that his administration is willing to invest State resources to mitigate the impact of the personal use fishery on the City of Kenai and the Kenai Peninsula.

**CITY OF KENAI  
CAPITAL IMPROVEMENTS PROGRAM (CIP) PRIORITIES  
FOR STATE & FEDERAL FUNDING REQUESTS FOR  
FY 2012**

PRIORITY NUMBER	PROJECT TITLE	DESCRIPTION	REQUIRED FUNDING	NOTES/COMMENTS
8	City of Kenai Recreation Center - Energy Upgrades/Improvements	This project would replace the major components of the heating ventilation system, replace wall coverings, replace/increase insulation in exterior walls and ceiling, replace the existing roof, and construct a new entrance.	\$ 500,000.00	
9	City of Kenai Wastewater Treatment Plant Upgrades & Renovations	This project would construct improvements to the City of Kenai's WWTP which would increase volume, decrease operating expenses and increase the quality of the effluent.	\$ 1,800,000.00	This is the first phase of a three phase project to construct improvements to the WWTP ans identified in the WWTP Master Plan prepared by CH2MHill in 2003.
10	Bridge Access Road, Pedestrian Pathway	This project would construct a pedestrian pathway from the Kenai Spur Highway to Kalifornsky Beach Road along Bridge Access Road. This area is heavily traveled by pedestrians, sight seer's, bicyclists, etc. This project is approximately 2 miles long and would complete the 24 mile Unity Trail that connects Kenai and Soldotna, along both the Spur Highway and Kalifornsky Beach Road.	\$ 2,000,000.00	I am not aware of any sources of funding that are available for this project, and several regulatory agencies (EPA, USDF&W) have expressed significant opposition to the project.

CITY OF KENAI

EXHIBIT A

**CAPITAL IMPROVEMENTS PROGRAM (CIP) PRIORITIES  
FOR STATE & FEDERAL FUNDING REQUESTS FOR  
FY 2012**

PRIORITY NUMBER	PROJECT TITLE	DESCRIPTION	REQUIRED FUNDING	NOTES/COMMENTS
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**OTHER PROJECTS WHICH WERE CONSIDERED**

	Garages (5) for Vintage Pointe Congregate Housing	This project would construct a building five garages for rent to residents of Vintage Pointe. Each garage would be 15'x20', heated, with an electrically actuated O/H garage door and a 3'0" personnel door.	\$ 125,000.00	Demand for garages at Vintage Pointe is questionable. The Council on Aging discussed this issue at several meetings and the Administration met with them and presented the results of a resident poll. Following Administration's meeting with the Council on Aging the Administration met with the residents of Vintage Pointe and it appeared support for paying \$200 a month for a garage was even less than the previous poll results.
	Momsen Subdivision, First Street Reconstruction	This project would re-construct First Street from California Avenue to Florida Avenue. This roadway exhibits differential movement of the curb & gutter and asphalt. Further the asphalt has and is failing.	\$ 360,000.00	Administration believes this project would best be funded from a State/Federal appropriation(s) such as priority #3, above.
	Central Heights Roadways, Street Lighting System Reconstruction/Replacement & Construction of a Storm water System	1. Replace the existing street lighting system 2. Replace the existing asphalt surfaced roadways and install new base material as needed 3. Install curb & gutter and a piped storm water collection system 4. Construct sidewalks	\$ 1,360,000.00	The cost estimate for specific components of this project is included in the attached information. The most practical project is probably to replace the lighting and asphalt (est. cost \$332,000). A storm water system is challenging as the subdivision was not originally designed taking into account surface/piped drainage. Curb & gutter is very expensive and it's installation would mandate the construction of a storm water drainage system.
	New Fire Engine	This new fire engine would replace an existing 26 year old fire engine. Our 1982 fire engine is the oldest equipment presently in use at the Fire Department, and was one of the last years in which "open jump seat" fire engines were allowed by code. The old engine has reached the end of it's useful life and should be replaced.	\$ 500,000.00	

# CITY OF KENAI CAPITAL IMPROVEMENTS PROGRAM (CIP) PRIORITIES FOR STATE & FEDERAL FUNDING REQUESTS FOR FY 2012

PRIORITY NUMBER	PROJECT TITLE	DESCRIPTION	REQUIRED FUNDING	NOTES/COMMENTS
	City of Kenai Indoor Turf Field Facility	This project would construct a 100'x200' indoor turf field, possibly as an addition to the existing Kenai Multi-Purpose Facility. The facility would be used by area schools, pre-schools, soccer and other organizations.	\$ 5,000,000.00	This project has been discussed by the parks & Recreation Commission and it is my understanding they wish to continue discussion on the subject. This project is certainly worthy of discussion but significant work needs to be accomplished to determine its feasibility.
	City of Kenai Campground for Tent/Vehicle	Project would construct a tent/vehicle campground located at the Kenai Sports Complex(?) located at Section 36	\$ 250,000.00	
	Lower Kenai River Drift Boat Pull-Out	Project would provide lower river access point for pull-out of drift boats only.	Unknown	ADNR is accomplishing a "Needs Assessment Study" scheduled to be finished in 2011. It's doubtful any funding would be available for this project in advance of the completion of the study, and that State/federal funding would be appropriated to a State Agency that would be responsible for the construction and operation of the facility.
	Kenai Spur Highway - Upgrade Five Intersections	This project is proposed to provide safety improvements to Beaver Loop, Thompson Park, Strawberry Road, Silver Salmon, and TBD to include turn lanes and lighting. Traffic accidents at these intersections usually involve at least one vehicle traveling at a high rate of speed, and are of significant severity.	\$ 3,000,000.00	This project has ranked high on the 2010-2013 STIP and funding is proposed in SFY 2011 for conceptual design, and ROW acquisition.
	Kenai Spur Highway - Upgrade to Five Lane configuration Between Soldotna and Kenai	Conflicting traffic patterns (through traffic vs business/residential traffic) and increased traffic counts have increased the number and severity of accidents between Kenai & Soldotna. Planned commercial developments will significantly increase traffic in the near future	\$ 30,000,000.00	This project has not ranked high on the 2010-2013 STIP. A predecessor project, the improvement of five intersections of this roadway has ranked well on the STIP and funding for conceptual study & ROW acquisition is proposed to begin in SFY 2011. The full five-lane project will not be considered for funding until the intersection project is through design, or possibly during construction.
	New Soccer Fields Irrigation	Project would design and install irrigation system for four soccer fields	\$ 250,000.00	



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# MEMO:

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*M*  
TO: City Council

FROM: Rick Koch

DATE: September 30, 2010

SUBJECT: Resolution No. 2010-57, State & Federal Capital Funding Requests  
for SFY12 & FFY 13

The purpose of this correspondence is to recommend Council approval of the above referenced resolution.

Council met in a work session on September 28, 2010 to review Administration's recommendations and to establish a priority listing for State & Federal capital funding request. The attached list and supporting information reflect the direction of Council.

Thank you for your attention in this matter.





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## **Kenai River Bluff Erosion/Stabilization**

The U.S. Army Corp of Engineers (COE) has determined that a project to halt the ongoing erosion is feasible. To date the COE has accomplished design to an 80% level, and over fifty-percent of the required NEPA documentation has been accomplished.

This important project can only be undertaken with the assistance of the State and Federal Governments. The congressional delegation has been able to appropriate approximately \$ 1.5 million over the preceding four years to forward the project through project scoping, planning, preliminary design and NEPA documentation, and another \$2 million is presently included in a Senate appropriations bill..

The latest project cost estimate accomplished by the U.S. Corp of Engineers for this project is approximately \$ 29 million.

A commitment to the project was made by the Kenai Peninsula Borough. The Borough Assembly adopted a resolution (attached) to provide Armor Rock, B-Rock, and Filter Rock for the project at no cost. The value of the Kenai Peninsula Borough commitment is approximately \$ 4,800,000.

The construction of this project will result in substantial investment and the creation of new and expanded businesses located on the bluffs above the mouth of the Kenai River.



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## **New Water Transmission Mains (Phase III)**

This project will replace approximately 3,200 lf of an asbestos cement piped water main, which is presently the sole connection from our water production facilities. The piping is approximately 40 years old and failures have become more frequent. Any failure of this transmission main is catastrophic to supplying water to the distribution grid.

This project will also construct approximately 2,500 lf of new distribution grid to create a connection with the transmission mains located in Lawton Drive and the Kenai Spur Highway.



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## **Paving Improvements to City Streets**

The City of Kenai owns and maintains over 64 miles of municipal roadways. Over 15 miles of these roadways are constructed only to improved gravel standards. Over the past three years the City has undertaken projects to improve approximately three miles of gravel roadways to a paved standard affecting over 300 properties. These projects include pavement, drainage, safety, and signage improvements.

Funding for these projects have been accomplished through local improvement districts (LID's), where the City, using City/State funding has funded 100% of the up-front costs of the improvements with assessments being levied upon properties in the LID for 50% of the project costs, resulting in shared 50/50 projects.

The city desires to continue this program of LID improvements, the benefits include but are not limited to:

1. Improving air quality
2. Improving the quality of storm water run-off
3. Decreasing maintenance costs
4. Improving safety
5. Increasing property values
6. Creation of local employment

Based on historical data, and contingent upon the condition of specific existing gravel roadways, \$1 million of funding will improve one mile to two miles of roadways to paved standards.



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## **Construct New City Light/Heavy Equipment Maintenance Shop**

The City of Kenai's Equipment Maintenance Shop provides services to the Public Works, Streets, Parks & Recreation, Fire, Police, and Senior Center Departments. It maintains over 400 pieces of City equipment.

The existing shop is over 30 years old, undersized, and not conducive to an efficient maintenance program. The size of the existing shop does not allow for the storage of equipment which is being worked and waiting for parts, resulting in the equipment being towed outside to make room for other maintenance work. Several pieces of equipment are too large for the existing shop, which is really only several connected large garages. When large equipment requires maintenance the work must be conducted outside. There is not a comprehensive ventilation system, nor is there separation between the welding area and the remainder of the shop. We use an adequate system of individual ventilators, but it is not an effective system. The parts room is a conex which has been connected to the shop. Bathroom/wash facilities are minimal, and the shop does not have a shower, other than in an emergency station.

The cost estimate for a new shop is as follows:

Sitework	\$ 100,000
Building Construction 150'x100'=15,000 s.f.	2,250,000
Fixtures & Equipment	500,000
Design, Administration & Contingency	<u>650,000</u>
Total	\$ 3,500,000



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## **Kenai Senior Center Vehicle Storage**

The City of Kenai owns and operates a Senior Center which provides a wide range of senior services including transportation and meal delivery. At present the Senior Center operates one fifteen-passenger bus, one ADA equipped van, two eight-passenger transportation vans, and two meal transport mini-vans. The amount of time it takes to adequately warm-up the vans during the winter months impacts the time available for senior transportation (especially in the larger vans) and meal delivery.

Maintenance and operations costs are also increased by the vehicles being stored outside. This project would provide for the construction of an 8 bay facility to accommodate present and future needs.

The cost estimate for the project is as follows:

Site Development	\$ 50,000
Utilities	25,000
Building (25'x100'=2,500sf @ \$100/sf)	250,000
Engineering & Contingency	<u>75,000</u>
Total	\$400,000



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## City Hall Heating Ventilation & Air Conditioning (HVAC) & Energy Conservation Improvements

The central administration building was constructed in 1980, when the cost of energy was a substantially lower percentage of overall building operation costs than it is today. The City had an energy audit of its buildings accomplished in 2007 which identified the City hall Building as having significant energy costs.

A cost estimate for the replacement of the HVAC System and Energy Conservation Improvements is as follows:

Demolition	\$ 40,000
Installation of new boilers (2 @ \$20,000)	40,000
Installation of new control system	50,000
Installation of new ventilation/air conditioning system	70,000
Installation of new insulated ducting system	20,000
Repair/Re-installation of Roof	40,000
Siding removal, insulation & siding replacement	90,000
Design & Admin	<u>50,000</u>
Total	\$400,000



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## State Personal Use Fishery, Capital Improvements

The State of Alaska Personal Use Fishery is both a positive and a negative for the City of Kenai. We welcome our Alaskan neighbors to take part in this fishery, however the activity has grown to such a level that the existing resources which the City provides are not adequate to respond to the crowds.

There are a number of issues which need to be addressed, these include enforcement, data collection, and State funding for capital projects to assist the City in providing a parking and camping area for the up to 15,000 individuals which participate in the fishery on a daily basis.

Our residential subdivisions near the beach are being over-run with vehicles/campers as they simply do not have alternative places to park. On one day during the last year's season an estimated 15,000 people were participating in the fishery at the mouth of the Kenai River, and 10,000 participants is commonplace.

One specific issue is the amount of fish waste that is deposited on tidelands owned by the City. When participants clean fish the fish waste is often thrown into the river/ocean where it ends up being washed up to the tideline. The City attempts to remove the decomposing fish wastes each evening by utilizing a tractor with a rake to transport fish wastes.

The City recommends that fish cleaning stations be constructed in three locations, (North Beach, Boat Launch and South Beach) and that disposal of fish waste from the personal use fishery into the Kenai River be prohibited by regulation.

Estimated costs for the construction of three fish cleaning stations, is as follows:

Water Systems	\$100,000
Site Preparation	30,000
Wastewater Disposal Systems	60,000
Cleaning Facilities & Appurtenances	75,000
Design, Administration & Contingency	<u>35,000</u>
Total	\$300,000

The fish cleaning stations could also be used as data collection, and enforcement stations for ADF&G and AST Brownshirts.



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## **City of Kenai Recreation Center Energy Conservation Upgrades**

The City of Kenai Recreation Center was constructed in 1982 when the cost of energy was a significantly less costly component of overall building operation. This project will replace the existing heating system, replace lighting systems, replace building control systems, and increase insulation in selected areas of the building.

Estimated Costs are as follows:

Demolition	\$ 40,000
Roof Insulation & EPDM	80,000
Replace Boilers (2)	50,000
Replace Control, Systems	75,000
Replace Exterior Windows & Doors	25,000
Replace Lighting Fixtures & Controls	40,000
Replace HVAC System	100,000
Design, Administration & Contingency	<u>90,000</u>
Total	\$500,000



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## **City of Kenai Wastewater Treatment Plant Upgrade & Renovations**

The City of Kenai's Wastewater Treatment Plant (WWTP) was constructed in 1982. It was sized to accommodate a population of 11,650 people and an average wastewater flow of 1.3 million gallons per day (mgd). The present population of Kenai is approximately 8,000 and average wastewater flow is 0.90 mgd, or 70% of the plant design capacity.

A Wastewater Facility Master Plan was completed in March 2004 by CH2MHill. The cost estimate for recommended improvements totaled \$ 5,198,000 (in 2004 dollars) and were identified as being accomplished in four phases. Estimated costs have been increased by 32% to account for construction inflation. These four phases were as follows:

<u>Phase</u>	<u>Description</u>	<u>Cost Estimate</u>
1	Activated Sludge System Improvements	\$ 3,040,000
2	Suction/Jetter (Vactor) Truck*	-0-
3	Pretreatment Process Improvements	1,450,000
4	Aerobic Digester Solids Handling Systems	<u>1,850,000</u>
TOTAL		\$ 6,340,000

\*Phase 2 shows a \$ -0- cost estimate as this equipment was already purchased by the City of Kenai in 2008.

This grant application encompasses improvements identified, in part, in Phase 1 of Capital Improvements Summary in the Master Plan, the installation of a second sludge belt press, and a 1,000 s.f. addition to the WWTP Control Building.

Below I will discuss each of the Phases identified in the Capital Improvements Summary, the second sludge belt press and how the City proposes to phase the WWTP Upgrades.

## **City of Kenai Wastewater Treatment Plant Upgrades – Phase I**

### **Sludge Belt Press - \$ 485,804**

The existing sludge belt press is 25 years old, and while not functionally obsolescent, it requires major maintenance/upgrades in the near future to maintain system reliability and compatibility with control systems.

The installation of a second sludge belt press will provide system redundancy and allow for the existing sludge belt press to be taken out of service for an extended period (4-6 months) while major maintenance upgrades can be accomplished.

### **Activated Sludge System Improvements - \$ 880,000**

1. Upgrade Fine Bubble Aeration - \$ 380,000  
Upgrade Aerobic Digester Blower System - \$ 270,000

The blowers currently provide three to four times the necessary oxygen concentration to the aeration basins and there is no way to efficiently control this with the existing equipment. The installation of one small blower with a variable speed motor, the installation of variable speed motors on the existing blowers, the installation of a new control system, and replacing the coarse bubble diffusers with fine bubble diffusers will result in improved treatment and a significant drop in power consumption.

2. Upgrade Waste Activated Sludge (WAS) System - \$ 200,000  
Upgrade Return Activated Sludge (RAS) System - \$ 30,000

The activated sludge treatment process works best when a steady low flow of sludge is returned to the aeration basin (RAS). The pumps currently in use return too much sludge in too short a time to the aeration basin resulting in system failures, increased maintenance and increased energy consumption.

The WAS pumps currently in service are a progressive cavity type that requires frequent service. Replacement with a simple centrifugal pump system would lower maintenance costs and improve treatment efficiency by allowing a steady flow of sludge to the aerobic digestion tank rather than large intermittent flows.

The upgrades to the RAS & WAS Systems, and the upgrades to the aeration system will significantly improve the performance of the WWTP in terms of decreasing the costs of aeration, improving the settleability of the sludge, and minimizing/eliminating permit non-compliance incidents.

### **WWTP Control Building Expansion (+/- 1,000 s.f.) - \$ 301,950**

The addition of a second sludge belt press will require the re-location of the WWTP laboratory. There is not sufficient space anywhere within the existing building to accommodate laboratory

operations. The construction of a 1,000 s.f. addition to the WWTP Control Building will provide the room necessary for a fully functioning laboratory sufficient to support the operations of the WWTP.

## **FUTURE PHASES OF THE CITY OF KENAI WWTP UPGRADES NOT SUBMITTED UNDER THIS ADEC MUNICIPAL MATCHING GRANT APPLICATION AT THIS TIME**

### **City of Kenai Wastewater Treatment Plant Upgrades – Phase II**

#### **Filament Control System Improvements - \$ 2,100,000**

The City of Kenai's WWTP periodically encounters problems with a floating sludge blanket. This is caused by the predominance of filamentous organisms in the activated sludge. The aeration basins will be modified to a plug flow regime and provide an anoxic zone in the first third of each aeration basin. This will improve activated sludge settling by minimizing filamentous organisms in the activated sludge. As a result the City will no longer need to operate both secondary clarifiers. This will reduce energy consumption and provide redundancy in the system.

### **City of Kenai Wastewater Treatment Plant Upgrades – Phase III**

#### **Pretreatment Process Improvements - \$ 1,455,000**

1. New Pump House - \$ 435,000

The existing pump house is undersized and is nearing the end of its useful life. The addition of sophisticated control systems and other improvements requires additional space in order to maintain system integrity and reliability.

2. Influent Manhole Modifications - \$ 60,000

Grease accumulates in the existing influent manhole. At times this grease layer will be as much as five-feet thick. Presently the vactor truck is used to remove grease from the influent manhole and transport to the WWTP. This modification would provide a system to pump the grease from the influent manhole to the aerobic digester for treatment.

3. Grit Removal Cyclone - \$ 120,000

This would provide for grit removal in the pretreatment process. The system currently includes two rotary screens, a by-pass screen, and screenings conveyor. They are not used because they are quickly overloaded by the material entering the plant during peak flows. This improvement would allow provide for washing, and compacting the collected screenings as is required.

#### 4. Bar Screens/Grinder Station - \$ 840,000

There are several areas in the wastewater collection system in which pretreatment of wastewater through screening and grinding would be beneficial. Wildwood Prison and future services comprised of fish processing plants. This will require further engineering review prior to a specific scope of work being identified.

### **City of Kenai Wastewater Treatment Plant Upgrades – Phase IV**

#### Aerobic Digester Solids Handling - \$ 1,840,000

These improvements include, mechanical improvements for the aerobic digester, an upgraded solids handling system, and re-coating the aerobic digester. Obtaining a sufficiently high concentration of solids is difficult. A higher concentration of solids will mean lower influent flow and longer residence time within the digestion tank. Twelve to eighteen days residence is typically required for adequate digestion of sludge when there is no primary settling in the WWTP process. Presently there is only eight days digester residence time.

To increase the solids concentration entering the sludge digestion tank, a gravity belt thickener will be installed. This will increase the capacity of the existing aerobic digestion tank to meet the projected waste loads for at least the next twenty years, and minimize/eliminate permit non-compliance incidents.

Re-coating of the 423,000 gallon aerobic digestion tank may move up to a higher priority based on inspections that will be accomplished this year. The purpose of the tank is to hold waste sludge, and through aeration inactivate any harmful microorganisms. The City of Kenai's WWTP does not have a redundant component for this process. Since the tank's construction in 1982 it has not been re-coated. If this aerobic digester tank were out of service for any extended period, the WWTP process would be severely impacted.



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## **Bridge Access Road Pedestrian Pathway**

The Kenai-Soldotna Unity Trail is designed to make an approximate 20 mile loop from Kenai to Soldotna on the Kenai Spur Highway. Then through Soldotna along the Sterling Highway to Kalifornsky Beach Road, then along Kalifornsky Beach Road to Bridge Access Road, then along Bridge Access Road to its intersection with Kenai Spur Highway, the beginning of the trail.

The trail is fully constructed with the exception of the approximately 3 mile long section along Bridge Access Road.

The cost estimate to construct the pedestrian pathway is as follows:

Paved Pedestrian Pathway (8' wide) 16,000 l.f.	\$1,600,000
Design, Administration & Contingency	<u>400,000</u>
Total	\$2,000,000