TOWN OF PARADISE
WASTEWATER TREATMENT
HISTORICAL BACKGROUND AND COMPARATIVE ANALYSIS

INTRODUCTION:

The single greatest obstacle to business and economic growth, including more jobs, investment, and re-investment in Paradise, has been the lack of a sewer system serving the commercial areas of our Town.

This has been the Town's unfortunate legacy, as well as the primary obstacle that the Town has had to contend with as a result of a misguided City Council decision in 1993, that completely reversed and set-aside thousands of dollars over the years that were spent on studies, bonds sold, and even a district formed to sewer the commercial areas of our community.

It was an example of a tremendous lost opportunity that has profoundly set the Town back in being able to diversify and strengthen its business economy, to realize greater local consumer choices and job opportunities for our citizens, and to increase Town revenues that would have vastly improved essential services, such as police and fire services, and streets and roads maintenance and improvements.

This lack of a fundamental sewer infrastructure to serve our commercial areas makes business growth and expansion far more complicated, more costly, and less cost-effective for our existing business community, and in attracting outside business interest in our community.

In other words, while the Town does everything right in terms of a well-documented record of pro-business and business growth-oriented goals, policies, practices, and programs that include but are not limited to one of the more streamlined business development review and approval processes in the county, a pro-active business assistance team that works with and nurtures prospective business development projects, keeping development fees the lowest in the county, and providing such incentives as development fee payment deferral and mitigation programs; the lack of a basic commercial sewer system seriously undermines, as well as contradicts these well-intentioned efforts.

With the lack of a commercial sewer system, and with the complications surrounding the application of commercial septic systems, the Town is simultaneously sending out two conflicting messages – that we're pro-business in terms of goals, policies, practices, and programs, but anti-business in terms of the wastewater infrastructure serving our commercial areas.

This is not to say that the Town hasn't tried to make the best of a difficult situation with few options since sewers were rejected in 1993. Our onsite wastewater management program is a

highly regarded program by the state, and has done a tremendous job in preventing ground water and surface water contamination in our community.

The Town of Paradise currently relies upon over 11,000 individual septic systems to treat and disperse wastewater generated by residential and commercial land uses. The degree and intensity of use for each property in the community is limited to the capacity to safely dispose of wastewater on site.

As the Town has grown and evolved, the need for a better means of wastewater collection and treatment, especially in our commercial areas, has become more urgent. This is particularly true within the Town's more intensively developed Downtown and other commercial areas where septic system failures are increasing and available land for replacement leach fields is constrained, or non-existent.

Over the last three decades, even before the Town's incorporation, the effects of wastewater from the Town's onsite systems have been studied as to their impacts on local streams. These early reports indicated that although carefully monitored and repaired onsite systems represented a permanent solution for residential areas, the Town's commercial areas would be severely limited if a more permanent solution was not attained.

Early reports predicted serious economic impact on the Town's commercial sector.
Even in a healthy economy, many of our commercial businesses cannot afford the high cost of septic system repairs or replacement; or the alternative, which is such limitations on their business operations as limiting the number of tables allowed in restaurants, the number of chairs in a salon, or the number employees that a business can hire. Septic systems even limit, or altogether prevent existing businesses or commercial property owners from expanding, or developing their property to its fullest potential.

Restrictions such as these, not only limit jobs and profits. They also have a deleterious effect on the overall local economy and its ability to grow, broaden, and diversify in the good times, as well as makes our narrow local economy that much more weak and vulnerable during the kind of long, sustained economic downturn that we're presently experiencing.

There has been an extended history of studying and planning for a sewer system to serve the commercial areas in Paradise. The following studies and reports support these claims and set the foundation for current and ongoing wastewater treatment solutions.

HISTORICAL BACKGROUND

<u>Butte County General Plan Water & Sewer Element (1969)</u>

This *preliminary* sewer system plan for Paradise and adjacent Upper Ridge communities was developed in 1969 by Butte County. This developed into a more comprehensive plan called the Eden Ridge and Basin Sewer Service Area Plan (Cook, 1972,) which proposed a gravity sewer

system connected to trunk sewers located on Clark and Pentz Roads treated by aerated lagoons and effluent disposal by land irrigation in the vicinity of Butte College.

A few years later as part of the general improvements to the Skyway, the beginning of a central wastewater collection system was started. Approximately 765 feet of 8 and 10 inch diameter trunk sewer pipe was installed under the Skyway, which may no longer be suitable for use in any newly proposed district.

Wastewater Management Study – Phase I Report (May, 1983) by James M. Montgomery, Consulting Engineers, Inc.

In a Water Quality Management Plan for Paradise and Magalia completed in 1979, it was concluded that much of Paradise was suitable for the continued use of on-site septic systems, and that centralized wastewater treatment should be constructed to serve the central Skyway area. It was also noted that additional water quality data should be collected to fully assess the operation of the onsite systems in Paradise.

To perform the recommended water quality monitoring and to evaluate the operation of the onsite systems more fully, the Town of Paradise initiated the process by receiving a Federal Clean Water Grant from the State Water Resources Control Board. The firm of James. M. Montgomery, Consulting Engineers, Inc. was selected to do the Step I Facilities Planning Study in 1980.

The objective of this original study was to evaluate the cumulative impacts of existing wastewater management practices in the entire Town of Paradise and to identify existing and potential water quality or public health problems associated with the continued use of onsite wastewater treatment systems. Based upon an evaluation of water quality data, soil characteristics, groundwater hydrology, topography, and septic system performance, it appeared that septic systems in major portions of Paradise are adequate. Through careful planning, proper maintenance and repair of failing systems, the need for centralized facilities in this area may be postponed or avoided. (Letter from Patrick L. Burke, Project Engineer dated May 3, 1983)

The project team found that the most severe water quality degradation occurred in the Upper and Middle Honey Run and Lower Skyway Basins, which encompass approximately 1,000 acres of dense commercial development. The report recommended that centralized wastewater management facilities be considered for these areas. (p.2-3)

The report further recommended that preventative planning and educational measures be adopted to ensure the continued effectiveness of onsite wastewater treatment for the remainder of the Town, which is largely residential. The report claimed that Paradise is the largest, incorporated unsewered community in California and called for further testing to determine the extent of water quality degradation in the central commercial area. (p.2-4)

Wastewater Management Study Supplementary Phase I Report (March, 1984) by George Tchobanoglous, Consultant – Davis, California

The Town of Paradise and the Regional Quality Control Board jointly agreed to conduct further tests during a wet period (May-July, 1983) and a dry period (September-October, 1983.) The results of the additional sampling and an ensuing analysis were presented in this report by George Tchobanologlous.

After collecting and analyzing water quality data, soil characteristics, groundwater hydrology, topography, onsite system performance, along with the data collected in the 1983 Montgomery Report, it was concluded that the level of wastewater treatment provided by well-managed and controlled onsite systems were adequate and that centralized wastewater management facilities were not warranted at the time. However, the report stated that as the Town continued to develop, centralized facilities would be needed along portions of the central Skyway area because of hydro-geological limitations. (p. 29)

The report called for short and long term needs to address the issue. Short term needs included regulations for new construction; regulations for commercial development along the central Skyway area; and adoption of a Sewage Disposal Ordinance. Long-term needs included an onsite wastewater management district; public education; possible sewerage treatment along the central Skyway area; and plans for the disposal of septage. (p.30)

The report states that it was prudent and mandatory for the Town to develop a long-range plan for providing centralized wastewater management in the central Skyway area, as future commercial development may not be possible without a wastewater treatment facility. The long-range planning effort called for an analysis of alternative collection systems; the identification of potential wastewater treatment sites; effluent and sludge treatment; and disposal options. (p.32-35)

In summary, this study reported high ground water, a shallow soil mantel and concentrated commercial development on small lots, as the reasons for needed wastewater treatment. In order to accommodate future development, plans should be made for centralized wastewater management for selected locations along the central Skyway area. (p.42)

Wastewater Management Plan Phase II Report (1985) by R.A. Ryder & Associates

This report studied the conditions posed in the Phase I Report, comprehensively studied and evaluated alternatives, and provided recommendations to manage wastewater disposal in order to protect public health, protect water quality, and retain and enhance social and economic vitality within the Town of Paradise. (Ryder, September 9, 1985)

While the first two reports focused primarily on Skyway, this report mentions that Clark Road commercial and industrial areas would also need treatment in the future due to shallow soils and the increased capacity for density in the future. (Ryder p. VI-10)

This report studied various methods and locations for both treatment and disposal and also studied the viability of an onsite wastewater district to ensure effective functioning of existing systems.

The recommendation was for the Town to adopt an onsite wastewater management zone; form a special assessment district to provide sewer treatment and disposal at a plant constructed on lower Neal Road; to provide for septage handling and disposal; provide hazardous waste receiving storage and transfer; and to hire an engineering and financial consultant to provide definite concepts for funding, land acquisition and implementation of both the onsite wastewater management zone and central area waster system.

Sewer Project Feasibility Study, (March 1989) by Kennedy/Jenks/Chilton

Continued study of the feasibility of different types of treatment and collection were the subject of this report. The recommendation was to proceed with the formation of a Special Assessment District to fund the design and construction of a conventional gravity sewer system for Skyway and Clark commercial corridors, with an aerated lagoon system and an advanced treatment system for further treatment prior to discharge onto property south of Neal Road near Elliot Spring (former McKnight Ranch property). (K/J/C March, 1989). An Environmental Impact Report was prepared by Quad Consultants in 1989.

On October 25, 1990, via Town of Paradise Resolution No. 90-47, the Town Council officially formed a Wastewater Design Assessment District for the purpose of developing a wastewater collection, treatment and disposal facility. The proposed sewer system was to serve only the core commercial area of the community.

Pursuant to the procedural requirements of California State Law, a protest hearing was convened on November 29, 1990 during which a number of citizens expressed concerns and voiced opposition to the formation of the district and the subsequent development of a sewer system for the Town. However, the volume of written and verbal protests received by the Town was insufficient to prevent progress toward formation of the district and development of the planned sewer system. At the conclusion of the hearing, the Town Council adopted Town Resolution No. 90-55, thereby overruling the protests.

Opposition to the project then manifested itself into an effort to recall seated members of the Town Council based upon their support for the project. The recall effort was successful in that four of the five seated Council members ware recalled and four new members were sworn into office on July 21, 1992. Efforts to dismantle the Wastewater Design Assessment District proceeded rapidly and on January 5, 1993, unanimous direction was given by the new Town Council that all work regarding the development of a sewer system to serve the core commercial areas of the Town be stopped. Subsequent resolutions were adopted on March 30, 1993 to begin the retirement of bonds and to formally abandon the sewer project.

RECENT BACKGROUND

As stated above in the historical timeline, the Town has explored many options, alternatives and locations for implementing a comprehensive alternative to on-site wastewater treatment and disposal. Because of the unfortunate decision to stop the progress of sewering the downtown and commercial corridors, business owners, property owners, developers and investors have all suffered the consequences. The consequences, which were predicted by all of the early studies and reports listed previously, are now being recorded in the maintenance and repair records for our commercial systems by our Onsite Wastewater Management District staff.

For instance, in reviewing Onsite records and discussing wastewater issues with Onsite staff, several businesses lack the physical area to repair their current wastewater system, which will require business closures unless alternate treatment is found off site. Several other businesses have completed expensive repairs to their engineered systems totaling as much as $250,000. We have six businesses in Town that currently have a "holding tank" that requires pumping every three months. This is not only expensive, but limits their business capacity to small retail and limits their employees to a maximum of two. These are very real statistics that currently exist throughout our commercial business zones.

In recent discussions with Onsite staff, an informal survey was taken of the downtown and former RDA project area. The purpose was to determine the extent of failures over the next 5-10 years and also to determine if those failures would have constraints such as high water tables and small parcels. Nearly every parcel in the downtown will have issues and experience expensive repairs. This will further impact the businesses downtown that are already experiencing economic issues.

In 2000, the Town Council adopted the Downtown Master Plan, which identified a clustered septic wastewater treatment system as critically important to the physical and economic revitalization of the Downtown.

The adopted Redevelopment Plan, in 2003, further identified and listed as a priority redevelopment funded project, a wastewater collection and treatment system that would serve the Downtown and parts of the RDA Project Area.

Since that time, the Town and its redevelopment agency evaluated various possible sites for a clustered septic wastewater treatment plant, both inside and outside of Town.

Town staff, NorthStar Engineering, and PID, among others, met to review previous work and look into possible solutions. This leads us to a more recent report by North Star Engineering entitled "*Final Wastewater Treatment & Collection Feasibility Study for the Town of Paradise Downtown Community Cluster System.*" This report analyzed the feasibility and cost associated with the construction of a community wastewater collection system designed to serve a defined area that would transport the wastewater to an off-site location.

This current effort took all prior studies and information into account, plus had the added benefit of applying new and improved methods of testing and treatment. All new and prior analyses concur that eliminating reliance on individual septic systems would allow businesses to develop and expand based upon the needs of the business and customer demand instead of being subject to the strict limitations of on-site wastewater disposal. However, the Town has the lost the ability to use Redevelopment funding for this important infrastructure and the Town has also lost a previous EDA grant that covered the cost of the 1990 collection system.

On August 2, 2011, the Town Council considered and discussed a Council Agenda Summary prepared by key members of Town staff providing an outline of three primary conceptual options for providing a community wastewater system for the Downtown area and other commercial corridors within the Town of Paradise. The main purpose of the agenda summary was to provide an opportunity for the Town Council to identify the most preferable wastewater system solution and provide direction to staff regarding the conduct of additional research and identification of steps toward the eventual establishment of a community wastewater system.

The potential area of benefit is at this time envisioned to include the Downtown, all of that area formerly known as the Redevelopment Project Area (RDA) and potentially other commercial areas of the Town that are not included within the RDA or the Downtown, e.g., the Clark Road commercial corridor from Pearson Road to Wagstaff Road. There are approximately 1,206 parcels in the conceptual area of benefit along Skyway, Pearson Road and Clark Road.

The three conceptual options considered are briefly described as follows:

Option 1: This option consists of a STEP (Septic Tank Effluent Pump) collection system with the construction of a secondary treatment plant located on lower Skyway west of the Town limits. A STEP system requires each property to have an appropriately sized septic tank to hold and separate the effluent, which is then transported through a pressurized network of pipes to a Membrane Bio Reactor (MBR) treatment system. The dispersal field area, although adequate for the initial phase of the collection system (Downtown and smaller adjacent commercial and residential areas), cannot accommodate future phases to include all RDA areas, most of the Pearson and Clark Road commercial corridors.

Option 2: This option would involve partnering with the owner of an 18-hole golf course located on lower Skyway and includes wastewater re-use for the golf course irrigation and a potential future housing development project. The system would be designed to transport effluent via a gravity pipe buried within the Skyway public right-of-way from the Town of Paradise to the golf course. Variations to the gravity system with pumping stations and storage tanks may be necessary depending on the ultimate design. The need for one or more large storage ponds to store approximately 90-days worth of treated sewage during the wet season is one drawback to this option. In addition, it is apparent from a recent Engineer's report that the golf course could accommodate the land application of treated effluent generated by all phases of this project.

Option 3: This concept was developed through preliminary discussions between staff and the City of Chico and provides the possibility of a mutually beneficial arrangement between the two jurisdictions. The Town of Paradise would tie into Chico's existing sewer collection system which conveys sewage to their state-of-the-art water pollution control plant, which has adequate capacity for all phases of the collection system. The system would be designed to transport effluent via a gravity pipe buried within the Skyway public right-of-way from the Town of Paradise to the City of Chico's collection system. Some pumping stations and storage tanks may be necessary, as in Option No. 2. Further discussions with the City of Chico and Butte County are needed to finalize the details of this system. This option eliminates the necessity for onsite septic tanks and minimizes ongoing maintenance and pumping costs. This option also eliminates the need for the Town to acquire a State Regional Water Quality Control Board's Waste Discharge Permit since the City of Chico already has a permit for the operation of their treatment plant. Obtaining such a permit would require extensive compliance monitoring and reporting and would be expensive to maintain.

At the conclusion of their discussion, the Town Council directed staff to further research the advantages and disadvantages for Option No. 2, the City of Chico option; and Option No. 3, the Tuscan Ridge Golf Course option. Staff's research in this regard focused on the following issues:

- The differences between the two alternatives in terms of regulations, permits, regulatory processes, expediency and complexity;
- The differences in cost and time to construct each alternative's collection system;
- The differences and opportunities for funding and financing for each alternative;
- An estimate regarding which alternative is the least expensive, including the life cycle costs for the end user customer;
- A determination of which alternative represents the least liability exposure for the Town and its customers;
- A determination of which alternative retains for the Town Council more local control; and
- A determination of what environmental benefits are provided by each alternative.

The following discussion is a compare/contrast analysis between the two options that the Council directed staff to further develop. The discussion also includes an Updated Conceptual Flow and Cost Estimate for Expanded Commercial Corridors Servicing Skyway, Pearson and Clark Roads, dated February 20, 2012, by NorthStar Engineering.

DISCUSSION

Regulatory Requirement Comparisons:

The California Regional Water Quality Control Board (RWQCB) permits the operations of wastewater treatment facilities. The regulatory process for issuing permits to new facilities is extensive and according to RWQCB staff, standards for operation are becoming more rigorous

as environmental concerns and liabilities increase in the State. The RWQCB staff has also expressed that substantial policy shifts are occurring that will allow fewer treatment plants and require a more regional approach to wastewater treatment.

Although both options require permitting through the State RWQCB, the City of Chico currently has both collection and discharge permits and the Town would only be required to obtain a collection permit for the installation and operation of its sewer trunk line. The entire environmental review and permitting process for this option could take up to 2 years.

The Tuscan Ridge option would require a Waste Discharge Permit for the treatment and dispersal of treated wastewater. Such permits establish stringent performance standards and set parameters for sampling and reporting frequencies. The permit is also fluid and may be altered by the State when more stringent environmental safeguards are created throughout the State. The entire environmental review and permitting process for this option could take up to 3 years and it is questionable as to whether the State RWQCB would permit a wastewater treatment plant facility that is large enough to accommodate the entire projected wastewater flows. The Tuscan Ridge area has very shallow soils without optimum conditions and there are no acceptable dispersal rates that would allow all of the wastewater from the Paradise service area to be dispensed at this site. For this and other reasons, the State RWQCB has expressed their strong preference for the Chico option.

Currently the existing septic system serving the golf course at Tuscan Ridge is only allowed to disperse the treated septage effluent 6 months out of the year. If this same condition were required by the State RWQCB for the Paradise community wastewater system, the storage pond sizing would be substantially larger than current estimates. A permit for the construction and operation of the storage ponds is required from the California Division of Safety of Dams. A permit may also be required under Butte County Resolution 87-108, which is purportedly being amended; and, therefore may not be an impediment to this option. It is estimated that the permitting process from the State RWQCB and the Division of Safety of Dams for the Tuscan Ridge option would take an additional 12 months longer than the Chico option.

The Butte County Local Area Formation Commission (LAFCO) exercises some control over regional facilities. However, if the Town's newly created wastewater district remains within the Town's established boundaries and if the pipe to Chico remains closed, LAFCO would not be involved in the regulatory process.

Both options will include a gravity pipe to be placed in the established Skyway right-of-way, which will require an encroachment permit that would be issued administratively by the Butte County Public Works Department. The encroachment permit would most likely be subject to conditions of approval addressing traffic control, construction safety, roadway repair, etc. In addition, the Tuscan Ridge project must also undergo permitting and environmental review processes through Butte County to establish a planned unit development on the site.

In comparing the regulatory requirements for both options, the Chico option would require less cost and time in the permitting processes.

Construction Cost Estimates

At the August 2, 2011, Town Council meeting NorthStar Engineering provided initial estimates for the three options. During the meeting, Mo West, owner of Tuscan Ridge, claimed that the estimates were not accurate. He provided a Preliminary Engineer's Report from a wastewater treatment company that suggested the cost for the complete build-out of the Tuscan Ridge Option at 534,000 gpd would be $8,365,416. A subsequent review by staff, and NorthStar Engineering, determined that this report addressed only the cost of the treatment plant, which is a small portion of the total costs. Not included in the Tuscan Ridge owner's cost estimate were the costs associated with:

- The collection system throughout the Town of Paradise
- The conveyance system that carries the wastewater from the Town limits to Tuscan Ridge
- Engineering and Construction Administration for the collection and conveyance system
- Upgrades to the spray dispersal system at the golf course, including monitoring wells
- CEQA compliance and State permitting, including Antidegradation analysis
- Storage pond construction and permitting (45 million gallon capacity at that time)

Construction Costs of all Phases

A recent Engineer's report provided by NorthStar Engineering has provided updated construction cost estimates for the expanded project boundaries that are now comprised in four phases (see attached report.) The new project boundaries include the prior Skyway corridor areas that comprised the former Redevelopment areas (RDA) and are also includes those areas on Skyway that are between the former RDA areas and extending west of Neal Road. Also included in the new service area is the Clark Road commercial corridor between Buschmann and Wagstaff roads. The Pearson Road corridor between Skyway and Clark roads is still included. The total wastewater flow anticipated from this entire service area is estimated at 822,000 gpd when all hook-ups are made.

Given this adjusted design flow of 822,000, the total construction cost for the Tuscan Ridge option, comprising the three components of collection/conveyance, treatment and dispersal is $41,130,000. The total construction cost for the Chico option which majority of the construction is comprised of just collection and conveyance systems is $28,779.000. There are no additional up-front construction costs for treatment or dispersal associated with the Chico option, because the Chico WPCP is already in place and has the capacity to accommodate the entire wastewater flows from the Paradise project.

Operational and Maintenance Costs for the Treatment Plant

It is important to note that Operational Costs do not include the Total Fee for Service Cost that the end user customer pays. The Operational Cost is a part of the consumer fee but other costs such as Financing Cost, Collection System Maintenance Costs, Annual Permit Costs and Life Cycle Costs (replacement) are included when assessing the Total Fee for Service Cost. Financing Costs have variables such as; grants received, interest rate secured, duration of loans, etc. Collection System Maintenance Costs will be secured by a contract yet to be negotiated. Life Cycle Costs are dependent on which option is chosen, and for the Chico option will be considerably less because the components of the system to be replaced will not include a treatment plant as they would for the Tuscan Ridge option.

Chico Option:

In preliminary discussions, the City of Chico has indicated that the charge to the Town of Paradise for their wastewater flows would be negotiated in an agreement between the two cities, similar to what they have with Chico State University. The arrangement would be a fee based primarily on the volume flowing into the Chico system. Under this model, Paradise would be treated much like a large industry that had a straight pipe discharge into the Chico collection system and would be charged a consumption rate. Currently the rate that CSUC pays is an average $2.05/ccf (748 gallons). It is impossible at this point to determine the rate that we would be charged, but for comparison purposes, staff assumed a rate increase of 10% for non-resident status. For Chico residents, a typical household with an average wastewater flow of 200 gpd would be apportioned an Operational Cost of approximately $18.00/month. This is a flat cost to the end user and does not fluctuate with the amount of wastewater collected from the Paradise service area. As discussed above, other fees would be added to this Operational Cost including a volumetric cost associated with the maintenance of the trunkline and the treatment plant capacity.

The Chico WPCP operation costs, as well as sampling and State RWQCB permit reporting, will be maintained by the City of Chico. These maintenance costs are at a reduced rate compared to the Tuscan Ridge option because the City of Chico already has personnel, a maintenance program, a sampling and testing program, a facilities operations program, and a permit reporting program in place. Additionally, the workload created by inflow from Paradise, will be small proportionate to the existing flows already received from Chico; therefore, the cost per gallon to operate and maintain this treatment plant will be effectively less than if a new treatment plant were built.

Maintenance of the collection and conveyance system would be the same for either option except that the Chico option requires maintenance of an automated lift station at the Butte Creek Crossing and an additional 4.8 miles of gravity trunk line extending into the City of Chico's collection system.

Tuscan Ridge Option:

Operational Costs for the Tuscan Ridge option include at least three certified, full-time employees to run the treatment plant. Components of the Operational Costs would also include minimum weekly laboratory testing, septage solids removal, data collection and report writing. Maintenance of the storage ponds as well as a sludge handling component of the treatment plant is also necessary. Approximately 5 cubic yards of sludge will be generated at the plant on a daily basis and will require off-site disposal. Dam maintenance as per the permit issued by the Division of Safety of Dams will be required for the approximate 16 acres of storage ponds (20 feet deep). Dam data collection may be required on a weekly basis as well as reports submitted annually. Maintenance of the collection and conveyance system in the Tuscan option is the same as the Chico option except the Chico option has an additional 4.8 miles of trunk line.

It is estimated that the Operational Costs would be approximately $350,000/yr. When the full build out of an 822,000 gallon per day system is achieved in the Paradise service area, this cost will result in approximately $.87/ccf (748 gallons) end user fee. For an average household with a wastewater flow of 200 gpd this Operational Cost would be about $7.00/month which is less than the similar Chico operational cost of $18/month. This fee is tripled, though, when only a third of the total wastewater collection occurs and doubled when only half of the total collection occurs. In other words, the operational cost for the Tuscan Ridge option is only realized at full build-out of the system.

The other costs that make up the remaining components of the Total Fee for Service would apply more to the Tuscan Ridge option than to the Chico option. Finance Costs will be higher because the Tuscan option is shown to cost almost $30 million more. Additional costs associated with the Tuscan option include a permit that the Town of Paradise would have with the State RWQCB. This permit has maintenance requirements including extensive quarterly and annual reporting and weekly and sometimes daily monitoring of wells, creeks, piezometers and run-off. Life Cycle Costs needed for the complete replacement of the treatment plant and dispersal system components must also be added into the Tuscan option. These “extra” costs not associated with the Chico option would be significant and cause the Total Fee for Service to the end use for the Tuscan Ridge option to be substantial.

Costs to increase the treatment component of the facility as the collection system is expanded through the town at full build-out:

The Chico WPCP has unused capacity of 5 million gallons per day in their plant and on their State waste discharge requirement permit. The Chico plant has no known immediate expansion costs associated with increased flows from Paradise.

The Tuscan Ridge option contains Membrane Batch Reactors or other treatment units that are modular in design. Increased capacity is engineered into the design; therefore, as flows increase and plant capacity is expanded, the costs increase for the additional plant modules.

Projected Construction Timelines

SEWER PROJECT CONSTRUCTION – TENTATIVE TIMELINE*		
Task	**Chico Option**	**Tuscan Option**
Environmental Review Process	15 mos.	20 mos.
Other Regulatory Permitting Processes	24 mos.	36 mos.
District Set-up	15 mos.	15 mos.
Actual Construction	15 mos.	15 mos.
TOTAL	3-4 YEARS	5-6 YEARS
* Not actual times. Many tasks can be done concurrently. Some tasks depend on weather. Outside agency permitting timelines are hard to guesstimate.		

Once the environmental review is completed and federal, state and local permits are secured; the construction times, including the bid process for both options, are estimated to be the same at approximately 1.25 years. Both options are identical in engineering and construction within the town limits and down to the Tuscan Ridge Golf Course entrance. From there, the Chico option differs in that the gravity main continues down Skyway to a lift station close to the Butte Creek crossing. After the lift station there is a connection station close to the Chico City limits. The Tuscan Ridge option turns south at the golf course entrance off of Skyway. Here the gravity main enters the golf course carrying the wastewater to the treatment plant located therein.

Environmental Review Process

Development of either system will be subject to environmental review pursuant to the California Environmental Quality Act (CEQA). It is likely that an Environmental Impact Report will be required to be drafted, circulated, finalized and certified for either option.

While both options share the same collection and conveyance corridors with similar potential environmental impacts, the Tuscan Ridge Golf Corse option will likely require a more detailed analysis of potentially adverse effects as a result of its storage, land application and disposal components. These components do not exist with the Chico option as environmental impacts to be reviewed because the Chico wastewater treatment plant has already undergone CEQA review and approvals.

The Tuscan Ridge Golf Course option involves treating the wastewater effluent from the Town of Paradise and irrigating the golf course with the treated water, which requires the construction of a 20-acre wastewater storage pond. The pond must be able to store treated wastewater during the rainy season, as the soils are not adequate to handle the required

amount of treated wastewater and rain water simultaneously. For this reason, wastewater treatment, storage and dispersal at the golf course will raise environmental issues not shared with the Chico option.

It should also be noted that although the Tuscan Ridge Golf Course property is assigned a Butte County General Plan land use designation and zoning that can potentially accommodate a 175 dwelling planned unit development, no environmental document has been circulated or certified pursuant to CEQA requirements nor have any project applications (e.g. tentative subdivision map) been submitted to Butte County for such a project.

In consideration of the circumstances outlined above, it appears that the Chico option may present a more straightforward, perhaps more expedient and less costly path through the CEQA environmental review process for the Town of Paradise. Below is an example of the EIR review process stating minimum timelines.

SEWER PROJECT EIR/EIS – TENTATIVE TIMELINE		
Task	**Chico Option**	**Tuscan Option**
Prepare, distribute RFP and execute contract with EIR/EIS consultant	4 weeks	4 weeks
Signed contract & receipt of project information, including project description	2 weeks	2 weeks
Prepare draft Project Description and NOP/NOI	4 weeks	4 weeks
Town review of Project Description/NOP/NOI	1 week	1 week
Finalize NOP/NOI	1 week	2 weeks
Schedule/conduct public scoping session	2 weeks	2 weeks
NOP public circulation	30 days	30 days
Consultant prepares ARDEIR/DEIS	12 weeks	16 weeks
Town review ARDEIR/DEIS	4 weeks	4 weeks
Consultant prepares Screencheck DEIR/DEIS	4 weeks	4 weeks
Town review Screencheck	1 week	2 weeks
Consultant prepares public review DEIR/DEIS	3 weeks	4 weeks
DEIR/DEIS public review	45 days	45 days
Consultant prepares FEIR/FEIS	6 weeks	6 weeks
Town reviews FEIR/FEIS	3 weeks	4 weeks
Consultant prepares Screencheck FEIR/FEIS	2 weeks	3 weeks
Continued on next page		
Town review Screencheck FEIR/FEIS	1 week	2 weeks
Consultant finalizes FEIR/FEIS and MMP	1 week	2 weeks
Hearing(s)/action on project	Min. of 10 days[1]	Min. of 10 days[1]
Total minimum	**+/-62 weeks**	**+/-73 weeks**

Notes:
1. CEQA requires that public agencies be provided with responses to their comments at least 10 days before the final action on the project. Typically, the Final EIR is completed at least 10 days before the final decision. The Town may choose to hold/schedule/coordinate any hearing(s) for the project only after the Final EIR has been completed.

Environmental Benefits

Use of treated wastewater to irrigate the 120 acre golf course may eliminate the need to pump up to 885,000 gallons of Tuscan Aquifer groundwater per day during warm, dry periods, as is the current practice. Eliminating the use of groundwater for irrigating the golf course will reduce the potential for deep aquifer drawdown. Tertiary treatment of the wastewater would be required for surface irrigation use. (Note: 885,000 gallons is derived from the Paradise flows of 822,000, the additional flows from the Tuscan Ridge housing complex, and rainwater storage.)

City of Chico staff have indicated that the Chico Water Pollution Contract Plant (WPCP) contributes approximately two-tenths of a percent to the total volume of water in the Sacramento River measured upstream of the treatment plant outfall. In addition, the water flowing into the river from the treatment plant outfall is of equal or higher quality than river water upstream of the outfall.

The Paradise Irrigation District (PID) has water rights to and draws water from its impoundments on Little Butte Creek, a tributary of Butte Creek, which is in turn a tributary of the Sacramento River. Prior to the establishment of the PID, water in Little Butte Creek ultimately flowed to the Sacramento River. None of the water provided by the PID to the Town of Paradise now finds its way to the Sacramento River. If the Chico option is chosen and implemented, up to 822,000 gallons per day of Little Butte Creek water will be returned to the Sacramento River, adding to its volume and potentially benefitting fish, wildlife and downstream users. This would partially restore the natural water cycle that had been in place prior to the establishment of the PID and the Town of Paradise.

Agriculture is a large downstream user of Sacramento River water. Farmers and ranchers are allowed water uptake directly proportionate to the volumes passing through the river. This was the impetus behind Assembly Bill 134, which passed in 2011, allowing the Sacramento Sanitation District to apply for a water rights permit to sell the recycled water that it discharges into the Sacramento River to downstream users, such as farmers. Therefore, water from Paradise passing through the Chico WPCP will directly benefit downstream agriculture by allowing more water uptake to be available to farmers and ranchers. This activity will also reduce the use of deep wells and reduce the possibility of deep aquifer drawdown.

In conclusion, both the Chico and the Tuscan Ridge Golf Course options promote environmentally beneficial purposes through the use of treated wastewater. One option will provide green golf course fairways, and the other will provide food through agriculture.

Capacity to collect, treat and disperse 822,000 gallons of wastewater/day

Wastewater treatment has three major components: (1) collection and conveyance, which is the process of getting the wastewater to the plant; (2) treatment, which is the actual

"cleansing" of the wastewater and which occurs at the plant site; and (3) discharge or dispersal, which is the elimination of the treated wastewater, either into a river, or into the ground via leaching fields or by some other means. Permitting is required at all levels by the State Regional Water Quality Control Board (RWQB) and is discussed at length in the next section of this report. The question of capacity must first be established.

Chico Option **-** The City of Chico is currently working with Carollo Engineering to update their Sanitary Sewer Master Plan Update (SSMPU). This report evaluates the City's sewer collection system with respect to growth projections and land-use designations identified in its 2030 General Plan, and provides a guideline for the development of the City's collection system for the next 20 years. Additional analysis is needed to determine the exact impacts associated with connection of the Town of Paradise to the City's sewer collection system; however, the most recent estimates indicate that the Town of Paradise may contribute up to one million gallons per day of wastewater flow to the City's collection system. This assumes connection would occur in the southeast portion of the city in the vicinity of the Skyway. It is important to note that this preliminary analysis assumes a "closed" system which prohibits sewage connections outside of the designated service area. Chico's Water Pollution Control Plant (WPCP) serves the residents of the Greater Chico Urban Area and also reserves the capacity to serve the County/City's Nitrate Action Project. Current estimates identify capacity at the plant sufficient to handle treatment of the proposed flows from the Town's commercial district as proposed in this report.

The City of Chico has a Wastewater Discharge Requirement permit from the RWQCB and a Federal National Pollutant Discharge Elimination System permit which allows them to discharge into the Sacramento River. As mentioned above, the permit requirements assures that the discharge meets or exceeds water quality standards thus providing a resource benefitting downstream agriculture, wildlife and communities.

Tuscan Option **-** At the Tuscan Ridge site, the County Assessor's records indicate that the parcels that make up the golf course cover a total land area of 150 acres. It has been estimated in a recent report by NorthStar Engineering that an area of 235 acres would be necessary to accommodate the wastewater flows from this project on a year-round basis. This estimation is derived from the parameters of the very shallow soils, the underlying "lava cap" of the Tuscan formation, the evaporation and evapotranspiration rates of the treated wastewater once it is sprayed onto the ground and the amount of annual rainfall in that area. This amount does not include the amount of pond area needed, which at a 20-foot depth requires at least 20 acres of pond storage. Basically, because of the very shallow soils, the Tuscan Ridge site simply does not have the necessary land space to accommodate the size of the dispersal area needed for this project.

<u>Associated Legal Issues and Local Control Concerns</u>

California Constitution Article XI, section 7 authorizes cities to adopt sanitary ordinances. In addition, California cities are expressly authorized to construct, establish and maintain drains

and sewers. See Government Code section 38900. To establish a specific area within the Town where wastewater services would be available to properties, the Town Council would need to adopt an ordinance setting forth, at a minimum, the following:

- A description of the wastewater collection system.
- The boundaries of the special wastewater service area.
- The scope of the wastewater services.
- The connection requirements.
- The connection fees and adoption procedure.
- The charges for the wastewater services and adoption procedure.

If a special benefit assessment is used to finance the design, construction, and other costs associated with a wastewater collection system, the assessment would need to comply with the procedural requirements of California Constitution Article XIIID, section 4. LAFCo would have no involvement in the formation of the special benefit assessment. In addition, a special assessment would have to comply with the procedural requirements of Government Code section 53750 et seq.

To commence the above procedure, the Town would need to provide an engineer report to the property owners within the proposed assessment area. The engineer report would describe the proposed project, its estimated cost, and how the special benefit would be apportioned. Thereafter, the property owners would vote for or against the proposed assessment. If there are more ballots against the assessment than for it, the assessment cannot be imposed. In tabulating the ballots, they are weighted based on the financial impact on a parcel.

Legal Review – Easement

To transport the wastewater from Paradise to Tuscan Ridge, the Town would need to obtain easements from the County of Butte. Under the Chico option, the Town would need easements from the County and Chico.

Legal Review – Chico Wastewater Treatment Agreement

Under the Chico option, the Town and Chico would need to enter into a comprehensive agreement that sets forth the rights and obligations of each party concerning the wastewater collection and treatment system, including wastewater capacity, ownership and maintenance of the wastewater collection system, fees and duration. Given the costs associated with the proposed wastewater collection system, the agreement should be for at least 50 years with renewal rights.

Legal Review – Tuscan Ridge Option

If the Tuscan Ridge option is selected, the Town should consider owning the location and wastewater treatment system so that the Town could directly provide quality control concerning the operation and maintenance of the system.

FUNDING FOR THE PROJECT:

The biggest hurdle for this project will be funding. As the report pointed out, the primary funding for the project, both in a direct sense, as well as in terms of leveraging other funding sources, was going to be redevelopment, as it applied to the Downtown and greater Redevelopment Project Area. However, the dissolution of redevelopment no longer makes that approach possible.

One of the Town's immediate tasks once the Town Council decides on which option they wish to pursue, comes down to developing a very comprehensive project description that becomes the basis for pursing the various federal and state grants, as well as special interest funding assistance legislation. This will help reduce the project's overall pre-development and development costs, and minimize the cost to the customers.

While staff realizes that the availability of federal and state grant funding is limited, we also strongly believe that the Town of Paradise, as one of the largest non-sewered municipalities, has a compelling case for various types of funding or assistance that is available.

FINAL ANALYSIS AND RECOMMENDATION TO COUNCIL:

This report's comparison between the two options clearly indicates that the Chico option is superior to the Tuscan Ridge option in terms of the total cost of the project (which is directly related to the end cost to the customer), the overall timeline for completion of the project, less regulatory permitting complexities and requirements, the ability to handle the amount of gallons per day that the Town's commercial district would generate, and less liability exposure to the Town. Both options offer very positive but different environmental benefits.

While the City of Chico staff has been very helpful in providing our Town staff with information that we needed for the purpose of this comparative analysis, it needs to be stated unequivocally that neither the Chico City Council nor its management or staff have endorsed, or at this point, support accepting or treating the effluent from the Town of Paradise commercial areas.

If the Town Council decides to support pursuing the Chico option further, we would want to, in the very near future, arrange a presentation before the Chico City Council with the hope of obtaining their approval to further explore and evaluate the feasibility of this project with the Town of Paradise.

Clearly, this type of cooperative project between two local government jurisdictions, in which one jurisdiction, such as Paradise, utilizes the resources of Chico, would generate revenue that might help stabilize Chico's future rate payers. Additionally, this could financially sustain their wastewater treatment plant for future growth and development, which not only represents a potential win-win for both communities, but speaks to the very heart of regionalism. It is extremely important to be open to regional approaches by addressing issues and challenges that go well beyond jurisdictional boundaries, not only for economic reasons, but also as a way to share and preserve resources for the future.

NorthStar ENGINEERING

March 6, 2012

Mr. Doug Danz, REHS
Onsite Sanitary Official
Town of Paradise
5555 Skyway
Paradise, CA 95969

Re: DRAFT Updated Conceptual Flow and Cost Estimates for Expanded Commercial Corridors Serving Skyway, Pearson and Clark Road Corridors

Dear Doug,

This memo is a follow up to the *Preliminary Conceptual Review of Three Options for Sewer Service for the Town of Paradise Downtown and Commercial Corridors Supplementing the Final Wastewater Treatment & Collection Feasibility Study for the Town of Paradise Downtown Community Cluster System, April, 2010* (3 Options Review) dated July 27, 2011 and summarizes most recent conceptual flow and cost estimates for the Skyway, Pearson and Clark Road corridors. This expanded scope of work was performed per your request on February 10, 2012 and based on our email and telephone conversations.

The scope of work included:

- Estimating wastewater flows for the Clark Road corridor from roughly Wagstaff Road to Buschmann Road and areas along Skyway between RDA areas identified in the *Final Wastewater Treatment & Collection Feasibility Study for the Town of Paradise Downtown Community Cluster System,* April, 2010 (Final Report) prepared by NorthStar Engineering and developing an updated design flow for an expanded conceptual Downtown Community Cluster System service area. In keeping with the Final Report conventions, this expanded service area is identified as Phase IV.
- Developing conceptual costs for a collection system to serve the areas identified above. Two cost estimates have been prepared, one for conveyance to Tuscan Ridge Golf Course and one to a conceptual point along Skyway to tie into the City of Chico sewer collection system. The Blue Oaks option analyzed in the 3 Options Review was not analyzed.
- Developing conceptual costs for an MBR treatment system capable of providing disinfected tertiary recycled water as defined in Title 22 standards for recycled water for irrigation.
- Developing conceptual sizing and costs for a year round spray and pond system for dispersal of the total flow from the Paradise commercial corridors and 26,400gpd from the proposed 165 residential units at the golf course. The estimate uses the year round spray and average seasonal rainfall scenario for sizing and construction cost estimates. All other assumptions used in the Final Report remain.

Estimated Wastewater Flows for the New Conceptual Service Area

Description

Town staff directed NorthStar to develop updated flow estimates for expanded areas of study, specifically, the Clark Road corridor from Wagstaff Road to Buschmann Road and areas along Skyway between RDA areas identified Final Report. These new study areas were combined with the Final Report Study area. Flows were estimated using the average commercial and residential flows derived as part of the Final

Report and the average commercial (65%) and residential (35%) distribution found in the DRA and RDA 1 through 7 study areas.

Using our existing GIS model developed for the 2010 Final Report, NorthStar identified the following:

The Clark Road study area is comprised of approximately 190 acres with approximately 190 parcels with an estimated wastewater projected flow of 226,000gpd.

The additional Skyway study area is comprised of approximately 112 acres with approximately 170 parcels with an estimated wastewater projected flow of 133,000gpd.

The current study area of Skyway, Clark Road, Pearson Road corridors is comprised of approximately 870 acres with approximately 1,206 parcels with an estimated wastewater design flow of 822,000gpd.

An exhibit depicting the conceptual areas of service and a breakdown of the flow estimates are attached.

Option #1 – Tuscan Ridge Golf Course

Description

The Town has been approached by the developer of Tuscan Ridge Golf Course with the proposal of recycling wastewater for golf course irrigation. Under this option wastewater effluent from the project area will be conveyed to the Tuscan Ridge Golf Course property located along the south side of the Skyway approximately 3.2 miles west of the current Town Limits. The Town would construct, maintain, and operate the treatment and dispersal facilities on the golf course property. Treatment is assumed to be tertiary with disinfection (Title 22 Standards). In addition, the developer anticipates the construction of 165 residential units around the golf course. The Town would accept flow from these units and treat the effluent to the California Department of Public Health Standards for unrestricted reuse. Using the base flow rate anticipated from the Town of 822,000gpd and assuming an average daily flow rate from the residential units of 160gpd, the total average daily flow would be approximately 848,000gpd. This option would require treatment facilities and operation to meet the requirements for disinfected tertiary recycled water. Recycled wastewater from the Town and the proposed development would be used to irrigate the golf course.

Based on the design flow and assumptions above, the pond size is conservatively estimated at 289 acre feet with a spray field of 235 acres. Assuming a total depth of 20 feet with 1.5 feet of freeboard and 4 to 1 side slopes on a square pond, the footprint of the pond would be approximately 20 acres.

The estimate of costs assumes the use of an MBR wastewater treatment system to treat and deliver Title 22 recycled water for unrestricted reuse.

Estimated Cost

Environmental Analysis (CEQA) and Permitting	$400,000
Studies and Design	$2,400,000
Property Acquisition (minor r/w and permitting)	$ 600,000
Collection System in Town of Paradise (Phase IV)	$18,400,000
Transport Line, Crossroads to Tuscan Ridge (3.2 miles)	$2,000,000
Treatment Plant (848,000 gpd Tertiary plus disinfection)	$10,900,000
Dispersal and Ponds System	$3,000,000
Construction Administration and Inspection	$3,430,000
Total	**$41,130,000**

Cost/gallon/day = $48 per gallon/day capacity
Cost/connection = $41,130,000/ (1,206 + 165) = $30,001 per connection

Option #2 – City of Chico

Description

Town Staff have engaged in discussions with the City of Chico to explore the feasibility of connecting the Project Area to the City of Chico Water Pollution Control Pant (WPCP). Under this option, the Town of Paradise would only be responsible for construction and operation of conveyance facilities in the Town limits. A trunk line from the Town of Paradise to the City of Chico, approximately 8 miles west of the current Town Limits would be constructed and connected to the City of Chico municipal sewer system. The Town of Paradise would be responsible for the construction and collection and conveyance of sewage within the Town limits as well as the construction of the conveyance to the connection point in the City system. The Town of Paradise would assume all responsibilities for wastewater operation and maintenance of the conveyance system outside of Chico city limits. The Town of Paradise would become a customer of the City of Chico.

Estimated Cost

Environmental Analysis (CEQA) and Permitting	$400,000
Studies and Design	$1,659,000
Property Acquisition (minor r/w and permitting)	$ 600,000
Phase IV Collection System (gravity collection)	$18,900,000
Trunk Line to Chico, 8 miles	$4,800,000
Construction Administration and Inspection	$2,370,000
City of Chico Application fee (based on time and materials)	$50,000
	Total $28,779,000

Cost/gallon/day = $35 per gallon/day capacity
Cost/connection = $35/1,206 = $23,863 per connection

Summary, Recommendations and Next Steps

The following steps are recommended in going forward with this project.

1. Explore project funding opportunities for both the conventional municipal and onsite waste dispersal options.
2. Continue coordination with the City of Chico on details of rate structure and relationship to better define the connection, capacity and service fees.
3. Perform a Full Life Cycle Cost Analysis for the selected options.
    a. This analysis should take construction, operation and maintenance, full infrastructure replacement costs and debt service.
    b. Use the Tuscan Ridge option as a point of comparison for the City of Chico option to verify that the Chico option is still the best option for the Town in terms of cost.
4. Using the information gathered above, develop a projection of monthly sewer rates for the two options.
5. Prepare a "Preliminary Engineering Report."
6. Prepare documents for State Revolving Fund application.

NorthStar Engineering

Dominickus J. Weigel III

REGISTERED PROFESSIONAL ENGINEER
DOMINICKUS J. WEIGEL III
C66282
EXP. 06/30/2012
CIVIL
STATE OF CALIFORNIA

March 6, 2012

DOWNTOWN COMMUNITY CLUSTER SYSTEM
Preliminary Opinion of Costs
PROJECTED WASTEWATER FLOWS Updated

Project: Town of Paradise DCCS

Project Data Summary

SECTION	PROJECT AREAS RES	COMM	TOTAL	% RES	% COMM	PROJECTED FLOWS RES	COMM	I&I	TOTAL
DRA	15.2 Ac	77.7 Ac	92.9 Ac	16.4%	83.6%	62,749 gpd	59,956 gpd	9,293 gpd	131,998 gpd
RDA-1	29.7 Ac	67.1 Ac	96.8 Ac	30.7%	69.3%	36,085 gpd	51,962 gpd	9,682 gpd	97,729 gpd
RDA-2	52.7 Ac	24.2 Ac	76.9 Ac	68.6%	31.4%	33,826 gpd	19,967 gpd	7,692 gpd	61,485 gpd
RDA-3	26.9 Ac	58.5 Ac	85.4 Ac	31.5%	68.5%	57,157 gpd	45,124 gpd	8,539 gpd	110,820 gpd
RDA-4	16.8 Ac	71.4 Ac	88.1 Ac	19.0%	81.0%	31,617 gpd	55,168 gpd	8,814 gpd	95,599 gpd
RDA-5	12.9 Ac	43.8 Ac	56.7 Ac	22.8%	77.2%	43,133 gpd	33,764 gpd	5,668 gpd	82,564 gpd
RDA-6	35.6 Ac	13.3 Ac	48.9 Ac	72.8%	27.2%	40,940 gpd	10,977 gpd	4,892 gpd	56,809 gpd
RDA-7	3.8 Ac	15.7 Ac	19.4 Ac	19.5%	80.5%	16,285 gpd	12,656 gpd	1,944 gpd	30,885 gpd
SKYWAY ADD	39.4 Ac	72.6 Ac	112.0 Ac	35.2%	64.8%	65,413 gpd	56,604 gpd	11,200 gpd	133,217 gpd
CLARK RD	66.8 Ac	123.2 Ac	190.0 Ac	35.2%	64.8%	110,969 gpd	96,024 gpd	19,000 gpd	225,993 gpd
PHASE I	45.0 Ac	144.8 Ac	189.7 Ac	23.7%	76.3%	98,835 gpd	111,918 gpd	18,975 gpd	229,728 gpd
PHASE II	141.4 Ac	298.8 Ac	440.2 Ac	32.1%	67.9%	221,435 gpd	232,178 gpd	44,020 gpd	497,632 gpd
PHASE III	193.7 Ac	371.6 Ac	565.2 Ac	34.3%	65.7%	321,793 gpd	289,574 gpd	56,524 gpd	667,891 gpd
PHASE IV	299.8 Ac	567.4 Ac	867.2 Ac	34.6%	65.4%	498,175 gpd	442,202 gpd	86,724 gpd	1,027,101 gpd

TOTALS	**AREA**	**PROJECTED GROSS FLOW**	**DESIGN FLOW**
PHASE I	**189.7 Ac**	**229,728 gpd**	**184,000 gpd**
PHASE II	**440.2 Ac**	**497,632 gpd**	**398,000 gpd**
PHASE III	**565.2 Ac**	**667,891 gpd**	**534,000 gpd**
PHASE IV	**867.2 Ac**	**1,027,101 gpd**	**822,000 gpd**

Notes

1. DRA - Downtown Revitalization District
2. RDA - Town of Paradise Redevelopment Agency
3. PHASE I - Comprises DRA and RDA-1.
4. PHASE II - Comprises DRA and RDA-1 through RDA-4.
5. PHASE III - Comprises DRA and RDA-1 through DRA-7.
6. Phase IV Comprises of DRA, RDA 1 through 7 and "Service Gaps" on Skyway Between RDAs and Clark Road Corridor

6. Infiltration and Inflow (I&I) from tanks and risers is assumed at 100 gpd/ac.
7. Design Flow is based on 80% of Projected Flow and Rounded to the Nearest 1,000 gpd.

DOWNTOWN COMMUNITY CLUSTER SYSTEM
Preliminary Opinion of Costs
COLLECTION (TUSCAN) Updated

Project: Town of Paradise DCCS

Estimated Construction Costs for Conventional Sewer Collection and Conveyance to Treatment (Update Based on Questa Report) and Preliminary Skyway and Clark Road Corridor System with 165 Units at Tuscan Ridge 848,000GPD	Quantity	Units	Unit Cost Range Low	Unit Cost Range High	Total Cost Range Low	Total Cost Range High
On Lot Facilities						
Pump Existing Septic Tanks[1]	1,206	ea	$325.00	$450.00	$391,950	$542,700
Abandon Existing Septic Tanks	1,206	ea	$750.00	$1,200.00	$904,500	$1,447,200
Reroute Building Plumbing as Necessary	1,206	ea	$400.00	$600.00	$482,400	$723,600
4" Service Lateral (unpaved Area)	30,150	lf	$30.00	$40.00	$904,500	$1,206,000
4" Service Lateral (paved Area)	30,150	lf	$50.00	$60.00	$1,507,500	$1,809,000
Collection System						
DRA (From Questa Report)						
12" Gravity Sewer - Zone 1	3,955	lf	$80.00	$100.00	$316,400	$395,500
8" Gravity Sewer - Zone 2	7,615	lf	$80.00	$100.00	$609,200	$761,500
8" Gravity Sewer- Deep Trenching - Zone 2	1,870	lf	$110.00	$120.00	$205,700	$224,400
8" Gravity Sewer - Zone 3	255	lf	$80.00	$100.00	$20,400	$25,500
3" Pressure Sewer Line - Zone 3	390	lf	$50.00	$60.00	$19,500	$23,400
Lift Station -Zone 3	1	ea	$40,000.00	$50,000.00	$40,000	$50,000
Manhole	29	ea	$5,000.00	$7,000.00	$145,000	$203,000
Clean Outs	7	ea	$350	$500	$2,450	$3,500
Skyway Corridor						
6" to 12" Gravity Sewer	32,531	lf	$80.00	$100.00	$2,602,480	$3,253,100
3" Pressure Sewer Line	0	lf	$50.00	$60.00	$0	$0
Lift Station	0	ea	$40,000.00	$50,000.00	$0	$0
Manhole	108	ea	$5,000.00	$7,000.00	$542,183	$759,057
Pearson Corridor						
6" to 12" Gravity Sewer	24,335	lf	$80.00	$100.00	$1,946,800	$2,433,500
3" Pressure Sewer Line	4,054	lf	$50.00	$60.00	$202,700	$243,240
Lift Station	2	ea	$40,000.00	$50,000.00	$80,000	$100,000
Manhole	81	ea	$5,000.00	$7,000.00	$405,583	$567,817
Clark Corridor						
6" to 12" Gravity Sewer	13,695	lf	$80.00	$100.00	$1,095,600	$1,369,500
3" Pressure Sewer Line	2,051	lf	$50.00	$60.00	$102,550	$123,060
Lift Station	1	ea	$40,000.00	$50,000.00	$40,000	$50,000
Manhole	46	ea	$5,000.00	$7,000.00	$228,250	$319,550
			Collection Subtotal		$12,795,647	$16,634,123
Contingency @ 25%					$3,198,912	$4,158,531
			Collection Estimated Cost		**$15,994,558**	**$20,792,654**
			Collection Average Cost		**$18,393,606**	
Conveyance						
Conveyance to Treatment Tuscan Ridge	16,896	lf	$80	$100	$1,351,680	$1,689,600
Contingency @ 25%					$337,920	$422,400
			Conveyance Estimated Cost		**$1,689,600**	**$2,112,000**
			Conveyance Average Cost		**$1,900,800**	
			Tuscan Ridge Collection and Conveyance		$17,684,158	$22,904,654
			Tuscan Ridge Collection and Conveyance Average		**$20,294,406**	

DOWNTOWN COMMUNITY CLUSTER SYSTEM
Preliminary Opinion of Costs
COLLECTION (CHICO) Updated

Project: Town of Paradise DCCS

Estimated Construction Costs for Conventional Sewer Collection and Conveyance to Treatment (Update Based on Questa Report) and Preliminary Skyway and Clark Road Corridor System 822,000GPD	Quantity	Units	Unit Cost Range Low	Unit Cost Range High	Total Cost Range Low	Total Cost Range High
On Lot Facilities						
Pump Existing Septic Tanks[1]	1,206	ea	$325.00	$450.00	$391,950	$542,700
Abandon Existing Septic Tanks	1,206	ea	$750.00	$1,200.00	$904,500	$1,447,200
Reroute Building Plumbing as Necessary	1,206	ea	$400.00	$600.00	$482,400	$723,600
4" Service Lateral (unpaved Area)	30,150	lf	$30.00	$40.00	$904,500	$1,206,000
4" Service Lateral (paved Area)	30,150	lf	$50.00	$60.00	$1,507,500	$1,809,000
Collection System						
DRA (From Questa Report)						
12" Gravity Sewer - Zone 1	3,955	lf	$80.00	$100.00	$316,400	$395,500
8" Gravity Sewer - Zone 2	7,615	lf	$80.00	$100.00	$609,200	$761,500
8" Gravity Sewer- Deep Trenching - Zone 2	1,870	lf	$110.00	$120.00	$205,700	$224,400
8" Gravity Sewer - Zone 3	255	lf	$80.00	$100.00	$20,400	$25,500
3" Pressure Sewer Line - Zone 3	390	lf	$50.00	$60.00	$19,500	$23,400
Lift Station -Zone 3	1	ea	$40,000.00	$50,000.00	$40,000	$50,000
Manhole	29	ea	$5,000.00	$7,000.00	$145,000	$203,000
Clean Outs	7	ea	$350	$500	$2,450	$3,500
Skyway Corridor						
6" to 12" Gravity Sewer	32,531	lf	$80.00	$100.00	$2,602,480	$3,253,100
3" Pressure Sewer Line	0	lf	$50.00	$60.00	$0	$0
Lift Station	0	ea	$40,000.00	$50,000.00	$0	$0
Manhole	108	ea	$5,000.00	$7,000.00	$542,183	$759,057
Pearson Corridor						
6" to 12" Gravity Sewer	24,335	lf	$80.00	$100.00	$1,946,800	$2,433,500
3" Pressure Sewer Line	4,054	lf	$50.00	$60.00	$202,700	$243,240
Lift Station	2	ea	$40,000.00	$50,000.00	$80,000	$100,000
Manhole	81	ea	$5,000.00	$7,000.00	$405,583	$567,817
Clark Corridor						
6" to 12" Gravity Sewer	13,695	lf	$80.00	$100.00	$1,095,600	$1,369,500
3" Pressure Sewer Line	2,051	lf	$50.00	$60.00	$102,550	$123,060
Lift Station	1	ea	$40,000.00	$50,000.00	$40,000	$50,000
Manhole	46	ea	$5,000.00	$7,000.00	$228,250	$319,550
Equalization						
1,000,000-gal Equalization Tank at Treatment Site	1	ea	$800,000	$1,500,000	$800,000	$1,500,000
			Collection Subtotal		$13,595,647	$16,634,123
Contingency @ 25%					$3,398,912	$4,158,531
			Collection Estimated Cost		**$16,994,558**	**$20,792,654**
			Collection Average Cost		**$18,893,606**	
Conveyance						
Conveyance to City of Chico	42,240	lf	$80	$100	$3,379,200	$4,224,000
Contingency @ 25%					$844,800	$1,056,000
			Conveyance Estimated Cost		**$4,224,000**	**$5,280,000**
			Conveyance Average Cost		**$4,752,000**	
			City of Chico Collection and Conveyance		**$21,218,558**	**$26,072,654**
			City of Chico Collection and Conveyance Average		**$23,645,606**	

DOWNTOWN COMMUNITY CLUSTER SYSTEM
Preliminary Opinion of Costs
TREATMENT (MBR) Updated

Project: Town of Paradise DCCS

Design Flow - 848,000 gpd
Phase IV
1,206 Paradise Connections and 165 Tuscan Ridge Connections
Total Connections 1,371

	Quantity	Units	Unit Cost Range Low	Unit Cost Range High	Total Cost Range Low	Total Cost Range High
MBR with Septage						
Treatment						
MBR Equip; Including Membrane, Chem Cleaning, and Controls.	1	ls	$1,800,000	$2,500,000	$1,800,000	$2,500,000
Headworks, EQ, Solids Management @ 50% MBR Equ	50	%			$900,000	$1,250,000
Septage Receiving	1	ls	$150,000	$200,000	$150,000	$200,000
Disinfection	1	ls	$260,000	$350,000	$260,000	$350,000
Laboratory Equipment	1	ls	$100,000	$125,000	$100,000	$125,000
				Material Sub Total	**$3,210,000**	**$4,425,000**
Sales Tax	8.25%				**$264,825**	**$365,063**
Installation @ 150% Equipment Costs	150%				**$4,815,000**	**$6,637,500**
Contingency @ 25% of Material Costs					**$802,500**	**$1,106,250**
				MBR Estimated Treatment Cost	**$9,092,325**	**$12,533,813**
				MBR Treatment Average Cost	**$10,813,069**	

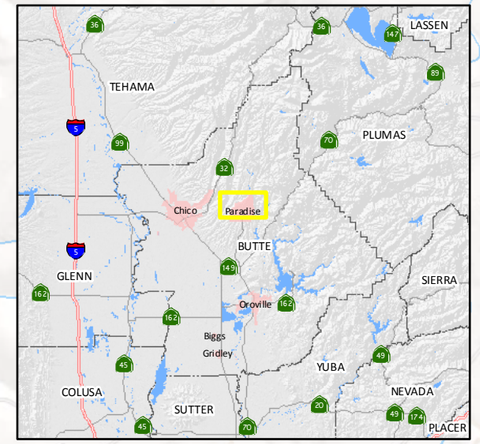
DOWNTOWN COMMUNITY CLUSTER SYSTEM
Preliminary Opinion of Costs
Updated

DISPERSAL (SPRAY)

Project: Town of Paradise DCCS
PHASE IV - 848,000GPD

	Quantity	Units	Unit Cost Range		Total Cost Range	
Year-round Spray and Wet Period Storage (Average Precipitation)			*Low*	*High*	*Low*	*High*
Spray Field	**235**	**ac**				
Pumping Systems	10	ea	$20,000	$25,000	$200,000	$250,000
Controls	1	ls	$50,000	$75,000	$50,000	$75,000
Header Pipe	21,000	lf	$5	$10	$105,000	$210,000
Sprinkler Line	240	ac	$1,000	$2,000	$240,000	$480,000
				Material Sub Total	$595,000	$1,015,000
Sales Tax	8.25%				$49,088	$83,738
Installation @20% of Material Costs					$119,000	$203,000
				Spray Sub Total	**$763,088**	**$1,301,738**
Pond Surface Area	**20**	**ac**				
Liner 60Mil Liner (Installed)	1,045,440	sf	$0.55	$0.75	$574,992	$784,080
Piping	1	ls	$100,000	$200,000	$100,000	$200,000
Electrical	1	ls	$60,000	$100,000	$60,000	$100,000
				Pond Material Sub Total	**$734,992**	**$1,084,080**
Earthwork						
Mobilization	1	ls	$10,000	$15,000	$10,000	$15,000
Excavate Pond to Subgrade	25,129	cy	$16	$20	$402,069	$502,587
Fine Grading	2	ac	$10,000	$15,000	$20,000	$30,000
Underdrain Construction	1905	lf	$10	$14	$19,050	$26,670
Liner Anchor Trench	5,600	lf	$10	$14	$56,000	$78,400
Erosion Control - Seed and Mulch	5	ac	$2,000	$2,500	$9,142	$11,428
				Earthwork Sub total	$516,262	$664,085
Land Acquisition	0.0	ac	$10,000	$25,000	$0	$0
Contingency @ 25% of Material Costs					$332,498	$524,770
				Total	**$2,346,839**	**$3,574,672**
				Average Cost	**$2,960,756**	

2012 Potential Areas of Service



Data Source: Parcels - BCAG, Town of Paradise
Topographic: Microsoft Virtual Earth
Map Date: March 6, 2012

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Figure 1

Town of Paradise Limits

Potential Areas of Service

0 0.25 0.5 1 Miles

0 1,000 2,000 4,000 Feet

NorthStar ENGINEERING