

## DESCRIPTION AND JUSTIFICATION

### 1.0 Introduction and Description of Filing

In this tariff filing, scheduled to become effective February 15, 2020, Somos, Inc. (hereinafter referred to as “Company”) proposes changes to Tariff F.C.C. No. 1, 800 Service Management System (SMS/800) Toll-Free Number Registry (TFN Registry) Functions (SMS/800 Tariff) including: update to Technical Publications; add service restriction on Resp Orgs that have not paid their invoice(s) within 30 days of the due date; change the street address for billing inquiries; specify that Company, when needed to protect users of the services offered, is not required to inform Resp Orgs of the use of proprietary information; and modify rates and charges based on an updated cost study and current cost and demand data. The proposed modifications are detailed below.

### 1.1 Modify Regulations and Service Offerings

- On pages 10 and 11, update the titles, issue numbers and dates for certain Technical Publications. All publications are available as of the filing date for this tariff.
- Section 2.4.1 (A), add that the Resp Org bills will be made available “On or before” the tenth work day of each month.
- Section 2.4.1 (D), add a paragraph that constrains the quantity of TFNs that a controlling Resp Org can transfer to/from another Resp Org whenever the controlling Resp Org has failed to pay all amounts owed to Company within 30 days of the invoice due date(s).
- Section 2.4.1 (E), change address for billing inquiries. This paragraph was previously paragraph (D).
- Section 2.4.1. paragraphs D through I are changed to E through J, respectively to account for the addition of a new paragraph D.
- Section 2.6.1 (E), add, “In such cases, the Company shall not be required to inform the Resp Org of such use, disclosure or access” when the disclosure is to protect users of the services and Resp Orgs, interexchange carriers, or local exchange carriers from fraudulent, abusive, or unlawful use of, or subscription to, such services

### 1.2 Modify Rates and Charges

This tariff filing is being made by Company to modify rates and charges in the SMS/800 Tariff. The proposed changes, reflecting the Company’s most current estimates of demand and cost for services provided under the tariff, would increase revenue over the prospective one-year period of February 15, 2020 through February 14, 2021 by \$3,529,641. A comparison of current and proposed rates, as well as the revenue impact of the rate changes, is displayed in Table 1 (after section 4.8).

## 2.0 Revenue Requirement Development

The prospective revenue requirement for SMS/800 from February 15, 2020 through February 14, 2021 consists of expenditures for ongoing operations of the existing system as well as expenses related to the design, architecture and development of a new SMS/800 platform. Specific budget items for the Company's ongoing operations are:

- SMS/800 Operation and Administration which consists of: (a) Help Desk operational support to SMS/800 users including telephone assistance related to interfacing with SMS/800 and preparation/maintenance of Toll-Free Number (TFN) records, service establishment, and processing of requests for changes in Responsible Organization (Resp Org) for TFNs; and, (b) day-to-day management, planning and administrative oversight provided by Company, external operational support services such as billing, accounting, cost analysis, website support and TFN authentication, and expenses associated with the Company's membership and Board of Directors to support management, operation and administration of the SMS/800.

The estimated revenue requirement for SMS/800 operation and administration for the one-year period of February 15, 2020 through February 14, 2021 is \$41,122,051.

- SMS/800 Data Center Operation reflects the cost of the ongoing support, maintenance of the existing production and test/disaster recovery SMS/800 data centers and operation of a Service Center (Help Desk) facility to handle security and access problems. It also includes costs associated with a technologically updated data center that will replace the existing data center. The estimated revenue requirement for the data center operation is \$18,478,534.
- SMS/800 Software Support includes the provision of software maintenance, computer site and application support, and software development for new features for the existing SMS/800 system. It also includes costs associated with the design and architecture of an updated software platform. The estimated revenue requirement for software support is \$3,857,655.

A comparison of projected past year and actual past year costs, and projected future year costs are shown in Table 2.

## **2.1 Revenue Requirement Distributions**

A detailed hardware, software and activity based cost study was performed to identify average unit costs for the SMS/800 rate elements. The updated costing methodology is consistent with the methodology used for previous SMS/800 Tariff filings. The average unit costs developed are shown in Table 5. The resulting revenue requirement for each rate element is shown in Table 4. Cost-causation analyses were performed and applied to budget elements as follows:

- A Task Oriented Costing (TOC) study was used to distribute Help Desk costs to rate elements. Help Desk managers identified the primary tasks performed, how often the tasks were performed, and the average time spent performing them. Each task was then analyzed and associated with the particular rate element it supports. To the extent that

Help Desk costs are not specific to a rate element, the costs are included in the CRA rate element. The resulting unit costs are shown in Table 5, column (a).

- Data center costs consist primarily of: (a) network equipment and facilities needed to provide communications access for customers' links; (b) storage hardware for TFN record data; and (c) a processing community used to respond to and execute customer requests for SMS/800 services. *Network costs* are attributable almost entirely to rate elements required to access SMS/800. A unit cost analysis of each type of connection to SMS/800 was used to determine its cost. The processing community, consisting of central processing units and server-based distributed processors, and storage costs are related almost exclusively to the support and processing of customer records and were therefore, with only a few minor exceptions, assigned to the CRA rate element. The Data Center also supports production of some reports and batch updates. Activity based analyses were used to capture these costs and associate them with the appropriate rate elements. The resulting average unit costs for the Data Center are shown in Table 5, column (b).
- The cost of software support includes software maintenance, site support and software development for new features. The software maintenance and site support dollars were attributed on the basis of analyses of effort by software personnel for the basic functions of software development, software maintenance and support services. The costs of the various functions were attributed to rate elements based on these analyses. The software development staff also supports production of some reports. Activity based analyses were used to capture these costs and associate them with the appropriate rate elements. The average unit costs developed for software costs are shown in Table 5, column (c).
- The Operations and Administration cost are analyzed to determine if they explicitly support any of the SMS/800 rate elements. With the exception of a small amount associated with Resp Org restoration (post suspension), the operations and administration costs are shared and common costs. The resulting average unit costs are shown in Table 5, column (d).

### **3.0 Basis of Ratemaking**

The rate structure for SMS/800 consists of service elements that are used by Resp Orgs. The proposed rate for each element is based on its projected revenue requirement and demand. The only exception are the proposed hourly rates for Resp Org requested MGI/WSI Additional Testing. This rate is based on changes to vendor contracts. The contractual rate of \$200 per hour is expected to remain valid for the proposed tariff period. This information is shown in Table 6.

### **4.0 Demand Forecast**

The demand forecast for the prospective tariff period is displayed in Table 3. Information and/or data considered in developing the forecast are discussed in the following sections.

#### 4.1 Customer Record Administration (CRA)

This rate element represents the quantity of toll-free numbers for which customer records exist in the SMS/800 and is charged on a recurring (monthly) basis for each number record administered. Following the methodology used to produce prior CRA forecasts, we examined alternative statistical models (e.g., simple regression, ARIMA), searching to find the best fit of the historical data. These models predict the future value of the dependent variable (toll-free numbers) largely by analysis of past values of that variable.<sup>1</sup>

The first issue addressed involved data frequency. The toll-free number data are collected and reported weekly, but previous tariff filings (as well as the CRA rate element charge) use monthly data. A two-year forecast of monthly data requires a 24-period forecast. Because data typically contain random elements, projections tend to become less reliable with the number of periods forecast. This problem can be mitigated by using lower data frequency, allowing random influences to offset, smoothing observed values. When high frequency forecasts are not needed, modeling the dynamics at a lower frequency is usually more accurate. For example, estimating a moving average error term with quarterly data provides an average over three months to improve the forecast, while using monthly data produces just one month's worth of moving average correction. When the individual months are not required in their own right—as is the case here—the longer observation period provides an error correction more closely related to the longer forecast needed. Of course, lower frequency data yield fewer observations over the same time frame and, all else equal, additional observations tend to improve estimation accuracy. Given that the use of annual data is ruled out due to insufficient degrees of freedom, we chose to perform our estimations with demand measured quarterly. This approach is designed to balance forecast variance against loss of observations.

The monthly forecasts for January 2020 through February 2021 reported in Table 3A represent either linear interpolations of the quarterly forecasts (2Q2020 - 2Q2021) or the result of estimated monthly CRA (1Q2020).<sup>2</sup> For the quarterly forecast, we used the unweighted average of the three months in each quarter to construct the quarterly series of toll-free numbers. The average monthly number of lines for a quarter is considered to be that number which would accrue to the middle month of each quarter. For example, the middle month for the quarter ending March 2008 is February 2008, the middle month for the quarter ending June 2008 is May 2008, etc. Use of this averaging methodology tended to smooth out random fluctuations, as desired.

Similar to the choice of quarterly data, a three-year estimation window represents a tradeoff between regime stability and the number of estimation observations. Shorter time periods for estimation were considered, but there was reason to believe that these estimates were more susceptible to short term fluctuations and were less precise. Longer periods were not used because

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<sup>1</sup> This is an example of the Box-Jenkins approach to time-series modeling that only uses past values of a variable to predict future values. In addition to past values, a time trend may also be considered as well as transformations of the variable (e.g. natural logarithms) and seasonal indicators (e.g. quarter). Indicator variables take on a value of 1 or 0 (e.g. an indicator for the first quarter of a year takes on a value of 1 for the first quarter; 0 for all other quarters).

<sup>2</sup> In the case of linear interpolations, if toll-free lines were projected to rise from 25,000,000 to 25,300,000 from one quarter to the next, the consecutive monthly totals would be 25,100,000, 25,200,000 and 25,300,000.

it is believed that factors that might drive demand change over time, and that factors that affected the market as recently as four years ago might not have any influence over current market conditions.

It should be noted that this forecast makes use of 13 quarters of CRA. To better estimate the first quarter of the tariff period, monthly data were used to estimate the months of December 2019 – March 2020 (actual CRA data were available through November 2019). The estimated months were then used to complete the 13-quarter series for the quarterly CRA tariff forecast (1Q2017 - 1Q2020). The CRA tariff quarterly forecast begins with 2Q2020.

In general, whenever actual data available ends mid-quarter, data for the remaining months of that quarter are unknown. This means that either some known data must be disregarded or that the remaining months in the quarter must be extrapolated. Since the former option requires disregarding actual data, the latter option is preferable. The methodology for forecasting demand for the remaining months of the quarter is similar to the methodology used for forecasting quarterly estimates (i.e., simple regression, ARIMA). The difference is that only monthly data will be used in this forecast, as opposed to smoothed quarterly data. The lack of smoothing is acceptable because the demand will only be forecasted three to four months ahead, which is a fairly short-run forecast.

*Forecasting December 2019 to March 2020 Monthly Demand*

Because the available data end in November 2019, to produce a quarterly forecast as described above, it is first necessary to produce a monthly forecast for December 2019 and for the first quarter of 2020. There are four models which fit the historical data the best, 2 simple regression models and 2 ARIMA models. Rather than combining the monthly forecasts from each of these models, the individual model forecasts are used in the quarterly demand forecast.

The two regression models explain undifferenced CRA using two lagged CRA terms, indicators for the month of April and for the April/May 2013 period, and the lagged average number of toll free numbers in use during the month (TFN\_AVG). The two ARIMA models explain differenced CRA using AR and MA terms, indicators for the month of April and for the April/May 2013 period, lagged average number of toll free numbers (TFN\_AVG), lagged difference between toll free numbers and the numbers in disconnect and transitional status (REMAINDER\_TFN), lagged toll free numbers in disconnect and transitional status as a percentage of toll free numbers in use (DISC\_TRANS\_AVG\_PCT) and lagged average toll free numbers in transitional status (TRANS\_AVG). The four models are defined by the following parameters and summary statistics:

Regression Model 1: R-Squared = 0.9997 R-Squared Adjusted = 0.9997

PARAMETER	ESTIMATES	STD ERROR	T-STAT
CONSTANT	59,797	36,736	1.6277
CRA(-1)	1.2388	0.0602	20.5716
CRA(-2)	-0.1863	0.0652	-2.8581
APR_IND	158,687	33,789	4.6964

APR_MAY_2013_IND	472,728	113,123	4.1789
TFN_AVG(-12)	-0.0544	0.0091	-5.9618

In equation form, the model indicates that:

$$\text{Forecasted Monthly CRA}_t = 59,797 + 1.2388*\text{CRA}_{t-1} - 0.1863*\text{CRA}_{t-2} + 158,687*\text{APR\_IND} + 472,728*\text{APR\_MAY\_2013\_IND} - 0.0544*\text{TFN\_AVG}_{t-12} + u_t$$

Regression Model 2: R-Squared = 0.9997 R-Squared Adjusted = 0.9997

PARAMETER	ESTIMATES	STD ERROR	T-STAT
CONSTANT	91,721	35,224	2.604
CRA(-1)	1.2791	0.0595	21.4875
CRA(-2)	-0.1466	0.0757	-1.9368
APR_IND	161,072	33,352	4.8295
APR_MAY_2013_IND	436,967	113,585	3.8470
TFN_AVG(-5)	-0.1348	0.0261	-5.1581

In equation form, the model indicates that:

$$\text{Forecasted Monthly CRA}_t = 91,721 + 1.2791*\text{CRA}_{t-1} - 0.1466*\text{CRA}_{t-2} + 161,072*\text{APR\_IND} + 436,967*\text{APR\_MAY\_2013\_IND} - 0.1348*\text{TFN\_AVG}_{t-5} + u_t$$

ARIMA Model 1: R-Squared = 0.4936 R-Squared Adjusted = 0.4771

PARAMETER	ESTIMATES	STD ERROR	T-STAT
AR(1)	0.2771	0.0576	4.8101
AR(3)	0.2668	0.0628	4.2457
APR_IND	149,713	25,766	5.8105
APR_MAY_2013_IND	644,392	41,887	15.3841
D(TFN_AVG(-12))	0.2083	0.0578	3.6059
D(REMAINDER_TFN(-8))	0.1750	0.0652	2.6843
D(REMAINDER_TFN(-9))	0.1580	0.0618	2.6843
D(DISC_TRANS_AVG_PCT(-5))	-9,999,539	2,473,411	-4.0428

In equation form, the model indicates that:

$$D(\text{Forecasted Monthly CRA}_t) = 0.2771*D(\text{CRA}_{t-1}) + 0.2668*D(\text{CRA}_{t-3}) + 149,713*\text{APR\_IND} + 644,392*\text{APR\_MAY\_2013\_IND} + 0.2083*D(\text{TFN\_AVG}_{t-12}) +$$

$$0.1750 * D(\text{REMAINDER\_TFN}(-8)) + 0.1580 * D(\text{REMAINDER\_TFN}(-9)) - 9,999,539 * D(\text{DISC\_TRANS\_AVG\_PCT}(-5)) + u_t$$

ARIMA Model 2: R-Squared = 0.4964 R-Squared Adjusted = 0.4823

PARAMETER	ESTIMATES	STD ERROR	T-STAT
AR(1)	0.9793	0.0168	58.3803
MA(1)	-0.7188	0.0514	-13.9830
APR_IND	142,101	25,438	5.5862
APR_MAY_2013_IND	628,929	35,002	17.9684
D(TFN_AVG(-6))	-0.2017	0.0697	-2.8955
D(TRANS_AVG(-8))	-0.2260	0.0847	-2.6688
D(DISC_TRANS_AVG_PCT(-5))	-8,184,232	2,469,512	-3.3141

In equation form, the model indicates that:

$$D(\text{Forecasted Monthly CRA}_t) = 0.9793 * D(\text{CRA}_{t-1}) + 142,101 * \text{APR\_IND} + 628,929 * \text{APR\_MAY\_2013\_IND} - 0.2017 * D(\text{TFN\_AVG}_{t-6}) - 0.2260 * D(\text{TRANS\_AVG}(-8)) - 8,184,232 * D(\text{DISC\_TRANS\_AVG\_PCT}(-5)) + u_t - 0.7188 * u_{t-1}$$

The forecasts for the December 2019 to March 2020 period are shown below:

	Regression Model 1	Regression Model 2	ARIMA Model 1	ARIMA Model 2
Dec-19	41,444,576	41,417,564	41,494,300	41,502,768
Jan-20	41,396,264	41,345,952	41,405,988	41,387,530
Feb-20	41,337,826	41,277,204	41,307,298	41,352,980
Mar-20	41,268,472	41,220,298	41,317,165	41,375,402

### *Forecasting Quarterly Demand Through February 2021*

Each of the four monthly forecast models were used to complete the most recent 13 quarters of CRA data (1Q2017 - 1Q2020). Models were then fit to each of these quarterly series. In each case, the model that best fits the data and reflects the current CRA trend is a model with the last actual CRA value adjusted for the trend in CRA observed in the most recent 13 quarters of data. Since this estimated trend varies across the four resulting quarterly series, an average of the forecasts produced by the four models is used as the forecast of quarterly demand through February 2021.

In equation form, the models indicate that:

Monthly Regression Model 1:

$$\text{Forecasted Quarterly CRA}_t = \text{CRA}_{t-1} - 3,089 + u_t$$

Monthly Regression Model 2:

$$\text{Forecasted Quarterly CRA}_t = \text{CRA}_{t-1} - 7,170 + u_t$$

Monthly ARIMA Model 1:

$$\text{Forecasted Quarterly CRA}_t = \text{CRA}_{t-1} - 2,374 + u_t$$

Monthly ARIMA Model 2:

$$\text{Forecasted Quarterly CRA}_t = \text{CRA}_{t-1} - 182 + u_t$$

Averaging the forecasts across the four models yields the forecasted quarterly demand:

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2020Q2	41,329,494
2020Q3	41,326,291
2020Q4	41,323,087
2021Q1	41,319,883

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The linearized monthly results of this forecast are shown in Table 3A.

#### **4.2 Change of Resp Org for Toll-Free Number**

This element provides for changing the Resp Org for a TFN and is charged on a non-recurring (per request) basis. Demand during the prior tariff period is expected to be 1,021 below the anticipated demand due increased compliance with the mandatory use of the Centralized Resp Org Change system. Projected demand is anticipated to remain at similar levels for the prospective one-year period of February 15, 2020 through February 14, 2021.

#### **4.3 SMS/800 Access**

This service element provides for the connection of dedicated and non-dedicated communications links to the SMS/800 and is charged on a recurring (monthly) basis. Monthly demand for non-dedicated access is expected to increase during the coming year as the Resp Orgs move from legacy forms of access to the new APIs. Company also expects forms of dedicated access to decline as customers adopt the new API access methods and prepare for the disconnection of the MGI interface in April 2021. Non-dedicated demand is expected to rise to 8,085, non-MGI dedicated access is expected to decline to 2,028 and MGI access is expected to decline from 679 in the prior tariff period to 560 in the prospective one-year period of February 15, 2020 through February 14, 2021.

#### **4.4 Service Establishment**

This service element provides for various aspects of establishing service, i.e., first logon ID, subsequent (additional) logon IDs and Security Keys as well as the restoration of services for Resp Orgs that have had service suspended. Charges for these services are applied on a non-recurring (one time) basis. Demand for first logon IDs is expected to increase over the upcoming tariff period to 15. Average monthly demand for subsequent logon IDs is anticipated to increase resulting in annualized demand projection of 585 for the prospective tariff period. The issuance of Security Keys are projected to decrease from the prior tariff period total of 62 to 34 for the prospective tariff period of February 15, 2020 through February 14, 2021. The demand for Resp Org Restoration of service (post suspension) has been reduced, in part, due to changes in process and thus is anticipated to have no demand for the prospective tariff period.

#### **4.5 Customer Reports**

This service element provides for the preparation and delivery of customer specific off-line reports as well as the preparation and delivery of standard recurring on-line reports. The on-line report demand for the prospective tariff period February 15, 2020 through February 14, 2021 is 110. The on-line report is charged “per report.” Off-line reports are charged “per hour” to prepare and deliver for each customer request. Ten (10) hours of effort are anticipated during the prospective tariff period of February 15, 2020 through February 14, 2021.

#### **4.6 MGI/WSI Additional Testing per Hour**

This service element provides for initial and/or additional testing as requested from the SMS/800 software support team and is charged on an hourly basis as required. There were no requests for MGI testing during the prior tariff period, and as MGI users prepare to transition to API interfaces, additional testing needs for MGI are not anticipated during the prospective tariff period February 15, 2020 through February 14, 2021.

#### **4.7 Batch Updates**

This service element allows customers to request changes and updates for multiple Toll-Free records and is charged per file processed. Monthly demand declined during prior tariff period, in part, due to the transition to the new platform. Demand for the prospective tariff period February 15, 2020 through February 14, 2021 is projected to increase to 74 batch updates.

#### **4.8 Batch Update Testing per Hour**

This service element provides for initial testing of batch update files and formats required to properly conduct batch updates on the SMS/800 system as requested from the SMS/800 support team and is charged on an hourly basis as required. No additional Resp Orgs are anticipated to be adding this functionality and thus there is no activity expected for the prospective tariff period February 15, 2020 through February 14, 2021.